

UNITED STATES INTERNATIONAL TRADE COMMISSION

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In the Matter of

Investigation No.

337-TA-1448

CERTAIN VIDEO-CAPABLE LAPTOP, DESKTOP
COMPUTERS, HANDHELD COMPUTERS,
TABLETS, TELEVISIONS, PROJECTORS, AND
COMPONENTS AND MODULES THEREOF

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OPEN SESSIONS

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UNITED STATES INTERNATIONAL TRADE COMMISSION

Washington, D.C.

Before the Honorable MaryJoan McNamara

Administrative Law Judge

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In the Matter of

Investigation No.

337-TA-1448

CERTAIN VIDEO-CAPABLE LAPTOP, DESKTOP

COMPUTERS, HANDHELD COMPUTERS,

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International Trade Commission

500 E Street, SW

Washington, D.C.

Evidentiary Hearing

Wednesday, March 4, 2026

Volume I

The parties met pursuant to notice of the
Administrative Law Judge at 9:30 a.m. Eastern.

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13 *** Index appears at end of transcript ***

14

15 PLEASE NOTE: Quotations from documents are reflected in the
16 transcript as read and may not constitute a verbatim quote.

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1 P R O C E E D I N G S

2 (In session at 9:30 a.m.)

3 JUDGE MCNAMARA: Good morning, everyone. It's
4 good to see you all this morning. We have a packed house.
5 Please be seated.

6 This should be a very interesting trial, I think.
7 We all use and have the benefits of this technology, so,
8 again, it's kind of exciting to see it in motion, as it
9 were, and I love punning, so there you go.

10 We're here today for the evidentiary hearing in
11 the matter of Certain Video-Capable Laptop, Desktop
12 Computers, Handheld Computers, Tablets, Televisions,
13 Projectors, and Components and Modules Thereof,
14 Investigation No. 1448.

15 So, again, it's good to see you all. It looks
16 like we'll have a good seven days. We have a lot of
17 witnesses to cover. But before we get started, what I would
18 appreciate is if each of the trial teams would introduce
19 your leads and your colleagues, starting with the
20 Complainant Nokia.

21 MR. LIPSCHITZ: Yes, Your Honor. Warren
22 Lipschitz for Nokia. And we have four client
23 representatives here for Nokia. We have Susanna
24 Martikainen.

25 JUDGE MCNAMARA: Good morning, welcome.

1 MR. LIPSCHITZ: Robert Gray.
2 JUDGE MCNAMARA: Morning.
3 MR. LIPSCHITZ: Clemens Heusch.
4 JUDGE MCNAMARA: Good morning.
5 MR. LIPSCHITZ: And Todd Leitstein.
6 JUDGE MCNAMARA: Good morning.
7 MR. LIPSCHITZ: And then the attorneys on the
8 team: Josh Newcomer.
9 JUDGE MCNAMARA: Good morning.
10 MR. NEWCOMER: Good morning.
11 MR. LIPSCHITZ: Mitch Verboncoeur.
12 JUDGE MCNAMARA: Yes, good morning.
13 MR. LIPSCHITZ: Jamie Levien.
14 JUDGE MCNAMARA: Yes, good morning.
15 MR. LIPSCHITZ: Alex Chern.
16 MR. CHERN: Good morning, Your Honor.
17 JUDGE MCNAMARA: Yes, good morning.
18 MR. LIPSCHITZ: Kyra Cooper.
19 JUDGE MCNAMARA: Good morning.
20 MR. LIPSCHITZ: Erik Fountain.
21 JUDGE MCNAMARA: Good morning.
22 MR. LIPSCHITZ: And Matt Cameron.
23 JUDGE MCNAMARA: Good morning.
24 MR. LIPSCHITZ: And also behind Mr. Cameron here
25 we have Omar Moreno.

1 JUDGE MCNAMARA: All right.

2 MR. LIPSCHITZ: And Melissa Kalka.

3 JUDGE MCNAMARA: Good morning.

4 MR. LIPSCHITZ: And then we also have some of our
5 witnesses here today, Your Honor.

6 JUDGE MCNAMARA: Sure.

7 MR. LIPSCHITZ: Okay. We have Dr. Pierre Moulin.

8 JUDGE MCNAMARA: Good morning, Dr. Moulin.

9 MR. LIPSCHITZ: Mr. Mike Akemann -- or, I'm
10 sorry, Dr. Mike Akemann.

11 JUDGE MCNAMARA: Good morning.

12 MR. LIPSCHITZ: We have Dr. Doug Chrissan.

13 JUDGE MCNAMARA: Good morning.

14 MR. LIPSCHITZ: And I see Dr. Keith Botner back
15 there.

16 JUDGE MCNAMARA: Yes, good morning.

17 MR. LIPSCHITZ: And Dr. Iain Richardson. There
18 he is.

19 JUDGE MCNAMARA: Ah, yes, Dr. Richardson and I
20 have met before.

21 MR. LIPSCHITZ: Okay. I apologize if I missed
22 anybody, but I think I got them all, Your Honor.

23 JUDGE MCNAMARA: Yes. All right. Thank you very
24 much.

25 All right. Now for Respondents?

1 MR. COLAIANNI: Good morning, Your Honor. Joseph
2 Colaianni on behalf of the ASUS Respondents.

3 JUDGE MCNAMARA: Yes.

4 MR. COLAIANNI: I'd like to introduce my
5 colleagues with me today. Mr. Linhong Zhang.

6 MR. ZHANG: Good morning, Your Honor.

7 JUDGE MCNAMARA: Good morning.

8 MR. COLAIANNI: Jack Wilson.

9 MR. WILSON: Good morning, Your Honor.

10 JUDGE MCNAMARA: Good morning, Mr. Wilson.

11 MR. COLAIANNI: Lawrence Jarvis.

12 MR. JARVIS: Good morning, Your Honor.

13 JUDGE MCNAMARA: Good morning.

14 MR. COLAIANNI: April Park.

15 JUDGE MCNAMARA: Good morning.

16 MR. COLAIANNI: Kyle Fleming.

17 JUDGE MCNAMARA: Good morning.

18 MR. COLAIANNI: And Damien Thomas.

19 JUDGE MCNAMARA: Good morning.

20 MR. COLAIANNI: We also have two representatives
21 from ASUSTeK Computer Inc. here today, one of which will be
22 a witness. That's Mr. Victor Cheng.

23 JUDGE MCNAMARA: Yes, I saw him on the schedule.
24 Good morning.

25 MR. COLAIANNI: And he is accompanied by Leslie

1 Wang.

2 JUDGE MCNAMARA: Okay, very good. Good morning.

3 MR. COLAIANNI: And we have a few of our experts
4 here who will also be testifying you'll hear in the coming
5 days. We have Dr. Dan Schonfeld.

6 JUDGE MCNAMARA: Yes, we've also met. Good
7 morning.

8 MR. COLAIANNI: Dr. Sheila Hemami.

9 JUDGE MCNAMARA: Yes, good morning.

10 MR. COLAIANNI: Dr. Tim Simcoe.

11 JUDGE MCNAMARA: Yes.

12 MR. COLAIANNI: And, finally, last but not least,
13 Dr. Mario Lopez.

14 JUDGE MCNAMARA: Yes, good morning.

15 MR. COLAIANNI: Thank you, Your Honor.

16 JUDGE MCNAMARA: And, of course, I've seen all of
17 your names. Good morning.

18 MS. ROBERTS: Good morning, Your Honor.

19 Stephanie Roberts from Morgan Lewis on behalf of Acer. With
20 me I also have my colleague Matt Rizzolo.

21 JUDGE MCNAMARA: Yes, good morning. How are you?

22 MS. ROBERTS: Brent Hawkins.

23 JUDGE MCNAMARA: Good morning.

24 MS. ROBERTS: Corey Houmand.

25 MR. HOUMAND: Good morning, Your Honor.

1 JUDGE MCNAMARA: Good morning.
2 MS. ROBERTS: Zach Miller.
3 JUDGE MCNAMARA: Good morning.
4 MS. ROBERTS: Jason Gettleman.
5 MR. GETTLEMAN: Good morning, Your Honor.
6 JUDGE MCNAMARA: Good morning.
7 MS. ROBERTS: Anne Le.
8 JUDGE MCNAMARA: Good morning.
9 MS. ROBERTS: Avery Welker.
10 MR. WELKER: Good morning, Your Honor.
11 JUDGE MCNAMARA: Good morning.
12 MS. ROBERTS: Alex Harrison.
13 JUDGE MCNAMARA: Good morning.
14 MS. ROBERTS: And we have several client
15 representatives with us. Sean Huang.
16 MR. HUANG: Good morning, Your Honor.
17 JUDGE MCNAMARA: Welcome.
18 MS. ROBERTS: Tristan Hsu.
19 JUDGE MCNAMARA: Good morning.
20 MS. ROBERTS: And Lou Wang.
21 JUDGE MCNAMARA: And welcome to all. It's going
22 to be quite a trial.
23 All right. And, of course, for Staff, I'm sorry,
24 Ms. Ducca.
25 MS. DUCCA: Not quite as many people as the

1 private parties, but I'm Marissa Ducca on behalf of OUII,
2 and joining remotely is Anne Goalwin.

3 JUDGE MCNAMARA: Yes. And I am delighted by
4 that.

5 Good morning, Ms. Goalwin.

6 And also with me today are Alton Hare, Jae Lee,
7 who is going to be listening in, again, on Webex, and also
8 Ngozi Ekweonu.

9 So before we get started, just a couple of
10 matters that I wanted to mention.

11 First of all, in the past, for those of you who
12 have been in hearings before me, I sometimes have been able
13 to go late at night, but I've been reminded that our staff,
14 our security staff, leaves at 5:30, and so we're going to
15 keep to the schedule of 9:30 to 5:30 each day to accommodate
16 them and be kind to them.

17 If you need additional time, where we'll need to
18 probably adjust a bit is lunchtimes and breaks. We'll shave
19 a little here, a little there, but the expectation is that
20 we won't need to do that, or I hope we won't need to do
21 that.

22 We will take two breaks during the day. We'll
23 take a morning break and an afternoon break. They will be
24 organic. They will be at natural stopping points.
25 Typically the presenter will ask whether it's a good time to

1 break, and I usually say yes. I don't think I've ever said
2 no.

3 And, of course, if Ms. Kinkade needs a break,
4 we're going to take a break, to be sure.

5 We'll also have a lunch break, and, again, in the
6 past I've done that fairly organically, but we're going to
7 stop at 1:00 so everybody has that expectation and can
8 prepare for that.

9 I think that's it insofar as any -- oh, the other
10 things. I would appreciate it, I know who many of you are,
11 I know your faces, but it would be very helpful, if when you
12 stand up to speak, you identify yourself again. It's good
13 for our record. It keeps the record moving.

14 Additionally, I would appreciate it if each of
15 the sides would provide a person who is going to be
16 timekeeper.

17 So for the Complainants, for Nokia, who is your
18 timekeeper?

19 MR. LIPSCHITZ: Mr. Elliott Clay.

20 JUDGE MCNAMARA: Good morning, Mr. Clay.

21 And for the Respondents?

22 MR. COLAIANNI: Yes, Joseph Colaianni. Our
23 timekeeper will be Mr. John Lund.

24 JUDGE MCNAMARA: Okay. And, in addition, and
25 whether these are the same individuals or if you appoint

1 different people, as you know, when we move on to the
2 confidential record, I need to be sure that the room has
3 been cleared of anyone who is not on a protective order.

4 So would each side designate someone to also be
5 the room clearer or gatekeeper?

6 MR. LIPSCHITZ: Yes, Your Honor. Arden Seavers
7 for our team is going to play that role.

8 JUDGE MCNAMARA: All right.

9 And for the Respondents again, Mr. Colaianni?

10 MR. COLAIANNI: Your Honor, we will designate an
11 individual. I don't have an individual right now in mind,
12 but we will certainly designate someone to make sure that
13 the courtroom is cleared at appropriate times.

14 JUDGE MCNAMARA: Okay. Very good.

15 I think as you probably saw yesterday, the orders
16 were placed on EDIS that involved the motion for summary
17 determination that had been filed by one of the Respondents,
18 and that was denied for the reasons explained. And we had
19 signaled to you by email that that was going to occur. It
20 was just a matter of getting the formal order on to EDIS.

21 The same is true of the motions in limine. So,
22 again, we signaled to you beforehand what the outcome would
23 be, and it was just a matter of getting the orders up on to
24 EDIS.

25 That's all I have for this morning. Is there

1 anything that you would like to address?

2 MR. LIPSCHITZ: Not for Nokia, Your Honor.

3 JUDGE MCNAMARA: Okay, very good.

4 Mr. Colaianni?

5 MR. COLAIANNI: Nothing on behalf of Respondents,
6 Your Honor. Thank you.

7 JUDGE MCNAMARA: Okay.

8 Ms. Ducca?

9 MS. DUCCA: Nothing on behalf of Staff,
10 Your Honor.

11 JUDGE MCNAMARA: Very good. Wow. It's a lean
12 morning.

13 So if you're ready to get started with openings,
14 I'm looking forward to them.

15 MR. LIPSCHITZ: Yes, Your Honor. Warren
16 Lipschitz for Nokia.

17 OPENING STATEMENT

18 JUDGE MCNAMARA: Yes, Mr. Lipschitz.

19 MR. LIPSCHITZ: May I proceed, Your Honor?

20 JUDGE MCNAMARA: Yes. Thank you.

21 MR. LIPSCHITZ: Now, first, I'd like to start
22 just by thanking Your Honor for your time and attention to
23 this case. This case is very important to Nokia and we
24 really appreciate it.

25 Now, I know you've read a lot of materials on

1 paper already about this, but we're here because Acer and
2 ASUS are infringing Nokia's patents, plain and simple. Both
3 companies know that they need a license. That's not
4 seriously disputed. But through their conduct, they have
5 made it clear that the only way they are going to take a
6 license is if they are forced to do so.

7 Nokia has been negotiating with both companies
8 for over five years, and you're going to learn all about
9 those negotiations, but for now all you need to know is that
10 Respondents' position is that they should pay less than
11 every other one of Nokia's licensees on a per-unit basis,
12 including HP, one of their biggest competitors, and that's
13 why we're here.

14 Now, I expect Your Honor is familiar with Nokia.
15 Nokia has been around for over 150 years. Nokia is home to
16 Bell Labs, which is a world-renowned research group. Nokia
17 is also an operating company. It's the second-biggest
18 supplier of telecommunications infrastructure in the
19 United States today.

20 Nokia has its U.S. headquarters in Dallas, with
21 major offices in Texas, Illinois, and New Jersey, among
22 other places. Nokia has over 7,000 employees in the U.S.
23 and thousands of them are engineers.

24 Now, this case and these patents relate to
25 video-coding technology, and people today consume a lot of

1 video. Over 80 percent of data on the internet is video
2 data. Think about that statistic. Eighty percent of all
3 internet data is video data. So compressing that data is
4 critical. It's what enables us to stream video on our
5 devices.

6 Now, you might remember these Nokia phones in the
7 mid-'90s.

8 JUDGE MCNAMARA: I think I have one. I think I
9 have an early Motorola phone. I think -- I keep holding on
10 to them thinking maybe, maybe someday they might --

11 MR. LIPSCHITZ: Yeah. I remember playing Snake
12 on these phones.

13 So in the mid-'90s, Nokia was one of the biggest
14 cellphone makers in the world, and, from that perspective,
15 Nokia recognized something fundamental: video was the future
16 for mobile devices and existing video compression was not
17 good enough.

18 The leading video codec at the time was H.263,
19 and it was primarily designed for videoconferencing over
20 dial-up. It was not designed for mobile devices on wireless
21 connections, and it was not widely used. So Nokia invested
22 early and at real risk for better video compression. There
23 was no consumer demand for it at the time.

24 Netflix and YouTube did not exist yet and would
25 not for many years to come. The first cellphone camera had

1 not even come out yet. Nokia was not investing in an
2 existing industry, Your Honor. It was helping to create a
3 new one.

4 Now, around 1996 Nokia assembled a team of
5 engineers, including some of the inventors of the patents in
6 this case, to develop a proprietary video codec in-house for
7 their cell phones. And those engineers built a codec that
8 performed better than anything on the market.

9 In 1998, the ITU, which is the organization that
10 published the prior codec, H.263, issued a call for
11 proposals for a next-generation video codec that would
12 become H.264.

13 And at the time there was not a lot of interest.
14 Only four companies submitted contributions in response to
15 the call for proposal, and Nokia was one of them.

16 Nokia was there from the beginning. Nokia
17 decided to contribute its proprietary video codec that it
18 had developed in-house, and the participants adopted and
19 merged the contributions made by Nokia and another company
20 named Telenor, and that became the foundation and starting
21 point for the H.264 standard.

22 Now, these two engineers from Nokia, Miska
23 Hannuksela and Jani Lainema, were there from the beginning,
24 and they still work at Nokia today, 30 years later. They
25 are two of the inventors of the patents-in-suit along with

1 some of their colleagues. Combined, these two made over
2 1,800 contradictions to the video coding standards, and they
3 are inventor on over 500 patent families.

4 Now, Nokia has been recognized for its
5 leadership. Judge Robart, in the Microsoft v. Motorola
6 case, published a factfinding identifying Nokia as one of
7 the entities that made possible much of the innovation
8 associated with the H.264 standard.

9 This is a timeline on slide 8 of video decoding
10 standards and specifications. Dr. Iain Richardson, a
11 world-renowned engineer, is going to walk you through this.
12 Our infringement allegations in this case are against H.264,
13 H.265, and AV1.

14 The H.264 standard has now been almost
15 universally adopted, and Nokia continued to play a leading
16 role in the next-generation standard, H.265, which is widely
17 credited with enabling 4K video. And H.265 doubled the
18 compression efficiency of H.264.

19 AV1 was later published by Google as a competitor
20 to H.265, and unsurprisingly it uses a lot of the same
21 technology. Nokia never participated in AV1, which is
22 important, because it means Nokia has no RAND obligation as
23 to AV1.

24 Here are the accused products, Acer and ASUS
25 computers and tablets. Every product in this investigation

1 supports hardware accelerated, H.264 and H.265, and all but
2 a tiny handful support AV1. And for those that support AV1,
3 no modification is required. There is an API that's
4 available, and any application that's loaded on to that
5 device can use the AV1 functionality in the device.

6 Think about like an iPhone with GPS hardware and
7 software in it that maybe Google Maps isn't downloaded yet,
8 okay. The API is there, the functionality is there, and
9 it's available for any application that wants to use it.

10 Now, today I'm going to talk about the patents,
11 domestic industry, and Respondents' RAND defense. So let's
12 start with the patents.

13 So here are the four asserted patents, and,
14 Your Honor, Respondents have made dozens of noninfringement
15 arguments across these patents and have close to 20
16 invalidity grounds. I can't imagine they are going to
17 present them all, but we don't know for sure which ones they
18 are going to present, and so I've done my best to address in
19 this presentation what they seem to be focusing on.

20 So let's start with the '321 patent. This patent
21 is asserted against decoding H.264, H.265, and AV1 video.
22 It was found essential to all three codecs and infringed in
23 the 1380 investigation.

24 This patent is based on a Nokia contribution that
25 was adopted into the H.264 standard. You can see here it's

1 a contribution by Miska Hannuksela, one of the engineers I
2 mentioned earlier, and it was proposed and adopted. This is
3 not disputed. And Respondents' products support the
4 standard, and so they infringe.

5 The same idea was then carried forward into H.265
6 and AV1.

7 Now, typical video shows 30 frames per second,
8 and not much changes from frame to frame. For example, the
9 sky doesn't change from frame to frame. So we only encode
10 information about the sky once for the first frame, and then
11 for the next frame, rather than encoding that data again, we
12 can refer back to the prior frame, and we call the prior
13 frame a reference frame.

14 Now, there are different types of frames, an
15 I-frame --

16 JUDGE MCNAMARA: Pardon me, Mr. Lipschitz, before
17 you proceed, as you're going through your narrative, would
18 you kindly mention the demonstrative that you're on.

19 MR. LIPSCHITZ: Yes, Your Honor.

20 So this is slide 18, Your Honor. And so there
21 are different types of frames. An I-frame is a standalone
22 frame, an independent frame. A P-frame, like P-11 shown
23 here, is a frame that's predicted from one reference frame.
24 And a B-frame is predicted from two reference frames.

25 And in the prior art cited by Respondents, which

1 is the 1993 MPEG-1 standard, frames were sent in groups
2 called group of pictures, and all the frames could only
3 refer to the closest P- or I-frame.

4 MPEG-1 also allowed using the last picture in the
5 prior group of pictures as a reference frame, as shown here.

6 And these rigid rules in MPEG-1 made buffer
7 management easy for the decoder. The decoder knew it only
8 had to store the most recent I- and P-frame for reference.
9 Other than that, the decoder could delete everything,
10 referred to as flushing the buffer.

11 Here on slide 19, you can see that H.264 did away
12 with those rules. One frame could refer back to another
13 frame that is a hundred or five hundred frames away. And
14 that greatly improved compression efficiency, but it caused
15 an issue for the decoders. If you can reach back five
16 hundred frames for a reference frame, does the decoder have
17 to store all the frames in its buffer?

18 And what about random access? When a user starts
19 a movie in the middle, would the encoder have to encode and
20 send the whole video?

21 Dr. Hannuksela of Nokia proposed something called
22 an IDR frame be added to the H.264 standard. It's an
23 indication sent in the bitstream that there will be no
24 reference pictures before this frame. And you can see the
25 identifiers on the frames, B1, P2, et cetera. Nokia also

1 proposed that, when an IDR is received, the decoder resets
2 its frame identifier locally to zero.

3 Now, Nokia's contribution created two benefits.
4 First, the IDR indication let the decoder know you can flush
5 all the pictures before this IDR frame. None of them will
6 be used as a reference frame.

7 Second, resetting the identifier to zero locally
8 at the decoder helped identify errors. The decoder reset
9 the identifier locally to zero, and then compared that
10 against the identifier that's decoded from the bitstream,
11 which should also be zero, and if it doesn't match, there's
12 an error.

13 As I noted before, and shown here on slide 21,
14 Dr. Hannuksela contributed this idea to the H.264 standard,
15 and it was adopted into the standard.

16 Now, you can see on the right on slide 22
17 excerpts from the H.264, H.265, and AV1 standards. And I'll
18 read the first claim limitation here.

19 Decode from the video sequence an indication of
20 at least one image frame, which is the first image frame, in
21 decoding order, of an independent sequence, wherein all
22 motion-compensated temporal prediction references of the
23 independent sequence refer only to images within said
24 independent sequence.

25 And you can see in the limitation below beginning

1 with the word "whereby," it says, whereby the video sequence
2 is decoded without prediction from any image frame decoded
3 prior to said first image frame.

4 And that's exactly how the IDR frame works,
5 Your Honor, and I'll just read from the top here for the
6 H.264 standard.

7 After the decoding of an IDR picture, all
8 following coded pictures in decoding order can be decoded
9 without interprediction from any picture decoded prior to
10 the IDR picture.

11 And the evidence will show that the same concept
12 exists in AV1, except it's called a key frame. And that
13 brings us to Respondents' first noninfringement argument
14 reflected on slide 23.

15 Respondents say that an IDR picture is not an
16 indication of at least one image frame. And here's their
17 argument. A frame in H.264 can be broken down into
18 component parts. At the highest level we have a picture or
19 a frame. That's the whole thing. Within that we have
20 slices. That's a subset of a frame.

21 And Respondents say that the IDR indication is
22 sent in the slice header, not the picture header, so it's
23 not an indication of a picture or a frame. But all the
24 slices in the IDR frame include the same indication. And
25 this indication tells the decoder that this frame is an IDR

1 frame.

2 And the whole frame is then treated as an IDR
3 frame. And in the accused products, notably, most of the
4 frames are just one slice anyway.

5 And, remember, what we're accusing is called an
6 IDR picture. Nobody in this trial will dispute that a
7 picture is a frame. And an indication of an IDR picture is
8 an indication of a frame.

9 And for AV1, we're pointing to an indication of a
10 key frame, that says "frame" in the name.

11 On slide 25 is their second noninfringement
12 argument. The claim requires the decoder to start the
13 decoding of the video sequence from the first image frame.
14 And Respondents say that in the accused products, before
15 they actually start decoding the pixels in the first frame,
16 they decode some control information, like the identifier
17 value.

18 But look at what the claim says, Your Honor.
19 Start the decoding of the video sequence from said first
20 image frame. Don't start from the second or the third image
21 frame, like was done in the prior art, start from the first.
22 And that's exactly how their products work.

23 Now, we're going to take the last two limitations
24 together. The claim requires that the decoder decodes
25 identifier values, and then in the last limitation resets

1 the identifier value for the indicated first image frame.

2 And this is slide 26.

3 And that brings us to their third noninfringement
4 argument. Respondents do not dispute that the decode
5 limitation is met. But they dispute the reset limitation.
6 On reset, they say the claim requires the decoder to reset
7 the same identifier value that it decoded in the prior
8 limitation.

9 Now, on the right we have Respondents'
10 pre-hearing brief, and on the top half you can see a
11 variable called picture_order_cnt_lsb, and that is an
12 identifier value, and they admit that is sent in the
13 bitstream and decoded by the decoder.

14 And on the bottom you see
15 prev_picture_order_cnt_lsb, which they admit is set by the
16 decoder. This is an excerpt from their pre-hearing brief,
17 Your Honor.

18 They say that these are two different identifier
19 values. The bottom one says prev in front of it. It's got
20 to be different. But the evidence will show you that these
21 represent the same identifier. The decoder has a local
22 variable that is associated with the picture_order_cnt_lsb,
23 which it receives in the bitstream. It says prev because
24 it's the previous one that the decoder decoded.

25 And the evidence will show that, when the decoder

1 receives an IDR frame, it performs a local reset to zero.
2 The decoder then compares its reset value of zero to the
3 picture_order_cnt_lsb decoded from the bitstream to make
4 sure it's also zero, and if they don't match, there's an
5 error. That's how the patent works, and that's how their
6 products work.

7 AV1 shown here on slide 27, same thing, different
8 name. In the top half we have order_hint in lowercase and
9 in the bottom half we have OrderHint in upper case. And
10 Respondents say these have got to be different. One is
11 lowercase, one is upper case. But Respondents admit in
12 their brief on the right here that the upper case OrderHint
13 is just the decoder side variable that holds lowercase
14 order_hint. It represents the same identifier.

15 And just like in H.264 and H.265, the decoder
16 resets this value to zero locally for OrderHint, and in this
17 case by resetting an array called OrderHints, which is shown
18 just below, and that is infringement, Your Honor.

19 Now, for invalidity, Respondents point, as I
20 mentioned, to the prior art 1993 MPEG-1 standard. We're now
21 on slide 28. The evidence will show this does not
22 invalidate for several reasons.

23 In MPEG-1, pictures were sent in groups, and the
24 standard did not allow pictures to reach back any number of
25 frames for a reference frame. So in MPEG-1, the encoder

1 didn't identify a frame and say decode this frame first and
2 delete everything before it. It did not work that way.

3 And, as a result, the evidence will show you that
4 MPEG-1 did not meet several of these claim limitations.

5 The next patent is the '714 patent found
6 infringed in 1380, and the decoding claims were found
7 essential to H.265. This patent is asserted against
8 decoding H.265 video and encoding video into an H.265
9 bitstream.

10 This patent is also based on a Nokia contribution
11 that was adopted into the standard. This one into the H.265
12 standard. Respondents support the standard, so they
13 infringe.

14 Let's go back to our series of frames that we
15 were looking at earlier. This is slide 31. Now, remember
16 our first frame can be used as a reference frame for other
17 frames. And here the car is moving, but we can still use
18 the reference frame by using motion vectors to represent how
19 far the car moved. So we encode the information about the
20 blocks for the car in the first frame, and then, as shown in
21 slide 32, in the second frame we encode a motion vector that
22 says how much that block moved from the prior frame.

23 The motion vectors for all the blocks in a given
24 area are typically similar. And this patent provides a way
25 to efficiently encode and decode the motion vectors for each

1 of these little blocks.

2 So let's take an example from a real video. This
3 is from the movie The Matrix. Each of those little white
4 dots and lines are motion vectors. They indicate how far
5 these blocks of pixels are moving from frame to frame.

6 Now focus on his hand closest to the left side of
7 the screen. We're going to zoom in on that, and we're going
8 to add lines so we can see where the blocks are. So we're
9 now on slide 36. We want to encode these motion vectors and
10 send them to the decoder.

11 Now, generally we encode motion vectors left to
12 right, top to bottom, like how we read in English. That's
13 not a hard rule, but that's generally the case.

14 So on slide 37, we're going to add some arrows so
15 this is easier to see. And we're going to imagine that
16 we've started encoding these motion vectors into our
17 bitstream, and we have finished encoding all the yellow
18 arrows. Those ones have already been encoded, but we have
19 not yet encoded the green ones, those green arrows.

20 And so let's focus on the middle green arrow.
21 How are we going to encode that middle green arrow? Well,
22 one way is to code all the information about the arrow into
23 the bitstream. We can code the direction that it's pointed
24 and the magnitude of the arrow, but that takes a lot of
25 bits.

1 And, remember, nearby motion vectors are often
2 similar, and we've already encoded five of them here in
3 yellow. So rather than encode the green one again, we could
4 refer to one of the yellow ones we've already encoded. So
5 we've labeled each of the yellow motion vectors that have
6 already been encoded MV1 to MV5. And the encoder is going
7 to make a list of potential motion vectors that it can use
8 to approximate the green arrow, the green motion vector.

9 The encoder is then going to look at each of
10 those surrounding motion vectors and pick the one that looks
11 the most like the green arrow, which in this example is
12 shown here in slide 40 as MV4.

13 So the encoder picks MV4, and it sends the
14 decoder a message saying use number 4 on the list. That's
15 all it has to say, use number 4 on the list.

16 Now, imagine that we're on the decoder side.
17 This is slide 41. The decoder is working its way through
18 this frame, and it decodes these yellow arrows and it's
19 getting ready to decode the arrow for that box in the
20 middle.

21 And so the decoder is also going to create a
22 list. This is a list of the surrounding motion vectors in
23 yellow that it's already decoded. And then the decoder is
24 going to look at what the encoder sent, which was use number
25 4 in the list.

1 And the decoder will then pick motion vector
2 number 4, as shown on slide 43, and apply it to that block.

3 Now, another important consideration here. The
4 shorter the list, the fewer bits the encoder needs to send.
5 So if we have a list that's only one entry long, we only
6 need to send one bit. If we have a list that's five entries
7 long, then to indicate each of those different five entries
8 would require three bits. And in video coding, every bit is
9 precious.

10 So to make this list shorter, we remove
11 duplicates. And this patent relates to how we make the list
12 and how we remove the duplicates. And you'll see that the
13 way the prior art builds the list was very computationally
14 intensive.

15 So let's build the list the way they did it in
16 the prior art.

17 And I want you to pay attention to something
18 here, Your Honor. We're going to do ten total comparisons
19 in this example, and I've got a comparison counter on the
20 top right here. This is how the prior art draft of the
21 H.265 standard worked before Nokia's contribution.

22 So we want to encode that green arrow, and the
23 way we're going to do it is we're going to build a list of
24 motion vectors from the next-door neighbors and then select
25 the yellow arrow that looks most like the green one.

1 So let's start on the top right. We've got MV1.
2 So we're going to put MV1 on the list. Now let's move to
3 the next one. We've got MV2. But before we put it on the
4 list, we're going to check and see, is it a duplicate of
5 MV1. And you can see we just incremented our comparison
6 counter up to 1. It's different, it's not a duplicate, so
7 it goes on the list.

8 Now let's check MV3. So we're going to compare
9 it to MV1, not a duplicate. MV2, not a duplicate. It goes
10 on the list. Then we do MV4, and it's the same thing.
11 We're going to compare it to each item on the list to see if
12 it's a duplicate. And you can see our comparison counter is
13 building. We're up to seven comparisons now.

14 Now we're going to do MV5. We're going to
15 compare it to MV1, MV2, MV3, and when we get to MV4, we have
16 a duplicate here. So this is not going on the list.

17 But this took ten computations, and we had to do
18 them one after another. This is extremely inefficient. And
19 Nokia saw a better way.

20 Here's Nokia's contribution to the H.265 standard
21 contributed by Jani Lainema, who is one of the engineers
22 identified earlier along with two of his colleagues at
23 Nokia. It says the claimed benefits are decreased
24 complexity by reducing worst case number of duplication
25 number from 10 to 5, achieving parallel derivation of

1 spatial candidates.

2 So Nokia cut the number of checks from 10 to 5 in
3 every block, thousands of blocks per frame, 30 frames per
4 second.

5 And Nokia's method also enables these
6 computations to be done in parallel, which is far faster.
7 So that's two benefits, half the number of computations and
8 much faster.

9 Slide 65. Here's Nokia's idea straight from the
10 contribution. And I'll be honest, Your Honor, I always
11 found this figure a bit confusing because of the size of the
12 different blocks when I looked at it, but this layout is
13 very similar to the example we just walked through.

14 We're trying to determine the motion vector for
15 the block in the middle. And we're going to make a list of
16 potential motion vectors using the surrounding blocks. And
17 the surrounding blocks, like B1 or B0, they look small in
18 the figure, but they could be any size. Here I have shown
19 B1 and a few additional potential sizes in dashed lines. It
20 doesn't matter how big it is.

21 And the Nokia inventors asked, why are we
22 comparing all of these surrounding blocks to each other to
23 find duplicates? Remember, vectors close to each other are
24 often very similar to each other. B0 and B1 are likely very
25 similar to each other. A0 and A1 are likely very similar to

1 each other. So we don't need to compare all of A0 and A1
2 and B0 and B1 to each other. Just compare from those two
3 groups, A1 and B1. That's good enough.

4 And by comparing these blocks, based on their
5 relative locations, we can create a predefined set of
6 comparisons, and this allows us to perform all those
7 comparisons in parallel in one go.

8 So this was adopted into the standard. And on
9 slide 71 here, I'm showing one of the asserted claims. So
10 let's briefly walk through it.

11 So, first, we have select a first spatial motion
12 vector prediction candidate from a set. So in this example
13 we're going to select B0.

14 Next, we're going to determine a subset of
15 spatial motion vector prediction candidates, based on the
16 location of the block associated with the first motion
17 vector. So here we're going to pick a subset, which is B1
18 based on the location because it's right next door.

19 Then we compare the two motion vectors. Are they
20 duplicates? Are they the same or different? Then we
21 determine whether to include them on the list based on the
22 comparison.

23 And that brings us to slide 76, what appears to
24 be Respondents' primary noninfringement argument. They say
25 first is limited to the first block that is selected. And

1 they say, according to the standard, the first block that's
2 selected is A1, and that goes on the list no matter what
3 without a comparison, and so they say there's no
4 infringement.

5 But you're going to hear from Dr. Pierre Moulin
6 who is going to explain to you that's not the way the
7 standard works. And it's also not what "first" means in
8 patent law.

9 "First" can refer to any of these blocks. It
10 could refer to B0, B1, B2, any of them. And I can't get
11 into the confidential information on the public record, but
12 you'll see that even under their interpretation there's
13 still infringement.

14 Now, for invalidity, none of the prior art
15 discloses these two limitations which require determining a
16 subset of motion vectors based on location of the block
17 associated with the first motion vector, and then comparing
18 those motion vectors.

19 Now, as explained before, all the prior art
20 requires comparing each new vector to each vector on the
21 list in serial order.

22 That brings us to the '267 patent, Your Honor,
23 slide 78. This patent was found infringed in 1380, and the
24 decoding claims were found essential to H.265 and AV1. This
25 patent is asserted against decoding H.265 and AV1 video and

1 encoding video into H.265 and AV1 formats.

2 This patent is also based on a contribution Nokia
3 made that was adopted into the H.265 standard. Respondents
4 support the standard so they infringe.

5 And the same idea was then carried forward into
6 AV1. At the top you see one of the inventors I mentioned
7 earlier, Jani Lainema, along with some of his colleagues.
8 And at the bottom it shows that this was adopted. This is
9 not disputed.

10 So a little additional background is required for
11 this one. So a typical laptop has millions of pixels on it.
12 And when you watch a video, every one of those pixels has
13 three values associated with it. And ultimately all of this
14 technology that we're talking about in this lawsuit is about
15 decoding the pixel values for every frame so we can watch
16 the video.

17 So why do we have three pixel values for each
18 pixel? Well, every frame is really made up of three
19 pictures. The first is Y, which is called luma. It's a
20 perfectly clear black-and-white image. And apparently the
21 human eye is very sensitive to light and dark, and,
22 therefore, the black-and-white image carries the most
23 detail.

24 And the color difference from the black-and-white
25 image is shown in these other two frames. And when you put

1 those three together, you get the final image.

2 So we have three pixel values associated with
3 each of the millions of pixels in an image frame. And the
4 pixel values, as shown here on slide 82, are represented
5 with bits.

6 Moving on to slide 83. To get more detail or
7 more precision, we can use more bits. So focus on the top
8 row. Here we're only using one bit; 0 is black, 1 is white.
9 And to the right of this chart you can see that indicates
10 that there are two potential values, black or white. And as
11 we go down the chart, we can use more bits to provide more
12 detail where each row has more potential values.

13 Slide 84. Now, in a video, the objects on the
14 screen will not always fall perfectly onto the pixel
15 locations. The pixel locations are shown in white here, and
16 that's what shows up on your TV or your laptop screen. But
17 when an object moves across the screen like a car, it
18 doesn't jump from pixel to pixel, it moves in a smooth,
19 continuous motion. And, as a result, the object inevitably
20 falls in between the pixels.

21 And the locations between the pixels are called
22 subpixel locations. They are not shown on your TV, but they
23 are used for computations. And we can calculate the values
24 of those subpixels by doing something called subpixel
25 interpolation, which we'll discuss in a moment. And we can

1 then use those subpixels to help predict the values for
2 other pixels that will show up on your screen.

3 So slide 85, Fig. 12 from the patent, and this
4 represents how subpixel interpolation is performed. Here we
5 have a pixel layout. And the dark pixels with uppercase
6 letters are the actual pixel locations that appear, for
7 example, on your laptop screen. And the subpixels in
8 between are labeled with lowercase letters.

9 So let's do an example shown here on slide 86
10 where the pixel values at the dark gray pixels can only be
11 white or black, just simple, 1 or 0. And let's say we're
12 trying to determine the value at subpixel location B.
13 Uppercase G might be a 1 to indicate white and uppercase H
14 might be a 0 to indicate black, and using interpolation we
15 can average them and we get gray. But to represent gray
16 requires more bits. With one bit we can only represent
17 black or white, so we need more bits. When you have
18 subpixels, you need more bits to represent more potential
19 values.

20 Now, let's say we have these three frames and we
21 want to do bi-prediction to predict the pixel values in the
22 middle frame. So bi-prediction is where we predict the
23 values in one frame using two reference frames.

24 So here if we know what's in the left frame and
25 we know what's in the right frame, then we can figure out

1 what's in the middle frame. And that means that the encoder
2 doesn't need to send that information about the middle
3 frame, the decoder can figure it out on its own, on its end.

4 So we're going to have two separate predicted
5 values for the pixels, one from frame 1 and one from
6 frame 2. And the '267 patent is about how we combine those
7 predictions into one pixel value for the middle frame.

8 And so this is Fig. 10 from the patent, and it
9 represents the prior art. And this was the problem,
10 Your Honor.

11 Now, as I've indicated at the top of the screen,
12 in this example the pixel values -- these are the pixels
13 that are at the pixel locations -- the pixel values are
14 8 bits. The predicted values which can be the results of
15 subpixel interpolation are 14 bits. They have over 16,000
16 potential values. And below in red we have our two
17 predictions we're trying to combine into a single
18 bi-predicted value.

19 And so in the prior art shown here on slide 89,
20 before we combine those predictions we would shift them to
21 the input bit depth, which means we would round them down,
22 and this reduced the precision. Then we would combine the
23 lower precision predictions, and that's what caused the
24 problem.

25 So here's an example you may remember from claim

1 construction. 2.5 plus 2.5 equals 5. If we round down the
2 2.5s before we add the numbers, we get 2 plus 2 equals 4.
3 So by rounding before adding we introduced a rounding error.
4 And those errors can propagate. We can get an error in one
5 block of pixels which is then used to predict another block
6 of pixels and another block, and so on.

7 Now, before Nokia's invention, as shown here on
8 slide 91, they tried to address this problem during H.265
9 standardization, and their solution was to increase the
10 number of bits for every pixel value by 50 percent. It was
11 one way to solve the rounding problem, you know. Instead of
12 rounding from 2.5 to 2, you round from 2.50005 to 2.5000.
13 But it added 50 percent more bits to every pixel across
14 millions of pixels per frame, 30 frames per second. The
15 whole point of this exercise is to reduce bits, not increase
16 them by 50 percent.

17 And so Nokia saw a better way. Here's Nokia's
18 solution. So we've got our two predictions, which are both
19 14 bits. This is Fig. 11 from the patent, slide 92.

20 We then reduce to an intermediate value of
21 10 bits, or we can even just maintain the same precision of
22 14 bits, but what's important is we don't yet go all the way
23 down to the input precision just yet. We maintain the
24 higher precision, and then we combine the predictions. And
25 this was a much more efficient way to solve the rounding

1 problem that we talked about earlier. Only after we do that
2 do we reduce the precision down to 8 bits.

3 So slide 96 is Nokia's contribution. We can see
4 here it's on high precision bi-directional averaging. You
5 see the inventor I mentioned earlier, Jani Lainema, and, at
6 the bottom, the decision adopted.

7 Nokia applied for and was granted a patent on
8 this idea.

9 Now, Respondents make their noninfringement
10 argument a few different ways, but it really boils down to
11 one issue. Focusing on the figure on the right, they don't
12 dispute that they start with high-precision predictions,
13 like those 14-bit predictions in the example. They don't
14 dispute that they maintain a higher precision before
15 combining, like shown with those 10-bit values there. But
16 they say, after combining, in the last step they don't
17 reduce the precision. And that is simply not true,
18 Your Honor.

19 This is a figure from Judge Elliot's opinion
20 addressing this argument in 1380. What's on the left is
21 what Respondents say -- and, I'm sorry, slide 98.

22 What's on the left is what Respondents say is
23 required by the claims, which is reducing the number of bits
24 to reduce the precision. And we agree that what's on the
25 left there does reduce the precision. But on the right is

1 where we disagree.

2 Respondents say they do arithmetic shifting. And
3 that doesn't reduce precision because it keeps the same
4 amount of bits. But more bits does not necessarily mean
5 more precision.

6 Here is slide 99. If you look at those bits in
7 the green boxes, they are identical on both sides of the
8 slide. And the red numbers to the right of the bits are
9 identical too. So the top row, both are minus 77. The next
10 row, both are minus 39. The bottom row, both of those sets
11 of bits equal minus 20.

12 The difference between the left side of the
13 screen and the right side of the screen are the red boxes,
14 and those red boxes are filler bits. They carry no
15 information. They don't change the value of the bitstream.
16 There could be a hundred of those filler bits, and it would
17 not change the value of the bitstream. This is
18 substantively identical to what's on the left. And both of
19 these are reducing precision.

20 Now, on invalidity, Respondents take a similar
21 approach. They equate more bits with more precision. So if
22 they lose on infringement, they should lose on invalidity
23 too, Your Honor.

24 And this, Your Honor, is respectfully where we
25 believe Judge Elliot erred in 1380. He correctly rejected

1 Respondents' noninfringement argument that more bits equals
2 more precision but then invalidated the claims based on the
3 same theory that more bits equals more precision.

4 All of the Respondents' prior art references rely
5 on technology that was in the H.264 standard before H.265
6 even came out. But if the H.264 standard had already solved
7 the rounding error problem I described earlier, there would
8 have been no reason to fix it in H.265.

9 And, in general, Respondents point to weighted
10 predictions and argue, because they are weighted, they have
11 more precision. And so on the right is an example. We have
12 a prediction pred0 that has 256 potential values. And when
13 we multiply by a weight W0, we still have 256 potential
14 values. We're not gaining any precision here. We're not
15 getting additional information. We're just scaling. Just
16 because it's a bigger number and has more bits doesn't make
17 it any more precise.

18 Now, Respondents are going to say that the
19 weights vary within the blocks of pixels, and that's a new
20 position, but Dr. Richardson will show you that's incorrect
21 and why Respondents' prior art does not increase precision.
22 He will also show you that Respondents' prior art
23 combination is pure hindsight.

24 And that brings us to the last patent,
25 Your Honor, the '701 patent, slide 101. This patent is

1 asserted against H.265 decoding.

2 Nokia did not contribute this idea to the
3 standard, but there's absolutely no claim that the 2012
4 H.265 contribution is prior art. Nokia's patent predates
5 the contribution of this idea to the H.265 standard by two
6 years.

7 Now, this patent relates to entropy coding. And
8 here I'm on slide 103. Entropy coding applies codewords
9 based on probability of occurrence. So it's kind of like
10 Morse Code. We give the most commonly used letters, like
11 the letter E, a really short code, and we give the least
12 commonly used letters, like Z, a longer code. And we can do
13 the same thing with information in a bitstream. Information
14 that appears over and over in a bitstream can be represented
15 with very few bits and vice versa.

16 Now, modern entropy coding also uses context
17 updating. So imagine as we're talking this list is
18 constantly updating based on our conversation. If for
19 whatever reason we start using the letter Z more, like we're
20 doing right now, we can assign it a shorter code. And then
21 if we stop using the letter Z at some point, we can assign
22 it a longer code again. And that will give you even better
23 compression efficiency, but it comes with a cost. Context
24 updating is very processing intensive.

25 And this patent teaches a threshold for deciding

1 when you are and are not going to apply context updating.
2 So we use entropy coding with context updating up to a
3 point, and then when we cross the claimed threshold, we use
4 entropy coding without context updating.

5 Slide 105. The entropy coding is being applied
6 to transform coefficients. So what are transformed
7 coefficients? So on the left we have a block of pixels that
8 we're trying to code. Each little square is a pixel. But
9 instead of sending the information on each one of these
10 pixels on the left, we can apply transform coding.

11 So in the middle we have a bunch of standard
12 patterns, and it turns out that you can use some combination
13 of these patterns to represent just about any pattern of
14 pixels.

15 So think of this thing in the middle like an
16 artist's palette, but instead of paint colors, we have
17 patterns. And so on slide 107, we have applied weights to
18 each of these patterns to recreate what's on the left.

19 So here I've added the weights for each pattern.
20 So starting on the top left we're going to apply minus 15
21 times the first pattern plus minus 9 times the second
22 pattern, plus 2 times the third pattern, and so on. And
23 each of these numbers is called a transform coefficient.

24 And when you add them all together, those weights
25 times those patterns, we can recreate what's on the left.

1 Now, it may not be perfect, but it's close. And it takes a
2 lot fewer bits to send these transform coefficients than all
3 the individual pixel values.

4 So let's focus on the transform coefficients
5 because that's what we're going to apply entropy coding to.

6 So this palette that we have here shown in
7 slide 110, it's designed so that you have big numbers on the
8 top left and small numbers on the bottom right. So put
9 otherwise, the patterns on the top left of the palette are
10 very commonly used and the patterns on the bottom right of
11 the palette are very infrequently used.

12 So look at the first one in the top left. It's
13 just a white box. We're going to use that a lot for just
14 about every time that we do this. The patterns on the
15 bottom right are intricate checkerboards. They are very
16 infrequently used so they're typically weighted 0 or 1.

17 So here on the left we have that same block of
18 transform coefficients, slide 111. We just removed the
19 patterns. And note that the numbers on the bottom right are
20 small and the numbers on the top left are big. And the
21 transform coefficients are represented in the bitstream
22 through these five elements that are shown on the right.

23 So let's take number 15 as an example and see how
24 this works. Now, think of these components, these five
25 parts here, like buckets, and we're going to divide this

1 number 15 up between the buckets.

2 So the first thing to note is that all the
3 numbers on the right side of the screen below the number 15,
4 they add up to 15. 1 plus 1 plus 1 plus 12 is 15.

5 Now, the first component is the sig_coeff_flag.
6 This asks, is there a non-zero value. 15 is a non-zero
7 value, so we're going to put a 1 there.

8 Is it greater than 1? Yeah, it's greater than 1.
9 So we're going to put a 1 there.

10 Is it greater than 2? Yes. So we're going to
11 put a 1 there.

12 Is it positive or negative? We represent
13 positive with 0, negative with 1, so we put a 0. And then
14 all the remaining value goes down into the last bucket.

15 Now, we're going to focus on two of these syntax
16 elements today. For the top one in red in the prior art, we
17 use entropy coding with context updating for all the
18 transform coefficients. So we're going to continually
19 update the context as we go, which is great for compression
20 but very processing intensive.

21 And for the bottom bucket in green, we do entropy
22 coding without context updating, which is not quite as good
23 for compression, but also not as processing intensive.

24 Now, remember, the invention is about using this
25 threshold to determine when are we going to stop using

1 entropy coding with context updating and start using entropy
2 coding without context updating.

3 And as required by H.265, the Accused Products
4 use this threshold. Once we cross the threshold, we stopped
5 context updating data in that red box up there, the greater
6 than 1 box, and instead we move that data over to the bottom
7 bucket for entropy coding without context updating.

8 So why do we use a threshold? It's because this
9 greater than 1 flag, this red box, is very helpful for the
10 low values on the bottom right of the transform block, but
11 it gets less and less helpful as we move our way up and to
12 the left.

13 Now, when we code these values in the transform
14 block, we do it in this zigzag order, starting on the bottom
15 right, and we kind of zigzag our way up to the top left.

16 And for anything that has a value of 1, that red
17 box, that greater than 1 flag, it saves you bits. So look
18 at the red box, if the greater than 1 flag is set to 1, like
19 we have here. So we've got -- or, I'm sorry, if the value
20 is 1.

21 So the first coefficient asks, is there a
22 non-zero value. Yes. It's a 1. Is it greater than 1? No.
23 It's a 0. We don't have to put anything in that green box.
24 That's a benefit to us because the compression is not as
25 good in that green box as it is in the red box.

1 But as we move our way up and to the right, we're
2 going to see what's in the red box is a 1 every single time,
3 and that's not helpful to us anymore.

4 So here we've got the number 4. If we code the
5 number 4, the greater than 1 flag is set to 1 because that's
6 greater than 1, but we're still putting values in that green
7 box. The flag didn't really help us very much.

8 We go to negative 9. For negative 9, the flag is
9 going to be 1. It doesn't help us. We're still putting a
10 bunch of data in that green box. So we're context updating
11 this red bucket, which requires all this processing power,
12 but it's not doing anything for us.

13 Skip forward to number 15. Same thing. Flag is
14 set to 1. Doesn't help. We still have a lot of data in the
15 green box.

16 At some point when we get closer to the top left,
17 that flag stops helping us, and we don't want to waste
18 processing power context updating it anymore.

19 So in H.265, a threshold was set. Once we get to
20 our eighth non-zero transform coefficient in our zigzag
21 pattern, we're going to stop using the red box. We're going
22 to stop using that greater than 1 flag and, instead, we're
23 going to put the data in the green box where there is no
24 context updating. That means we're not doing context
25 updating on the red bucket anymore because we're not using

1 it anymore. Instead, we're moving it to the green bucket.

2 Slide 121. In 2010 one of our inventors that we
3 mentioned earlier, Jani Lainema, and some of his colleagues
4 filed their patent application on complexity balanced
5 entropy coding.

6 This is the part of the H.265 standard where the
7 threshold is implemented. You only use this greater than 1
8 flag, what we were showing in the red box earlier, if you've
9 had less than 8 greater than 1 flags, which means 8 non-zero
10 transform coefficients.

11 Slide 123 is Respondents' first noninfringement
12 argument. And they make two noninfringement arguments
13 regarding this claim limitation.

14 First, they don't dispute that they use that
15 threshold of 8 transform -- non-zero transform coefficients
16 that we just talked about, but they say the choice of 8
17 wasn't based on anything; it's totally arbitrary. This is
18 from their pre-hearing brief. The value of 8 was an
19 arbitrary choice.

20 But as shown on slide 124, the evidence will show
21 you it was not arbitrary at all. The H.265 contribution for
22 this feature explains in detail how the contributors tested
23 different values for the threshold to find the best tradeoff
24 of performance and throughput improvement.

25 Nokia's technical expert, Dr. Chrissan, will show

1 you how these tests were based on exactly the expected
2 frequency of occurrence of these non-zero transform
3 coefficients in the bitstream.

4 And that brings us to their second
5 noninfringement argument on this limitation, slide 125.

6 They say the infringing threshold is based on
7 non-zero transform coefficients in the bitstream and that --
8 and Respondents say these non-zero transform coefficients,
9 they are not coded directly into the bitstream. Instead,
10 they are broken up into those five component parts that we
11 talked about earlier, and those are coded into the
12 bitstream.

13 So they say the threshold isn't based on the
14 syntax elements. It's not based on the non-zero transform
15 coefficients because those things aren't put directly into
16 the bitstream. But a person of skill in the art would look,
17 of course, to the H.265 standard itself to see what a syntax
18 elements is.

19 And the standard defines "syntax element" as an
20 element of data represented in the bitstream. And these
21 transform coefficients are elements of data. There's no
22 question about that. And they are represented in the
23 bitstream using the five variables that are shown on the
24 right.

25 Slide 126. As for invalidity, we have a number

1 of distinctions over the various prior art references. But
2 one common distinction is that none of Respondents' prior
3 art teaches the threshold based on the expected frequency of
4 occurrence of syntax elements in the bitstream.

5 The claim requires basing the threshold on the
6 expected frequency of occurrence of syntax elements, and
7 what they point to are expected frequency of particular
8 values in the bitstream. And Dr. Iain Richardson will
9 explain why this difference is crucial to the improvements
10 of the '701 patent and why this patent is valid over the
11 prior art.

12 So next, Your Honor, I'm going to turn to
13 domestic industry.

14 So Nokia has over 100 licenses to its video
15 patents. Two of those licenses are with Microsoft and
16 Samsung. Here on slide 128 I'm showing the domestic
17 industry products. Every one of them supports H.264 and
18 H.265. And the investment in these products in the
19 United States has been very significant.

20 Microsoft and Samsung fully cooperated in this
21 investigation, and they gave us their internal accountings
22 on the investments. And Respondents cannot seriously
23 dispute that the investments in these products are
24 significant. And their expert will not say that the
25 investments are not significant. Instead, their expert just

1 tries to poke holes in the data provided by Microsoft and
2 Samsung.

3 And because they can't seriously dispute that
4 these investments are significant, Respondents argue that
5 the system on a chip, SoC, or in some cases the graphics
6 processing unit, the GPU, in the DI products, they say
7 that's the article of commerce, not the whole product, and
8 so the investments for the whole product are irrelevant.
9 But as you will see, not a single asserted claim in this
10 investigation can be practiced by the SoC or the GPU alone.

11 These patents are directed and specifically
12 designed to be used in end-user devices. And I'll show you
13 the claims in a moment. But here are two figures as
14 examples from the '714. Both of these figures appear in
15 both the '714 and '267 patents.

16 You may recognize Fig. 2 as one of those classic
17 Nokia phones. The patent refers to this phone as the
18 apparatus 50 and says the apparatus includes the parts shown
19 in Fig. 1.

20 In Fig. 1 you have a controller, that's a
21 processor. There's also a separate memory with computer
22 programming code on it. And those parts work together to
23 implement the invention. The processor calls the computer
24 programming code which is in memory and executes it. And
25 this is all required by the claims.

1 So on slide 130 I have two exemplary claims here.
2 Every single apparatus claim asserted in this case has these
3 same limitations across all four patents.

4 The apparatus claim requires a processor and, in
5 addition, a memory that includes computer programming code.
6 The SoC and the GPU do not satisfy those claim limitations
7 on their own.

8 As the claims explain, the processor executes the
9 computer programming code, which is stored in the memory,
10 which causes the products to then practice the remaining
11 parts of the claim.

12 On slide 131 here, this is from one of the DI
13 products, the Xbox, and you can see that it's got ten memory
14 banks in green surrounding the SoC, which is in the middle,
15 and there are 320 little, tiny lines running from those
16 memory banks to the SoC. The SoC does not work without
17 those memory banks. Those memory banks are a critical part
18 of the design of this product, as you will see. And they
19 don't come with the SoC. And they are required by the
20 claims.

21 The domestic industry products practice the
22 asserted claims. The SoC and the GPU do not. And that ends
23 the inquiry into article protected by the patent.

24 But even if you apply the article of commerce
25 test, the investments for the entire products are still

1 relevant.

2 You'll see evidence that the SoCs and the GPUs
3 and the DI products are highly customized, not available to
4 anybody else on the market and essential to the operation of
5 the products.

6 I have limited time so I'm going to give you one
7 example. For the Microsoft Xbox, Microsoft and AMD spent
8 years and a lot of money collaborating to develop a highly
9 customized SoC for the Xbox reflected here on this slide.

10 On slide 132 I have a quote from an AMD blog post
11 after the Xbox was released, and AMD said, AMD and Microsoft
12 worked together for several years to design and optimize
13 every aspect of the Xbox Series X system on a chip. The
14 goal was to deliver a transformational design.

15 And because of this, Judge Johnson Hines found
16 that the evidence as shown on slide 133 -- the evidence
17 supports that those chipsets are custom and exclusive for
18 the Xbox, not available for sale separately, and essential
19 for the operation of the Xbox.

20 And Judge Elliot reached the same conclusion.

21 The SoCs and the GPUs in the DI products are
22 specifically designed to be part of a completed end-user
23 product. They are permanently soldered in place, fixed, in
24 the DI products, and intraoperatively connected to the
25 memory and other parts of the device. The only way a user

1 can buy this functionality is as part of the end-user
2 product.

3 And the evidence will show you that the
4 investments in the Microsoft and Samsung domestic industry
5 products are relevant and significant.

6 And that brings us to our last topic, Your Honor,
7 Respondents' RAND defense.

8 So Respondents claim that Nokia breached RAND.
9 Slide 135. In this case, RAND applies to H.264 and H.265
10 decoding claims only. RAND does not apply to AV1 because
11 Nokia did not participate in AV1 and never submitted a RAND
12 declaration for AV1, and it does not appear that that is
13 disputed by Respondents.

14 RAND does not apply to encoding because the
15 standards themselves say that they do not standardize the
16 encoding process. And for that reason, Judge Johnson Hines
17 found that RAND does not apply to encoding claims.

18 Now, regardless, the evidence will show that
19 Nokia satisfied its RAND obligations. Nokia has made offers
20 to Respondents at the same rate agreed to in over 100 Nokia
21 license agreements, and they will not accept them. They
22 claim that all these license agreements are with small
23 companies. But, as you will see, that is not true.

24 Nokia has made Acer and ASUS the same offer
25 accepted by their major competitor, HP. It is the same

1 exact rate per unit as HP and almost entirely the exact same
2 terms word for word, and they won't take it. They won't
3 take anything close to it, Your Honor.

4 Now, you'll hear from Susanna Martikainen, who is
5 the chief licensing officer at Nokia for mobile devices.
6 She has been negotiating licenses for Nokia for 25 years,
7 and she is the team leader for the Acer and ASUS
8 negotiations.

9 You will also hear from Robert Gray, who is a
10 senior member of the video licensing team at Nokia.
11 Mr. Gray has worked at Nokia for close to 20 years, and he
12 has negotiated many of Nokia's most significant video
13 license agreements, including with HP, Samsung, Roku, and
14 many others that you'll hear about. And he is also in the
15 negotiations with Acer and ASUS.

16 They will tell you about Nokia's years of
17 good-faith efforts to reach agreements with Respondents and
18 Respondents' refusal to agree to a RAND license.

19 And I can't say the number in open court, but you
20 will see evidence that ASUS made an offer to Nokia in early
21 2022 that was less than 0.5 percent of what its competitors
22 pay, including HP, on a per-unit basis, less than 0.5
23 percent. And ASUS would not budge off of that offer for all
24 of '22, all of '23, all of '24, and most of '25 until six
25 months after Nokia filed this lawsuit.

1 Finally, in October 2025, two days after their
2 RAND expert served his report, they sent a two-line email to
3 Nokia matching the per-unit rate their paid expert said is
4 RAND. It was still 20 times less than Nokia's program rate.

5 And then just last week with this trial imminent,
6 ASUS made another offer, but they are still offering less
7 than 40 percent of what HP paid on a per-unit basis.

8 And as for Acer, its current offer is less than
9 15 percent of what HP paid on a per-unit basis.

10 Now, what Respondents will propose in this
11 hearing is unprecedented. They are going to ask Your Honor
12 to ignore over 100 licenses to the patents-in-suit. They
13 will not identify a single court that has done anything
14 close to that.

15 They will say that, instead, you should look at
16 what the patent pools charge for video patents, patent pools
17 that Nokia never agreed to join, patent pools that consist
18 of major implementers that wanted low royalties. And that's
19 okay for those implementers, but Nokia isn't bound by the
20 rates offered by others.

21 All of the Respondents' RAND arguments in this
22 case were previously presented by many of these same lawyers
23 and same experts in the 1379 and 1380 investigations, and
24 Judge Johnson Hines and Judge Elliot rejected them across
25 the board.

1 This is from 1379 on top, Judge Johnson Hines'
2 finding that there was no credible evidence showing that
3 Nokia's program rates are not RAND.

4 Judge Elliot said, Amazon has not shown that
5 either patent pool's rate is comparable to Nokia or that
6 Nokia's current offer is otherwise unreasonable.

7 Two additional German judges have also looked at
8 this issue and reached the same conclusion. One of them was
9 just a few weeks ago. This German judge specifically found
10 that Nokia complied with its RAND obligations and these very
11 negotiations between Nokia, Acer, and ASUS.

12 That's four independent judges evaluating Nokia's
13 program rate all concluding it does not breach RAND.

14 And that brings us to the final issue that I will
15 cover today, which is related to the RAND defense. After
16 years of delay, years of using Nokia's video patents without
17 paying a penny, and only after Nokia filed this lawsuit,
18 Respondents filed a rate-setting case in the UK. And
19 Respondents asked the UK Court to set a rate for Nokia's
20 H.264 and H.265 patents, including for Nokia's United States
21 patents.

22 And Respondents say, because they do that, the
23 U.S. and Your Honor should step aside and let the UK decide
24 the rate for Nokia's H.264 and H.265 patents.

25 Now, as an initial matter, AV1 is not part of the

1 UK case because Nokia has no RAND obligation for AV1. So
2 whatever happens in the UK proceeding has absolutely no
3 bearing on the AV1 claims asserted here.

4 As for H.264 and H.265, Respondents have no law
5 to support their request that Your Honor and the Commission
6 step aside and let a foreign court decide the remedy for
7 infringement of United States patents. No U.S. court has
8 ever done it.

9 Respondents will argue that Nokia has consented
10 to a UK rate-setting in other contexts, but that is
11 irrelevant. Of course, a party can consent to any court
12 resolving their dispute. But without consent, courts in the
13 UK, China, and other countries have no right to decide the
14 remedy for infringement of U.S. patents. That is the
15 exclusive jurisdiction of the United States.

16 Respondents' request that the Commission step
17 aside also cannot be squared with Section 337's mandate to
18 investigate unfair trade acts expeditiously. We may be
19 looking at three to five years before we get a result out of
20 the UK. And there is no purpose in waiting for the UK's
21 opinion when four judges in the U.S. and Germany have
22 already said that Nokia's program rates are RAND.

23 Respondents have also now put the issue before
24 Your Honor and the Commission. They are asking you to
25 decide whether Nokia breached RAND. They will have a full

1 and fair opportunity to make all of their arguments right
2 here in this court. A UK judge's opinion on RAND is no more
3 relevant or important than the opinion of a U.S. judge.

4 Your Honor, we believe the evidence will show
5 that Respondents are violating Section 337 and that an
6 exclusion order is appropriate, and we look forward to
7 proving our case.

8 Thank you, Your Honor.

9 JUDGE MCNAMARA: Thank you, Mr. Lipschitz.
10 Mr. Colaianni?

11 MS. DUCCA: Your Honor, before the Respondents
12 begin their presentation, is this a good time for a break?

13 JUDGE MCNAMARA: Yes. Thank you.

14 All right. I'll see you back here in 15 minutes.

15 (Whereupon, the proceedings recessed at 10:46
16 a.m.)

17 (In session at 11:00 a.m.)

18 JUDGE MCNAMARA: Please be seated.

19 There you are, Mr. Colaianni. You're up.

20 MR. COLAIANNI: Thank you, Your Honor. Good
21 morning.

22 JUDGE MCNAMARA: Good morning.

23 OPENING STATEMENT

24 MR. COLAIANNI: Joseph Colaianni on behalf of the
25 ASUS Respondents, and presenting this opening statement on

1 behalf of both Acer and ASUS Respondents.

2 On behalf of Respondents, I'd like to thank you
3 for your attention to this matter. We know this has been a
4 big, complicated case with a lot more issues than you
5 typically see in some 337 actions. You've seen a lot of
6 them, and this is a pretty complex one.

7 JUDGE MCNAMARA: It sure is. But I think what I
8 find so fascinating and, in a way, comforting is that I've
9 been using one of these for a very long time, and I have
10 been doing video streaming for a very long time, and I
11 believe Dr. Richardson testified in a case in which we had
12 very similar concepts.

13 So that's really lovely to be able to go back and
14 revisit these issues and see them in a slightly different
15 way.

16 MR. COLAIANNI: Absolutely. I appreciate that.
17 Respondents are very eager to participate in this hearing,
18 and we look forward to presenting our case and our evidence,
19 which we submit to you compels a finding of no violation.
20 You've heard a lot from Nokia's counsel just now. There's
21 obviously another side of the story. We would like to
22 present that.

23 And I'll start off by just saying that this
24 investigation implicates, as you know, video coding patents.
25 These are complex technology here. Thankfully we have very,

1 very competent experts on both sides to help explain this
2 for all of us and really focus on the disputed issues, and
3 there are disputed issues.

4 This case also, as you know, involves what Nokia
5 alleges to be standard essential patents and their express
6 RAND commitments that they made in connection with those
7 patents. And it requires us to consider all this against
8 the backdrop of a worldwide campaign by Nokia. This is one
9 piece of a worldwide campaign here for injunctive leverage
10 to extract what we contend are extra supra-FRAND rates for
11 the licenses.

12 To be clear, Acer and ASUS are willing licensees
13 here. They have committed to taking a license under Nokia's
14 video patent portfolio, including the asserted patents, on
15 FRAND terms that are -- would be decided by a neutral
16 arbiter.

17 The only reason this investigation was initiated
18 along with several others is part of Nokia's plan to extract
19 leverage under the guise of exclusionary relief and,
20 thereby, extract supra-FRAND rates.

21 I'm going to move ahead, and I will try to
22 remember to call out the slides, as Your Honor asked. This
23 is slide number 2 of our opening.

24 As Your Honor knows, we've had a lot of discovery
25 in this case. There's been a lot of witnesses, a lot of

1 document production, a lot of depositions, and just a lot of
2 information to process, and we've worked to distill it and
3 we've had a good discovery period.

4 We submit that the evidence here shows that there
5 is no violation of Section 337 for several separate and
6 independent reasons, Your Honor.

7 The first of which is noninfringement. We heard
8 Nokia's counsel say several times that, well, they practiced
9 the standard so they infringe. Well, it's not that simple.
10 We're going to hear about that a lot over the next week.
11 There's a lot of details in here. The standards are very
12 specific documents.

13 And there are things that -- the accused products
14 are also very complicated devices. And the experts have
15 done the hard work of analyzing those products, analyzing
16 the patents and the standards, and we're going to see that
17 there are key differences. I'm going to highlight some of
18 them this morning during this opening statement. I won't
19 touch on all of them because I think we don't have time for
20 that, and you're going to hear a lot about that. But we
21 submit the evidence compels a finding of noninfringement.

22 We also submit that these concepts in Nokia's
23 patents are not new. A lot of these concepts were well
24 known at the time Nokia patented them. We're going to show
25 that prior art and how it discloses a lot of these

1 limitations, either alone or in combination with other prior
2 art -- the experts are going to walk through that and
3 explain that to you, that there is a real invalidity case to
4 be made here. And we submit the patents -- the asserted
5 claims of the patents here are not valid in view of that
6 prior art.

7 We also contend that domestic industry is not
8 present. We heard Nokia's counsel talk about the very
9 large, significant investments in the downstream articles
10 that Microsoft and Samsung are producing. But we submit to
11 you that's not the correct inquiry. That's not the correct
12 inquiry because there's been an intervening Presidential
13 Commission case law that tells us we have to look at this in
14 a different way. We have to look at the actual article that
15 is alleged to practice the accused functionality.

16 Now, Nokia's counsel says, well, the downstream
17 products do that. Well, we'll talk about that. But this is
18 an issues that is of first impression. The Commission
19 Presidential opinion came down after the 1379 and the 1380
20 investigation. So we need to look at that fresh here.
21 That's a fresh issue. We submit that when you apply that
22 test, domestic industry is lacking.

23 And then, finally, of course, as Your Honor
24 knows, we have asserted several defenses relating to RAND
25 breaches by Nokia. There's a whole host of them. There's

1 breach of duty to negotiate in good faith, breach of their
2 RAND commitment, estoppel, several of these defenses that
3 all of which we contend form the basis for a finding of no
4 violation, or, at a minimum, if a violation is found, they
5 would preclude the imposition of a remedy on equitable
6 grounds. And we'll talk about that as well.

7 And Nokia's counsel made much of the 1379 and
8 1380 investigations. We're all aware of those. We're all
9 aware of those. They went to initial determination. We
10 have all read them.

11 We submit to you, Your Honor, when you hear the
12 evidence in this case, this case, not those cases, this
13 case, there's new issues. We have new parties here. We
14 have new evidence. We have new case law. There are
15 different issues in this investigation and new defenses that
16 require Your Honor to look at these with a fresh eye and
17 evaluate them on the merits.

18 I'm going the wrong way here. I'm sorry.

19 Let's begin with some brief historical
20 background, if we can, about the parties, Nokia's RAND
21 commitments. And you heard from counsel about a UK action.
22 I'll mention that briefly. Because these issues explain why
23 we're here today and why exclusionary relief is not
24 appropriate under the circumstances.

25 Let's begin with the parties. Nokia is a Finnish

1 corporation, once a mainstay in the cellular handset
2 business. You saw -- you said you had a Nokia handset.

3 JUDGE MCNAMARA: Yes, an old one. It is
4 definitely one of the early ones.

5 MR. COLAIANNI: An early one. Yes, I'm well
6 familiar with those.

7 And Nokia -- for purposes of this investigation,
8 Nokia is not relying on any products that it makes or sells.
9 Its domestic industry is based on licensing products, as
10 Your Honor knows.

11 And so Nokia -- and you heard correctly that
12 Nokia has been a very active participant in the
13 standards-setting organizations, especially with respect to
14 the telecom and video standards.

15 Slide 5. We have a little bit of overview here
16 on Acer. Acer and ASUS both are Taiwan-based manufacturers
17 of notebooks, tablets, Chromebooks, and other products that
18 are at issue in this investigation. Both parties have a
19 presence in the United States. They are respectively the
20 fifth and sixth largest producers of notebook PCs in the
21 United States.

22 As I mentioned, the patents here are
23 RAND-encumbered. They are declared by Nokia to be standard
24 essential to the ITU, which is the standard-setting
25 organization.

1 Nokia's ITU declaration, which we have reproduced
2 here on slide 7, is a contract. It's a contract in which
3 Nokia is obligated to license its standard essential patents
4 on RAND terms to all comers. That's what a party does when
5 it submits a RAND declaration. That's the commitment that
6 it makes, and it has to stand by that commitment.

7 Your Honor, I need to -- for a moment I need to
8 go on the confidential record for about a few minutes.

9 (Whereupon, the hearing proceeded in confidential
10 session.)

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1 O P E N S E S S I O N

2 JUDGE MCNAMARA: All right. Very good.

3 MR. COLAIANNI: The four patents asserted in this
4 case relate to hardware-accelerated video encoding and
5 decoding.

6 And counsel for Nokia spent a lot of time and
7 gave a great amount of detail regarding the patents,
8 Your Honor. I will refrain from repeating -- I think he did
9 a very good job of explaining a lot of the basic concepts.
10 I'm not going to repeat things, spare everybody that, and I
11 will try to focus this presentation on the issues that are
12 actually in dispute and the basis for Respondents' defenses.

13 So what is hardware acceleration? Hardware
14 acceleration is sort of a boost. Without hardware
15 acceleration, if you only have software doing the video
16 encoding or decoding, your computer's CPU, which is the
17 brain of the computer, it does all the work.

18 Now, it is capable of doing that, but it's a
19 generalist device, so it can do it, but it's going to do it
20 slower than if you have a dedicated processor such as a GPU,
21 graphics processing unit, or some built-in decoder to assist
22 it, and something that's designed to do the type of
23 repetitive math that this encoding and decoding requires.

24 That's what hardware acceleration is. It's sort
25 of an add-on to assist the device with speeding up and

1 smoothing out the video encoding and decoding process.

2 In this investigation, Nokia's only accusing of
3 infringement the hardware-accelerated video coding and
4 decoding in the accused products that relate to the 264,
5 265, and AV1 specifications. They are not accusing the
6 software decoding due to the license issue.

7 Now, before I dive into the patents, I'll just
8 say, Nokia made much about how in the 1379 and 1380
9 investigations of these, some of these patents were found to
10 be infringed, valid, et cetera. But, again, I would stress
11 that much of what is in dispute here is different than the
12 1379 and 1380 investigations, which of course did not
13 involve Acer or ASUS. They were not involved in those
14 investigations.

15 So I'm going to preview here now some of the new
16 arguments that Your Honor will be hearing about in the
17 coming week and submit that these deserve a fresh look
18 because they were not already addressed in the prior
19 investigations.

20 So let's look at the individual patents. The
21 first one is the '321 patent. This is displayed here on
22 slide 19, for the record.

23 The '321 patent was previously addressed in the
24 1380 investigation, but there are new issues here that bear
25 a fresh look.

1 The '321 patent is directed to a well-known
2 approach for allowing access at a random point in the video.
3 If you want to start looking at a video in the middle or
4 toward the end, you can move around the video. That's what
5 this is -- at a high level is directed to.

6 And it does that by -- the claims require certain
7 steps, one of which is numbering each of the frames. The
8 video sequence is a number of frames. It gives them numbers
9 just for purposes of encoding and decoding. And then it
10 groups the frames. It groups them into these individual
11 groups that are individually decodable. This group is
12 individually decodable from this group, and this group. So
13 it just forms a grouping.

14 And then the claim talks about resetting the
15 value, the identifier value, for the first image frame in a
16 group. And this just allows someone to browse or access a
17 random point in a video.

18 We have illustrated that here on slide 21 --
19 excuse me, slide 19. The digital video is a sequence of
20 frames. That's the green. Each of the blocks below are
21 image frames. The larger video sequence is encompassed in
22 the green.

23 And then within that the claim talks about
24 independent sequences. And these are the groups I was
25 referring to. In the patent, they are actually called

1 groups of pictures, or GOPs. Each of these GOPs is shown
2 here in slide 19. We have labeled them Independent
3 Sequence 1 and Independent Sequence 2 in yellow.

4 And then, finally, the claim talks about first
5 images of each of the groups. And that's shown. The first
6 image in the first independent sequence is in red on the
7 left, and then the first image of the second independent
8 sequence is on the right there. This just sort of sets the
9 table for what the claim is talking about.

10 Slide 20. Now, one limitation of claim 8
11 involves resetting, okay, resetting the identifier value for
12 the first image frame of the sequence. Your Honor is well
13 familiar with this. There's a claim construction live
14 dispute over resetting. But this is a limitation of the
15 asserted claim.

16 Dr. Hemami, Respondents' expert, will explain,
17 Your Honor, during her testimony how in the accused
18 products, okay, the alleged identifier value of the first
19 image frame is not reset, according to the claims here.

20 Nokia identifies a number of identifier values in
21 its infringement allegations, some of which have been
22 previously found not to satisfy the resetting limitation in
23 the 1380 investigation.

24 For example, the frame_num in H.264 that we've
25 reproduced here in slide 21 is an identifier value

1 identified by Nokia that is found not to be satisfying the
2 resetting limitation.

3 Now, there are other identifier limitations that
4 Nokia -- excuse me, there are other identifier values Nokia
5 has identified in this investigation as satisfying the
6 claim. Those values were not challenged in the 1380
7 investigation, but they are here.

8 Dr. Hemami now will explain during her testimony
9 how those additional identifier values similarly do not
10 reset the identifier value of the first image frame
11 according to the claims.

12 With respect to the prior art, you heard during
13 Nokia's opening about this MPEG-1. That's an older
14 standard. It's indisputably prior art to the patent.

15 In the 1380 investigation, the Respondents raised
16 MPEG-1 as a prior art reference, and Judge Elliot found that
17 it taught every limitation of the '321 patent, except
18 instead of resetting step being performed by the decoder, in
19 MPEG-1 he found the resetting step was performed by the
20 encoder. So that's shown here at the bottom, step 8.d on
21 slide 22. This was the deficiency in the MPEG-1 reference
22 that Judge Elliot had identified in the earlier
23 investigation.

24 In this investigation, Dr. Hemami will introduce
25 new evidence and explain to Your Honor why it would have

1 been obvious for the decoder to do the resetting. This is
2 again a new issue. There's new evidence being put forth
3 here relating to validity that needs to be considered. And
4 she will explain why it would be obvious in view of the
5 MPEG-1 reference alone and also in combination with other
6 references.

7 And so this evidence was not available to ALJ
8 Elliot, and it establishes the invalidity of the '321 patent
9 claims.

10 Let's move ahead to the '714 patent. I'm on
11 slide 24.

12 This patent also was previously litigated in the
13 1380 investigation, but here Respondents also have new
14 arguments and evidence that Your Honor needs to consider.

15 The '714 patent relates to video coding using
16 something called motion prediction. You heard a lot about
17 that during Nokia's opening with the motion vectors, and
18 that was a nice little presentation that sort of summarizes
19 the motion vector aspects of it, looking at surrounding
20 blocks and trying to pick the best motion vector from among
21 the ones you see, the ones that most closely approximate the
22 frame you're trying to code.

23 So the coding of a block -- when an image is
24 divided into a number of blocks, pixels, the coding of each
25 block is done by predicting the pixel values in that block

1 using the motion of the surrounding blocks, detection of
2 motion in those surrounding blocks. And the data that's
3 used in the surrounding blocks is called spatial motion
4 vectors. It's a bit of a mouthful, but spatial motion
5 vectors, just those arrows that we saw in counsel's opening.

6 The patent aims to build this motion vector list,
7 a list of those motion vectors, as counsel explained, based
8 on candidates from the neighboring blocks. And the patent
9 involves streamlining the process of building this list by
10 limiting the number of comparisons between these blocks so
11 that identical values aren't compared. Rather than compare
12 two blocks that we know are identical, we can discard one,
13 and it's fewer computations, fewer comparisons. And that is
14 purported to save resources. That's sort of the goal of the
15 patent.

16 With reference to slide 27, what was known in the
17 art was to generate this list, those spatial motion vectors,
18 and what was also known in the art was to remove identical
19 candidates from the list. So the purported novelty of this
20 patent is the removal of those candidates by using --
21 resulting in fewer comparisons. That's sort of the point of
22 the novelty of this patent.

23 Claim 15 is asserted. I'm speaking with
24 reference to slide 28. And claim 15 requires that, as part
25 of this spatial motion vector candidate prediction/selection

1 process, it requires that a subset of these spatial motion
2 vector prediction candidates, subset, be determined based on
3 the location of a block that has the first one of them.
4 Okay? The subset has to be based on the location of the
5 block associated with the first spatial motion vector
6 prediction candidate.

7 Dr. Hemami has analyzed the 265 standard and the
8 accused products in great detail, and she will testify that,
9 to the extent any subset is determined at all in the Accused
10 Products, it's based on the location of the block currently
11 being coded, not -- not the candidate block with the first
12 spatial motion vector prediction candidate. There's a
13 fundamental difference between the way the Accused Products
14 operate and the way the patent is designed and claimed.

15 I'm referencing slide 28 here.

16 This noninfringement argument that I just
17 mentioned was not at issue in the 1380 investigation because
18 it was not raised by Amazon. Amazon didn't raise it because
19 of the claim construction issue in that investigation, so
20 this is a new argument that Your Honor needs to consider in
21 connection with this investigation and the new evidence that
22 you will hear.

23 Slide 29.

24 With reference to slide 30, Acer, not ASUS, Acer,
25 will be advancing invalidity arguments based on prior art

1 for this patent. The reason ASUS is not is that ASUS filed
2 a petition for inter partes review at the Patent Office,
3 which was instituted and is ongoing right now, and, as part
4 of that process, ASUS stipulated not to advance invalidity
5 defenses in this investigation. So this defense will be
6 entirely on behalf of Acer, just to be clear.

7 The evidence will show that H.265 standard
8 follows largely the same motion vector selection process as
9 the prior art, especially a reference to Rusert. And any
10 minor differences in Rusert, such as the number of
11 comparisons made, the order in which they are performed, are
12 immaterial to the claims of the patent. So this Rusert
13 reference renders the claim invalid, and Dr. Hemami will
14 explain that during her testimony.

15 Let's move ahead, if we can, Your Honor, to the
16 '267 patent. This patent relates to bi-prediction which we
17 heard about during Nokia's opening as a type of motion
18 compensation where multiple reference frames are used to
19 predict the value of a block of an image.

20 The bi-prediction process involves a number of
21 mathematical calculations, and the '267 patent focuses on
22 maximizing the accuracy of those calculations.

23 In particular, the '267 patent focuses on
24 delaying mathematical rounding operations until the end of
25 the bi-prediction process, and the patent specifies the

1 precision of data at different points in the process.

2 The '267 -- the idea -- the concept behind the
3 '267 patent represents a minor contribution to the H.265
4 standard, as acknowledged here on slide 32. This is just a
5 clip from the proposal submitted by the inventor to the
6 standards body referring to it as a minor fix.

7 The '267 patent relates to a process by which a
8 block of pixels is predicted based on the two predictions
9 that are combined to form a final prediction. So we saw in
10 Nokia's opening there's a prediction in one block,
11 prediction in another block, and there's a combination of
12 the prediction values.

13 Nokia did not invent bi-prediction. It's been
14 known for decades. This is a process that is old and well
15 known. And, you know, a fundamental way of describing this,
16 which you have already heard from Nokia's counsel, and you
17 might recognize this graphic, Your Honor, from the claim
18 construction hearing, it's your basic arithmetic from grade
19 school that just makes the point of delaying the rounding.

20 On the left side, if we round -- we're adding 2.4
21 and 2.4, we would round down to 2. And if we do that
22 rounding before we add them together, we get the result of
23 4, which produces a delta of .8 from what the actual answer
24 would be. If we, instead, delay the rounding and do it at
25 the end, our result is 4.8, which is only .2. So this is

1 sort of a high-level way of illustrating the concept.

2 That was slide 34, for the record.

3 Now, with reference to slide 35, in the 1380
4 investigation, several of the '267 patent claims were
5 invalidated in view of a reference called Walker.

6 For the other '267 patent claims asserted in the
7 1380 investigation, Judge Elliot found that the difference
8 between the claims and the Walker reference was minimal, a
9 motivation to combine the reference's teachings was present,
10 and that there was no indicia of non-obviousness.

11 However, he found that the evidence presented
12 regarding level of ordinary skill in the art and the
13 expectation of success to be lacking, and so, therefore, he
14 did not invalidate certain claims.

15 So in this investigation we're going -- we
16 followed Judge Elliot's roadmap, and we will provide the
17 additional expert testimony to address those shortcomings
18 and show why the '267 patent claims are invalid.

19 Now as Your Honor is aware, in this investigation
20 Nokia has injected a new claim construction dispute
21 regarding the term "precision," and it's done that in an
22 attempt to dodge the invalidity ruling based on the Walker
23 reference. Specifically, despite the fact that in the prior
24 proceedings Nokia agreed to Respondents' construction of
25 precision, now Nokia is arguing for a narrower

1 interpretation of that term. And that, under this narrower
2 interpretation, invalidity is lacking.

3 Respondents' expert, Dr. Schonfeld, will explain
4 how the Walker reference invalidates the '267 patent under
5 any of these constructions.

6 In particular, the evidence shows that Walker
7 alone invalidates as well as in combination with another
8 reference called Srinivasan.

9 Slide 38 presents just a quick, easy chart for
10 Your Honor. This maps the asserted claim to the '267 patent
11 in this case versus their disposition in the 1380
12 investigation, to the extent that is helpful to be able to
13 track the claims. We can see on the right column there how
14 those claims were disposed of in the 1380.

15 In addition to showing the '267 patent is
16 invalid, Respondents will show that various accused products
17 do not practice the '267 patent.

18 In that vein, Dr. Schonfeld will explain how the
19 source code for these accused products does not perform the
20 right shifting that's required by the claims here, as shown
21 in slide 39.

22 Let move ahead to the '701 patent. This patent
23 is newly asserted in this investigation. It was not
24 asserted or at issue in the prior investigations. And as we
25 heard during Nokia's opening, this patent relates to

1 something called entropy encoding. This represents a minor
2 feature of H.265, which was well known in the prior art.

3 The '701 patent discloses categorizing something
4 called syntax elements in a video stream, and categorizing
5 them into two buckets. And that categorization is based on
6 a frequency of occurrence, so how often a syntax element is
7 predicted to be likely to occur. If it's likely to occur
8 frequently, more than the threshold, it's put into one
9 bucket. If it's predicted to occur less than that,
10 letter Z, it's put into the other bucket. That's the first
11 step here.

12 Now, the symbols that are in the bucket that
13 occur frequently are not subjected to what's referred to as
14 context update. While the syntax elements in the other
15 bucket that the occur less frequently, they get the context
16 update, because it's less computation, less processing to do
17 that updating for the lesser occurring term than for the
18 ones that occur a lot. So that's sort of at a high level.

19 And with respect to slide 43, we've mapped this
20 on to claim 1. And it just highlights the steps that I just
21 described. The first step, determining this frequency of
22 threshold. The second step is categorizing the syntax
23 elements based on that frequency threshold. And then the
24 third category is encoding each of those categories, one of
25 which gets the context update and one of which does not.

1 Just as a note, there was a certificate of
2 correction filed for this patent, and so the claims -- the
3 words "first" and "second" actually have been swapped here.
4 They are not as -- what's presented here on slide 43 is the
5 way the claim looks, but the certificate of correction
6 swapped the words "first" and "second." This is not at
7 issue. I don't think it's in dispute or affects anything
8 the Court will be doing. I just wanted to note it for
9 accuracy purposes.

10 With respect to slide 44 now, Nokia in its
11 infringement analysis relies on the syntax elements with
12 reference to the H.265 standard, and in the standard the
13 syntax elements are actually spelled out. We have
14 reproduced on slide 44 the portions of the specification
15 that relates to syntax elements.

16 And while Nokia relies on this definition, if you
17 will, of syntax element in this standard, it does not
18 identify the actual syntax elements, which are shown here at
19 the bottom, in these right here. It doesn't actually
20 identify those in its infringement analysis. Instead, it
21 relies on what we heard during opening of these non-zero
22 transform coefficients that are generated as part of the
23 video decoding process. But those non-zero transform
24 coefficients are very different things than the syntax
25 elements here. Dr. Schonfeld will explain that difference

1 and why that matters.

2 As another note, this portion of the standard was
3 actually submitted by Qualcomm, not by Nokia, this portion
4 of the H.265 standard. And Nokia here is forced to
5 mischaracterize this portion of the standard to maintain the
6 infringement case.

7 This is reference to slide 44, for the record.

8 Moving ahead to slide 45, Dr. Schonfeld will
9 explain during his testimony that, according to H.265, the
10 syntax elements are coded in either context-adaptive mode or
11 in bypass-mode, meaning they are coded -- either the syntax
12 elements receive the context update or they don't. But,
13 either way, they are coded regardless of their frequency of
14 occurrence. That's very important.

15 Remember, there's a step in the claim that
16 requires categorizing these based on the frequency of
17 occurrence. It's not the way the standard operates. In the
18 standard, the context coding is done regardless of the
19 frequency of occurrence.

20 The Accused Products follow the process specified
21 in the standard and, therefore, do not practice the claimed
22 step of categorizing the syntax elements based on a
23 frequency of occurrence threshold, and, therefore, they do
24 not infringe the claims of the '267 patent -- excuse me --
25 the '701 patent.

1 With reference to slide 46, under Nokia's flawed
2 interpretation of the claims for purposes of supporting this
3 infringement allegation they have made, we'll see that the
4 claims read on the Marpe and Peacock prior art.

5 Just a word about the Accused Products here. I'm
6 just watching the Ravens-Steelers game on the slide here.
7 With regard to the Accused Products, there are certain
8 Accused Products in the case of Acer and ASUS that have been
9 designed specifically to disable this hardware-accelerated
10 video encoding and decoding. And those products have been
11 the subject of discovery in the case, and they are ripe for
12 adjudication by Your Honor.

13 So to explain the disabling of the
14 hardware-accelerated video coding, it's first necessary to
15 understand that video coding can be done either by software
16 or by hardware, as we talked about earlier, and that's shown
17 here on slide 47.

18 At a high level, you know, you have the software
19 decoding and you have the hardware decoding. Together this
20 represents sort of a hardware-accelerated. It adds that
21 boost here. But you don't have to do it both ways. But
22 that's the hardware-accelerated model, and that's what's
23 accused in this case, only the hardware-accelerated video
24 encoding and decoding.

25 With reference to slide 49, Acer and ASUS have

1 redesigned certain products to disable those. How have they
2 done that? There's code loaded onto those processors that
3 prevents -- that basically disables/prevents
4 hardware-accelerated encoding and decoding from taking
5 place. So that the video is still processed, you can still
6 watch video, you can do everything you want to do, but it's
7 just done by software, only by software. So, in other
8 words, these accused products disable the very functionality
9 accused of infringement here by Nokia.

10 With reference to slide 50, the disablement here
11 is not -- the merits of the disablement is not really at
12 issue. Nokia is not contending that those disabled products
13 actually do have hardware acceleration. They are not
14 arguing that.

15 What they are saying instead is that, oh, we
16 could just reverse these; these are easily capable of having
17 the hardware acceleration reactivated. That's not true,
18 Your Honor. That's not true for a number of reasons.

19 One, these products were made available for
20 inspection. Nokia's experts came over and looked at these
21 and spent six days to reverse-engineer a handful of these
22 out of a larger number. And they did that by downloading
23 code to basically modify the products in a way that's not --
24 the products themselves out of the box were not capable.
25 They modified them by adding code to them to make them react

1 to hardware acceleration. But, again, they were only able
2 to do it on a few of them, and it took days to do it.

3 But, more importantly, more importantly, these
4 products that Nokia's experts came to inspect are prototype
5 products. They are not yet commercially available products.
6 And, therefore, the software that Nokia's experts were using
7 to try to reactivate the hardware acceleration will not be
8 available at all after the products go live. So they will
9 not at all be capable of reactivating hardware acceleration,
10 and, therefore, they should be found not capable of
11 infringing, not infringing.

12 Let's move on to domestic industry. I'm on slide
13 51. As noted, Nokia does not make or sell any products that
14 it is relying on in this investigation for its domestic
15 industry. Its claimed domestic industry consists of
16 downstream investments in products that merely use the
17 technology, not the actual articles that implement the
18 accused functionality.

19 The actual articles that practice the accused
20 functionality are chipsets, discrete chipsets, and software
21 provided by chipmakers, Intel, Qualcomm, AMD, companies like
22 that. These are the building blocks that actually do the
23 video decoding. That's what these patents are all about.

24 Downstream, the OEMs that are being relied on in
25 this case for domestic industry, Microsoft and Samsung, they

1 just acquire these chips and put them in their products,
2 into the Surface laptops, the Xboxes, the Galaxy phones.
3 These are just components that they incorporated.

4 Nokia does not identify any investments directed
5 to these specific components. What they are relying on are
6 the investments that Microsoft and Samsung make in other
7 activities.

8 You might wonder why Nokia is not relying on the
9 investments made by the U.S. chipmakers like Intel and AMD
10 and Qualcomm. It's because they are not licensed, that's
11 why.

12 Slide 53. The economic prong of domestic
13 industry requirement requires that these investments,
14 however, be directed to the actual products that practice
15 the patent. This is well-established.

16 And the approach being pursued here by Nokia has
17 been specifically rejected by the Commission. This
18 generalized downstream product spending that's divorced from
19 the spending on the actual article just does not establish
20 domestic industry.

21 And this precise issue -- I won't say precise,
22 but this issue was the subject of the Commission Opinion in
23 the 1351 investigation that analyzes this in some detail,
24 and we think it's instructive here, Your Honor. This
25 opinion was issued after the 1380 investigation came out,

1 and we think it needs to be analyzed carefully here and
2 applied, because it is binding precedent of the Commission.

3 So in the 1351 investigation, the Commission
4 applied this test, the three-factor test, from the Magnetic
5 Tapes investigation. And the three prongs are whether the
6 patented technology is sold as a separate entity -- that's
7 the first step -- separate entity or article of commerce.

8 The next step is whether it is an essential
9 component, okay, of the downstream product.

10 And, third, whether the domestic industry
11 activities have a direct relationship to the exploitation of
12 the patented technology. This is the test that needs to be
13 applied here, because Nokia is relying on downstream
14 articles, not the chips.

15 So with reference to slide 55, we can look at
16 these three factors. Factor 1, this factor favors
17 Respondents because the components that actually practice
18 the accused functionality, the chipsets, are sold. They are
19 separately sold and provided by third parties to Microsoft.
20 They are separate articles of commerce that are sold not
21 just to Microsoft and to Samsung, but to other entities who
22 use these chips.

23 That separate sale significantly weakens any
24 claim that these downstream investments are with respect to
25 the patented articles. This is precisely what the first

1 factor is trying to go to.

2 And there's no requirement that these sales be
3 made by the Complainant or the entity relying on it for
4 domestic industry purposes. They can be made by the
5 third-party chipset makers here, for example.

6 You'll hear from Nokia arguments about
7 customization. They are going to argue that, well, these
8 aren't just off-the-shelf chips, these are customized for
9 our products. But, Your Honor, you have to realize that
10 customization does not relate to the accused video decoding
11 functionality. It's different features.

12 And this general customization-related argument
13 that Nokia is making here was expressly rejected by the
14 Commission in the 1351 investigation. So this Factor
15 number 1 favors Respondents.

16 If we move ahead to Factor number 2, the
17 Commission made clear in its opinion that this factor
18 focuses on the question we have here on slide 56, is the
19 downstream product necessary for the exploitation of the
20 patented technology.

21 The answer here is, no, it's not. Incorporating
22 these components into the downstream Microsoft and Samsung
23 products is not the exclusive means of exploiting the
24 asserted patents.

25 The patented technology is sold separately in

1 these chipsets. Excuse me. The downstream devices, the
2 Microsoft and Samsung products, they do require video, sure.
3 They require some sort of codec or processor to process the
4 video. They don't require those specific patented
5 technology for doing it, though, not essential component.
6 And this factor also favors Respondents.

7 Respondents' expert, Dr. Seth, is going to
8 explain -- is going to walk through these factors in detail
9 and explain this during her testimony.

10 And, finally, we look at Factor number 3.
11 There's no relation here, let alone a direct one, between
12 Microsoft's investments and activities and the patented
13 technology. You heard from -- the spending that Microsoft
14 and Samsung are making on their products is far removed from
15 the patented technology.

16 Microsoft and Samsung are not investing in
17 anything relating to the decoding, video decoding. They are
18 investing in other things, retail sales, marketing, things
19 like that for their products, the downstream products.
20 Their investments are not directed to the actual article
21 that practices the patent, the decoding functionality.

22 There's no evidence here that Microsoft or
23 Samsung customized or invested in anything relating to video
24 decoding technology. This similarly was raised and
25 addressed in this 1351 Commission Opinion.

1 You heard from Nokia's counsel during his opening
2 that in 1379 and 1380 investigations the ALJs blessed this
3 domestic industry theory, but, again, this 1351 Commission
4 Opinion came down after those investigations. It requires a
5 fresh look here, and we look forward to presenting that
6 evidence through Dr. Seth.

7 We also heard from Nokia's counsel that these
8 chips aren't the patent-practicing products because they
9 lack certain elements, such as memory or processors or
10 thinks like that that the claims require. And he pointed to
11 some figures in the patent that showed a picture of a phone
12 and things like that.

13 But that argument fails because, as the evidence
14 will show, and the experts will explain, the chips contain
15 the material functionality for enabling the practice of the
16 264 and 265 video encoding standards. Everything inventive
17 about this technology is included in those chips, right?

18 At most, the downstream products had known
19 conventional elements, such as memories and things of that
20 nature. That's the proper way to look at this, and we look
21 forward to explaining that through Dr. Seth.

22 This is slide 57, for the record.

23 So, to recap, under the facts and circumstances
24 here, Nokia has not established the downstream products are
25 the relevant articles protected by the patent and has failed

1 to establish the presence of a domestic industry.

2 In addition to the standard essential
3 patent-based public interest concerns that I previously
4 mentioned, traditional public interest considerations weigh
5 against the imposition of an exclusionary relief in this
6 investigation.

7 With reference to slide 59, we see the well-known
8 four public interest factors that the Commission is required
9 to consider in every case.

10 Dr. Seth will address these public interest
11 factors, and she will explain some details about Acer and
12 ASUS's market share in certain products, particularly in the
13 education segment, for example. Notebook PCs, they have a
14 very significant U.S. market share. The same is true for
15 the gaming segment and some others.

16 There were not any reasonable alternatives to
17 fill voids that we left in the market in the event of an
18 exclusionary order because we'll see that every price band,
19 the other OEMs, other producers, would have to significantly
20 ramp up their production, sometimes on the order of up to 90
21 percent, which is not realistic.

22 And she will explain this and explore this along
23 with other factors that would explain why in this particular
24 investigation this -- these public interest factors, along
25 with the standard essential public interest factors that I

1 mentioned earlier weigh against the imposition of
2 exclusionary relief.

3 The exclusion order here would harm U.S.
4 consumers too in the form of product shortages, increased
5 prices, and things of that nature that also she will explore
6 in some detail during her testimony.

7 And finally, Your Honor, if there's a remedy in
8 this case, it should be specifically tailored. The evidence
9 adduced shows that -- of course, we believe no remedy should
10 be forthcoming here based on the evidence, but if there is a
11 remedy, it should be tailored specifically based on the
12 facts that are developed during discovery.

13 In particular, in view of the UK rate-setting
14 action I mentioned earlier that's ongoing and imminent, it
15 simply makes sense here to delay any exclusion order until
16 we find out the rate that is set by the court, since the
17 Respondents have already committed to accepting that rate.
18 Any remedy should be suspended until the conclusion of the
19 UK rate setting action.

20 We also submit that the evidence supports a
21 carveout for the education segment of notebook PCs based on
22 the market share data that Dr. Seth will explain, as well as
23 a certification provision, and a warranty and repair
24 exception. Both Acer and ASUS offer quite extensive
25 warranties for their products and U.S. consumers shouldn't

1 be punished if an exclusion order issues.

2 Finally, we submit that no bond is appropriate
3 here or warranted. Nokia is not advancing any competing
4 products of its own. There's no reason to impose a bond
5 here to protect products that don't exist.

6 So I'll close out, Your Honor, by just a brief
7 introduction and a preview of the roles of our Respondents'
8 witnesses.

9 I mentioned earlier Ms. Kate Shang and Mr. Victor
10 Cheng will be fact witnesses testifying on behalf of Acer
11 and ASUS respectively regarding the businesses of
12 Respondents and the negotiations they have had with Nokia.

13 Our technical experts are Dr. Sheila Hemami, who
14 will be handling infringement and invalidity issues
15 regarding the '321 and the '714 patents.

16 Dr. Schonfeld will have a similar role with
17 respect to the other two patents, the '267 and the '701
18 patents.

19 Dr. Acton is a technical expert who will discuss
20 the relative technical contributions to the standards of
21 Nokia's patents versus patents in the patent pools. He has
22 kind of a very specific role he'll be talking about.

23 At the bottom we see our economic experts,
24 Dr. Lopez and Dr. Simcoe. They will be testifying about
25 FRAND-related issues and supporting our FRAND defenses.

1 And, finally, Dr. Seth will be handling the
2 domestic industry economic prong and public interest
3 considerations. She will be supported by Dr. Phiroz, who
4 will focus specifically on the supply chain disruptions that
5 would ensue in the result of an exclusion order and how they
6 would impact the market in the event of an exclusion order.

7 With that, Your Honor, I will conclude, and I
8 thank you for your attention.

9 JUDGE MCNAMARA: Thank you, Mr. Colaianni.
10 Ms. Ducca?

11

12 OPENING STATEMENT

13 MS. DUCCA: Good morning, Your Honor. Marissa
14 Ducca on behalf of OUII. I will try to be brief. I am not
15 going to repeat all of the other arguments that you heard
16 about. I agree with Respondents that there are a lot of
17 issues in this case.

18 What I'm going to do in my next 15 to 20 minutes
19 is highlight the Staff's positions and also try to identify
20 where I see the biggest disputes, because I do think there
21 are some smaller disputes, some bigger disputes.

22 There was a lot of talk about the 1379 and 1380
23 investigations. Full disclosure. I was the Staff attorney
24 on both of those investigations. And we were full
25 participation in 1379 and partial participation in PI and

1 remedy in 1380. The Staff's positions in this investigation
2 largely reflect the ALJ's decisions in 1379 and 1380,
3 because they largely reflect the Staff's positions in those
4 investigations as well.

5 I do agree with the Respondents, there are some
6 new issues, there are some new arguments here. Two of the
7 areas where I've seen a little bit more development is in
8 the invalidity front. I think they have introduced some new
9 evidence for invalidity, including some new combinations,
10 and I've also seen the Complainants introduce more evidence
11 and more argument with respect to the economic prong, and,
12 in particular, the marketplace arguments.

13 The RAND arguments are largely the same, in the
14 Staff's view. The argument about the -- about the patent
15 pools is largely the same. Nokia's behavior during license
16 negotiations is largely the same. Of course, Acer and ASUS
17 are different parties, so they behave differently, but, in
18 the end, the arguments are similar.

19 Looking at slide SDX-1.2, in the Staff's view,
20 the evidence will likely show that there is a violation in
21 the '321, '701, and '714 patents, and that there will be no
22 violation on the '267 patent, and that's because the Staff
23 believes that that patent is invalid.

24 Slide 1.3 shows -- there's animation on this
25 slide -- a summary of the Staff's positions for all -- for

1 the four asserted patents. You can see for the '701, the
2 '321, and the '714 patents, in the Staff's view, the
3 evidence will show that there is infringement for all of the
4 accused products as well as the modifiable redesigns.

5 I'm not going to get into too much detail about
6 the redesigns because of CBI, but in the Staff's view, the
7 evidence is going to show that there's two categories of the
8 redesigned products. Some of the redesigned products are
9 unable to be modified, and the Staff believes that those do
10 not infringe.

11 However, and Respondents touched upon this, there
12 were several redesigns where the Complainants' expert was
13 able to modify them. The Staff expects the evidence is
14 going to show that those modifications were not that
15 difficult, and it was quite easy and something that a user
16 can do in their home easily based on software that's
17 downloadable from the websites, the Respondents' websites.

18 Now, I understand that Respondents indicated that
19 that will not be there, but it's there now, and the evidence
20 shows that it's available right now. And so looking at
21 these redesigns, the Staff believes that those still
22 infringe.

23 The '267 patent, of course, is the other one, and
24 the '267 patent, of course, the Staff believes is invalid.
25 And so no products, none of the accused products would

1 infringe an invalid patent. But, in addition, the
2 nonmodifiable redesigns would not infringe on top of the
3 invalidity.

4 The Staff believes the evidence is going to show
5 that an LEO, a CDO are appropriate and zero bond should be
6 issued during the Presidential Review Period, and the PI
7 factors do not preclude relief in this case.

8 Briefly touching on each of the asserted patents,
9 the first patent is the '321 patent, and in this case, where
10 there have been -- there were a number of noninfringement
11 arguments that were raised, a number of invalidity arguments
12 that were raised, the Staff believes the main issue and the
13 biggest dispute between the parties is going to be whether
14 the identifier -- the identifier value is actually reset.

15 And Your Honor saw a preview of this during the
16 claim construction argument, and of all the noninfringement
17 arguments, I think most of the evidence is going to focus on
18 this.

19 Of course in the 1380 ID, this patent was also
20 asserted, and claims 8 and 10 were found to be infringed and
21 were not found to be invalid.

22 The '701 patent, this is our new patent that was
23 not asserted in the 1380 investigation. Here the one area I
24 believe should be most focused upon and what's going to
25 determine whether there's infringement and whether there's

1 invalidity is exactly what the meaning of a syntax element
2 in the symbol is. What Your Honor will see is that the
3 evidence is going to focus on whether -- what the
4 Complainant points to as a syntax element is indeed a syntax
5 element or not.

6 So the important key is going to be what is a
7 syntax element and what is a symbol. Neither of those terms
8 were raised by either party for construction, but,
9 nonetheless, all of the disputes sort of hinge on that.

10 And in the Staff's view, the Complainants'
11 interpretation is correct in view of the intrinsic record
12 and as well as all the other evidence. And once those
13 interpretations are applied, the patent is both infringed
14 and valid. And this is slide 1.5.

15 Turning to slide 1.6, talking about the '714
16 patent, and the Staff sees the most prominent dispute here,
17 and I think this was highlighted by both the Complainants
18 and the Respondent, is the identification of what the first
19 spatial motion vector prediction candidate to be considered
20 for the motion vector prediction list is. Most of the
21 noninfringement arguments hinge on that particular issue or
22 some variation of that issue.

23 This patent was adjudicated before. It was found
24 both infringed and valid in 1380. It's the Staff's
25 understanding that there is also a German ruling on the

1 German counterpart that found this patent infringed in
2 Germany as well. The German counterpart, of course, not the
3 U.S. patent.

4 JUDGE MCNAMARA: Yes.

5 MS. DUCCA: Slide SDX-1.7, finally, the '267
6 patent, here the Staff expects the most prominent argument
7 to be validity. This patent is very mathematically
8 intensive. It relates to preserving a higher level of
9 precision while also still being able to transmit a
10 reasonable amount of data.

11 Now, the Respondents previewed the invalidity
12 argument based on the claim construction argument, and we
13 had a lot of discussion about the meaning of precision.

14 JUDGE MCNAMARA: Yes.

15 MS. DUCCA: And I think no party was quite sure
16 exactly what the wording of that construction should be.

17 The Staff still agrees with Complainant that
18 there needs to be a little meaning to the meaning of
19 precision, that it shouldn't be just more filler, filler
20 bits. However, looking at the evidence, looking at the
21 additional expert evidence that the Staff expects
22 Respondents to present with respect to the Walker reference,
23 the Staff believes that this patent will be shown to be
24 invalid under either construction.

25 The Staff does agree with Complainant that in the

1 1380 ID, it was a little bit of a different construction
2 applied for invalidity and infringement, but the Staff
3 believes that, in the end, this patent is going to be
4 invalid under either construction.

5 Now, turning to economic prong, there was a
6 little bit -- there was quite a bit of preview here with the
7 Respondents especially. The biggest issue here is going to
8 be whether the DI products are the articles to consider when
9 determining the domestic industry investments.

10 Briefly speaking about 1351, Respondents are
11 correct, that decision came out after both the 1379 and 1380
12 IDs. In the Staff's view, 1351 is definitely a decision to
13 consider and apply. However, the facts are very different
14 in 1351 and in this case. And the facts are -- this is a
15 very factually intensive issue to consider.

16 And so it's addressed in the pre-hearing brief.
17 I don't want to go into detail in case there is CBI, but,
18 ultimately, the Staff believes the facts are sufficiently
19 different in this case to reach a different conclusion. And
20 the Staff believes that the articles to consider are the DI
21 products as opposed to the chips in this case.

22 The Staff also believes that even if the articles
23 to consider are the chips, the realities of the marketplace
24 are going to show that the downstream products are the
25 proper domestic industry articles to consider. As I

1 mentioned before, the evidence -- there's more evidence in
2 this case than in the previous two cases in view of those --
3 I don't want to say dueling decisions because both 1379 and
4 1380 found domestic industry -- however, there is additional
5 evidence to show that the realities of the marketplace
6 support looking at the DI products as a whole. And this is
7 slide 1.9.

8 Slide 1.10 identifies a lot of the defenses. I
9 was happy to not hear a lot about all of these defenses.
10 The Staff hopes that there might be some case narrowing
11 going on and perhaps we won't be hearing about every
12 defense.

13 But the Staff does believe -- the only defense
14 that the Staff believes there will be enough evidence to
15 show is prior art Walker -- either Walker alone or Walker
16 and the Srinivasan reference under the '267 patent.

17 And speaking briefly about all of the different
18 RAND defenses, there are several RAND defenses, breach of
19 RAND obligations, this relates to whether or not the --
20 whether or not Nokia made a RAND offer, breach of duty to
21 negotiate in good faith, and also waiver, implied estoppel,
22 and equitable estoppel. That's the one that relates to that
23 UK decision. These were all adjudicated in 1379 and 1380,
24 and the outcomes were consistent, and they rejected each of
25 these defenses.

1 Slide 1.12, remedy and bond, as I mentioned
2 earlier, the LEO is the appropriate relief here. The Staff
3 believes a warranty carveout is appropriate and a
4 certification provision is appropriate. The Staff does not
5 believe a delay is warranted, both in view of the UK
6 decision or in view of any issues with respect to the
7 education area.

8 CDOs should issue to Acer and ASUS. And the
9 Presidential Review Period bond should be zero percent.

10 Moving to public interest, this is SDX-1.13. The
11 Staff believes the evidence is going to show that the
12 accused products can be used for medical and health reasons.
13 They are computers. We all do that. I use computers for
14 medical and health reasons. But so can any other computer
15 on the market. There are no critical functions that are
16 specific to the Respondents' products that would pose any
17 sort of public interest health concerns.

18 The accused products are part of a very
19 competitive industry. I think we heard that they are number
20 5 and number 6 in the laptop market. And there are no
21 shortage concerns.

22 There is going to be -- we have supply chain
23 experts on both sides, and the evidence is going to show
24 that they will be able to maintain enough inventory in the
25 United States with respect to the many different competitors

1 in the market.

2 All relevant products are produced abroad. There
3 is no evidence in the record that anything is going to be
4 moved over to the United States or that there are any plans
5 to move any production to the United States.

6 And, finally, there is not going to be any
7 material adverse effect on the U.S. consumers because there
8 is a sufficient supply of competitive products.

9 And on SDX-1.14, here are the citations to the
10 1379 and 1380 IDs that reached that same conclusion.

11 And that brings us to SDX-1.15, which is
12 RAND-related issues. So Your Honor heard a lot about RAND
13 in this investigation.

14 JUDGE MCNAMARA: It is not the first time.

15 MS. DUCCA: I know. The RAND issues are why I'm
16 here. Of course, in the 794 investigation, the USTR wanted
17 to make sure that we took sufficient evidence and
18 sufficient -- we looked into all of the facts to make sure
19 there's no public interest concern with respect to RAND.
20 And I can confirm that there was a lot of evidence taken on
21 the RAND issues in this case.

22 And based on the RAND issues, the inquiries that
23 the Staff looks at is: number 1, is there even a RAND
24 obligation; has Nokia failed to satisfy that RAND
25 obligation; are Respondents unwilling licensees; and, given

1 all the facts, under these circumstances, would exclusionary
2 relief be contrary to the statutory -- the public interest
3 factors.

4 I did not plan to address the UK decision in my
5 opening, but I do want to briefly just talk a little bit
6 about the Staff's position on the UK decision, since we
7 heard so much about it today.

8 The Staff believes the UK decision is one
9 datapoint out there. But the UK decision is a different
10 court. There's a different presentation of evidence in
11 front of that court. And it's a different country. And so
12 in the United States we have not had to follow the UK's
13 decisions for at least 250 years.

14 Now, that said, it is a datapoint just like the
15 German court is a datapoint. So is the 1379 and the 1380
16 investigation.

17 But, in the Staff's view, we need to look at the
18 evidence that is in the record here as opposed to the
19 evidence outside of the record. And in the Staff's view,
20 the evidence shows what it showed in 1379, what it showed in
21 1380, and that is that there is no public interest issue
22 with issuing an exclusion order in this investigation.

23 Briefly, before I go to the next slide, is there
24 a RAND obligation? So as you heard from the Complainants
25 and the Respondents, there are three -- two standards and a

1 specification that are alleged to infringe the patents.
2 It's H.264, H.265, and AV1. The Staff expects the evidence
3 is going to show that there is no RAND obligation for AV1,
4 and that there is no RAND obligation for the encoder side
5 claims for H.264 and H.265.

6 And the Staff submits that if any of those
7 standards or specifications are found to infringe, that
8 there would be no impact from these RAND-related arguments
9 at all.

10 Moving on, talking about slide 1.16 relating to
11 Nokia's behaviors during negotiations, which, as I
12 mentioned, are very similar, if not identical, to those in
13 the 1379 and 1380 investigations. Nokia's offers were RAND,
14 and that's how they have so many licenses out there at their
15 rates. They negotiated in good faith. They made the same
16 offers to Acer and ASUS that they made to other entities.

17 Now, the evidence tends to show and the Staff
18 does not believe any ultimate decision needs to be made on
19 the Respondents' behavior, but based on the offers that they
20 made throughout the investigation, the evidence does tend to
21 show that the Respondents did not negotiate in good faith on
22 the -- it tends to show that they were delaying as much as
23 possible.

24 Slide SDX-1.17, in the Staff's view, patent pools
25 are not a good benchmark in this case, because we have a lot

1 of actual comparable licenses that were negotiated at arm's
2 length to look at.

3 The Staff believes patent pools might be a good
4 thing to look at in, for example, a situation where there
5 are no licenses, other than patent pool evidence. That's
6 not the case here.

7 But patent pools in this case, they are going to
8 set lower sub-RAND rates to gain more pool members for
9 cross-licenses, and also, because that is known, they are
10 going to tend to attract weaker patents, because licensors
11 with valuable patents are more likely to engage in bilateral
12 licensing, such as that that Nokia is engaging in.

13 So, from that standpoint, here where we have
14 these actual licenses, patent pools are not the appropriate
15 avenue to look at.

16 And, Your Honor, if you have any other questions,
17 I'm happy to answer them, but that is the Staff's
18 presentation.

19 JUDGE MCNAMARA: Thank you, Ms. Ducca.

20 MS. DUCCA: Thank you, Your Honor.

21 JUDGE MCNAMARA: All right.

22 I think that, if you're ready, Mr. Lipschitz,
23 we're ready for Complainants' first witness.

24 MR. LIPSCHITZ: Yes, Your Honor, we are.

25 MR. VERBONCOEUR: Your Honor, for its first

1 witness, Nokia calls Dr. Iain Richardson.

2 Your Honor, this is Mitch Verboncoeur,
3 representing Nokia.

4 JUDGE MCNAMARA: Thank you. I really appreciate
5 that.

6 Before you are seated, Dr. Richardson, it's good
7 to see you again, it's been some years.

8 THE WITNESS: Nice to see you, Your Honor.

9 JUDGE MCNAMARA: Yes. If you could kindly raise
10 your right hand.

11 IAIN RICHARDSON,
12 having been first duly sworn or affirmed on
13 their oath, was thereafter examined and testified as
14 follows:

15 JUDGE MCNAMARA: Please state your full name.

16 THE WITNESS: Iain Edward Richardson.

17 JUDGE MCNAMARA: Thank you very much. You may be
18 seated.

19 MR. VERBONCOEUR: May I proceed?

20 JUDGE MCNAMARA: Yes. Thank you,
21 Mr. Verboncoeur.

22 DIRECT EXAMINATION

23 BY MR. VERBONCOEUR:

24 Q. Good afternoon, Dr. Richardson.

25 A. Good afternoon.

1 Q. I believe you are already familiar, but can you
2 please introduce yourself to the Court?

3 A. Your Honor, it's nice to see you again. As you
4 know, my name is Iain Richardson.

5 Q. Did you prepare a set of demonstrative slides to
6 assist your testimony?

7 A. I did.

8 Q. And are we looking at those slides marked as
9 CDX-2?

10 A. Yes.

11 Q. What is your educational background?

12 A. So if we could turn to slide 3, please.

13 So I was -- I received my undergraduate degree
14 from Heriot-Watt University in Edinburgh in Scotland, and I
15 was awarded a Ph.D. from the Robert Gordon University in
16 Aberdeen, also in Scotland.

17 My undergraduate degree was in electronic and
18 electrical engineering, and my Ph.D. topic was video coding
19 and communications.

20 Q. Do you have any work experience?

21 A. I do. If we look at slide -- I think we're on
22 slide 3 now, yes -- I was employed in the School of
23 Engineering at the Robert Gordon University for I think over
24 15 years, first as a lecturer and then ultimately as a full
25 professor. And so I taught courses on electronic

1 communications, signal processing, electronic design, and
2 video compression coding, which is my specialist subject.

3 Q. Do you have any work experience outside of
4 academia?

5 A. I do. If we could go to the next slide, please.
6 This is slide 4.

7 I've set up three startup companies, 4i2i,
8 Vcodex, and one codec, also called Beamshare.

9 All of those companies, my activities were
10 relating to video coding and video streaming. And I've also
11 shown on the right of this slide 4 an image of the
12 International Space Station. So one of my video codec
13 designs was launched into orbit in the space station.

14 Q. Can you tell us more about how one of your video
15 codec designs was on the International Space Station?

16 A. So, Your Honor, it's quite a funny story, at
17 least for me. I left the 4i2i company in 1999. A few years
18 later I had a phone call from a NASA engineer, I think she
19 is based here in D.C., and she said, we have a problem with
20 an upgrade of your video codec on the space station, can you
21 help us out. And I said, what video codec, on what space
22 station?

23 And what I hadn't -- I wasn't aware of was that
24 after I left 4i2i, one of my video codec designs, they had
25 licensed that design to NASA, who installed it on the space

1 station, and so there's a period in the early 2000s where if
2 you logged on to NASA's webcam, which showed you the feed
3 from the International Space Station, you would have been
4 watching that feed through my video codec or using my video
5 codec.

6 Q. Doctor, do you have any other relevant experience
7 in video coding?

8 A. I've carried out research in video coding for
9 over 30 years. I've written many research papers on that
10 topic.

11 And if we go to slide 5, I've also written four
12 books on video compression and video coding. The first one
13 was in 1997. I wrote a book for video codec design
14 specifically about the implementation of video codecs and
15 compression in software and in hardware.

16 And on the bottom row of slide 5, I've written
17 two books focusing on the H.264 standard, and most recently,
18 Your Honor, and I think this might be new since our last
19 meeting, a book focusing on the H.265 standard.

20 MR. VERBONCOEUR: At this time, Your Honor, I
21 would like to proffer Dr. Iain Richardson as an expert in
22 the field of video decoding and encoding.

23 JUDGE MCNAMARA: Is there --

24 MR. WILSON: No objection, Your Honor.

25 JUDGE MCNAMARA: Yes. And would you identify

1 yourself?

2 MR. WILSON: Jack Wilson from Fish & Richardson.

3 JUDGE MCNAMARA: Of course. Thank you.

4 With that, since there is no objection,
5 Dr. Richardson is accepted as an expert for the topics on
6 which he has been called to testify without objection.

7 MR. VERBONCOEUR: Thank you, Your Honor.

8 Q. Dr. Richardson, why are you here?

9 A. If we go to slide 6, today, Your Honor, I've been
10 asked to give a very high-level introduction to some of
11 these topics. I'll give a very -- a basic introduction to
12 video coding technology. I'll talk briefly about how
13 typical consumer devices encode and decode video. I'll talk
14 briefly about video coding standards. And I want to give a
15 very quick overview of the four asserted patents and their
16 priority dates.

17 Q. As an initial matter, how would you define a
18 person having ordinary skill in the art in this field?

19 A. If we could go to slide 7, please?

20 So, in my opinion, a person of ordinary skill in
21 the art, and I might call them a POSITA, for the four
22 patents at issue, would have at least a relevant bachelor's
23 degree such as in electrical engineering or computer
24 engineering or a related field, and at least or around two
25 years of experience in video decoding or encoding

1 technologies.

2 Q. Were you a person of ordinary skill in the art at
3 the time of the inventions in the four asserted patents?

4 A. Yes, I would have met this level, Your Honor, at
5 least by the mid-1990s.

6 Q. Doctor, why should we all care about video
7 coding?

8 A. So if we go to slide 8, this is a still image,
9 Your Honor, from a live video stream from a rugby match in
10 Scotland a few weeks ago. This is my daughter, Iona, who is
11 a TV presenter. I'm very proud of that fact.

12 JUDGE MCNAMARA: Yes.

13 A. And so when I'm watching this stream remotely,
14 and I live in the Netherlands now, she is in Scotland, when
15 I'm watching it remotely, it is made possible by video
16 coding. So as I think you yourself said earlier, we all,
17 whether we know it or not, use video coding all the time
18 when we watch or send video to others.

19 Q. How does video coding enable us to view video in
20 this way?

21 A. So if we go to slide 9, just one very quick
22 example, Your Honor, let's say my smartphone has around 500
23 gigabytes of memory. Without video coding, I would only be
24 able to store one TDX on my smartphone before my entire
25 memory was used up. With video coding, I would be able to

1 store at least 300 high-definition movies on the same
2 device.

3 So that's just one of the many examples of why
4 video coding is important, and I think you'll hear many more
5 over the next few days.

6 Q. Can you give us a primer on video coding?

7 A. So I was asked to do this at a high level,
8 Your Honor, and I didn't want to go into the details of the
9 technologies, which you'll hear a lot about, so I wanted to
10 talk rather about the concepts that we rely on to compress
11 video.

12 If we look at slide 10, I'm just going to talk
13 about three concepts. Slide 10, please.

14 First of all, the first concept is to look at
15 what's special about the data itself. So video is not just
16 general data. It's not random. It has very specific
17 properties that we can use or exploit.

18 For example, it has similarities in space and
19 similarities in time.

20 So this slide 10 is showing a block of pixels,
21 let's say, and pixels around about that block tend to be
22 similar to the ones inside the block. So it's possible to
23 predict the information inside the block from what's outside
24 the block.

25 And if we go to slide 11, another property is

1 similarity in time. So we've got an image of a jockey here
2 on slide 11. If his arm is occupying a particular position,
3 it was probably in a similar position maybe with some
4 movement in the previous frame. So we can exploit that
5 property and predict the block in the current frame from the
6 block in the previous frame.

7 So that's the first concept.

8 The second concept, slide 12, please, is to
9 exploit the viewer. It sounds bad, but what I mean by that
10 is to look at what's special about the way we see images and
11 the way we respond to images and video.

12 And to illustrate this, I've got a figure -- or,
13 sorry, a photograph, rather, on the left of this slide, and
14 this is a photograph in full resolution. And you can see
15 there's a boat, there's a sea, there's a pier. You might be
16 able to make out some people standing on the pier.

17 What I've done in the image on the right, just to
18 illustrate how we look at images, is to take away a lot of
19 the information. I've filtered it in such a way that most
20 of the detail is lost, so you can't really make out the
21 people on the pier anymore. But as humans we are very good
22 at filling in that detail if we have literally the big
23 picture, and so it's still possible to recognize that
24 there's a boat, there's a nice scene, and the sea and so on.

25 So we can make use of this in video coding by

1 deliberately removing or discarding information that the
2 human observer doesn't really need to see.

3 And then the third concept -- slide 13, please --
4 is to look at properties of the data itself that we are
5 sending in a compressed bitstream. And one of these
6 properties that I think, again, you'll hear a lot more about
7 is the statistical behavior of that data.

8 And here I'm illustrating that we might have
9 certain values in data that occur very commonly. You
10 actually heard the Morse Code analogy earlier, which is a
11 great analogy for this. Common data values, we can assign
12 shorter codes or represent fewer bits in the bitstream, such
13 as the green boxes here. Values that don't occur very often
14 at all, rare values, such as the red box here, we can assign
15 longer codes.

16 And if we do that over a period of time, we
17 should end up with further compression of the data.

18 Q. Are there any tradeoffs in video coding we ought
19 to consider?

20 A. There are. If we look at slide 14, so this is a
21 photograph that's illustrating a typical videoconference
22 situation or a Zoom call or something like that, and there
23 are a number of tradeoffs that have to be taken into account
24 when we're designing video coding systems.

25 These would include compression, which we've

1 spoken about, quality of the image. It's got to be good
2 enough. What's also important is the computational load,
3 can the processor -- can the system basically keep up with
4 decoding and displaying video in real time.

5 And then a fourth factor or tradeoff is what you
6 could generally call usability, and you'll hear, Your Honor,
7 about a particular use case where we want to join a stream
8 or maybe join a Zoom call partway through, and the idea of
9 joining partway through without having to decode from the
10 very beginning of the stream or the call, that's what we
11 sometimes call random access.

12 So all of these things have to be taken into
13 account when we design video compression systems.

14 Q. Earlier we were talking about your video codec on
15 the International Space Station. What's a codec?

16 A. Oh, sorry, yes, what's a codec. Slide 15.

17 So this is a diagram from one of my books. So
18 I'm showing a video encoder that takes uncompressed video
19 and turns it into a compressed or coded form, which could be
20 a file or it could be a video stream. And on the bottom I'm
21 showing a video decoder that takes a compressed video stream
22 or coded video file and turns that into video frames that
23 can be displayed to a viewer.

24 These might not be the same as the original
25 frames, because you remember a few minutes ago I was saying

1 that we sometimes discard information, but hopefully they
2 will be usable.

3 And if we consider the encoder and decoder
4 together, that's a video codec, and so the whole concept is
5 what we call video coding.

6 Q. How is video coding carried out on typical user
7 devices?

8 A. So if we go to slide 16, so I've just shown some
9 example devices, a TV, a smartphone, a laptop, a gaming
10 platform, if these devices are carrying out video coding,
11 that is typically going to be done in the combination of
12 software and hardware.

13 So you have processors in the device. You've got
14 software running on those processors. We heard earlier
15 about hardware acceleration. So it's typically a
16 combination of these things.

17 Q. You mentioned software and hardware working
18 together in combination. How does that happen?

19 A. So if we go to slide 17, this is a diagram from a
20 publicly available document from the company NVIDIA. NVIDIA
21 makes, among other things, graphics processing units, and in
22 my experience, this is a reasonably typical relationship
23 where you have a client application, so that's going to be
24 software running on a platform such as a PC or a mobile
25 device, there is something called a driver, which is also

1 software, and that's software that interfaces between the
2 client application and in this example dedicated hardware,
3 which is shown at the bottom right of the diagram in green,
4 and it says GPU HW video decoder, and that stands for
5 graphics processing unit, which is the NVIDIA GPU, hardware
6 video decoder. So this is something that can carry out
7 hardware acceleration during video decoding.

8 Q. Is hardware acceleration used for both encoding
9 and decoding?

10 A. Yes, it can be. This slide is showing decoding.
11 There's actually a similar NVIDIA diagram for the encoder
12 side, if I remember correctly.

13 Q. Can you show us how hardware acceleration works
14 in practice?

15 A. So slide 18, this is my illustration to show how
16 it would typically work in my experience in a consumer
17 device such as a laptop.

18 So I mentioned the software side and the hardware
19 side. So if I have a video player on my computer, if I
20 press the play button, there is a communication to the
21 driver software. The driver software, which is running on
22 the CPU, as I've illustrated here, will initialize decoding,
23 and that will include decoding some of the header
24 information relating to the video bitstream, and then at
25 some point it will start decoding of what we call slices.

1 And a slice in at least the H.264 and H.265
2 standards, a slice might be a complete frame of video or it
3 might be part of a frame of video.

4 And then typically what happens is that the
5 software driver decodes the header of that slice, and then
6 instructs the hardware, which is -- acts as sort of a
7 helper, and the hardware carries out decoding of data within
8 that slice, and the hardware will typically carry out
9 computationally intensive tasks, such as some of the things
10 we've heard about earlier, prediction, the transform that we
11 heard about in the opening statements, entropy coding, and
12 so on.

13 And when the hardware reaches a certain point,
14 such as the end of a slice or the end of perhaps a number of
15 slices, it passes control back to the software, which will
16 typically be responsible for displaying that information, so
17 putting it on the user's screen, for example. And then the
18 software will kick off decoding of the next slice, and the
19 process will continue.

20 So it is this kind of ping-pong between the two,
21 with the software initializing things, the hardware doing
22 some of the work, and passing back to the software.

23 Again, as we heard during the openings, one of
24 the reasons for doing this is to allow the hardware to take
25 some of the burden, computationally intensive tasks away

1 from the software because we are dealing with millions and
2 millions of pixels per second in a typical scenario.

3 Q. What is a video coding standard?

4 A. So a standard is essentially a document. If we
5 go to slide 19, this is a well-known paper in my field which
6 gives an overview of the H.264 standard. It is basically a
7 document that defines a bitstream, defines a syntax and the
8 behavior of a bitstream. So that's in layman's terms the
9 format of a compressed file or stream.

10 And it also defines a way of decoding that stream
11 to decompress it and produce a video output.

12 Q. And for the record, we're on slide 19, looking at
13 CX-6294.

14 Why do video coding standards only define a
15 decoding process but not an encoding process?

16 A. So the purpose -- or one purpose of the standard
17 is to allow interoperability so that an encoder and a
18 decoder from different manufacturers can actually talk to
19 each other. And by doing it in this way, by defining the
20 bitstream and the decoding process but not defining the
21 encoder, as the authors of this paper said, this permits
22 maximal freedom to optimize implementations, for example, to
23 design different encoders that might trade off quality,
24 computation, and so on, in different ways.

25 Q. Is this limitation on the decoding process but

1 not the encoding process true of both the H.264 and H.265
2 standards?

3 A. Yes. If we go to slide 20, both of these
4 standards define the decoding process as the process
5 specified in this recommendation or specification, so that's
6 the process that's defined in the document.

7 Both of the standards define the encoding process
8 as a process not specified in the recommendation or
9 specification. But that process should produce a bitstream
10 that conforms to the standard.

11 Q. Can you give us a history of video coding
12 standards?

13 A. Okay. I don't have too long, Your Honor, but if
14 we go to slide 21, I'll give you a very quick history of
15 some of the standards. There are actually more than this.

16 But my involvement with video compression started
17 in the early 1990s, and at that time we had the early H.261
18 standard.

19 I'll just draw your attention to MPEG-2 in 1995.
20 That was the point when video coding started to affect
21 consumers in a big way, because that standard was used for
22 early digital TV and for DVDs. I still have some DVDs in
23 the cupboard. And then in 2003 the H.264 standard was
24 published.

25 In 2013, the H.265 standard was published. And

1 I've also shown the publication date of the AV1
2 specification in 2018.

3 Q. How are these standards developed?

4 A. So if we go to slide 22, I've illustrated the
5 development process for H.264 and H.265. In both cases
6 there was a call for proposals, basically from the
7 standardization bodies at the ITU-T and/or the ISO/IEC, and
8 that was a call for proposals to begin trying to develop a
9 new standard.

10 In H.264's case, there was then a committee set
11 up, a committee of experts, and they met regularly over a
12 period of a few years, culminating in the completion of a
13 standard in 2003.

14 And then there was a similar process for H.265.
15 In 2010 there was a call for proposals. And then there was
16 a period of development. There was a new committee set up,
17 the joint coding team for video compression, the JCT-VC, and
18 again, that committee worked for a period of years to
19 develop the standard.

20 Q. Was Nokia involved at all in the development of
21 these standards?

22 A. Yes. In both cases, the way these committees
23 worked was to meet every few months and invite contributions
24 from experts and from groups of experts. Nokia contributed
25 to the first call for proposals for -- that led to H.264 in

1 1998. They contributed to the call for proposals in 2010
2 that led to H.265. And I followed both of these processes
3 closely, Your Honor, and at every one of the meetings there
4 were, in my experience, multiple contribution proposals from
5 Nokia engineers.

6 Q. What is the AV1 specification?

7 A. So this is a specification for video coding. My
8 recollection is it has the concept, again, of defining a
9 bitstream and a decoding process, and not defining an
10 encoder. It was developed by an industry consortium, and
11 I've chosen to use a different color to represent it here.
12 It didn't have, as far as I'm aware, the same publicly
13 visible development process that the H.264 and H.265
14 standards had.

15 Q. Was Nokia involved in the development of the AV1
16 specification?

17 A. Not as far as I'm aware.

18 MR. VERBONCOEUR: Your Honor, I'm mindful that
19 we're close to 1 p.m. I imagine that I have slightly over
20 ten minutes left, just in case you wanted to break now.

21 JUDGE MCNAMARA: If you have ten minutes, I would
22 suggest we just keep going and finish this phase. Thank
23 you.

24 MR. VERBONCOEUR: Okay.

25 Q. Doctor, let's turn to the patents that you

1 mentioned earlier. How many patents are at issue here?

2 A. Four patents.

3 Q. Can we just give a brief overview of each in
4 turn?

5 A. Sure. If we go to slide 23, and this is the
6 first of the four, at least in my list, is the '714 patent.
7 And this patent is about prediction, which we've heard about
8 already, and it's about the concept that when we're
9 predicting a current block of pixels, there is a good chance
10 that one of the neighboring blocks or more than one of the
11 neighboring blocks might have similar prediction
12 information, such as a similar motion vector.

13 And so we have this concept of candidates that
14 previously coded blocks, and we want to check whether or not
15 they have motion information that we can copy for this
16 block.

17 And the patent invention is about creating a
18 short list of candidates in a very computationally efficient
19 way, firstly by minimizing the number of comparisons that
20 are needed to be made, and, secondly, by making sure that
21 comparisons can be done in parallel.

22 And this is important, in my view, because these
23 blocks of pixels, there are tens or hundreds of thousands of
24 these being processed every second, so it is possible to
25 simplify the process and to make it more amenable to

1 parallel processing that can have a big impact on
2 computation.

3 Q. What is the priority date of the '714 patent?

4 A. The 4th of November 2011.

5 Q. Do Respondents dispute the priority date?

6 A. Not to my knowledge.

7 Q. Did Nokia share the invention of the '714 patent
8 with others?

9 A. If we go to slide 24, I spoke about the process
10 by which the standards were developed. During the
11 development process for the H.265 standard, Nokia made a
12 contribution to one of the standardization meetings. The
13 contribution or proposal was evaluated and the decision was
14 made to adopt the proposal, and, as a result, it became part
15 of the H.265 standard.

16 Q. Do Respondents dispute that Nokia made a
17 contribution and that contribution was adopted?

18 A. Not to my knowledge.

19 Q. Can we turn to the next patent?

20 A. So slide 25, please.

21 The next patent is the '267 patent. This is also
22 about prediction, and this is about the accuracy of the
23 prediction process.

24 And I've shown a figure from the patent on slide
25 25. It's this concept where we can make a prediction from a

1 block by combining two different prediction sources and
2 sometimes this is called bi-prediction.

3 So in this figure we have a prediction P1 and a
4 prediction P2, and these are combined together to make the
5 bi-prediction or combined prediction P. And the invention
6 is about making that contribution as accurate as possible,
7 because a more accurate prediction can give us better
8 compression performance.

9 Q. What is the priority date of the '267 patent?

10 A. 7th of January 2011.

11 Q. Do Respondents dispute this priority date?

12 A. Not to my knowledge.

13 Q. Did Nokia share the inventions in the '267 patent
14 with others?

15 A. If we go to slide 26, once again, Nokia made a
16 contribution during the process that led to the H.265
17 standard. The contribution was evaluated by this team of
18 experts I mentioned, and it was adopted into the draft
19 standard, and, as a result, became part of H.265.

20 Q. Do Respondents dispute that Nokia made a
21 contribution and that contribution was adopted?

22 A. Not to my knowledge.

23 Q. Can we move on to the next patent?

24 A. If we go to slide 27, the next patent is the '701
25 patent. And this is about computational complexity of

1 something called entropy decoding, which I talked very
2 briefly about earlier, and the idea here is to, at a point
3 when the volume of data that a decoder has to deal with is
4 getting above a certain level, to switch or to use a simpler
5 or computationally simpler method of entropy decoding.

6 And by doing this, the invention seeks to reduce
7 or manage the computation so that a decoder can carry on in
8 real time but without losing any compression performance.

9 Q. What is the priority date of the '701 patent?

10 A. 28th of July 2010.

11 Q. Do Respondents dispute this priority date?

12 A. Not to my knowledge.

13 Q. Did Nokia share the inventions of the '701 patent
14 with others?

15 A. So there was a contribution to the H.265
16 standardization effort by a different company, by Qualcomm,
17 I think around two years after this provisional application
18 date, and, as a result of Qualcomm's contribution, the
19 invention of the '701 patent ended up in the H.265 standard.

20 Q. Can we turn to the last patent now?

21 A. If we go to slide 28. So this is the '321
22 patent. And I mentioned earlier, Your Honor, this idea of
23 usability and of joining a video stream partway through,
24 which we in the field sometimes call random access.

25 So this patent relates to random access, and the

1 invention is a new type -- or a type of coded video frame
2 which acts as a random access entry point.

3 So when a decoder finds one of these frames, it
4 knows it can start and continue decoding without having to
5 have received or decoded any information before that random
6 access point.

7 Q. What is the priority date of the '321 patent?

8 A. 23rd of January 2002.

9 Q. Is that prior date disputed?

10 A. Yes.

11 Q. And let's turn back to that, but, first, did
12 Nokia share the inventions of the '321 patent with others?

13 A. Yes. If we go to slide 29, so this -- 2002 was
14 the time period when the earlier standard H.264 was being
15 developed, and the inventor of the '321 patent made a
16 contribution to the joint video team, the body responsible
17 for developing H.264, and that contribution was evaluated
18 and adopted and became part of the H.264 standard.

19 Q. Do Respondents dispute that Nokia made this
20 contribution and that it was adopted?

21 A. Not to my knowledge.

22 Q. I'd like to turn back to the '321 patent's
23 priority date. What did you consider in forming any
24 opinions you have on the patent's priority date?

25 A. If we go to slide 30. So, among other things, I

1 considered the claims, asserted claims. So these are claims
2 8 and 10, and on the left of slide 30 I've combined these
3 into one, just for simplicity. And on the right I'm showing
4 the Finnish Patent Application which I considered in
5 reaching my opinions.

6 Q. And, for the record, we are on slide 30, and the
7 Finnish Patent Application is CX-6090.

8 So, in your opinion, doctor, does the Finnish
9 Patent Application support the priority date of the '321
10 patent?

11 A. Yes.

12 Q. You mentioned that there was a dispute between
13 you and Respondents on this point. Where does the dispute
14 lie?

15 A. If we go to slide 31, my understanding is that
16 the dispute is about one element of this -- of these two
17 claims. So the way I have listed it on slide 31, there are
18 five elements, A through to E.

19 My understanding is that there is no dispute for
20 elements [A], [B], [C], and [D], but there is a dispute
21 about elements 8[E] and 10[E], which involve resetting an
22 identifier value.

23 Q. Let's focus our discussion on the last
24 limitation, [E], then.

25 Under which constructions did you reach your

1 conclusions on priority date?

2 A. If we go to slide 32, my conclusions, I believe,
3 hold under Staff's proposed construction -- sorry, the claim
4 term that's relevant here that came up in claim
5 constructions, as I understand it, is reset or resetting.
6 And I reached my conclusions under Staff's proposed
7 construction and under Nokia's proposed construction.

8 Q. Why didn't you reach your conclusions under
9 Respondents' proposed construction?

10 A. In my opinion, Your Honor, Respondents' proposed
11 construction of reset as to set an identifier value, again,
12 is not consistent with how a person of ordinary skill in the
13 art would understand resetting and is a term that we tend to
14 use quite a lot.

15 And I also didn't find support in the '321 patent
16 or its file history for Respondents' proposed construction.

17 Q. How does the Finnish application support
18 limitation [E] of '321 patent's claims 8 and 10?

19 A. If we go to slide 33, so at the top of this slide
20 I've shown the disputed elements of claims 8 and 10 of the
21 '321 patent.

22 On the left-hand side, highlighted in green I've
23 shown some extracts from the Finnish Patent Application. So
24 paragraph 34 of the Finnish Patent Application talks about a
25 sub-sequence, and that is this independently decodable

1 sequence that we can decode without reference to previous
2 video frames. Within a subsequence we have video frames,
3 which are given image numbers, so they've got a numbering
4 scheme.

5 Paragraph 48 on the left of slide 33 identifies a
6 potential problem to do with resuming or joining a stream at
7 a random point, which is this random access challenge that I
8 talked about.

9 And then on the right-hand side I've got an
10 extract from paragraph 49 of the Finnish Patent Application,
11 and this is talking about a particular final highlighted
12 sentence, when activated at a random point, the decoder sets
13 the identifier of the first image frame at zero. So this is
14 setting to zero with respect to numbering scheme, which, in
15 my view, supports the two disputed elements, claim 8[E] and
16 10[E].

17 I forgot to mention, Your Honor, but these are
18 both decoding claims. So these are both concerned with a
19 decoding method or a decoding apparatus. So the relevant
20 paragraph is talking about, specifically about a decoder
21 carrying out this action of setting an identifier to zero or
22 resetting an identifier.

23 Q. Did you consider any other materials in forming
24 your opinions?

25 A. I did. If we go to slide 34, I also considered

1 the U.S. prosecution history of the '321 patent, and on the
2 left of slide 34 I've got an extract of the '321 patent, the
3 U.S. publication of the '321 Patent Application,
4 paragraph 57, and I've highlighted a sentence with identical
5 wording to what we just saw, Your Honor. Consequently, when
6 activated at a random point, paraphrasing, the decoder sets
7 the identifier at zero.

8 And the reason I think this is significant is
9 that there was a discussion between the applicant and the
10 Examiner. The Examiner raised the question of support for
11 these claim elements, and the applicant, as I've shown on
12 the right of slide 34, pointed the Examiner specifically to
13 this paragraph 57 to support the reset or resetting
14 limitations. And after that discussion, the '321 patent was
15 allowed.

16 Q. Professor, earlier we were talking about the
17 Finnish application, and now we're talking about the U.S.
18 application. What relationship is there between the
19 application we see on slide 34 and the Finnish application
20 we were talking about earlier?

21 A. If we go to slide 35, on the left I have
22 paragraph 57 of the U.S. publication of the '321 Patent
23 Application, which I've just been talking about. On the
24 right I have paragraph 49 of the Finnish Patent Application,
25 which I talked about a few minutes ago, and the sentence in

1 the middle that I've highlighted is identical, and, in fact,
2 it's a lot of text, but the entire text is identical.

3 So the same paragraph that the U.S. Examiner --
4 or the applicant and the Examiner discussed, paragraph 57,
5 is also present in the Finnish Patent Application.

6 Q. Thank you.

7 MR. VERBONCOEUR: Your Honor, I pass the witness.

8 JUDGE MCNAMARA: Thank you, Mr. Verboncoeur.

9 At this point it makes sense to break for lunch.
10 I said we would do it at 1:00 exactly, but here we go.
11 There is always an exception to every rule, right?

12 I'll see you back here in an hour. Thank you,
13 everybody.

14 (Whereupon, the proceedings recessed at
15 1:08 p.m.)

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1 AFTERNOON SESSION

2 (In session at 2:06 p.m.)

3 JUDGE MCNAMARA: Thank you, everyone. Please be
4 seated. I hope everybody was able to get some lunch. I
5 know it's really difficult around here. There's not much
6 around.

7 All right. I think we're ready to get started
8 with the cross.

9 MR. WILSON: Thank you, Your Honor. Jack Wilson
10 on behalf of the Respondents.

11 JUDGE MCNAMARA: Thank you.

12 MR. WILSON: May I proceed?

13 JUDGE MCNAMARA: Yes. Thank you.

14 CROSS-EXAMINATION

15 BY MR. WILSON:

16 Q. Good afternoon, Dr. Richardson.

17 A. Good afternoon.

18 Q. It's good to see you again.

19 Before we get into detail, I want to make sure
20 we're on the same page about the role of encoders and
21 decoders. Okay?

22 An uncompressed video is encoded to produce an
23 encoded bitstream of reduced size, correct?

24 A. It can be.

25 Q. And to transmit video for playback elsewhere,

1 it's necessary to first encode that video in a transmittable
2 format, right?

3 A. In many practical applications, yes. It's not
4 strictly necessary, but it's practically expedient to do so.

5 Q. And an encoder performs that encoding of video
6 data into a transmittable format, correct?

7 A. It can -- it can do. A video encoder can
8 produce, such as the ones that I think we talked about in
9 general earlier, can produce a compressed bitstream.

10 Q. And we saw earlier on your direct that H.264
11 defines the encoding process, right?

12 A. No. It defines the words "encoding process," but
13 it specifically does not specify or define an encoding
14 process in the document.

15 Q. H.264 supplies a definition for the phrase
16 "encoding process," correct?

17 A. It supplies a definition of that phrase for the
18 purposes of, as I recall, understanding and interpreting the
19 standard.

20 Q. And H.264 defines encoding process as a process
21 that produces a bitstream conforming to the recommendation,
22 correct?

23 A. That's not the complete definition, no.

24 Q. Mr. Davis, do you have Dr. Richardson's
25 demonstrative CDX-2? Could you pull up CDX-2.20?

1 Dr. Richardson, you remember providing testimony
2 about CDX-2.20 in your direct?

3 A. I do, yes.

4 Q. And you supplied the definitions for decoding
5 process and encoding process for both H.264 and H.265,
6 correct?

7 A. I've excerpted these from the standards
8 themselves.

9 Q. And you would agree with me that for H.264,
10 encoding process is defined as a process not specified in
11 this recommendation or International Standard that produces
12 a bitstream conforming to this recommendation and
13 International Standard, correct?

14 A. That's the, yes, the section -- I think it's
15 entitled Definitions, and you read that out, yes.

16 Q. And H.265 supplies a very similar definition for
17 encoding process, correct?

18 A. The H.265 definition of the term "encoding
19 process" is similar. It replaces the word "Recommendation
20 International Standard" with "Specification."

21 Q. So the encoding process is the process that
22 produces the bitstream for both H.264 and H.265, correct?

23 A. In each standard, an encoding process, as used
24 elsewhere in the standard, is defined as this definition
25 here.

1 Q. And specifically, sir, the encoding process
2 produces a bitstream, right?

3 A. An encoding process, according to these
4 definitions, is a process that produces a bitstream.

5 Q. Thank you.

6 Now, the decoding process is defined in H.264 and
7 H.265 as a process that is specified in the recommendation
8 or standard that reads a bitstream and derives decoded
9 pictures from it, correct?

10 A. Once again, in both of these standards, that's --
11 the purpose as I recall of this section is that when the
12 term "decoding process" is used elsewhere in the standard,
13 it is intended to be understood as something according to
14 this definition.

15 Q. And that something in particular is something
16 that reads a bitstream and derives decoded pictures from it,
17 correct?

18 A. You're reading that correctly. I mean, it's not
19 in particular, it's part of the definition.

20 Q. Now, one of the patents you talked about in your
21 direct was the '714 patent, correct?

22 A. I recall that, yes.

23 Q. And then the '714 patent relates to motion
24 prediction in video coding, right?

25 A. Yes.

1 Q. And motion prediction is a widely used technique,
2 fair?

3 A. I'm sorry. I'm just rephrase it. I probably
4 call it motion compensated prediction, but I'm perfectly
5 happy with motion prediction as well.

6 Q. Fair enough.

7 A. And apologies for interrupting you. Motion
8 compensated prediction is, I would say, well-known in the
9 video coding field.

10 Q. And I want to be precise. So if you prefer
11 motion compensation prediction, we can use that term. Okay?

12 Now, motion compensation prediction attempts to
13 find a prediction for a block of pixels in a current video
14 frame in a correspondingly size region of a previously coded
15 frame, correct?

16 A. So you asked me to be precise. So in video
17 encoders I'm familiar with, the process of motion estimation
18 is a term that we would use for attempting to find a
19 matching block. The process of motion compensated
20 prediction involves using that block to predict.

21 Q. And when you say "using that block," what you
22 mean is a block in a previously coded region of a previously
23 coded frame, right?

24 A. I think in the answer I just gave, I'm talking
25 about a block used for prediction. So that would be -- in

1 the case of motion compensated prediction, that would be at
2 least derived from one or more previously coded frames. It
3 doesn't need to be used -- it's not necessarily used
4 directly.

5 Q. And for motion compensated prediction, motions,
6 information, can be conveyed as a motion vector; is that
7 right?

8 A. So in video encoders that I'm familiar with, it's
9 certainly possible for motion information or information
10 specifying the relative motion of a prediction and a current
11 block could be specified at least in part as a motion
12 vector. There might be other things as well that need to be
13 specified.

14 Q. But at least one way to represent motion
15 information is using a motion vector?

16 A. That's certainly a well-known technique in video
17 coding, is to use one or more motion vectors to represent
18 motion.

19 Q. And a motion vector typically has a horizontal or
20 a vertical component?

21 A. Again, there are many different approaches in
22 video coding, but in certain video codecs that I'm familiar
23 with, we might expect to find motion vectors. We might
24 expect them to have -- each have a horizontal and a vertical
25 component.

1 Q. And, sir, you were present during the opening
2 presentations this morning?

3 A. Yes.

4 Q. And do you recall counsel for Nokia explained
5 that the '714 patent was about how you make the list and how
6 you remove duplicates, right?

7 A. I remember a discussion of the list of, I
8 think -- I can't remember whether counsel talked about
9 motion vectors or candidates. I remember discussion of
10 duplicates. I wouldn't like to characterize his description
11 of what the patent was about, but I remember discussion of
12 those two concepts.

13 Q. Let's look at this a little bit.

14 Mr. Davis, could you bring up Dr. Richardson's
15 demonstratives at slide 23, please, CDX-2.23.

16 And, Dr. Richardson, you recall providing
17 testimony about Fig. 9 of the '714 patent in your direct,
18 correct?

19 A. I honestly don't remember whether I referred
20 directly to Fig. 9, but I remember -- I created these slides
21 or instructed these slides to be created, and I remember
22 choosing to put Fig. 9 on the slide.

23 Q. You put Fig. 9 on this slide to present in your
24 direct testimony, correct?

25 A. I'm responsible for these slides, yes.

1 Q. And item number 900 that's shown in Fig. 9 of the
2 '714 patent is the current block that's being evaluated,
3 correct, or encoded?

4 A. I don't have the patent in front of me. That's
5 broadly consistent with what I remember.

6 Q. And, sir, as a person of skill, just looking as
7 Fig. 9, you would expect that block 900 is the subject block
8 that's being encoded, correct?

9 A. I think in the context of the '714 patent, that
10 would be reasonable for a person of ordinary skill. If my
11 memory is correct, I think you would need some context.

12 Q. Now, also in Fig. 9 there's these other blocks
13 that are labeled A0, A1, B0, B1, and B2. Those are spatial
14 neighbor blocks, correct?

15 A. Now, I don't have the patent in front of me. I
16 don't recall whether they're described as complete blocks or
17 whether they are meant to represent, if you like, a corner
18 position of a complete block.

19 Q. But they would represent information associated
20 with an adjacent block, adjacent to block 900, right?

21 A. Again, I don't have the patent in front of me.
22 My recollection is that they at least relate to relative
23 block positions compared to a current block.

24 Q. And in particular, sir, they are adjacent to
25 block 900, correct?

1 A. Again, I don't have the patent in front of me,
2 but that's broadly consistent with my memory of the patent.

3 Q. Mr. Davis, could we bring up Dr. Richardson's
4 opening report at paragraph 92, please?

5 And, Dr. Richardson, paragraph 92, about halfway
6 through, you're referring to these blocks, and you say, the
7 following figure, Fig. 8, and you provide a cite,
8 conceptually illustrates five spatial neighbor blocks, A0,
9 A1, B0, B1, and B2, that are spatially adjacent to the
10 current block to be encoded.

11 Do you see that?

12 A. I do, yes.

13 Q. And does that indicate to you that the blocks A0,
14 A1, B0, B1, and B2 are in fact spatially adjacent to the
15 current block to be encoded?

16 A. I can't see the entire figure. I don't know if
17 it's possible to make it a little bit --

18 Q. Mr. Davis, if you could --

19 A. -- smaller so that I can see the text and the
20 diagram at the same time.

21 Okay. Annoyingly across two pages. I think what
22 you said is consistent with this diagram here, which, by the
23 way, is not the same diagram that I showed on my earlier
24 slide.

25 Q. The two diagrams convey the same information,

1 correct?

2 A. In what respect?

3 Q. The relationship between the block and the
4 spatially adjacent blocks, correct?

5 A. So this diagram, which I believe comes from a
6 paper, if I remember correctly, again, I can't see all the
7 text, it's a little bit difficult, this diagram comes from a
8 paper published by Gary Sullivan and others, and I think, as
9 far as this diagram goes, as my explanation says, it's meant
10 to indicate a current block, which is blank in the way I'm
11 seeing it here, and five spatially adjacent blocks.

12 JUDGE MCNAMARA: Pardon me, Mr. Wilson. What's
13 the exhibit number, please, and the page number, if you've
14 got it?

15 MR. WILSON: This is Dr. Richardson's opening
16 report. I neglected, Your Honor -- I don't have the exhibit
17 number available, but I can provide the exhibit number.

18 JUDGE MCNAMARA: Okay. Great.

19 MR. WILSON: And this is paragraph 92 of that
20 report.

21 Q. Mr. Davis, why don't we bring up CX-1964, and
22 just at page 1, please.

23 Dr. Richardson, you have authored several books
24 in the area of video coding, correct?

25 A. Yes.

1 Q. And CX-1964 is one of your books, correct?

2 A. It appears to be the front cover of one of my
3 books.

4 Q. Mr. Davis, could we go to page 4 -- or exhibit
5 page 426 of CX-1964?

6 Dr. Richardson, you're familiar with Fig. 6.97
7 from your book?

8 A. I must admit, I'm slightly confused by the page
9 numbering because I don't think -- there shouldn't be that
10 many pages on.

11 Q. Sir, do you recognize the figure?

12 A. I think so. Yeah, I don't think it would be at
13 page 400 and something unless it's to do with the electronic
14 copy.

15 Q. This is the same book that we were just looking
16 at, CX-1964, correct?

17 A. It appears to be, yes. And, thank you, that
18 makes more sense to my memory, yep.

19 Q. If we look on page 206 of your book, which is
20 exhibit page 1964.426, you've illustrated Fig. 6.97,
21 correct?

22 A. Yes.

23 Q. You've labeled Fig. 6.97 as evaluating spatial
24 candidates, correct?

25 A. As merge mode evaluate spatial candidates.

1 Q. And now, sir, in the merge mode, you understand
2 that there could be more than one block immediately above or
3 immediately to the left of the current PU, correct?

4 A. So PU here stands for prediction unit, and in my
5 Fig. 6.97 from my book, I'm showing a square PU, and it's
6 possible that, for example, above that PU there might be --
7 immediately vertical above there could be two or more PUs
8 depending on how the vertically adjacent block has been --
9 sorry, the vertically adjacent area has been subdivided.

10 Q. Sir, in your book you write, there may be more
11 than one immediately above or immediately to the left of the
12 current PU, as shown in Fig. 6.96, correct?

13 A. Yes, absolutely. And that's -- I'm sorry. I
14 wasn't looking up. I'm actually illustrating that in
15 Fig. 6.96.

16 Q. So you'd agree with me there can be more than one
17 block above or immediately to the left, correct?

18 A. And just for completeness, here I recall I'm
19 talking about the H.265 standard. So, in that context,
20 then, this is correct, as far as I'm aware.

21 Q. And you also see in Fig. 6.96 of your book, which
22 is Exhibit CX-1964, that spatially adjacent blocks can be
23 different sizes, correct?

24 A. Yes. And here we're talking about prediction
25 units, which is a particular term from the standard. So

1 adjacent prediction units or blocks, if you like, can be of
2 different sizes.

3 Q. And, in fact, we see a couple different sizes in
4 Fig. 6.96. The one on the bottom left is very small. The
5 one on the top left is sort of the same width but half the
6 height. The one immediately above is half the width but the
7 full height, for example, correct?

8 A. Yes.

9 Q. And you could have a spatially adjacent candidate
10 that's the same size as the prediction unit that you're
11 looking at, correct?

12 A. Yes. In H.265, yes.

13 Q. Mr. Davis, could we pull up the Complainants'
14 opening demonstrative CDX-1 at slide 38, please.

15 And, sir, you remember seeing this demonstrative
16 in openings this morning?

17 A. I think so.

18 Q. And when the blocks are all the same size, that
19 would correspond to the figure for the shapes of the blocks
20 in CDX-1.38, right?

21 A. Sorry. I'm not quite sure what you're asking me.

22 Q. The spatially adjacent candidates shown in
23 CDX-1.38 are all roughly the same size as the current
24 prediction unit, correct?

25 A. So I'm not -- this isn't my slide, but if you're

1 asking me to imagine that these each represented an H.265
2 prediction unit, then I think that would be consistent with
3 what you just said.

4 Q. I want to talk a little bit about how this
5 process works.

6 Mr. Davis, could we go back to Dr. Richardson's
7 book, which was Exhibit CX-1964, page 426, please?

8 Dr. Richardson, you recognize Exhibit 1964 and
9 the Fig. 6.97 we were just talking about?

10 A. Yes. Again, I'm assuming that this is an
11 electronic copy of my book, hence the page numbering and the
12 formatting.

13 Q. Now, in the opening we heard counsel for Nokia
14 say that the -- all the blocks, the spatial motion vector
15 prediction candidate blocks, may be evaluated in parallel.
16 Do you recall that testimony?

17 A. I don't recall precisely, no.

18 Q. Do you remember in your direct you testified that
19 part of the '714 patent is making sure that the comparisons
20 can be done in parallel?

21 A. Now, I don't remember the exact words I used, but
22 I think I was quite careful and said that comparisons could
23 be done in parallel. I don't remember saying that all of
24 the comparisons could necessarily be done in parallel.

25 Q. But one benefit of the '714 patent, as you

1 testified, was that the comparisons could be done in
2 parallel?

3 A. That's roughly what I said earlier, yes.

4 Q. But you'd agree with me, sir, that H.265 in fact
5 specifies the order in which the five spatial neighbor
6 blocks are evaluated, correct?

7 A. I don't have the standard in front of me. I have
8 read that part of the standard many times, but it's merge
9 mode. The description runs to quite a few pages, and I
10 don't have them in front of me.

11 Q. Mr. Davis, could we bring up Dr. Richardson's
12 opening report again at paragraph 92, please?

13 Dr. Richardson, about halfway through this
14 paragraph there's a sentence that reads, the availability of
15 these blocks, and that's a reference to the blocks A0, A1,
16 B0, B1, and B2, for merging is evaluated in the following
17 order, A1, B1, B0, A0, B2, right?

18 A. Availability, yes.

19 Q. And the availability, in particular, is in that
20 order?

21 A. I'm summarizing quite a complicated piece of the
22 standard. This is certainly what I wrote, as I recall, and
23 I'm summarizing several pages of the H.265 standard.

24 Q. Why don't we take a look at your textbook.

25 So let's go back, Mr. Davis, to CDX -- excuse me,

1 CX-1964 at page 424. Let's just zoom in on that first
2 bullet. Thank you.

3 Sir, in your book you mention, again, about
4 halfway through this block 1, immediately after this
5 highlighted sentence, there may be more than one block
6 immediately above or immediately to the left of the current
7 PU.

8 That's what we saw earlier, correct?

9 A. Sorry. Yes.

10 Q. And so the blocks that contain the positions A1,
11 B1, B0, A0, and B2, in that order are chosen as the
12 potential candidates, correct?

13 A. You've read that text correctly, yes.

14 Q. So, again, we're emphasizing that the blocks are
15 chosen as potential candidates in that order, right?

16 A. Who is emphasizing?

17 Q. This is your book, sir.

18 A. Okay. You read the text correctly.

19 Q. And you agree, sir, that the blocks that contain
20 the positions A1, B1, B0, A0, and B2, in that order are
21 chosen as potential candidates, correct?

22 A. That's what I wrote, and my recollection is that
23 I'm summarizing -- summarizing merge mode of H.265.

24 Q. Are you familiar with a gentleman, Thomas
25 Wiegand, correct?

1 A. I think it might be Wiegand.

2 Q. Wiegand?

3 A. You pronounced it perfectly last time we met.

4 Thomas Wiegand, yes.

5 Q. Wiegand, okay. Well, you know Mr. Wiegand,
6 correct?

7 A. Yes.

8 Q. And, in fact, he was a cochair of the group that
9 was responsible for developing H.265, correct?

10 A. That's my recollection, yes.

11 Q. And you cite some of his papers. In fact, you
12 cited one of his papers in your direct demonstratives,
13 correct?

14 A. I cited a paper, and he was one of the coauthors,
15 I think, yes.

16 Q. And, Mr. Davis, can we bring up CX-6289, please?
17 Let's just go to the first page.

18 This is one of the papers that you rely on in
19 your report, correct, by Thomas Wiegand?

20 A. I can't honestly remember, but I wouldn't be
21 surprised because it's a well-known paper, and I don't
22 remember whether I cited it or not.

23 Q. Mr. Davis, let's jump to page 13 of this exhibit,
24 so CX-6289.013. And let's zoom in on the Fig. 8.

25 Dr. Richardson, this paper from Thomas Wiegand

1 also illustrates the position of spatial candidates of
2 motion information, correct?

3 A. Yes. I think this might actually be the diagram
4 that ended up in -- that I excerpted in my report.

5 Q. And in the paragraph below this figure --

6 Mr. Davis, let's look at the text. Thank you.

7 -- Mr. Wiegand explains that for each candidate
8 position, the availability is checked according to the
9 order, and, again, A1, B1, B0, A0, B2, correct?

10 A. Yeah, that's what the text says. The
11 availability is checked according to the order, and then the
12 order you just read out.

13 Q. And you're familiar with Vivienne Sze, I believe,
14 is how you pronounce her name?

15 A. Yes.

16 Q. And she has a textbook titled "The High
17 Efficiency Video Coding: Algorithms"?

18 A. I can't remember the title. She is one of the
19 coeditors of that textbook, and I think she wrote maybe one
20 of the chapters.

21 Q. And you relied on -- you relied on that textbook
22 to form your analysis in this case, correct?

23 A. I don't remember whether I cited it, but it's a
24 well-known textbook, and, yeah, I'm familiar with it.

25 Q. Mr. Davis, let's bring up CX-6097, at pages 133

1 to 134 of the exhibit.

2 MR. WILSON: Your Honor, while Mr. Davis is
3 bringing that up, the exhibit number for Dr. Richardson's
4 opening report is RX-2660C.

5 JUDGE MCNAMARA: Thank you.

6 MR. WILSON: CX-6097.133 to 134.

7 Q. Let's go to the top of page 134, please.

8 Dr. Richardson, what we have here is an excerpt
9 from the Sze textbook, and, again, the last sentence of this
10 description is that for interprediction block merging, up to
11 four candidates are inserted in the merge list by
12 sequentially checking A1, B1, B0, A0, and B2, in that order,
13 correct?

14 A. I can't remember who wrote -- I think it wouldn't
15 have been Vivienne Sze that wrote this chapter, but assuming
16 that this is from that textbook, you certainly read that
17 correctly.

18 Q. And you understand that the candidates are
19 inserted into the merge list sequentially by checking A1,
20 B1, B0, A0, and B2, in that order.

21 A. That's the way it's described here. I don't
22 recall how it matches up in the standard itself.

23 Q. Let's shift gears.

24 One of the other technologies that you talked
25 about for the '267 patent was by directional motion

1 compensated prediction or bi-prediction, correct?

2 A. Yes, I believe I did mention that.

3 Q. You would agree with me that bi-prediction has
4 been known for decades?

5 A. So bi-prediction, as I recall, was certainly in
6 use in the MPEG-1 standard, which was standardized in the
7 early 1990s, so that's just over 30 years ago.

8 Q. And I think, you don't have to look at it, but
9 your timeline, you had MPEG-1 published in 1993. Does that
10 sound familiar?

11 A. That sounds about right, yes.

12 Q. So bi-prediction, using values from the forward
13 and backward references, and averaging them with something
14 that could be done in MPEG-1, correct?

15 A. There was a form of that done in MPEG-1. It's
16 quite different once you get to H.264 and H.265.

17 Q. Let's talk about the '321 patent.

18 Now, in your direct you referred to a Finnish
19 application related to the '321 patent, correct?

20 A. Finnish Patent Application, yes.

21 Q. And on your direct, I believe that you testified
22 that the Finnish application establishes priority for the
23 '321 patent under Nokia and Staff's proposed constructions
24 of the "resetting" term, correct?

25 A. Yes, that's my opinion, and that's what I said,

1 yes.

2 Q. So you'd agree that if the ALJ adopts
3 Respondents' proposed construction, that the Finnish
4 application would not establish priority for the '321
5 patent, correct?

6 A. I haven't formed an opinion on that.

7 Q. When you were -- in your direct you didn't
8 provide any testimony establishing that if the ALJ adopts
9 Respondents' proposed construction, that the Finnish
10 application would provide priority support for the '321
11 application -- the '321 patent, excuse me, correct?

12 A. Not that I recall.

13 Q. And that's because the Finnish application never
14 uses the word "reset," correct?

15 A. That's not what I said.

16 Q. You would agree with me, though, that the Finnish
17 application doesn't actually use the word "reset," right?

18 A. I don't have the Finnish Patent Application in
19 front of me. I can't recall every paragraph of it.

20 Q. Mr. Davis, could we bring up Dr. Richardson's
21 demonstrative CDX-2 at slide 33, please?

22 Sir, for the resetting limitations, none of the
23 highlighted text includes the word "reset" in CDX-2.33,
24 correct?

25 A. I don't see the word "reset" in those highlighted

1 portions.

2 Q. And it doesn't say to "set again" either,
3 correct?

4 A. I don't see the word "set again" in these
5 highlighted portions.

6 Q. In your direct you also testified about hardware
7 acceleration, correct?

8 A. I talked about hardware acceleration and, yeah,
9 in the context of other things.

10 Q. And just to be clear, you didn't investigate any
11 of the accused products in this case, correct?

12 A. I have not analyzed any of the accused products
13 in this case.

14 Q. You haven't evaluated any of the redesign
15 products in this case, correct?

16 A. I have not.

17 Q. Now, it's possible to decode a H.265 encoded
18 bitstream without using hardware acceleration, correct?

19 A. In what context?

20 Q. It's possible, it can be done without using
21 hardware acceleration, correct?

22 A. So I'm aware that, for example, there is test
23 model software for the H.265 standard, which is capable
24 of -- when executed on a CPU is capable of decoding H.265
25 bitstreams, as far as I'm aware, without the use of a GPU

1 hardware accelerator.

2 Q. Are you familiar with a VLC media player, sir?

3 A. Generally, yes.

4 Q. And you understand in VLC, for example, you can
5 disable any hardware acceleration and still play back
6 videos, correct?

7 A. I haven't tried that for a while, but I think
8 I've done that in the past. I think it is possible.

9 Q. And that's what I'm trying to understand. It's
10 possible to use a software-only decoder that doesn't require
11 any hardware acceleration to view H.265 encoded videos?

12 A. When you say "view," what do you mean?

13 Q. For a viewer to watch them, to decode them and
14 turn them back into --

15 A. Well, that -- I'm sorry to interrupt you.

16 Q. Back into video, that a regular viewer could
17 watch.

18 A. I think that would depend on the resolution and
19 the bitrate of the video capabilities of the processor that
20 the software is running on. So, for example, the test model
21 software I just mentioned would not be possible to do that
22 and actually view video of a reasonable resolution in real
23 time.

24 Q. It's not necessary to have hardware acceleration
25 to decode an H.265 video, correct?

1 A. So leaving aside the question of displaying in
2 real time, decoding by itself can be done, as I understand
3 it, in software without hardware acceleration.

4 Q. You also provided some testimony in your direct
5 about the '701 patent, correct?

6 A. I did, yes.

7 Q. And the '701 patent is about bypassing context
8 updating for certain data elements that would otherwise
9 undergo context adaptive updating, right?

10 A. That's not everything it's about. My
11 recollection is that that's part of its disclosure. Or,
12 yeah, I mean, sorry, I'm just hesitating, because the word
13 "bypass" has a particular meaning, but, generally, it's
14 generally concerned with, let's say, when to use context
15 updating and when not to use context updating.

16 Q. Okay. So would you agree with me that the '701
17 patent is about using bypass mode for certain data elements
18 that would otherwise be encoded in a context adaptive mode?

19 A. What do you mean by "bypass mode" in that
20 question?

21 Q. At a minimum, sir, you would agree that the '701
22 patent involves diverting some of the data elements that
23 would otherwise be coded using context adaptive probability
24 modeling so that they are coded using fixed probability
25 bypass coding, fair?

1 A. Again, generally, these concepts are in the
2 patent. I'd want to sort of know the specifics before
3 saying that that's everything that it's about.

4 Q. I'm not saying everything, but it involves --
5 that's one of the topics that the '701 patent involves,
6 right?

7 A. Sorry to talk over you. There is disclosure in
8 the '701 patent of encoding and decoding -- encoding and
9 decoding using probability updates. There's disclosure of
10 encoding and decoding using -- without using probability or
11 context model updates, and the patent is concerned with, if
12 you like, choosing which of those techniques to use in
13 certain situations.

14 Q. Mr. Davis, let's bring up Dr. Richardson's
15 opening report at paragraph 127.

16 In paragraph 127 you say, the invention of the
17 '701 patent involves diverting some of the data elements
18 that would otherwise be coded using context adaptive
19 probability modeling so that they are coded using fixed
20 probability, bypass coding, correct?

21 A. That's what I said.

22 Q. Now, let's take a look at the opening exhibits,
23 CDX-1.115, Mr. Davis, if you could bring that up, please.

24 And, sir, you recall seeing slide 1.115 in the
25 opening?

1 A. I think I recall this slide. Again, this is not
2 my slide, so I don't quite recall what was said along with
3 this slide.

4 Q. What's depicted on the left side of slide 115 is
5 a block of transform coefficients, correct?

6 A. I'm not sure. This is not my illustration.

7 Q. Okay.

8 Mr. Davis, could we bring up Dr. Richardson's
9 rebuttal report at page 119, please? And zoom in on that
10 block.

11 Dr. Richardson, you recall preparing this block
12 of transform coefficients in your rebuttal report, correct?

13 A. Excuse me. Could I just see the context of this?

14 Q. Sure.

15 A. I need to know the context. Thank you.

16 Sorry, could you zoom out a little bit more? I
17 really need to see the paragraph.

18 Q. Sir, I believe there's a binder that has your
19 rebuttal report in it in front of you, but there are also
20 dozens of binders.

21 A. Okay. Could I take a moment to look at that?
22 Because the paragraph is cut off. Where would I find it,
23 please?

24 Q. I think there's a binder with your report in it.

25 MR. WILSON: Your Honor, may I approach?

1 JUDGE MCNAMARA: Yes, please.

2 THE WITNESS: Seven binders.

3 Fantastic. Thank you very much.

4 Q. Sir, we were looking at page 119.

5 A. Okay. I have it.

6 Q. And, sir, this is an example of a block of
7 transform coefficients that you provided in this case,
8 correct?

9 A. Yes. It's meant to be illustrative -- at the
10 beginning of the paragraph that's cut off, I'm saying it's
11 illustrating a 4x4 transform unit with nine transform
12 coefficients.

13 Q. And the coefficients in this example are the
14 numbers that are in the boxes themselves, so 13, 9, 7, 10,
15 et cetera, correct?

16 A. That's my recollection, yes.

17 Q. And you understand that in H.265 there's a syntax
18 structure that explains how to decode these types of blocks,
19 correct?

20 A. It's not really a correct way to put it, no.

21 Q. Say that again? I didn't hear you.

22 A. Sorry. I wouldn't say that's how -- that's not
23 how I would describe it, no.

24 Q. You disagree there's a syntax structure for
25 explaining the transform coefficient, sir?

1 A. So my recollection is that the H.265 standard
2 defines a syntax structure relating to, I think, residual
3 coefficients. It's for a transform sub-block rather than
4 a -- necessarily a transform unit, and the syntax structure
5 isn't the entirety of the explanation. You need to also
6 read the semantics that goes along with it.

7 Q. Well, let's take a look at it.

8 Mr. Davis, could you bring up CX-5885.076?

9 And, Dr. Richardson, you recognize this
10 section 7.3.8.11, residual coding syntax, from the H.265
11 standard?

12 A. It's familiar, yes.

13 Q. Now, you understand that the residual coding
14 syntax structure in section 7.3.8.11 is what Nokia argues
15 practices the '701 patent, or at least in part, right?

16 A. My recollection is that Nokia is accusing
17 products of practicing the patent rather -- this is just a
18 diagram -- sorry -- a table in the standard.

19 Q. But part of their infringement analysis relies on
20 the syntax structure in section 7.3.8.11, fair?

21 A. I don't have their analysis in front of me. I
22 recall reading infringement contentions, and I think that
23 would be -- I think I recall this section being referenced.
24 But, yeah, I don't have those contentions in front of me.

25 Q. Mr. Davis, could we scroll down a little bit, or

1 go to the next page? Thank you.

2 Now, sir, you see in this syntax structure
3 there's some bolded elements, correct?

4 A. Is it possible to zoom out a little bit? I find
5 that we're right in the -- thanks. If everyone can read
6 that, I can read that better.

7 Q. Again, you should have a copy of this in a
8 binder. I can help you find it, if we need to.

9 A. Okay. Go ahead, and I'll let you know if I need
10 to see context.

11 Q. You see there are bolded elements of the syntax
12 structure?

13 A. I see bolded designators or words.

14 Q. And we have highlighted one, the sig_coeff_flag.
15 That's bolded in this section of H.265, correct?

16 A. I see sig_coeff_flag.

17 Q. And because it's bolded, we understand that
18 sig_coeff_flag is a syntax element in H.265, correct?

19 A. I know that sig_coeff_flag is a syntax element in
20 H.265. Part of the reason I know that is that I'm familiar
21 with the terminology of this section and the part that
22 introduces this section.

23 Q. And, in part, it's -- the fact that it's bolded
24 is consistent with the H.265 standard that bolds syntax
25 elements, right?

1 A. So H.265, as I said, I think, in at least one of
2 my reports, specifies the term, what it means by the phrase
3 "syntax element," and then at the very start of this set of
4 tables of syntax elements there is text that talks about the
5 bolding, the bold type use.

6 Q. Let's just focus on this sig_coeff_flag syntax
7 element. You would agree with me that a 1 would indicate
8 it's a non-zero coefficient and a 0 would indicate a zero
9 coefficient, correct?

10 A. So the context here, if I could use that word in
11 its other meaning, is that this is a process that, as I
12 recall, looks at a 4x4 sub-block of -- or considers a 4x4
13 sub-block of transform coefficients. And for each position
14 in that 4x4 sub-block where there is a non-zero transform
15 coefficient coded in the bitstream, sig_coeff_flag will be
16 set to 1. And for each position in that 4x4 sub-block where
17 there is not a non-zero coefficient or where the coefficient
18 is 0, that flag would be set to 0.

19 Q. Mr. Davis, let's scroll down a little bit to see
20 the next syntax element. Thank you.

21 And, Dr. Richardson, the next bolded text in this
22 syntax structure is coeff_abs_level_greater1_flag, correct?

23 A. Yes.

24 Q. And that is another syntax element in H.265,
25 correct?

1 A. My recollection is that that is a syntax element
2 in the H.265 standard.

3 Q. And when the coeff_abs_level_greater1_flag is a
4 1, that means that the value of the coefficient is greater
5 than 1.

6 A. So a little bit of context again. This, as I
7 recall, is part of the syntax that deals, again, with the
8 transform sub-block. That's a 4x4 block of coefficient
9 values. For each position in that sub-block, there's a --
10 the logic says that, if that sig_coeff_flag that we
11 mentioned is set to 1 for that position, and if something
12 else is satisfied, then this flag is present in the
13 bitstream.

14 My recollection is that, when you look at the
15 semantics in the standard that tells you how to interpret
16 this, that that is pretty much what you said, that if this
17 flag is a 1, then the coefficient at that position has an
18 absolute magnitude that is greater than 1.

19 Q. And this flag is only used up to eight times for
20 any sub-block, transform sub-block, correct?

21 A. So, again, you can see that line immediately
22 above is a test for this transform sub-block. If something
23 called num_greater1_flag is less than 8, then this
24 coeff_abs_level_greater1_flag value is present. And each
25 time it's present, that num_greater1_flag is incremented.

1 So we get to a point when the num_greater1_flag test fails
2 and then there are no more of these flags.

3 Q. So you agree with me that it can be used a
4 maximum of eight times, the coeff_abs_level_greater1_flag?

5 A. You know, I think that's correct. I would have
6 to sort of work through this to be absolutely sure, because
7 we set that flag -- sorry -- yeah, we set the
8 num_greater1_flag higher up, and then there's an increment.
9 And I would just need to check, but I think it's eight
10 times.

11 Q. Mr. Davis, let's go to the next page, please.

12 And, sir, the next bolded element here is
13 something called coeff_abs_level_greater2_flag, correct?

14 A. I can't remember if it's the next one. You kind
15 of went quickly. I'm happy to accept it, but I can't
16 remember if -- I don't recall if there's one in between.

17 Q. That's fair. This is another one. The
18 coeff_abs_level_greater2_flag is another syntax element in
19 this syntax structure, correct?

20 A. Yes, in the syntax structure we've been
21 discussing.

22 Q. And when the coeff_abs_level_greater2_flag is set
23 to 1, that indicates that the coefficient at that position
24 has a absolute value greater than 2.

25 A. That is my recollection, yes.

1 Q. And this flag, the `coeff_abs_level_greater2_flag`,
2 is only ever used once in a transform sub-block.

3 A. That's my recollection. It's used once, and then
4 once -- and then, after that point, it's simply not present
5 in the bitstream or it's not coded in the bitstream.

6 Q. Let's go to the next bolded text. There is a
7 `coeff_sign_flag`. That is another syntax element in the
8 syntax structure we're looking at, correct?

9 A. That's my recollection, yes.

10 Q. And this flag signifies that, for each non-zero
11 coefficient with a -- if it's a negative value, there's a 1,
12 and if it's a positive value, it's a 0, correct?

13 A. It doesn't necessarily indicate it for every
14 single coefficient. There is some logic immediately above
15 that. If that condition immediately above is satisfied and
16 if this syntax element is present, then it would indicate
17 the sign of a non-zero coefficient, as I recall.

18 Q. And let's go down just a little bit more,
19 Mr. Davis.

20 And the last one I want to talk about is
21 `coeff_abs_level_remaining` also in bold. That is another
22 syntax element in this syntax structure, correct, sir?

23 A. That's my recollection, yes.

24 Q. And the `coeff_abs_level_remaining` sort of
25 collects the remaining coefficient values that are not

1 otherwise indicated by the other flags that we've already
2 been talking about, correct?

3 A. That's broadly correct. I think the way I
4 would -- I might put it is that, if certain conditions are
5 satisfied and this syntax element is present, then it
6 indicates the absolute value of the coefficient at that
7 position with any contribution of the greater than 1 and/or
8 greater than 2 flags removed.

9 I think you probably put it better than that
10 actually. It's hard to explain this.

11 Q. All right, sir. Now, in your -- I'm going to
12 shift gears a little bit.

13 In your direct you talked about Nokia sharing of
14 the invention of the '701 patent with the world. Do you
15 recall that testimony?

16 A. I recall being asked that, something along those
17 lines.

18 Q. My recollection is that you explained that
19 Qualcomm submitted a proposal that was ultimately
20 incorporated into H.265, and it's that proposal that
21 embodies the '701 patent.

22 A. I didn't put it quite like that. My rec- --
23 well, it's on the record. I think I said something like,
24 along the lines of, my understanding is that Qualcomm -- a
25 team from Qualcomm made a proposal or a contribution to the

1 JCT-VC in 2012, if I remember correctly. That proposal was
2 adopted, and, as a result of that proposal being adopted,
3 the invention of the '701 patent is now in the H.265
4 standard.

5 Q. In your direct you didn't provide any evidence
6 that someone from Nokia disclosed the invention of the '701
7 patent to someone from Qualcomm that led to Qualcomm's
8 proposal, correct?

9 A. I did not say that.

10 Q. And in your direct you didn't identify any Nokia
11 contribution for the '701 patent that ended up in the H.265
12 standard, correct?

13 A. Sorry. Could you ask that again? I missed part.

14 Q. In your direct you didn't identify any
15 contribution or proposal from Nokia to the H.265 standards
16 body that led to -- that embodied the invention of the '701
17 patent. Do you understand that?

18 A. I think I understand your question. I think the
19 answer is, no, I did not.

20 MR. WILSON: We pass the witness, Your Honor.

21 JUDGE MCNAMARA: Okay. Thank you. Thank you,
22 Mr. Wilson.

23 Ms. Ducca?

24

25

1 EXAMINATION BY COUNSEL FOR ITC STAFF

2 BY MS. DUCCA:

3 Q. Good afternoon, Dr. Richardson. It's good to see
4 you again.

5 A. Good afternoon. Likewise.

6 Q. I'm Marissa Ducca from the Office of Unfair
7 Import Investigations. I just have a couple questions for
8 you.

9 I'm wondering if somebody can pull up
10 slide CDX-2.20 for me.

11 Dr. Richardson, this is one of your slides that
12 you testified about the decoding and encoding processes in
13 H.264 and H.265, correct?

14 A. These are specifications of those terms, encoding
15 process and decoding process, from those two standards.

16 Q. Does the AV1 specification specify a decoding
17 process?

18 A. I don't have the specification in front of me.
19 My recollection -- I am familiar with it, and I don't recall
20 whether it uses -- has this same definition, but I do recall
21 that it does set out a process for decoding video.

22 Q. Do you recall whether it specifies an encoding
23 process?

24 A. My recollection is that the AV1 specification
25 does not specify an encoding process.

1 Q. Now, with H.264 and H.265 with respect to the
2 encoding processes, it says that the encoding process is not
3 specified in the recommendation or specification, correct?

4 A. That's correct, yes.

5 Q. What does that mean as compared to the decoding
6 process where it says the process is specified in this
7 recommendation?

8 A. I think you can sort of take it literally. If
9 you take either of those documents, and they are very
10 publicly available -- I'm sure you've looked at them -- the
11 document sets out step by step in great detail exactly how
12 to decode an H.264 bitstream or how to decode an H.265
13 bitstream, and that includes the steps to follow and also
14 some things about -- some aspects about the output and what
15 it --you know, how it should be produced, how many --
16 something called a hypothetical reference decoder process.

17 So you can follow that. You can design -- "you,"
18 as in an engineer or somebody, can design a codec, and the
19 standard says something along the lines of, your decoder has
20 to produce the identical output to this decoding process.
21 I'm paraphrasing, but that's my recollection.

22 On the encoding side, as I think I tried to
23 explain earlier, an encoding process, any encoding process,
24 has to meet the constraint that it produces a bitstream
25 conforming to the standard. And conforming to the standard,

1 again, means that it follows the syntax that we discussed,
2 which is set out in detail, and also that the bitstream,
3 again, functions, if you like, with this set of constraints
4 about not using too much memory in the decoder, for example,
5 and things like that.

6 As long as you meet those specifications, you as
7 a designer of an encoder, your encoder meets this definition
8 of encoding process.

9 And, as I said, my understanding is the intention
10 is to give flexibility to manufacturers. So, for instance,
11 one manufacturer might make a realtime encoder that doesn't
12 consume much processing power and can sit in a
13 battery-powered device. Another manufacturer might choose
14 to make a high-speed encoder that runs on a server in the
15 cloud somewhere and can process, you know, millions of
16 frames per hour or whatever.

17 So you have that flexibility, but, by doing
18 things in this way, you still have conformance.

19 Q. So I actually think you predicted my next
20 questions to you. So my next question was going to be, what
21 does it mean when it says in the encoding process that it
22 produces a bitstream conforming to this recommendation.

23 Let me ask a different question, and that is,
24 does the specification provide any details on how the
25 encoding process must be performed?

1 A. Okay. So really interesting question.

2 First of all, the specification defines these
3 constraints on the bitstream that I mentioned. It has to
4 follow the syntax. It also has to -- there's a -- it's kind
5 of defined as a model or a hypothetical model decoder, and
6 the way I sometimes explain it, which is my terminology, is,
7 it can't break that decoder.

8 And my understanding is, the purpose of that is,
9 for example, so that the manufacturer of a decoder that has
10 a certain amount of storage space and processing power, that
11 it will not be overwhelmed by an encoder that produces a
12 bitstream. So it has to meet the constraints of the
13 bitstream.

14 And, I'm sorry, I forgot the second part to your
15 question, the rest of your question.

16 Q. I think you answered it. It was whether the --
17 whether the standards specify how to perform the encoding
18 process.

19 A. Yes. I'd just like to finish by saying, that at
20 a fairly fundamental level, it does not tell the encoder how
21 to do that, it just says, paraphrasing, you have to do that,
22 you have to make this thing that conforms to the standard;
23 how you make that thing is up to you. Again, these are my
24 words.

25 And the standard is also -- when you're reading

1 it, it's very specific about which parts are normative. And
2 normative, in terms of the standard, means that the standard
3 says, typically for the decoder, the decoder must carry out
4 these steps.

5 And then there's another -- there are parts of
6 the standard that are informative. So there are, for
7 example, informative descriptions of example encoding
8 processes, but the use of the word "informative" means that,
9 as a manufacturer of an encoder, you are not obliged to
10 follow that methodology or to follow that example, and it's
11 a separate question from whether or not you're producing a
12 conforming bitstream.

13 Q. Are there different ways that an encoder can be
14 designed to create a conforming bitstream?

15 A. Yes, absolutely.

16 Q. Can we take a look at slide 32?

17 There were a couple of questions on both sides
18 about the parties' construction of the term "reset."

19 Do you recall that?

20 A. Yes.

21 Q. And Respondents' construction says, quote,
22 setting the identifier value again, correct?

23 A. I see that, yes.

24 Q. If you look at Staff's proposed construction,
25 about halfway down, do you see where it says, or setting the

1 identifier value again to restart the numbering scheme?

2 A. Yes.

3 Q. So do you agree that the Respondents' proposed
4 construction is actually part of Staff's proposed
5 construction?

6 A. I agree that the words are there. I honestly
7 would have to really think about as to whether the meaning
8 was there. I'm obviously not a lawyer, and I know that word
9 meanings are important. I certainly agree that the wording
10 is in there. Whether it has the same technical meaning, I
11 would have to think about that.

12 Q. Okay. All right. And, in fact, there's
13 additional parts of Staff's proposed construction that are
14 not part of Respondents' proposed construction, correct?

15 A. Yes.

16 MS. DUCCA: That's all the questions I have for
17 you now. Thank you for your time, Dr. Richardson.

18 JUDGE MCNAMARA: Thank you, Ms. Ducca.

19 Any redirect, Mr. Verboncoeur?

20 MR. VERBONCOEUR: Yes, Your Honor. Mitch
21 Verboncoeur on behalf of Nokia. Just a brief redirect.

22 REDIRECT EXAMINATION

23 BY MR. VERBONCOEUR:

24 Q. Doctor, you were asked about the H.265 merge
25 mode, right?

1 A. I recall that, yes.

2 Q. Does an encoder need to use merge mode?

3 A. No. For example, an encoder can produce an H.265
4 compliant bitstream without using motion-compensated
5 prediction, and actually that's what you would call an
6 intra-only encoder, and that would not use merge mode. That
7 would not require the decoder to use merge mode.

8 Q. Does an encoder need to use bi-prediction?

9 A. An encoder conforming to H.264 or H.265 does not.
10 And I could give a similar example. Intra-only encoding in
11 both standards would not use bi-prediction.

12 Q. Mr. Moreno, can we please have CX-5885, please.

13 Doctor, you were asked about the H.265 standard.
14 Is CX-5885 the H.265 standard?

15 A. It appears to be, yes.

16 Q. This question might sound obvious, but is the
17 H.265 standard the best source of information about how the
18 H.265 standard works?

19 A. Yes. It's not an obvious question, because
20 that's something that I'm pretty sure I wrote in the
21 introduction to my book, that I'm explaining things in my
22 books, but I direct the reader to the H.265 standard if
23 there's anything they are not sure about.

24 Q. Can we please have page 165 of CX-5885?

25 I'd like to ask you, Doctor, about the sub-clause

1 at the bottom of this page. What is your understanding of
2 sub-clause 8.5.3.2.2?

3 A. So this relates to merge mode, which I was asked
4 about earlier. That's a mode that involves identifying
5 prediction parameters for motion-compensated prediction.

6 Q. If we could please have page 166 of CX-5885.

7 About halfway down the page -- a little higher,
8 please, Mr. Moreno -- there is the sentence beginning with,
9 the motion vectors mvL0 and mvL1... are derived by the
10 following ordered steps.

11 Are you able to see that text?

12 A. Yes.

13 Q. Can you please explain to Her Honor what that
14 text means?

15 A. At a high level, Your Honor, it means that a
16 decoder can follow the process, the ordered process that
17 comes after this, and that, as a result of that, it will end
18 up with motion vectors mvL0 and mvL1. These are two motion
19 vectors that could be used for bi-prediction. L0 is
20 prediction in one direction, L1 is in another direction, as
21 I recall.

22 So by following these steps in the order shown, a
23 decoder should derive these vectors.

24 Q. You mentioned following the steps "in the order
25 shown." When the standard says, the following ordered

1 steps, does that mean you need to perform step 1 first and
2 then step 2, step 3, et cetera?

3 A. You have to perform the steps. I think to the
4 extent that there's any -- there is any dependency between
5 the steps, you would need to -- you as a decoder would need
6 to resolve that.

7 Q. I'd like to ask about step 1. If you look at
8 step 1 on page 166 of CX-5885, there's reference to
9 availability flags, and then there are a series of letters
10 and numbers, like A0, A1, B0, B1, et cetera.

11 Are these -- A0, A1, et cetera, are these the
12 locations you were talking about with counsel for
13 Respondents corresponding to that figure of the '714 patent?

14 A. That's my recollection, and they should be
15 consistent with that figure.

16 Q. What is the output of step 1 on page 166 of
17 CX-5885?

18 A. So the output of this step 1 is -- it's kind of
19 halfway down the paragraph -- the availability flags that
20 you just mentioned, and there's five of them, and also
21 reference indices, and also prediction list utilization
22 flags, and also motion vectors.

23 Q. Which spatial candidate location is listed first
24 as far as the availability flags are concerned?

25 A. The first flag is available flag A0. So my

1 recollection is that corresponds to the block with location
2 A0 that we discussed earlier.

3 Q. Now I'd like to ask you about page 167 of
4 CX-5885.

5 Do you see at the top of page 167 where step 5
6 begins?

7 A. Yes.

8 Q. Can you please explain to the Court what step 5
9 is?

10 A. So this is -- this step involves constructing a
11 list of candidates, and I mentioned a list of candidates
12 earlier. So by the time this step is complete, there will
13 be a list of candidate block positions. And, as I recall,
14 the general idea is that an encoder can then identify one of
15 these and a decoder knows that it should inherit its
16 prediction parameters from the identified location.

17 Q. When we're talking about what you referred to
18 earlier as the merge list, is that the same thing as merge
19 CAND list?

20 A. That's my recollection, yes.

21 Q. Do the candidate locations need to be in a
22 certain order in the merge list?

23 A. In the merge CAND list, my recollection is that
24 they should be in a particular order, because you'll see
25 that if you -- this is pseudocode, Your Honor. If you read

1 the pseudocode from the top down, you are placing candidates
2 such as A1 into the list, and then -- and the next
3 candidate, B1, is also placed into the list, and there's an
4 index I that has been incremented between each of those
5 steps.

6 So my recollection is that, if these locations
7 are considered available, they will be put into the list,
8 and the list will have a certain order.

9 Q. So the list has a certain order, but now let's go
10 back to step 1 on page 166 of CX-5885.

11 Can you remind us, what's the output of step 1?

12 A. The output is -- was a whole bunch of things.
13 The first set of things is a set of available flags,
14 available flag A0, available flag A1, and so on.

15 Q. When we were looking at step 5, we saw these
16 available flag checks. Are the outputs of step 1 put into
17 step 5?

18 A. Yes, absolutely. These are the availability
19 flags that we saw a moment ago in that step 5.

20 Q. Earlier you mentioned that the candidate location
21 A0 is listed first in step 1. Does step 1 require any order
22 of figuring out these available flags?

23 A. Not that I recall.

24 Q. Can you figure out these available flags in a
25 parallel process?

1 A. That's my recollection, because of the way the
2 derivation process in clause 8.5.3.2.3 of the H.264 standard
3 is set out.

4 Q. And can you please explain to Her Honor what a
5 parallel process is?

6 A. So a parallel process means that I want to
7 calculate -- generally I want to calculate two things. I
8 could calculate thing 1 and then calculate thing 2, or I
9 could calculate both of them at the same time.

10 And why that's often important for computational
11 reasons is that -- you've probably heard the term "parallel
12 processing" or "multicore" or something like that. Many of
13 our consumer electronic devices have multiple processors and
14 are capable of doing things in parallel if the process
15 itself is parallelizable, is itself capable of being carried
16 out in parallel.

17 Q. We can zoom out here, Mr. Moreno.

18 You were asked about a description of merge mode
19 in your book. In your view, is there any inconsistency with
20 the way your book describes the merge mode process and the
21 ordered steps we're looking at here on pages 166 and 167 of
22 CX-5885?

23 A. I don't believe there's an inconsistency. There
24 certainly wasn't -- it was my intention when writing the
25 book to be consistent with the standard, but you can see

1 just from the text that there's a lot more detail in the
2 standard than in my book.

3 And, as I said, there's that advice at the
4 beginning of my book, as I recall, if you want to know the
5 details of any of these processes, go to the standard
6 because, by definition, the standard is the correct
7 description.

8 Q. We can please take that down. Thank you.

9 Doctor, you were also asked about syntax
10 elements.

11 A. Yes.

12 Q. Are non-zero transfer coefficients syntax
13 elements?

14 A. In the context of -- I think the discussion was
15 in the context of the '701 patent, and the way the term is
16 used in that patent, in my view, they are, yes.

17 Q. Why do you have that view?

18 A. Well, first of all, from reviewing the
19 specification and the claims of that patent. And when
20 considering the patent in the context of, for example, the
21 H.265 standard, as I set out in my report, the H.265
22 standard defines the expression syntax elements as -- I
23 think it's along the lines of an element of data represented
24 in the bitstream. And, in my view, non-zero transform
25 coefficients in, for example, transform sub-blocks in H.265

1 are indeed elements of data represented in the bitstream.

2 Q. And, finally, you were asked about Qualcomm's
3 contribution, which you said in your opinion led to the
4 invention of the '701 patent being in the H.265 standard.

5 Is there anything unusual about the fact that the
6 Qualcomm contribution was adopted here?

7 A. It's certainly something that, in my view, is
8 perfectly possible. I have actually encountered it before
9 that -- and the context here, again, that word, is that by
10 that point in the standardization process, quite late -- it
11 was in 2012, the standard was released in 2013 -- by that
12 point there was a focus and an effort within the
13 standardization group to reduce complexity, and, in
14 particular, to reduce complexity of entropy coding and, in
15 particular, to reduce the number of context-coded bins, is
16 the term, the amount of context coding being used in the
17 draft standards.

18 So I'm not surprised that the contribution was
19 made that related to this process of reducing the number of
20 context-coded bins.

21 Q. Thank you.

22 MR. VERBONCOEUR: No further questions.

23 JUDGE MCNAMARA: Thank you, Mr. Verboncoeur.

24 Mr. Wilson?

25 MR. WILSON: Thank you, Your Honor. Just

1 briefly.

2 RE CROSS-EXAMINATION

3 BY MR. WILSON:

4 Q. Dr. Richardson, you recall just providing
5 testimony about the Qualcomm proposal, correct?

6 A. I mentioned a Qualcomm contribution, yes.

7 Q. And you don't have any evidence that Nokia
8 provided any information to Qualcomm that led to the
9 Qualcomm proposal, correct?

10 A. I have no particular knowledge of how that
11 proposal was developed.

12 Q. And so --

13 A. Sorry. Apart from who developed it and when.

14 Q. So any thoughts about how Qualcomm may have
15 figured out the invention of the '701 patent is your
16 speculation?

17 A. I don't think I've made any such speculation. I
18 wouldn't want to speculate.

19 Q. Thank you.

20 MR. WILSON: Nothing further, Your Honor.

21 JUDGE MCNAMARA: Thank you, Mr. Wilson.

22 Ms. Ducca?

23 MS. DUCCA: No additional questions from Staff,
24 Your Honor.

25 JUDGE MCNAMARA: Thank you very much.

1 Dr. Richardson, you may step down. Thank you
2 very much.

3 THE WITNESS: Thank you, Your Honor.

4 MR. VERBONCOEUR: For Nokia's next witness we
5 will call Dr. Pierre Moulin.

6 JUDGE MCNAMARA: Very good.

7 MR. VERBONCOEUR: And I hope you'll pardon us,
8 Your Honor. We'll need a second to pass out the binders.

9 JUDGE MCNAMARA: Of course.

10 MS. DUCCA: Your Honor, is this a good time to
11 take our afternoon break?

12 JUDGE MCNAMARA: Sure. All right. I will see
13 you back here in 15 minutes.

14 (Whereupon, the proceedings recessed at
15 3:28 p.m.)

16 (In session at 3:40 p.m.)

17 JUDGE MCNAMARA: Thank you, everyone. Please be
18 seated.

19 I see you're calling Dr. Moulin, Mr. Verboncoeur.

20 MR. VERBONCOEUR: That's correct, Your Honor.

21 JUDGE MCNAMARA: Yes. Good afternoon,
22 Dr. Moulin. Would you kindly remain standing and raise your
23 right hand.

24 PIERRE MOULIN,
25 having been first duly sworn or affirmed on

1 their oath, was thereafter examined and testified as
2 follows:

3 JUDGE MCNAMARA: Please state your full name.

4 A. Pierre Moulin.

5 JUDGE MCNAMARA: Very well. Thank you.

6 MR. VERBONCOEUR: Mitch Verboncoeur on behalf of
7 Nokia.

8 JUDGE MCNAMARA: Yes.

9 MR. VERBONCOEUR: May I proceed?

10 JUDGE MCNAMARA: Yes, thank you.

11 DIRECT EXAMINATION

12 BY MR. VERBONCOEUR:

13 Q. Good afternoon, Professor.

14 A. Good afternoon.

15 Q. Did you prepare a set of demonstrative slides to
16 assist your testimony?

17 A. Yes, I did.

18 Q. Are we looking at those slides?

19 A. Yes.

20 Q. Can you introduce yourself to the Court?

21 A. Yes. Can we move to slide 2, please?

22 I received my education in electrical engineering
23 mostly. My doctoral degree in 1990 from Washington
24 University, master's from the same university, and that
25 followed my undergraduate education also in electrical

1 engineering from Belgium.

2 Q. What work experience do you have?

3 A. Move to slide 3, please.

4 So after my Ph.D., I started my career at Bell
5 Communications Research in New Jersey as a research
6 scientist. Then five years later I moved to the University
7 of Illinois, first as an assistant professor in the
8 electrical and computer engineering, and then I got promoted
9 and since 2003 I've been a full professor in the same
10 department. And I've also been an affiliate professor in
11 statistics at my university.

12 Q. What courses do you teach?

13 A. Let's move to slide 4, please.

14 I teach many classes, including image and video
15 processing. In particular, I have developed an
16 undergraduate class in image and video processing back in
17 1996 when I joined the university. And so this was actually
18 a kind of first experiment teaching that material at the
19 undergraduate level.

20 And so this on the left is a 2000 paper that
21 Michael Orchard and I were invited to present at a
22 conference in our field where we described our approach to
23 teaching these materials at the level of seniors.

24 Q. Do you still teach that image and video
25 processing course today?

1 A. Yes. In fact, my students have their midterm
2 exam tonight.

3 Q. Are you familiar with the H.265 standard?

4 A. Yes, quite.

5 Q. Do you teach the H.265 standard in your course?

6 A. Yes. It is part of the video compression video
7 component of my course.

8 Q. Are you familiar with the AV1 specification?

9 A. Yes.

10 Q. Do you teach the AV1 specification?

11 A. Yes, I also do.

12 MR. VERBONCOEUR: At this time, Your Honor, I
13 would like to proffer Dr. Pierre Moulin as an expert in the
14 field of video decoding and encoding.

15 JUDGE MCNAMARA: Is there any objection?

16 MR. HOUMAND: No, there is not. Corey Houmand
17 from Morgan Lewis on behalf of the Respondents.

18 JUDGE MCNAMARA: Thank you.

19 Any objection, Ms. Ducca?

20 MS. DUCCA: No objection from Staff, Your Honor.

21 JUDGE MCNAMARA: Then Dr. Moulin is accepted as
22 an expert on the topics for which he has been called to
23 testify without exception.

24 A. Thank you.

25 MR. VERBONCOEUR: Thank you.

1 Q. Professor, why are you here?

2 A. I'm here to present opinions on two patents. If
3 you could move to slide 5, please.

4 So these are the '714 and '267 patents, and I
5 will demonstrate that both Acer and ASUS infringe both
6 patents, both under direct infringement through the
7 apparatus claims and indirect infringement, that's the
8 method claims, and I will also show that the technical
9 domestic industry, in particular, Samsung and Microsoft,
10 practice the claims of the standards.

11 Q. What claims did you analyze from the '714 and
12 '267 patents?

13 A. Let's move to slide 6, please.

14 For the '714 patent, I examined decoding claims 9
15 and 23, that's method and apparatus, as well as encoding
16 claims 1 and 15.

17 And for the '267 patent, I investigated decoding
18 claims as well, 20 and 26, and encoding claims 2 and 8.

19 Q. You mentioned Acer products. Which Acer products
20 did you consider?

21 A. Let's move to slide 7, please.

22 I looked at, regarding the '714 patent at
23 products that are capable of decoding H.265-compliant
24 bitstreams as well as encoding video into H.265-compliant
25 formats.

1 And regarding the '267 patent, I looked at the
2 capability and also the same one adding AV1 instead of
3 H.265, and here are some representative products from Acer
4 that I've considered.

5 Q. For the record, we're on slide 7, and also
6 looking at CX-6688C and CX-6452C.

7 What ASUS products did you consider?

8 A. Let's move to slide 8, please.

9 So for ASUS I considered, again, the same
10 capabilities, and I'm showing here three products from ASUS
11 that I've considered.

12 Q. And, again, we're on slide 8, looking at CX-6712C
13 and CX-6453C.

14 You also mentioned Microsoft and Samsung
15 products. Which of those did you consider?

16 A. Let's move to slide 9, please.

17 So for Microsoft, I considered Surface Pro tablet
18 as well as Xbox, and also Samsung smartphones.

19 Q. Before we get into the substance of your opinion
20 today, what is your understanding of a person of ordinary
21 skill in the art in the field of the '714 and '267 patents?

22 A. Let's look at slide 10, please.

23 So in my view, a POSITA for both patents would
24 have at least a bachelor's degree in electrical engineering,
25 computer engineering, or a related field, as well as about

1 two years of experience in video decoding and encoding
2 technologies.

3 Q. Did you qualify as a person of ordinary skill in
4 the art at the time of the inventions in the '714 and '267
5 patents?

6 A. Yes.

7 Q. What evidence did you consider in forming your
8 opinions in this matter?

9 A. Let's look at slide 11.

10 Regarding decoding claims, my general approach
11 was to first consider the H.265 decoding standard. In fact,
12 all versions of it, as well as the AV1 specification. It is
13 not really called a standard, but it's a specification.
14 That's relative to the '267 patent. Also, spent quite a bit
15 of time looking at source code for those products. And I
16 did playback testing of video on the different products.

17 And regarding encoding, I again examined source
18 code, and I used also a tool called VQ Analyzer, which is
19 extremely helpful to investigate the encoder.

20 Q. Why did you list different sources of evidence
21 for decoding claims versus encoding claims?

22 A. Let's move to slide 12.

23 So as has been explained earlier, H.265 is really
24 a decoding standard, and the encoder merely has to produce a
25 bitstream that conforms to the specification.

1 The same goes with AV1. So AV1 describes a
2 decoding process, and the encoding process merely has to
3 conform to the description of the decoder.

4 Q. For the record, we're looking at slide 12,
5 CX-5885, the H.265 standard, and JX-138, the AV1
6 specification.

7 You mentioned testing that you performed. What
8 products did you test?

9 A. Let's look at slide 13, please.

10 I considered eight Acer products, ten ASUS
11 products, three Microsoft products, and three Samsung
12 products.

13 Q. How did you perform your testing in this case?

14 A. Let me show slide 14.

15 So I will explain how I investigated computer
16 program code and how I analyzed -- how I used the
17 VQ Analyzer as well.

18 Q. Mr. Moreno, could we please have slide 13 again?
19 Doctor, I want to follow up on a point here.

20 You mentioned that you tested, I guess it's
21 20-something products.

22 A. Right.

23 Q. What test did you perform on those products?

24 A. Yeah, the test that I mentioned in my previous
25 slide, so I considered these products, a large number of

1 products, of course, and I chose those.

2 Q. How did you determine which products to test?

3 A. Well, as I said, there is a really long list,
4 there are dozens of pages of different products. And since
5 I observed no material difference between the performance of
6 those products and the infringement issues, I stuck to these
7 products, and same with the domestic industry products. I
8 considered this analysis suffices.

9 Q. For the record, we're on slide 13, and there is
10 also a citation to CX-6454C.

11 Now, Professor, I want to ask you, do Respondents
12 dispute the sufficiency of any of your sources of proof?

13 A. Yes, they do.

14 Q. What arguments do Respondents have?

15 A. So let's go back to slide 14.

16 First, they are disputing the analysis of or the
17 definition of computer program code. Second, they take
18 issues with the VQ Analyzer tool as an investigative tool.

19 Q. And let's take each of those in turn, but, first,
20 Mr. Moreno, can we have slide 15?

21 Your Honor, at this time we need to go on the
22 third-party source code record.

23 JUDGE MCNAMARA: All right. Very good.

24 (Whereupon, the hearing proceeded in confidential
25 session.)

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1 O P E N S E S S I O N

2 JUDGE MCNAMARA: Okay.

3 BY MR. VERBONCOEUR:

4 Q. Let's turn to the VQ Analyzer testing you
5 mentioned. What is that?

6 A. Let's move to slide 18, please.

7 So VQ Analyzer is an application that takes an
8 encoded bitstream and decodes it. So on the left, for
9 instance, it will decode and display a video scene. So that
10 was encoded video. It is now decoded and displayed.

11 And then on the right I'm showing an example of
12 information that's extracted by the VQ Analyzer. It shows
13 important details of the encoder. Very basic things such as
14 the size of the picture, the number of bits for the input,
15 the color format, but as we see in greater detail later,
16 things like motion vectors, and it will do quite a refined
17 analysis based on the VQ Analyzer.

18 Q. Does the VQ Analyzer show an encoding process?

19 A. It does show vital information to determine what
20 was done by the encoder. So, again, the encoder has to be
21 compliant with the H.265 decoder. So there are lots of
22 things that it cannot do, and lots of things that we're
23 going to show can be inferred from this analysis.

24 Q. Dr. Moulin, which patent should we start with
25 today?

1 A. Let's start with the '714 patent, slide 19.

2 Q. And before we get into the substance of your
3 opinions, is there any background that will help us
4 understand the '714 patent?

5 A. Yeah, the '714 patent is really about motion
6 compensated prediction. So I'm showing here an example,
7 we're seeing a car or a minivan here, or actually a big van.
8 So this is the current picture to be encoded. It has been
9 simplified a bit, partitioned to blocks of equal size, with
10 yellow block to be encoded in the current picture, and on
11 the left I'm showing a reference picture, whose information
12 has been encoded already, and the decoder has access to it.

13 And we see in the reference picture there is a
14 matching block, also highlighted in yellow. So the core
15 idea of motion compensated prediction is to say, well, first
16 of all, the correspondence between these two blocks is
17 through a motion vector, which in this case aligns pretty
18 well with physical motion of the vehicle.

19 And then the reference picture, if the prediction
20 is pretty good, there's very little difference, it is called
21 a residual, and encoding the residual or prediction error,
22 as it's called, is very simple, does not require too many
23 bits. And so that has been known for a long time to be a
24 real effective method in video coding.

25 Q. How does a decoder know what motion vector to

1 use?

2 A. Let's move to slide 20.

3 So the decoder -- so, first of all, we need to
4 know the motion vectors. So I'm highlighting here in
5 turquoise a block motion vector. So in the past a long time
6 ago motion vectors would be simple like this, but it's a lot
7 of information.

8 So you notice that motion vectors of adjacent
9 blocks are very similar. So that leaves with the idea of
10 really predicting a motion vector from an adjacent block, or
11 in some cases, because these motion vectors may be
12 identical, reusing the motion vector of a neighbor. So that
13 would be the notion of merging blocks for the purpose of
14 sharing motion vectors.

15 Q. And how does a decoder know what motion vectors
16 apply to other blocks?

17 A. Yeah, let's move to slide 21.

18 So this actually would be one way to implement
19 it. So the current block to be encoded, this is taken from
20 the patent, will have neighbors, and in this merge mode some
21 of these motion vectors will be available, ready to the
22 decoder. So all the decoder has to do is to know which
23 motion vector to use.

24 Q. Why are the yellow blocks on the figure on
25 slide 21 from the patent so small compared to the block

1 labeled 900?

2 A. Yeah, that's a conceptual diagram, so these
3 yellow blocks could be exactly the same size as the current
4 block, but they could also be smaller, because there's
5 what's called variable size coding which allows for smaller
6 blocks to be used as well.

7 Q. And earlier, I think you were in the courtroom,
8 there was a discussion of merge mode. Can you tell us how
9 that worked at the time of the '714 patent?

10 A. Yes. Let's move to slide 22.

11 So here is a bit more detail about this merge
12 mode. As I said, we have this current block in the center
13 to be encoded on the left side. And so we have, say, five
14 spatial locations, A0, A1, B0, B1, B2, and they could
15 contain motion vectors which might be candidates for
16 merging.

17 And so the idea of the encoder would be to have a
18 list of candidates, in this case it's called merge list,
19 with B1, A0, B2 on it. And it is very important to realize
20 that the decoder has access to the same -- is able to form
21 the same list because it has already decoded those
22 neighboring blocks A0, A1, and so on.

23 So the encoder really, all it has to do is to
24 signal which one of the candidates on the merge list is to
25 be used.

1 So there's a merge_idx parameter which we will
2 see throughout my entire presentation many times. And in
3 this example the value of merge_idx is equal to 1, and we
4 see in the merge list next to 1 there's a star. So that
5 indicates that it is spatial location A0, which is to be
6 used.

7 And so the decoder knows it has to use the motion
8 vector from location A0, because it receives the merge
9 index. It's a real efficient way to implement merge mode.

10 Q. And I have two follow-up questions, Doctor, on
11 your slide 22. The first is, why is the block location A1
12 highlighted in red?

13 A. It's highlighted in red because, remember, not
14 all neighbors have a motion vector. So it could be -- say
15 A1 does not have a motion vector. It could be encoded in
16 what's called intramode. And then it's not even considered.
17 It cannot be on the list.

18 Q. My second question on slide 22 is, why are blocks
19 B1 and B0 highlighted in orange?

20 A. Yes. So it could be, and that is an essential
21 idea in the patent, that B1, B0 are the same motion vector.
22 So why would you have both of them on the list. It's
23 redundant. It costs more bits to send the merge index. So
24 you have every advantage in eliminating duplicates.

25 So in this case B0 is a duplicate, and it did not

1 make it to the merge list.

2 Q. Can you tell us how merge lists were constructed
3 prior to the '714 patent?

4 A. Yeah. Let's move to slide 23.

5 So the other thing to do if you want to eliminate
6 duplicates, there's up to five candidates, is simply to
7 compare them all. And that takes, we've seen earlier today,
8 ten comparisons to compute all possible pairs, when you have
9 five quantities.

10 So in this example here, with step 1, let's say
11 we have five candidates, but in green I have a motion vector
12 90,1, which is the same motion vector for A1 and B0. And
13 the same thing in yellow with motion vector 95,1, which is
14 the same for both B1 and B2.

15 So if you compare all these candidates, you at
16 the end have only a list with three, right, only one color
17 of each. It's efficient in terms of size on the list.
18 Unfortunately, it is quite a bit of work to compare all
19 these candidates.

20 Q. What approach did the '714 patent take to the
21 merge list?

22 A. Let's move to slide 24.

23 So one core idea of the patent was to do a
24 limited set of comparison, so not an exhaustive set.
25 Basically, at most five. So how is that done?

1 So the idea is to go through all the candidate
2 locations, the left column in my table, A0 and so on, but
3 every time we evaluate a candidate location or the vector
4 that's there, we compare only one or two or three, a limited
5 number of comparison, not an exhaustive number.

6 So in this example, A1, this is from the patent,
7 A1 is the subset location, and it would be only one
8 comparison made. And then if you proceed through the list
9 corresponding to every candidate, there would be a subset.
10 There's a pairing between candidate and subset. And the
11 subset is small, so that if you count the total number of
12 comparisons can never exceed five.

13 Q. Did Nokia share its merge mode idea with others?

14 A. Yes, let's look at slide 25.

15 Nokia submitted its invention to the JCT-VC,
16 which was charged with developing the H.265 standard. And
17 so the claimed benefits, as we see, as I said, decrease
18 complexity by reducing worst case number of duplication
19 checks from 10 to 5, also it is quite important achieving
20 parallel derivation of spatial candidates. So that cuts
21 down on the computing time by distributing the load.

22 And so that was submitted and was evaluated as
23 part of what's called a core experiment, CE9, by the
24 committee.

25 Q. And for the record, we're on slide 25, looking at

1 CX-6091.

2 And now, Professor, can you tell us more about
3 what happened to that contribution?

4 A. Let's move to slide 26.

5 So upon completion of this core experiment, the
6 method was then recommended for adoption in the standards.

7 Q. And on slide 26, we are looking at CX-6101 and
8 JX-0207.

9 And I want to follow up on something on slide 26.
10 I see a reference to tester 1 and tester 2, and then there's
11 Nokia and Sony listed.

12 What does that mean?

13 A. Yeah. So, of course, Nokia tested their own
14 invention, but also there's a tester that was Sony in this
15 case. And the authors of this experiment are also people
16 received from the authors list, Mr. Kim from Samsung,
17 someone from Orange, and someone from Fraunhofer in Germany.

18 Q. Were there any claim constructions that you
19 considered in forming your opinions for the '714 patent?

20 A. Yes. Let's move to 27.

21 So the important claim term here is first spatial
22 motion vector prediction candidate, which is using claims 1,
23 9, 15, and 23.

24 So there are three constructions that have been
25 proposed by Staff, by Nokia, and by Respondents. So, first,

1 according to Staff and Nokia, really means first, as opposed
2 to the others, okay, and for Respondent, however, the
3 initial first is different. They really mean first for
4 processing.

5 Q. Do the different constructions affect your
6 ultimate opinions in this matter?

7 A. No, there is infringement under all three
8 constructions.

9 Q. How did you organize your analysis of the '714
10 patent claims at issue here?

11 A. Let's move to slide 28.

12 So I looked at the decoding claim 9 and organized
13 it element by element. So I verified that each element of
14 the claim is practiced by the domestic industry product and
15 also by the accused products. And same thing with decoding
16 claim 23, the apparatus claim.

17 Q. Professor, I'm looking at slide 28, and I see
18 that you have an asterisk by limitations 9[C] and 23[C].
19 Why is that?

20 A. Yeah. So the asterisk denotes elements that
21 are -- where infringement is disputed by Respondents.

22 Q. Can we please have slide 29?

23 Your Honor, at this time we need to go on the
24 Acer/ASUS confidential record.

25 (Whereupon, the hearing proceeded in confidential

1 session.)
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1 O P E N S E S S I O N

2 BY MR. VERBONCOEUR:

3 Q. Do you have any evidence relevant to the domestic
4 industry products?

5 A. Yeah. Let's move to slide 33.

6 So, likewise, I considered, as I said, a
7 Microsoft Surface Pro which includes a processor. This one
8 is an Intel processor. It has the memory as well with
9 multiple -- 8 gigabytes, 16 gigabytes, and so on, and the
10 program code. And for Samsung I considered a smartphone.
11 This one has a Snapdragon processor manufactured by Qualcomm
12 as well as memory, obviously.

13 Q. And on slide 33 we are looking at CX-5922 and
14 CX-6952.

15 Do you have any additional evidence for us to
16 consider on claims 9[A] and 23[A]?

17 A. Let's move to slide 34.

18 So this refers back to the ability of the accused
19 and DI products to play back H.265 video. So here I'm
20 showing the screen of an Acer Aspire Vero 16. So this
21 was -- I used the HEVC application here to play that video.
22 It was encoded, as we see at the bottom left, using Acer
23 2265. And then when you play back on the Acer device, what
24 you see on the right side of the picture up there is the
25 task manager, and it shows GPU activity.

1 And you see on the far side of this graph there's
2 a jump in the activity of the GPU. That's the purple line
3 over there. And so that starts at a precise moment that the
4 video is played back. So the GPU is used to decode the
5 video.

6 Q. And, Professor, I want to ask two follow-up
7 questions on slide 34.

8 The first is, did you conduct this form of
9 playback testing on the other products at issue in this
10 matter?

11 A. Yes, I did.

12 Q. And did you see consistent results in your
13 testing?

14 A. Yes.

15 Q. For the record, on slide 34, we are looking at
16 CX-6450C.

17 I want to ask you about the playback testing.
18 How do you know that the videos you played back included
19 merge mode?

20 A. Let's move to slide 35.

21 So this is, again, where the VQ Analyzer comes
22 into play as an investigative tool. So I show on top a thin
23 strip of the --

24 (Clarification requested by the court reporter.)

25 A. I show a thin strip on top of that box. I show

1 VQ Analyzer shows it. So it shows successive pictures from
2 the sequence.

3 And here the VQ Analyzer is going to focus on one
4 particular picture, okay, number PUC equals 14. And then
5 here we are focusing on one particular block of that video,
6 and it's highlighted in magenta. And you see it says, merge
7 mode, and this will show a motion vector underneath with
8 components minus 28 and minus 4.

9 Then on the left side you see a syntax
10 information box. It provides, as I said, lots of details
11 about this block. It comes from a coding unit, and there's
12 different values that are indicated.

13 But I want to draw your attention to merge_flag
14 and merge_idx. So merge_flag is equal to 1. That has been
15 shown on the left side. So that means merge is on. And,
16 also, we see the value of this merge_idx is also equal to 1.
17 So that signals which motion vector is to be used for
18 decoding.

19 Q. Professor, did all -- were all the products you
20 considered able to play back merge mode?

21 A. Yes, they were.

22 Q. Can we move on to the next limitation?

23 A. Yes. Let's move to 36.

24 Q. What evidence do you have for limitations 9[B]
25 and 23[B]?

1 A. Yes. So what I've done here is to highlight --
2 and I do that for the other limitations too -- highlight
3 portions of the element and map that to the H.265 standard.
4 So I'm quoting here on this, here from the standard, and you
5 see a picture on the right, which we've seen quite a bit at
6 this point on the right side.

7 So let's see in yellow what is the first spatial
8 motion vector prediction candidate. So in the H.265
9 standard, I'm highlighting the portion that ends with B0 in
10 the candidates. And so for B0 a certain number of things
11 have to apply.

12 And just as a reminder, looking at the diagram on
13 the right side, B0, highlighted in yellow, is the one that
14 is on the right and above the current block to be encoded.
15 The current block to be encoded is highlighted in turquoise.

16 So going back to the elements, that candidate is
17 selected from a set of candidates. So the set of candidates
18 was five elements, B0, B1, B2, B2 -- sorry -- A1, A0. So
19 the selected candidates is from a set, a larger set, which
20 is shown in green, B1, B2, A1, A0, plus B0.

21 Q. Professor, I want to ask you about slide 36.
22 You've highlighted in yellow the location B0.

23 Do your opinions apply to the other possible
24 candidates?

25 A. Yeah. As I said, there is similar language, but

1 every candidate. I'm just showing the one that applies to
2 B0.

3 Q. And do you have any evidence for the part of the
4 claim limitations on slide 36 that you don't have
5 highlighted?

6 A. Yes. Let's move to slide 37.

7 So that refers to the inclusion in a motion
8 vector prediction list that's highlighted in magenta again.
9 And here I'll refer you to that box also from the H.265
10 standard. This is step 5, this ordered series of steps from
11 the standard.

12 So that is the list. It's called mergeCandList,
13 and it is constructed as follows. And so checking
14 availability, it's called available flag, for A1, B1, so on,
15 it would be added to the list in that order.

16 And so that list comprises motion information.
17 As we see on the right side, that's equations 8-134 through
18 136. That information is the motion vector itself, the
19 index of the reference frame, and the prediction flag.

20 Q. And I notice on slide 37 you have an asterisk by
21 these claim limitations, which you told me means there's a
22 dispute. So what's Respondents' argument here?

23 A. Well, let's look at slide 38.

24 All right. So I've highlighted in red what I
25 disagree with.

1 So, first, Respondents say there's no dispute of
2 the following clause. This is incorrect. There is a
3 dispute.

4 They say, highlighted in red, that under the
5 H.265 standard the A1 candidate is the first candidate
6 processed. So this is absolutely false. I will show that.
7 It is certainly the first candidate in list, but not the
8 first processed. It is very different concepts.

9 The last part, the second box, is similar to the
10 first one. Supposedly H.265 processes candidates in a
11 strictly ordered process, A1, B1, B0, A0, and, finally, B2,
12 not in parallel or any order. So this is, again, false, and
13 I will show it.

14 Q. And, Professor, show us why you think Respondents
15 are incorrect.

16 A. Sorry, say again?

17 Q. Can you show us why you think Respondents are
18 incorrect?

19 A. Yeah. Let's move to 39.

20 So, here I'm simply showing portions of the H.265
21 standard. We have seen and discussed already this step 5,
22 which is the mergeCandList. And that checks for
23 availability, right, available flag A1 and so on.

24 Sometimes you see evaluate; it's a flag. So it's
25 either 1 or 0. You evaluate the flag. And if it's 1, it

1 goes on the list. If it's 0, it does not.

2 On the left, however, this is step 1 of this
3 ordered process. So the standard says very clearly that
4 motion vectors and so on are derived by the following
5 ordered steps. So I'm going to read from number 1 here.

6 Number 1 says, the derivation process for merging
7 candidates from neighboring prediction unit is involved with
8 certain inputs and look at the outputs. The outputs are the
9 availability flags for A0, A1, B0, B1, B2.

10 So the first thing you notice is, it's not even
11 the same order as on the list. A0 is listed first, not A1.
12 So this order is completely immaterial. In fact, nowhere in
13 step 1 or anywhere in the standard does it say that the
14 derivation of these available flags has to be done in a
15 particular order. It can be done in parallel as well.

16 Q. All right. Can we move on to the next
17 limitation?

18 A. Yes. Let's move to slide 40.

19 Q. What evidence do you have for claims 9[C] and
20 23[C]?

21 A. Right. So this is about determining a subset
22 shown in yellow. So I'm using B1 here as an example of a
23 subset.

24 And in green it's based on the location of the
25 block associated with the first candidate. That's B0 in

1 green. And we see again from the standard it says very
2 clearly that available B1 is set to true, seek to true, and
3 the prediction covering the location for B1 and B0 have the
4 same motion vectors and the same indices.

5 Q. And just as -- I know I asked about this earlier,
6 but is B0 the only candidate with a determined subset?

7 A. No. I'm only showing here a pair, right, B0/B1,
8 and there are similar pairs. I'm just showing one
9 particular pair. I'm just showing one of those from the
10 standard.

11 Q. And can you show us the other candidate pairs?

12 A. Yes. Move to slide 41.

13 Again, from the standard -- that's this table I
14 showed earlier -- is the candidate location. Green is A0.
15 The corresponding subset would be A1, so they are paired
16 together. For B0 candidate, the subset is B1 and so on. So
17 that's determined in the standards.

18 Q. I see that these limitations, 9[C] and 23[C],
19 have asterisks again. So what is Respondents' argument
20 here?

21 A. Right. Let's look at slide 42.

22 Right. So if we look at the bottom here, what is
23 highlighted in red is what I disagree with. They say that
24 the H.265 standard lacks any mechanism that uses the
25 location of the first candidate to determine a subset of

1 candidates; therefore, the accused encoders and decoders
2 cannot satisfy this limitation.

3 So, first, H.265 is not an encoding standard, so
4 encoders should not be part of the sentence.

5 Second, regarding to location, we can just look
6 at the diagram on the right side. If, say, B0 is the
7 candidate, there is a matching subset, which is B1. So this
8 association is simply based on location. So that's very
9 clear from the standards.

10 Q. Do Respondents raise any other arguments?

11 A. Yes. Let's look at slide 43.

12 So they also claim that the subsets I mentioned
13 are not -- so this, again, are subsets of spatial motion
14 vector prediction candidates. They are supposedly not
15 dynamically determined by any accused product.

16 So, number 1, there is no requirement in the
17 claims that anything be dynamical. Second, the subsets of
18 motion vectors, that's inherently a dynamical process
19 because it depends on the video. So this claim of
20 Respondents is incorrect.

21 Q. And I want to follow up on that last point you
22 made. How does the motion vectors depend on input video?

23 A. Depend on?

24 Q. Input video, like you just said. You said the
25 motion vectors depend on the input video. Can you explain

1 that a little more?

2 A. Yes. So a process by which motion vectors are
3 computed and use the video as an input, right, so the result
4 is the function of the input video. So they vary just like
5 the input video varies over time and space.

6 Q. Do Respondents raise any other arguments that we
7 should look at?

8 A. Yes. Let's look at slide 44.

9 So, again, referring back to the subset of
10 spatial motion vector prediction candidate, they say that
11 the only input to this is location of the current block --
12 there's a big block in the center -- not the location of the
13 first candidate.

14 So the first candidate in my diagram on the right
15 is B1. And so the subset, which is the motion vector
16 associated with A1, clearly depends on the location, right,
17 on the location of B1. It's very clear. There maybe some
18 confusion because there is a larger set which contains all
19 five potential candidates, and there is a possible confusion
20 between what's a set and what's a subset. But it's very
21 clear that this claim from Respondents is incorrect.

22 Q. Can we move on to the next limitation?

23 A. Yes.

24 Q. What evidence do you have for claims 9[D] and
25 23[D]?

1 A. Yes. Let's move to slide 45.

2 So this is now about comparing -- that's
3 highlighted in turquoise -- these candidates with the other
4 ones from the subset.

5 So, again, highlighted in yellow here is
6 candidate B0. Highlighted in green is the paired subset B1.
7 And that portion of the H.265 specification checks whether
8 these two have the same motion vectors and the same
9 reference indices. So that practices that element of the
10 claim.

11 Q. On slide 45 I notice that you have a portion of
12 claims 9[D] and 23[D] not highlighted. Do you have any
13 additional evidence for us to consider?

14 A. Yes. And, of course, before moving there, I
15 again excerpted language that applies to B0. There is
16 similar language for every combination of subsets.

17 Q. And can we look at the other evidence that we
18 should consider?

19 A. Yes. Let's look at 46.

20 So, again, without making a comparison, so in the
21 standard, again, we see there's a candidate location and a
22 subset. Only those two are compared. There's no comparison
23 of A0 with anything else other than A1. And same with the
24 other candidates.

25 Q. Can we move on to claims 9[E] and 23[E] now?

1 A. Yes. Slide 47, please.

2 So that's whether to include or exclude the
3 candidate in the list based on the comparing.

4 And so that determination results in this
5 available flag B0 highlighted in peach, or it's going to be
6 either 0 or 1 to flag. And to make the determination,
7 there's a comparing highlighted in turquoise.

8 And this is what I mentioned. Again, we have the
9 same motion vectors and the same reference indices. Then
10 you set in this case available flag B0 to be equal to 0.
11 Otherwise, B0 would make it to the list.

12 Q. Professor, I notice on slide 47 you don't have
13 highlighted in the motion vector prediction list. Is there
14 additional evidence for us to consider?

15 A. Yes. Let's move to slide 48.

16 So slide 48 shows that mergeCandList in
17 turquoise. We see -- oh, in green first we see candidate B0
18 has made it to the list, and it was based on the comparing.
19 This available flag B0 was equal to 1, which means the
20 comparing was successful, there's no duplication, and then
21 it goes on the list.

22 Q. Can we move on to limitations 9[F] and 23[F]?

23 A. Yes. Slide 49, please.

24 So this is now selecting a candidate from the
25 motion vector prediction list. So, again, it's highlighted

1 in purple. This is the entire list. And elements on the
2 list are the potential candidates A1, B1, B0, A0, B2.

3 Q. I notice that a large part of the claim
4 limitation on slide 49 are not highlighted. Is there
5 additional evidence we should consider?

6 A. Yes. Let's move to slide 50.

7 So this is about the identifier I mentioned
8 highlighted in yellow, merge index, at the bottom from the
9 specification H.265. It specifies the merging candidate
10 index from the list. So that is the crucial index to be
11 sent to the decoder.

12 Q. Can we please have slide 51?

13 MR. VERBONCOEUR: Your Honor, at this time we
14 need to go on the third-party source code record.

15 (Whereupon, the hearing proceeded in confidential
16 session.)

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1 O P E N S E S S I O N

2 BY MR. VERBONCOEUR:

3 Q. Can we turn to the '267 patent now?

4 A. Yes.

5 Q. Is there any technical background that would be
6 helpful for us to know?

7 A. Yes, certainly.

8 Can we move to slide 79?

9 All right. So so far we've seen motion
10 compensated prediction with one reference picture, and
11 bi-prediction, sometimes called bi-directional prediction,
12 two reference frames. It could be one in the past, one in
13 the near future, for instance.

14 So I'm highlighting the same sequence here with a
15 van moving on the road. If we look at the current picture,
16 I've highlighted in black a particular block to be encoded.
17 As I explained earlier, there would be a reference picture
18 with a matching block highlighted in yellow. And also then
19 the correspondence is through a motion vector, which is also
20 shown in yellow.

21 In bi-prediction, there would be at least a
22 second reference picture, and that one also has a matching
23 block. I've highlighted it in magenta. And so the
24 correspondence now is through another motion vector, which
25 is shown in magenta.

1 So now you have two predictions, which could be
2 pretty good for predicting the current block. It turns out
3 you can combine these two predictions to form an even better
4 prediction. So that's a very popular and powerful technique
5 in video coding.

6 Q. Are there any other topics we have to know about
7 to understand the '267 patent?

8 A. Yeah, let's look at slide 80.

9 So these motion vectors, they point not
10 necessarily to existing pixels, but they control in between
11 pixels, let's say halfway between two pixels.

12 So I'm showing here, it is highlighted in blue,
13 existing pixels that I have named such as E1, F1, G1, H1,
14 and so on. And let's say subpixel location small B, which
15 is halfway between two pixels, so I have a motion vector
16 that points there. Now I need to compute a value, right, at
17 this new location B.

18 So the formula here on the right is taken from
19 the patent. So that value would be given as the output of
20 what is called an interpolation filter. So it basically
21 forms a linear combination of the -- of several other
22 existing pixel values, like E1, F1, multiplied by filter
23 coefficient 3 minus 17 plus 78, and so on.

24 And so the formula there is called filtering, and
25 at the end the result is right shifted by 1 bit. It is

1 presented all in arithmetic.

2 Q. I want to ask you a couple questions on your
3 slide 80. The first is, there's a symbol in that equation
4 that's a double caret. What's the double caret refer to?

5 A. That means an arithmetic right shift.

6 Q. Is this equation from the patent?

7 A. Yes.

8 Q. How do you know that the double caret refers to
9 an arithmetic right shift?

10 A. So in video coding, this double caret refers to
11 arithmetic right shift.

12 Q. The other question I want to ask you on slide 80
13 is about the capital letter values that are in the equation
14 you've shown us for interpolation. Are those values
15 independent of one another?

16 A. Well, the pixel values, okay, so they are
17 generally different.

18 Q. Is there any dependency on the capital letters in
19 the equation on your slide 80?

20 A. These are pixel values. I mean, E1, say if you
21 take E1, can have pretty much any value in a range that is
22 allowed.

23 (Clarification requested by the court reporter.)

24 A. E1, for instance, which is a pixel value, can
25 have any possible value in a range that is allowed.

1 Q. Are there any other topics we should understand
2 for the '267 patent?

3 A. Yes. Let's move to slide 81.

4 So we're talking about values that you want to
5 represent. So if I compute a new pixel value, like this B,
6 how should I represent that with bits.

7 So if I have a only 1 bit, I can represent maybe
8 black and white, but nothing else really. So if I want to
9 represent gray levels, I'm very limited.

10 If I'm given 2 bits, I can still present black, I
11 will use 00, and white by 11, but now also I have dark gray
12 and light gray, which could be encoded by 01 and 10. So I
13 have four possible values.

14 If I have 3 bits, I can do even better. I have 8
15 values and I can represent more shades of gray.

16 If I have 8 bits, which is pretty common in
17 video, I can represent 256 values. And if I have 10 bits,
18 which is even more common today, I could represent 1,024
19 values. So you have better and better rendition of gray
20 levels.

21 Q. Does this concept of precision you're talking
22 about on slide 81 relate to subpixels like we were talking
23 about before?

24 A. It does relate to it. I want to show that on
25 slide 82.

1 So going back to this problem of interpolation,
2 imagine that I have an image where the left side is black
3 and the right side is white, but my motion vector points to
4 a subpixel in between, so that would be this gray location.
5 So I've shown that on the right.

6 So somehow I need to compute a value for this
7 subpixel. And so the question, then, is how many bits
8 should be used to represent a value.

9 Q. How was this phenomenon with a change in
10 precision for the subpixel interpolation predictions handled
11 in the prior art?

12 A. Okay. So, again, I want to emphasize, more bits
13 gives you more possibilities, which is good, so let's see
14 slide 83, the prior art.

15 So you have, say, a particular frame, B4, which
16 is to be bi-predicted using references B3 and B2. So when
17 you have, say, a subpixel that you've computed coming from
18 the first reference frame, let's say it has a value 2.5, and
19 let's say the subpixel from the second frame, reference
20 frame, is also 2.5.

21 Well, if you need to use a small number of bits
22 or you may need to round this number, you cannot represent
23 2.5, and let's say you need to round it down to 2. And the
24 same goes with the second prediction. It's rounded down
25 to 2.

1 So now when you add 2 plus 2, you get 4, where
2 the correct result was actually 5. So you have a rounding
3 error, which is quite a bit of a problem because it tends to
4 propagate. So that is undesirable.

5 Q. Does the '267 patent discuss rounding error?

6 A. Yes. So let's go to slide 84.

7 So it has been known to be a problem especially
8 because of accumulation of errors, and that makes coding
9 performance worse.

10 So there are ways that we propose and used
11 before. So you could have some alternating schemes,
12 sometimes round down, sometimes round up. These are quite
13 simple. There are better ways where there's a small
14 signaling scheme for using rounding up and rounding down in
15 a certain way, but it is a bit complicated and it needs to
16 be signaled in the bitstream.

17 Q. What were some attempts to address the rounding
18 error problem prior to the '267 patent?

19 A. So let's look at slide 85.

20 So the patent -- or the idea was submitted to the
21 JCT-VC, and so the inventors recognized that, okay, at the
22 time there were what's called two different profiles in the
23 drive for H.265. One is called low complexity. It uses
24 fewer bits, which is beneficial in many ways. But it has
25 rounding control, which is quite expansive.

1 Then you still have the high efficiency profile,
2 which is this more bits, which is better in terms of coding
3 performance, but, of course, requires more processing power
4 and more storage.

5 But it did not need any rounding control, because
6 the accuracy was sufficient.

7 So the proposal actually made it possible to
8 combine both profiles into one. But this was the state of
9 the art before the invention.

10 Q. On slide 85, we're looking at JX-201.

11 How did the '267 patent solve this problem?

12 A. So let's look at slide 86.

13 So I mentioned the two predictions from two
14 different reference frames. So in the top branch in this
15 diagram, so this is a diagram from the patent, there is
16 what's called a P-tap filter with integer coefficients. So
17 this is the interpolation I mentioned. Then rounding of set
18 is used. Then you're going to shift to a certain precision,
19 okay, which is, say, a high precision. It's larger than the
20 precision of the --

21 So let's say you input video at 10 bits. Well,
22 that's shift to M, M could be 14 bits. So it's a larger
23 number. So that's the first prediction, P1, that you saw in
24 the formula previously.

25 The same is done for the second branch from the

1 second prediction, and you get a second prediction P2. Then
2 the two are combined into this green box. And another
3 rounding offset is added.

4 And then, finally, you round back, you shift back
5 to the original bit depth, which was, say, 10 bits in my
6 example.

7 Q. Did the inventors of the '267 patent share their
8 invention with others?

9 A. Yeah, let's go to slide 87.

10 So as I said, they submitted the ideas to the
11 JCT-VC, and they emphasized that this has the benefit of
12 harmonizing the high efficiency and the low complexity
13 precision for profiles, and so the key idea, as I said, is
14 to keep a higher precision for P1 and for P2. And it's not
15 obvious, because the view was, well, you should have as few
16 bits as possible or you should have rounding, and this
17 really found the best balance.

18 Q. For the record, we're looking at slides 87 and
19 JX-201 and CX-6102.

20 Let's turn to the substance of your opinions,
21 doctor.

22 Did you consider any claim constructions?

23 A. Yes, let's look at 88.

24 So the term precision is a claim term present in
25 claims 1, 7, 19, and 25. So there are three constructions

1 that have been proposed by Staff, Nokia, and Respondents.

2 Q. Do the different constructions affect the
3 ultimate conclusions you reached in this case?

4 A. So first thing we mentioned, on the face of it,
5 the three constructions are similar. However, the word
6 needed that's present in Respondent's construction, which
7 can be abused, okay, but, other than that, the three on the
8 face of it, the three constructions are similar.

9 Q. And did you reach the same conclusions on
10 infringement in domestic industry in this matter under any
11 of the proposed constructions for precision?

12 A. Yes. There's infringement in all three cases.

13 Q. How did you organize your analysis of the '267
14 patent claims at issue?

15 A. Let's go to 89.

16 So as I did with the other patent, I decomposed
17 the claim into elements, and I verified that each element is
18 infringed upon or practiced by the domestic industry
19 products.

20 Q. I notice that you have some asterisks on
21 slide 89. Can we talk about any potential disputes on those
22 limitations when we get there?

23 A. Certainly, yes.

24 Q. All right. Let's turn to claims 19[A] and 25[A]
25 and [B]. What evidence do you have?

1 A. Let's move to slide 90.

2 So this is about apparatus, so it is the same
3 evidence I showed earlier for the '714 patent.

4 Q. Do you have any other evidence for us to
5 consider?

6 A. Yes, we'll go to 91.

7 So I'm showing here that in this case, the Acer
8 Aspire Vero 19 is able to decode H.265-compliant bitstreams.
9 So that's something I showed earlier.

10 Q. And did you perform similar testing as shown on
11 slide 91 with the other groups of products at issue in this
12 matter?

13 A. Yes, and they were all able to play H.265 video.

14 Q. And were the products at issue in this matter
15 able to play AV1-compliant bitstreams as well?

16 A. Yes. Yes, both of them.

17 Q. And for the record, on slide 91 we're looking at
18 CX-6450C.

19 How do you know that the videos you played back
20 on the products at issue in this matter have anything to do
21 with bi-prediction?

22 A. Okay. Let's look at slide 92.

23 So, again, this is where the VQ Analyzer tool
24 comes in handy. So you look at a particular frame, you look
25 at a particular block, highlighted in magenta, and then you

1 see inside there's two motion vectors. One is minus 104,
2 minus 8, the other one is 178,2. So that means you have two
3 motion vectors. So this is bi-prediction.

4 Q. Can we move on to the next limitation?

5 A. Let's move to 93.

6 Q. What evidence do you have for claims 19[B] and
7 25[C]?

8 A. All right. So this is about decoding for a
9 current block, so that's highlighted in yellow. I'm again
10 showing language from the H.265 specification.

11 There's a first motion vector in purple that
12 would be called mvL0. In this case zero stands for list 0.
13 A second motion vector in turquoise is mvL1, from list 1.
14 There's a reference block in green that's reference block
15 for list 0. And then in red for list 1.

16 So there's also a first precision, so the pixels
17 of the current block, the first and second reference blocks
18 have first values with first a precision, and that's
19 specified in equations 7-4 for luma and 7-6 for chroma.

20 So that's where you find this common value for
21 the first precision.

22 Q. I want to ask you a question on slide 93. Are
23 bit depth and precision the same concepts?

24 A. No.

25 Q. Why not?

1 A. They refer to different things. So bit depth is
2 just counting. So if I see I have, say, 8 bits, I just
3 count them, I have 8 bits. It is not the same as precision.

4 JUDGE MCNAMARA: Pardon me. Dr. Moulin, would
5 you please repeat the first part of that answer? I didn't
6 quite catch it, and I'm not sure it was correct.

7 You were talking about precision and bit
8 something.

9 THE WITNESS: Bit depth.

10 JUDGE MCNAMARA: That's what I thought. It's bit
11 depth.

12 THE WITNESS: My TH is not that ideal.

13 JUDGE MCNAMARA: That's what it is. Thank you.
14 I just wanted to check the record on that.

15 MR. VERBONCOEUR: It is also listed on slide 93,
16 if that's helpful.

17 JUDGE MCNAMARA: Right, but it's the record.

18 MR. VERBONCOEUR: Sorry, Your Honor.

19 JUDGE MCNAMARA: Thank you.

20 MR. VERBONCOEUR: When I said it's listed on
21 slide 93, I was referring to Ms. Kinkade in case that would
22 be helpful.

23 Q. Do you have any other evidence of this
24 limitation, doctor?

25 A. Let's move to slide 94, please.

1 This is now -- I'm showing an excerpt from the
2 AV1 specification. So the names have been different, the
3 same concepts. But bi-prediction is called compound
4 prediction in AV1. Combining prediction is called blending
5 predictions in AV1. But it is really the same concept, just
6 different names. And so the motion vector refers the
7 current frame to the reference frame.

8 So all these concepts are exactly the same in
9 AV1.

10 Q. Professor, I notice on slide 94 there's a portion
11 of limitations 19[B] and 25[C] that you don't have
12 highlighted. Is there additional evidence we should
13 consider?

14 A. Yes. Move to slide 95.

15 So this is about I want to highlight the first
16 precision, so we see it highlighted in purple at the bottom.
17 The reference frame, both reference frames, match the
18 current frame in bit depth and other things, so they all
19 have the same bit depth in this case.

20 Now, I really need to emphasize in this case,
21 because we talk about input video, bit depth is the same as
22 precision in this case. In many other cases it is quite
23 different, but we are talking about input video here and so
24 this is why in this case it's the same.

25 Q. How do you know with reference to slide 95 that

1 bit depth and precision would be the same number here?

2 A. Well, because I was talking about 10 bits as an
3 example. So you input video. The pixel values could be
4 anything, so they are represented using 10 bits. That's the
5 bit depth. And you really need 10 bits to represent them,
6 so that would be also in this case the same as precision in
7 this case.

8 Q. Let move on to claims 19[C] and [D] and 25[D] and
9 [E]. What evidence do you have for us there?

10 A. Let's go to 96.

11 So here using the first reference block
12 highlighted in yellow, so this refPicLXL, to obtain first
13 prediction --

14 (Clarification requested by the court reporter.)

15 A. I was just reading refPicLXL, just the yellow
16 box. That's the reference block. And the first prediction
17 and the second prediction have a second precision. So the
18 prediction is called predSampleLXL. So X again is either 0
19 or 1.

20 Q. Do you have any other evidence for these
21 limitations?

22 A. Yes. Move to 97.

23 So the same goes with AV1. So we see a reference
24 block, it's called ref, and we see a prediction highlighted
25 in green that's called pred, and the second precision is

1 also indicated. We see this Round2 operation with the input
2 S and InterRound. So that would determine the second
3 precision, just like we had with the H.265.

4 Q. Can we move on to the next set of limitations?

5 A. Yeah. 98, please.

6 Q. What evidence do you have for claims 19[E] and
7 [F] and 25[F] and [G]?

8 A. So this is about combining the two predictions in
9 green and magenta. And this equation A-266 from the H.265
10 standard shows how that combining is done. You see
11 predSamplesL0, L1 is added together, and then other things
12 are done.

13 And then there is, you know, it is a binary
14 presentation. We will shift to the right by shift 2. So
15 that determines the second precision.

16 And in AV1, again, a similar concept. Preds[0]
17 and preds[1] are added together. Then there's the Round2
18 operation which determines the second precision. And in
19 yellow that is called -- that would be called basically the
20 combined prediction.

21 JUDGE MCNAMARA: Pardon me, Mr. Verboncoeur.
22 Just a reminder that we need to stop at 5:30 for the day.
23 So we're getting close.

24 MR. VERBONCOEUR: Yes. Your Honor, I'll tell
25 you, I think we're likely to -- if we were to continue

1 going, we would likely exceed that time. So I will defer to
2 Your Honor on when you would like to break.

3 JUDGE MCNAMARA: We can't. As I mentioned at the
4 start of the hearing, because of security, because of the
5 way security works here, we really can't stay past 5:30.

6 MR. VERBONCOEUR: I apologize, Your Honor. What
7 I meant to say was, I'm happy to break whenever you are. I
8 just wanted to you to know that if we were to keep going, I
9 anticipate us -- we would go longer than 5:30. I think we
10 have another --

11 JUDGE MCNAMARA: I understand. I do understand.
12 Again, we just need to stop at 5:30, so just --

13 MR. VERBONCOEUR: Okay. So I'll cut off my
14 questioning shortly before 5:30.

15 JUDGE MCNAMARA: Great. Thank you. I appreciate
16 that.

17 Q. Professor, I've got two questions with reference
18 to slide 98.

19 The first is, I see a double caret that's
20 highlighted in the teal color. What does that double caret
21 refer to?

22 A. So, again, it refers to arithmetic right shift.

23 Q. And then also -- and also in teal there's
24 something called Round2. What's Round2?

25 A. Round2 is a rounding function in AV1.

1 Q. Can we please have slide 99?

2 Professor, can you explain to us how Round2 works
3 in AV1?

4 A. Yes. So Round2 is the name suggested to use for
5 rounding applied to an input X, and then you need to round.
6 So it basically means take X, add enough set, and divide by
7 2 to the power n, and then you take the floor of function.
8 So it is basically a division with rounding.

9 Now, the AV1 specification also shows a way to
10 implement that with the code. So if n is 0, it's a trivial
11 operation. It returns just as itself --

12 (Clarification requested by the court reporter.)

13 A. If n is 0, that's a trivial operation. It
14 returns just as itself. However, if n is positive, greater
15 than 0, it is going to return X plus an offset, shifted to
16 the right, by n, and it is an arithmetic right shift again.

17 Q. Doctor, I notice on slide 99 you have your
18 asterisks with these limitations. What arguments do
19 Respondents make?

20 A. Let's look at slide 100.

21 So there's two elements of dispute here.
22 Number 1, Do arithmetic right shifts decrease precision?
23 And so there's a quote here that opines that the precision
24 of a signed representation decreases after performing an
25 arithmetic right shift.

1 And Dr. Schonfeld claims this is incorrect. I
2 will show that, no, it is indeed correct.

3 The second dispute is whether truncation is a
4 right shift. And Dr. Schonfeld will testify that truncation
5 and other similar operations are not equivalent and are
6 significantly different from an arithmetic right shift. So
7 I will show that that is incorrect as well.

8 Q. Doctor, is there any technical background that
9 will help us understand these disputes?

10 A. Yes. Let's look at 101.

11 So a little crash course on binary arithmetic,
12 which is something we teach to our freshman students at my
13 university.

14 So let's say you want to represent an integer in
15 the range 0 to 15. So there are 16 possible values. So
16 they are positive numbers. So this will be encoded as 1101.
17 So how do we recover the number 13, which is the value,
18 decimal from that.

19 So you take what's called the most significant
20 bit. That's a bit to the left. It's one here highlighted
21 in blue. You multiply it by 2 to the power of 3. Then from
22 the second box you take the second bit, which is, again, 1.
23 You multiply it by 2 to the power 2. From the third box you
24 take that bit that is 0 here, so just add 0. And from the
25 last box you get the last bit 1, multiplied by 2 to the

1 power 0.

2 So when you add these numbers together, you get 8
3 plus 4 plus 1, which equals 13. So each of the 16 possible
4 values as a little code using 4 bits. So that's for
5 positive numbers.

6 Now, when you work with negative numbers, this is
7 a little bit more tricky. This is what is used in video
8 coding actually. You use what is called Two's Complement
9 Binary Arithmetic.

10 So I give as an example here 16 possible values
11 in the range minus 8, minus 7, to plus 7.

12 So they can be encoded again using 4 bits. So
13 the difference is the first bit is called a signed bit. It
14 could be either 1 or 0. So if it's 1, it means it's a
15 negative number. So the value in this case is if you take
16 that value 1 and now you multiply by minus 2 to the power 3
17 in this case, and the rest of the calculation proceeds like
18 before.

19 So if I do this, I get minus 8 plus 4 plus 1,
20 that equal to minus 3. So for every number between minus 8
21 and 7, there corresponds a little binary string, I guess.

22 Q. How do these two ways of computing a binary
23 arithmetic rate to precision?

24 A. Okay. Let's move to slide 102.

25 So let's say -- let's look at the top row, for

1 instance. Let's say I have some positive number in the
2 range 0 to 15. So there are 16 possible values.

3 So this 0011 I'm showing as an example represents
4 number 3. And let's say we do an arithmetic right shift by
5 one position to the right. So what that does is displays to
6 the right these 4 bits, and removing the last one.

7 So this red highlighted 1 is going to disappear.
8 It is going to be destroyed so there is no more information
9 coming from there. Then you would be left with 3 bits. So
10 with an arithmetic right shift, you need some filler, okay,
11 a filler bit. You put a 0 in front which conveys no
12 information. So that represents number 1.

13 For logical right shift, which is also used
14 sometimes, it's the same result. And for a truncation, if I
15 do a right shift and I simply do a truncation, I don't use a
16 filler bit, I still get the same 001, this blue pattern. We
17 see this blue pattern is the information that remains, 001.
18 So whether there's a filler bit or not, we see the same
19 information.

20 So when you work with negative number, it's a
21 slightly -- it's a very similar concept with a little
22 nuance.

23 So my example, I start from 1011, which
24 represents number minus 5, in a Two's Complement Arithmetic.

25 So when you right shift again, this red 1, the

1 last bit, is going to be killed. So we move the yellow
2 pattern 101 to the right, but we need a filler bit again.
3 So we're going to duplicate the signed bit. So it was 1, is
4 was just duplicated and remains a 1. If it would have been
5 a 0, it would have been remained a 0. It's just duplicated.

6 You don't do negative right shifts with negative
7 integer, so let me jump to the last box here. It's right
8 shift with truncation.

9 So if I take this pattern again, 1011, and I
10 truncate the last bit, I kill the red bit at the end, I'm
11 left, again, with 101, the yellow pattern.

12 So I see again that this yellow pattern is the
13 information that is left after, whether it's a right shift
14 with truncation, is the exact same information. And the
15 extra bit that we have in the arithmetic right shift on the
16 left is just a -- it's just a duplicate in this case. It
17 conveys absolutely no information, given the existing
18 information.

19 MR. VERBONCOEUR: Your Honor, we're at a natural
20 breaking point.

21 JUDGE MCNAMARA: I think that sounds good.

22 MR. VERBONCOEUR: Thank you.

23 JUDGE MCNAMARA: All right. Thank you.

24 So thank you very much. We are stopping just for
25 the evening. We'll pick up tomorrow morning at the same

1 time, at 9:30 a.m.

2 And we'll deal tomorrow with any exhibits that
3 need to be admitted, and typically what I do is just, again,
4 they come in organically when it makes sense to do it as the
5 witnesses finish their testimony.

6 All right. Thank you. I'll see you all tomorrow
7 morning at 9:30. Have a good evening.

8 ///

9

10 (Whereupon, at 5:26 p.m., the proceedings
11 adjourned, to reconvene the following day, March 5, 2026, at
12 9:30 a.m.)

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1	C O N T E N T S				
2	INDEX OF WITNESSES				
3					
	WITNESS	DIRECT	CROSS	RE- DIRECT	RE- CROSS STAFF
5	IAIN RICHARDSON.....	121	148	188	197 183
6	PIERRE MOULIN.....	199			
7					
8					
9					
10	AFTERNOON SESSION.....				148
11					
12					
13					
14					
15					
16	CONFIDENTIAL SESSION.....				72- 81
17	CONFIDENTIAL SESSION.....				208- 209
18	CONFIDENTIAL SESSION.....				220- 221
19	CONFIDENTIAL SESSION.....				235- 251
20					
21					
22					
23					
24					
25					

C E R T I F I C A T E

TITLE: CERTAIN VIDEO-CAPABLE LAPTOP, DESKTOP COMPUTERS,
HANDHELD COMPUTERS, TABLETS, TELEVISIONS, PROJECTORS, AND
COMPONENTS AND MODULES THEREOF

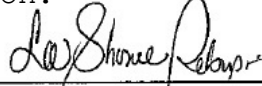
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HEARING DATE: March 4, 2026

LOCATION: Courtroom A

NATURE OF HEARING: Evidentiary Hearing

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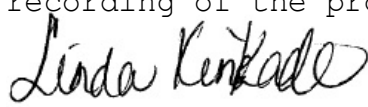
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UNITED STATES INTERNATIONAL TRADE COMMISSION

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In the Matter of

Investigation No.

337-TA-1448

CERTAIN VIDEO-CAPABLE LAPTOP, DESKTOP
COMPUTERS, HANDHELD COMPUTERS,
TABLETS, TELEVISIONS, PROJECTORS, AND
COMPONENTS AND MODULES THEREOF

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UNITED STATES INTERNATIONAL TRADE COMMISSION

Washington, D.C.

Before the Honorable MaryJoan McNamara

Administrative Law Judge

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In the Matter of Investigation No.

337-TA-1448

CERTAIN VIDEO-CAPABLE LAPTOP, DESKTOP

COMPUTERS, HANDHELD COMPUTERS,

TABLETS, TELEVISIONS, PROJECTORS, AND

COMPONENTS AND MODULES THEREOF

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International Trade Commission

500 E Street, SW

Washington, D.C.

Evidentiary Hearing

Thursday, March 5, 2026

Volume II

The parties met pursuant to notice of the
Administrative Law Judge at 9:30 a.m. Eastern.

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13 *** Index appears at end of transcript ***

14

15 PLEASE NOTE: Quotations from documents are reflected in the
16 transcript as read and may not constitute a verbatim quote.

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1 P R O C E E D I N G S

2 (In session at 9:30 a.m.)

3 JUDGE MCNAMARA: Good morning, everyone.

4 Please, be seated. Thank you. Okay.

5 I see I have the time tracker for today. I
6 appreciate that. Thank you. We see where we are.

7 All right. Is there anything that you would like
8 me to address this morning before we get started?

9 MR. NEWCOMER: Josh Newcomer. I'm going to
10 introduce Garrett here who is going to be the housekeeping
11 for the exhibits.

12 JUDGE MCNAMARA: Very good. Are you NEXT
13 Advocates?

14 MR. NEWCOMER: He is, yes, Your Honor.

15 JUDGE MCNAMARA: Good. Very good. Thank you.

16 MR. GRIGGS: Good morning, Your Honor.

17 JUDGE MCNAMARA: Good morning.

18 MR. GRIGGS: Garrett Griggs on behalf of
19 Complainants.

20 JUDGE MCNAMARA: All right.

21 MR. GRIGGS: I have two issues for you.

22 JUDGE MCNAMARA: Sure.

23 MR. GRIGGS: First, we would like to seek to
24 admit a list of pre-admitted, without a sponsoring witness,
25 exhibits.

1 JUDGE MCNAMARA: Yes.

2 MR. GRIGGS: And then, secondly, we would like to
3 admit a combined list of exhibits from Dr. Richardson's
4 testimony yesterday.

5 JUDGE MCNAMARA: Yes, okay.

6 MR. GRIGGS: And that is it.

7 JUDGE MCNAMARA: All right.

8 IS there any objection?

9 MS. ROBERTS: No, Your Honor. Stephanie Roberts.

10 JUDGE MCNAMARA: Yes. Thank you very much.

11 All right, then. Oh, I'm sorry, Ms. Ducca.

12 MS. DUCCA: That's okay. No objection from
13 Staff, Your Honor.

14 JUDGE MCNAMARA: Thank you.

15 All right, then the identified lists of exhibits
16 and exhibits will be admitted into evidence without
17 objection.

18 (Whereupon, the exhibits as recited by counsel
19 and reflected in the attached index were submitted and
20 received in evidence.)

21 JUDGE MCNAMARA: All right.

22 Mr. Verboncoeur, are you ready to get started?

23 Good morning, Dr. Moulin.

24

25

1 MR. VERBONCOEUR: Good morning, Your Honor.

2 Mitch Verboncoeur, on behalf of Nokia.

3 PIERRE MOULIN,

4 having been previously duly sworn or affirmed
5 on their oath, was thereafter examined and testified further
6 as follows:

7 JUDGE MCNAMARA: Good morning. Are you ready to
8 get started again?

9 THE WITNESS: Yes, Your Honor.

10 JUDGE MCNAMARA: All right. Just so you know,
11 you're still under oath.

12 MR. VERBONCOEUR: May I proceed, Your Honor?

13 JUDGE MCNAMARA: Yes. Thank you.

14 DIRECT EXAMINATION (continued)

15 BY MR. VERBONCOEUR:

16 Q. Dr. Moulin, yesterday you were telling us with
17 reference to slide 102 about these different forms of right
18 shifts.

19 Since you've given us that explanation, now what
20 I'd like to do is ask you to explain with an example how
21 that relates to precision.

22 A. Yes. So just to recap, I had given a little
23 example with only 4 bits, and we saw this blue pattern, 001,
24 which is preserved no matter how we arithmetic right shift
25 or truncation, same with the little yellow pattern, 001.

1 So as we see on the arithmetic right shift, we
2 have killed the insignificant bit, which is red 1, and then
3 after the right shift, what we have in front is a new bit --
4 it is not really new, it is a really a duplicate bit, so it
5 conveys no new information relative to the information
6 pattern, like 101.

7 And now I'd like to show on the 103 how it
8 applies to a video example.

9 So there I'm showing an 8-bit pattern on top,
10 11010101, and really the concept is the same. So if we look
11 at arithmetic right shift, so first that number represents
12 minus 43. We shifted to the right, and you see this red
13 cross means we get rid of the least significant bit, and on
14 the left you see another 1 with a little key. That's a
15 duplicate of the most significant -- of the signed bit that
16 existed. And then we can shift again.

17 So we have shifted by 2, with 2 crosses at the
18 bottom. And if you look on the left, we have these two
19 locks, and it's not 1, it's now 2 duplicates of the signed
20 bits.

21 So we can do this as many times as we want. We
22 always duplicate the signed bit. It is very easy.

23 Q. And, Professor, with reference to slide 103, what
24 do those little padlock icons mean?

25 A. Yes. As I said, this little padlock is a

1 duplicate of the signed bit. So they convey -- sometimes
2 called fillers in terms of information. So the information,
3 after we've destroyed the least significant bit, is only --
4 at the very bottom the 6 bits that remain, and these fill-in
5 bits are indicated here by little padlocks.

6 Q. And with reference to slide 103, I see that this
7 says "signed example." Can you give us an example with an
8 unsigned number?

9 A. Yeah, let's go to 104.

10 So it's really in this case, first, when you have
11 an unsigned example, arithmetic and logical right shift are
12 the same thing, right?

13 So what I showed here is the same for logical and
14 arithmetic, and it's really the same kind of example.

15 And at the bottom, though, what you see is that,
16 under logical right shift, what you -- what you do is to add
17 0's up front. So these are the fill-in bits. On the
18 logical right shift they are 0's. They convey no
19 information.

20 Q. Can you explain what's going on on slide 104 with
21 what you've labeled as a truncated right shift?

22 A. Right. So if instead of doing the right shift,
23 as described on the left, where we killed with the red cross
24 the least significant bits, we had done truncation. It is
25 still the same red crosses, we kill the same bits, it's the

1 same information that's left, but that's -- the
2 representation here does not include the filler bits, which
3 convey information.

4 Q. Professor, do you have a doctrine of equivalents
5 theory in this matter?

6 A. Yes, I do. Let's look at 105.

7 So what I've been talking about shifting bits to
8 the right and truncation, so it's the same function,
9 operating on binary arithmetic. The way it's done is by
10 removing the least significant bits, and the result is
11 reduced precision in all cases.

12 Q. If we move on to the next limitation in our
13 progression?

14 A. Yes, that would be 106.

15 So the next limitation, 19[G], 25[H], was
16 reconstructing in green the block of pixels based on the
17 combined prediction in turquoise.

18 So that's reflected on top in the H.265
19 specification. We see the combined prediction in turquoise
20 called predSample --

21 (Clarification requested by the court reporter.)

22 A. -- predSamples in turquoise is the combined
23 prediction. On the left we see recSamples in green, that is
24 your construction, this equation 8-327 in the standards.
25 And for -- if you want, that's at the bottom, as I explained

1 earlier, it's a pretty similar process with just different
2 names and with the same combined prediction in turquoise,
3 and the reconstruction is shown in green, CurrFrame.

4 Q. Do you have any evidence that the dependent claim
5 limitations are met?

6 A. The?

7 Q. Do you have any evidence that the dependent claim
8 limitations are met?

9 A. Yes, if we go to slide 107.

10 So the dependent claim is the case where the
11 first motion vector points to a subpixel that's highlighted
12 in yellow.

13 So looking at, again, H.265, if we look on the
14 right side, this are the grids. I've highlighted in yellow
15 a subpixel, B00. So the motion vector could point to a
16 subpixel, like B00, so that is covered in H.265 as well
17 under that particular paragraph.

18 And we see, in fact, at the bottom, the details,
19 how is the first prediction obtained. So the first
20 prediction is shown by this equation at the bottom in green,
21 B00, and then in turquoise I've highlighted pixel values of
22 the first reference blocks, it's these capital letters, A
23 minus 30, and so on.

24 So all these A values combined together through
25 an interpolation filter, and then -- we'll discuss that

1 later, but you have a right shift using shift 1.

2 Q. And, Professor, I notice on slide 107 that you
3 have evidence from the H.265 standard. Do you have any
4 evidence from the AV1 specification?

5 A. Yes, let's look at slide 108.

6 So it's very similar, just, again, the names are
7 a little bit different. On the left, this is the horizontal
8 filtering portion of interpolation, and then it's a cascade.
9 On the right side we have the vertical filtering, which is a
10 two-stage process.

11 And the process, the interpolation process, uses
12 the Subpel filters function, which is self-explanatory. And
13 so we have the inputs, there's a reference, and then in
14 green at the ends we have the first prediction, that's
15 shortened as pred in the green box.

16 Q. Can we please have slide 109?

17 MR. VERBONCOEUR: Your Honor, at this time we
18 need to go on the third-party source code record.

19 JUDGE MCNAMARA: And I would appreciate it,
20 whoever is confirming, that you check your mic when you do
21 so, so that we can hear you.

22 MR. BURNS: Robert Burns, Your Honor. Clear for
23 Nokia.

24 JUDGE MCNAMARA: Okay. Can you do that again?
25 Because it's a little low.

1 MR. BURNS: Robert Burns, Your Honor. Clear for
2 Nokia.

3 JUDGE MCNAMARA: Thank you. Yes. Okay.

4 (Whereupon, the hearing proceeded in confidential
5 session.)

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1 O P E N S E S S I O N

2 JUDGE MCNAMARA: All right. Thank you.

3 MR. HOUMAND: There will be some binders, we're
4 distributing to both counsel and Staff.

5 May I proceed in the meantime?

6 JUDGE MCNAMARA: Yes, please.

7 CROSS EXAMINATION

8 BY MR. HOUMAND:

9 Q. Good morning, Dr. Moulin.

10 A. Good morning, sir.

11 Q. So I introduced myself to the court. I represent
12 Acer. I'm going to be asking you some questions today.

13 I'd like to start with the '714 patent.

14 A. Okay.

15 Q. You agree that the '714 patent did not invent
16 merge mode, correct?

17 A. The '714 patent did not invent merge mode, no.

18 Q. In fact, prior to the '714 patent some video
19 codecs would generate a motion vector prediction list
20 consisting of motion vectors of spatial adjacent blocks,
21 correct?

22 A. This is consistent, yeah, with merge mode
23 existing and it has been tested multiple times.

24 Q. You agree that in these prior art video codecs,
25 once the motion vector prediction list is generated, some of

1 the motion vector candidates may have the same motion
2 information, right?

3 A. It depends on the type of encoder.

4 Q. But that could happen, right?

5 A. You have not told me which encoders. If you have
6 all possible encoders, yes, that could happen.

7 Q. And a check was then done to remove any duplicate
8 motion vector prediction candidates from the list to reduce
9 redundancy.

10 A. Done by who?

11 Q. In these prior art video codecs.

12 A. Well, some of these older codecs did not even
13 move duplicates. So you told me this is any encoder you're
14 talking about, so some were pretty bad.

15 Q. Mr. Davis, may we have paragraph 85 of
16 Dr. Moulin's report?

17 Sir, directing your attention to the final
18 sentence in paragraph 85, you wrote, a check is then done to
19 remove any duplicate motion vector prediction candidates
20 from the list to reduce redundancy.

21 Did I read that correctly?

22 A. Well, this is a quote from some reference? What
23 is the reference? You quote from a reference?

24 Q. You wrote this in your report, correct?

25 A. So this sentence is from my report, it appears to

1 be a quote from a reference, correct?

2 Q. So, just so that everyone is clear on this point,
3 you are not contending that the '714 patent invented
4 removing redundancy in a motion vector prediction list,
5 correct?

6 A. As I explained, the concept was known before. An
7 exhaustive search was definitely performed, but duplicates
8 were checked for in prior art, that's correct.

9 Q. We can take that down, Mr. Davis.

10 And in its place, can we please pull up
11 CX-5885.174. That's Fig. 3 from the H.265 standard.

12 174, Mr. Davis.

13 And if we can blow up Fig. 8-3.

14 So, sir, this is, we agree this is Fig. 8-3 from
15 the H.265 standard, correct?

16 A. That's correct.

17 Q. You had this figure on several of your slides,
18 right?

19 A. That's correct.

20 Q. Okay. Fig. 8-3 of the H.265 standard shows the
21 locations of the set of spatial motion vector prediction
22 candidates, right?

23 A. No.

24 Q. No? Okay.

25 Can we have Dr. Moulin's report at paragraph 195?

1 Sir, directing your attention to the first
2 sentence, you wrote that, the H.265 standard includes an
3 informative diagram at Fig. 8-3 (reproduced below) showing
4 the locations of the set of spatial motion vector prediction
5 candidates for an encoded block of pixels.

6 Did I read that correctly?

7 A. That sentence is correct. There's context. As
8 I've explained, there may not be any candidates, so there is
9 an assumption there that candidates exist. So if candidates
10 existed, this is, yes, correct.

11 Q. Now, let's go back, if we can just scroll down to
12 Mr. Moulin's report, he actually has Fig. 8-3 on the page as
13 well.

14 Or we can go back to the standard, either way.

15 So, Dr. Moulin, just so that we're clear on this
16 point too, you're not suggesting that this arrangement of
17 five spatial neighbors is something that the '714 patent
18 invented, right?

19 A. This arrangement had been considered before,
20 that's correct.

21 Q. And you also agree that the '714 patent did not
22 come up with the five labels, right?

23 A. With what?

24 Q. The labels.

25 A. The labels? The labels are not really important,

1 but they were used before the patent.

2 Q. A0, A1, B2, B1, and B0, those are widely used
3 labels, right?

4 A. As are A, L, and so on that I showed. The labels
5 don't really matter, but, yeah, that was known before.

6 Q. Okay. I want to now focus your attention on A1.
7 Okay?

8 You are not contending that A1 can be the claimed
9 first spatial motion vector prediction candidate, right?

10 A. Correct. The claim does not practice for A1.

11 Q. The claim is not practiced for A1, right?

12 A. That's correct.

13 Q. Okay. The H.265 standard does not describe
14 determining a subset of spatial motion vector prediction
15 candidates based on the location of the candidate from A1,
16 right?

17 A. That is correct.

18 Q. And that is because A1, if available, is not
19 compared with another candidate before being added to the
20 merge list, right?

21 A. That is correct.

22 Q. Instead, it's your testimony that the '714 patent
23 is practiced only for the candidates A0, B0, B1, and B2,
24 right?

25 A. That is correct.

1 Q. Okay. Can we take this down, please, Mr. Davis,
2 and in its place put up CX-5885.167. And can we blow up
3 equation 8-119?

4 So, Dr. Moulin, this is equation 8-119 of the 265
5 standard.

6 You talked about this on direct, right?

7 A. Correct.

8 Q. Okay. Equation 8-119 describes the process of
9 constructing the merge and candidate list, right?

10 A. That's correct.

11 Q. And you believe that this merging candidate list
12 in H.265 is the motion vector prediction list that's in the
13 claims, right?

14 A. This is not the same. The claims describe a
15 general procedure. You don't even see the letters A1, B1,
16 and so on in the claims.

17 Q. But you're mapping -- the motion vector
18 prediction list element in the claim, you're mapping it to
19 the merging candidate list, correct?

20 A. It's a different thing. I thought you were
21 asking me if this appears in the claims.

22 Q. No. I -- okay. Let me clear it up.

23 My question was, your reading -- the claim has a
24 limitation or an element motion vector prediction list,
25 right?

1 A. Correct.

2 Q. And you contend that this merging candidate list
3 is the motion vector prediction list, right?

4 A. The correct word would be mapping, as you said
5 earlier, so yes.

6 Q. Okay. The merging candidate list maps to the
7 motion vector prediction list?

8 A. That's the mapping that makes most sense,
9 correct.

10 Q. Okay. Now, equation 8-119 illustrates a loop by
11 which each candidate is placed onto the merging candidate
12 list based on its availability flag, right?

13 A. I wouldn't put it that way.

14 Q. Okay. Let's pull up paragraph 238 of
15 Dr. Moulin's report.

16 Directing your attention to the sentence that
17 begins, the following pseudocode after which we see equation
18 8-119, the following pseudocode illustrates a loop by which
19 each is placed onto the list if it is determined to be
20 included based on its availability flag.

21 Did I read that correctly?

22 A. Correct. The best word to describe it is
23 sequential. So a loop -- this is a special case of a loop,
24 because it's sequential. So the better -- the ideal word
25 would be it's done sequentially.

1 Q. Okay.

2 A. But it is still an instance of a loop.

3 Q. Okay. So the better way to describe this is that
4 it's a sequential loop?

5 A. It is a very simple sequential process.

6 Q. Okay. And you'd agree with me that the order of
7 entries on this equation has to be fixed, right?

8 A. What do you mean the order of entries in the
9 equation has to be fixed?

10 Q. Instead of the equation, let me replace equation
11 with array.

12 You'd agree with me that the relative order of
13 entries found in this array has to be fixed?

14 A. The entries on the list are found in a precise
15 order.

16 Q. Right. And equation 119 specifies that order,
17 right?

18 A. It describes that order. It would be, say, A1
19 first, if available, then B1, if available, and so on.

20 Q. So A1 is first?

21 A. If available.

22 Q. If available. And available flag A1 is the first
23 to be evaluated, right?

24 A. The first to be evaluated is conditional
25 statements, yes.

1 Q. So if A1 is in the merging candidate list, it
2 must be first, right?

3 A. It must be first in merged candidate list,
4 correct.

5 Q. Otherwise you'd get a contradiction?

6 A. There's no contradiction. By construction it has
7 to be that way.

8 Q. It has to be that way. Okay.

9 And so you mentioned this previously, but you
10 have to populate the merging candidate list with A1 before
11 you -- before B1 goes on the list, right?

12 A. If A1 is available, it goes on the list first.
13 And then B1 gets its chance.

14 Q. We can take that down, Mr. Davis.

15 And let's pull up claim 9 of the '714 patent,
16 please.

17 Okay. Dr. Moulin, claim 9 is one of the asserted
18 claims, right?

19 A. Correct.

20 Q. And claim 9 requires determining a subset of
21 spatial motion vector prediction candidates based on the
22 location of the block associated with the first spatial
23 motion vector prediction candidate, right?

24 A. This is quite blurred and I see a small portion
25 of the language. Can we go back to the original resolution?

1 Q. Do you want to see it like this or --

2 A. Well, I just see a portion at low resolution. I
3 prefer to look --

4 Q. All right. You prefer it to be like that. Okay.
5 Do you want me to reask my question?

6 A. Yes, please.

7 Q. Okay. Claim 9 requires determining a subset of
8 spatial motion vector prediction candidates based on the
9 location of the block associated with the first spatial
10 motion vector prediction candidate, correct?

11 A. That's correct.

12 Q. So all of the asserted claims have this
13 requirement, right?

14 A. There is a subset in the asserted claims for the
15 '714 patent, correct.

16 Q. And the claim language says that the
17 determination of a subset must be, quote, based on the
18 location, correct?

19 A. That's correct.

20 Q. The claim language does not say that the
21 determination of a subset must be based solely on the
22 location, right?

23 A. It does not say that. The word "solely" does not
24 appear.

25 Q. And you applied the claim language literally in

1 your infringement analysis, correct?

2 A. I applied the claim language in my analysis,
3 correct.

4 Q. Your analysis of infringement did not require
5 subsets to be based solely on the location of the block
6 associated with the first spatial motion vector prediction
7 candidate, right?

8 A. The fact that the subset is based on the
9 location, there is no other qualifier that I used.

10 Q. Let's now talk about how you analyze location.

11 And, to do that, let's pull up Fig. 8-3 from the
12 H.265 standard again.

13 So CX-5885.174.

14 Dr. Moulin, there's a big unlabeled block in the
15 middle of Fig. 8-3, right?

16 A. Correct.

17 Q. And that big, unlabeled block represents the
18 block of pixels that is being decoded, right?

19 A. That's correct.

20 Q. And if we map it to the claim language, the big
21 unlabeled block is the encoded block of pixels in the
22 claims, right?

23 A. I don't know if that's the exact words that are
24 used in the claim language, but the idea is correct.

25 Q. Okay. Now, in your analysis of the claims, when

1 you talk about the location of the candidate associated with
2 A0, that's the location relative to the encoded block of
3 pixels, right?

4 A. Well, we have a geometric configuration, which we
5 can all see here with the diagram, and so, indeed, A0 is
6 below A1 and it's to the lower left of the big block in the
7 center.

8 Q. Is the answer to my question yes?

9 A. Can you repeat your question?

10 Q. Yes. In your analysis of the claims, when you
11 talk about the location of the candidate associated with A0,
12 that's the location relative to the encoded block of pixels,
13 right?

14 A. Well, that location, in this diagram, it is
15 fixed, so you can use a relative location, if you wish, or
16 you could use an absolute location. It is just using
17 different coordinates. It's a fixed location in this
18 diagram.

19 Q. Can we have -- you were deposed in this case,
20 correct, sir?

21 A. I what?

22 Q. You were deposed in this case, correct?

23 A. That's correct, yes.

24 Q. Can we have Dr. Moulin's deposition transcript at
25 page 196, lines 19, through 197, line 1?

1 JUDGE MCNAMARA: What was the date of the
2 deposition?

3 MR. HOUMAND: The date of the deposition,
4 Your Honor?

5 JUDGE MCNAMARA: Yes.

6 MR. HOUMAND: December 8, 2025.

7 JUDGE MCNAMARA: Thank you.

8 Q. Question. Now, in your analysis, when you talk
9 about the location of the candidate associated with A0,
10 that's the location relative to the encoded block of pixels,
11 right?

12 Answer. Correct.

13 Did I read that question and answer correctly?

14 A. As I just said, it doesn't matter which
15 coordinates are used. You can say yes, I used relative
16 coordinate or I used absolute coordinate. It's the
17 equivalence. It's the same thing.

18 Q. Fair. And the same is true for the other
19 candidates A1, B0, B1, and B2, you viewed the location as
20 being relative to the encoded block of pixels in your
21 analysis.

22 A. As I explained, when you look at this diagram,
23 these locations of A0, A1, and so on, it doesn't matter if
24 you use absolute coordinates or if you use relative
25 coordinates. The geometry is exactly the same. It doesn't

1 matter.

2 Q. Let's pull up Dr. Moulin's deposition transcript,
3 page 197, lines 2-6.

4 Question. And the same is true for the other
5 candidate A1, B0, B1, B2, you view the location as being
6 relative to the encoded block of pixels in your analysis,
7 right?

8 Answer. Correct.

9 Did I read that correctly?

10 A. You read it correctly, and this sentence is
11 correct. It's equivalent also -- you could use relative
12 coordinates equally. You could say A0 as the location
13 relative to A1. It's the equivalence because the geometry
14 is fixed.

15 Q. We can go ahead and take that down.

16 Let's pull up slide 41 from your opening
17 demonstratives, direct demonstratives I should say,
18 CDX-3C.41.

19 So, Dr. Moulin, you had a table like this in your
20 report as well as in your demonstrative slides.

21 This table summarizes the subsets that correspond
22 to each location for a given candidate, correct?

23 A. It shows the subset location corresponding to the
24 candidate location.

25 Q. I want to focus our attention on when the alleged

1 subsets have been determined. Okay? And I want to start
2 with the -- to do that, I want to use the example of the
3 first row in your table, the candidate location, A0, and its
4 subset A1.

5 Are you with me?

6 A. I see that, yes.

7 Q. Okay. In this example the determination of the
8 subset for A0, which is A1, that determination was made a
9 long time ago when the H.265 standard was adopted, right?

10 A. Well, the pairings of candidate location and
11 subset location has been done before as reflected in this
12 document, the H.265 specification. But let's be clear. We
13 are talking about locations, right? The claim here, the
14 claim element is about subsets of motion vector prediction
15 candidates. So one should not confuse the two.

16 Q. Okay. So can we -- before I ask the question
17 again, I want to see if we can agree on some preliminary.

18 You would agree -- I believe you testified
19 yesterday when you had this slide up, you said, so that's
20 determined in the standards.

21 A. I said what?

22 Q. You said that's determined in the standards. So
23 are you saying that -- are you saying the candidate pairings
24 were determined in the standards?

25 A. You say "that," but I don't know what "that"

1 refers to.

2 Can you read the previous sentences?

3 Q. Well, let me just ask my question again.

4 In this example, the first row of your table, the
5 determination of the subset for A0, which is A1, that
6 determination was made a long time ago when the H.265
7 standard was adopted.

8 A. So the pairing, as I just explained, of this
9 candidate location A0 to the subset A1 was done a long time
10 ago.

11 Q. Okay.

12 A. That's reflected in the standards.

13 Q. Okay. I appreciate that. So the determination
14 of the pairing was made a long time ago.

15 A. Correct.

16 Q. And that logic would extend to the other rows
17 that are in your table, right? Those pairings were also
18 determined a long time ago?

19 A. It's the same logic for the other rows indeed.

20 Q. Okay. All right. And the first -- the year that
21 the first H.265 standard came out was 2013, right?

22 A. If I don't remember the exact official date of
23 the first release.

24 Q. Can you repeat your answer?

25 A. I don't remember the official date of the first

1 release, the first time it was published.

2 Q. Okay. Well, you cited to a 2013 version of the
3 standard in your report.

4 A. Yeah, that's likely. There have been multiple
5 versions. So if you say 2015, that's a later version.

6 Q. Well, you would agree, at the very least, that
7 the relevant functionality for the '714 patent was specified
8 in each version of the H.265 standard starting from the
9 earliest, right?

10 A. Starting from when?

11 Q. The earliest.

12 A. What is the earliest?

13 Q. The earliest version of the standard.

14 A. Can you qualify that? Are you talking about
15 working drafts or published versions?

16 Q. Okay. Let's pull up your report at paragraph
17 145, Mr. Davis.

18 Okay. The bottom, the final sentence, you wrote,
19 the relevant functionality for the '714 patent and the '267
20 patent was specified in each version of the H.265 standard
21 starting from the earliest.

22 Is that a true statement?

23 A. That is correct, yes. So it was -- what I refer
24 to there was the published versions, not to be confused with
25 the working drafts.

1 Q. Thank you for clarifying.

2 So the candidate pairings that we were discussing
3 on slide 41, those were determined over a decade ago when
4 the standards were published, right?

5 A. Well, my sentence is about the relevant
6 functionality. So I would have to read the context here.

7 Q. I'm asking a different question.

8 My question is, the candidate pairings that you
9 discussed during your direct, those were determined and set
10 forth in the standards over a decade ago, right?

11 A. So they were present in the, yeah, in the
12 earliest, during the first version of the standards.

13 Q. Okay.

14 A. Published version.

15 Q. Sorry. I didn't mean to cut you off.

16 A. I qualified published version.

17 Q. That didn't have any effect on your infringement
18 opinions, right?

19 A. What did not have any impact exactly?

20 Q. Well, you concluded the claims were infringed,
21 the '714 patent claims were infringed, even though these
22 candidate pairings were determined over a decade ago, right?

23 A. So the candidate pairings were present in the
24 earliest version of the standards, and even the earliest
25 version of the standards, yeah, that is correct.

1 Q. Okay. Now I want to go back to the question that
2 I was asking you before, and I want to talk about the
3 specific claim language to determine a subset. Okay? And I
4 want to go back to this example of A0 and A1 and I want to
5 ask my question again. Okay?

6 So in this example, the determination of the
7 subset for A0, not just the candidate pairing, but the
8 determination of the subset, that determination was made a
9 long time ago when the H.265 standard was adopted, right?

10 A. No, that's not the correct way to view it.

11 Q. Okay. Can we have Dr. Moulin's deposition
12 transcript at page 217, please, lines 4-8?

13 Question. So that example, the determination of
14 the subset for A0/A1 you mentioned was made a long time ago
15 when the H.265 standard was adopted, right?

16 Answer. Correct.

17 Did I read that correctly, sir?

18 A. You read it correctly. There's a context,
19 however. Here we are talking about the pairings between
20 locations. So the language of the claim is a subset of
21 vectors. You can't possibly determine a subset of motion
22 vectors because they depend on the input video. That's
23 not -- the input video is not present in the standards.

24 So this applies to the subsets of locations, not
25 the motion vectors themselves. It is very important to

1 distinguish between a spatial location and a motion vector
2 associated with that location, which is, as I explained, a
3 dynamic process.

4 Q. That's the answer you gave at your deposition?

5 A. There's a context. This applies to the pairing.
6 Obviously what's written there is not a subset of motion
7 vectors. The subset of motion vectors of a video today
8 cannot have been known ten years ago. So this is a
9 statement about pairings between spatial locations.

10 Q. Let's go ahead and take that down, Mr. Davis, and
11 let's put up slide 41 again.

12 So I want to go back to the table of subsets that
13 you prepared, and I want to ask you about some more, kind of
14 the candidates of the set and subset, okay?

15 A. Okay.

16 Q. Let's start with the set.

17 You agree that the set of candidates in H.265 is
18 A0, A1, B0, B1, and B2, right?

19 A. Potentially as large as that, correct.

20 Q. The original five neighbor candidates in H.265
21 are the set, right?

22 A. Yeah, this is the five possible candidates.

23 Q. Okay. Now let's talk about subsets.

24 You agree that in the '714 patent there's no
25 limitation on the size of the subset.

1 A. Well, the size of the subsets cannot exceed the
2 size of the original set it comes from.

3 Q. Okay. So that's one limitation, but, beyond
4 that, there isn't one.

5 A. There's no additional limitation, not like a
6 specific number that is used, no.

7 Q. Right. There's nothing wrong with a subset
8 having one element, right?

9 A. Correct.

10 Q. And you show that in your table, right?

11 A. Patent specification gives such examples, too,
12 yes.

13 Q. There's nothing wrong with a subset having more
14 than one element, right?

15 A. That's correct, for instance, B2.

16 Q. Right, B2 is an example of that, right?

17 A. B2 is location, and the subset in this case has
18 two elements.

19 Q. Right. So you concluded that there was
20 infringement based on subsets having one element and subsets
21 having more than one element, right?

22 A. So the key concept is that the subsets has to be
23 smaller, strictly smaller than the entirety of the set minus
24 the candidate, right? That's crucial. Otherwise, there is
25 an exhaustive comparison.

1 Q. But if you meet that, then you have a subset
2 under the claims.

3 A. So the subset cannot be as large as everything
4 but the current candidate; otherwise, that would be an
5 exhaustive comparison.

6 Q. Okay.

7 A. So, for instance, in this table the largest
8 number is 2. It could even have been 3, that's okay, but
9 not 4.

10 Q. So at least using this set of neighbor
11 candidates, you could have a subset of 3, right?

12 A. Well, that idea did not make its way to the
13 standard, but that could have been an idea, correct.

14 Q. Okay. Now, it's also okay for different
15 candidates to have the same subset, right?

16 A. What do you mean it's okay?

17 Q. Well, if you look at your table, for candidate
18 location A0 and B1, they both have the same subset of A1,
19 right?

20 A. That is correct.

21 Q. Okay. I want to show a demonstrative that we
22 prepared that illustrates that.

23 Can we pull up RDX-12.2?

24 Are you seeing that on the screen, Dr. Moulin?

25 A. Yes, I do.

1 Q. Okay. So our coloring is a little different than
2 yours. What we did is we took the table from your report
3 that is very similar, slide 41, and we're looking at the
4 example of B1, candidate location B1.

5 Do you see that in blue?

6 A. I see that.

7 Q. Okay. So in this row B1 is the selected
8 candidate, right?

9 A. No, that's not correct. The selected candidate
10 would be motion vector. So this is the location of the
11 candidate.

12 Q. Okay. Thank you for -- so the location of the
13 candidate is B1, right?

14 A. Hopefully, I would be very clear in the
15 distinction between a spatial location and a candidate,
16 which is a motion vector.

17 Q. Okay. But just for purposes of illustrating this
18 location, B1 is what we're highlighting in blue, right?

19 A. B1 is the candidate location as you explained to
20 me.

21 Q. Okay. And as you describe B1 in your report, B1
22 is located directly above the encoded block, right?

23 A. That is correct.

24 Q. Okay. And for the candidate from the B1
25 location, A1 is the subset, right?

1 A. B1 is the corresponding subset, correct.

2 Q. Okay. And that's what we're seeing in green
3 here, right?

4 A. That's correct.

5 Q. And as you described it in your report, A1 is
6 located directly to the left of the encoded block, right?

7 A. That's correct.

8 Q. Okay. So let's now go to the next slide,
9 RDX-12.3.

10 So here we now have a different candidate
11 location. We have A0 that we're focusing on.

12 And that's what we're seeing in blue here, right?

13 A. Correct.

14 Q. And A0 is located below and to the left of the
15 encoded block, right? That's how you described it in your
16 report.

17 A. That's correct.

18 Q. Okay. And the candidate from location A0 is --
19 excuse me. Let me start that one over.

20 And the candidate from location A0, A1 is the
21 subset for that candidate too, right?

22 A. That is correct.

23 Q. And that's what we're seeing here in green,
24 right?

25 A. Correct.

1 Q. Okay. So if we go to RDX-12.4, we can see this
2 here. And just so that we can make things clear, in your
3 infringement analysis, the candidate located above the
4 encoded block and the candidate located below and to the
5 left of the current block, they have the same subset.

6 A. The subset is A1, highlighted in green.

7 Q. And the subset is the same for both locations?

8 A. If the candidate location is B1, the subset is
9 A1. If the candidate location is A0, the subset is the
10 same, A1.

11 Q. Okay. So for purposes of your infringement
12 analysis, candidates from different locations can have the
13 same subset, right?

14 A. They can have the same subset location again.
15 Okay? So, again, let's not confuse the subset, which is
16 motion vectors, with location. So they can have the same
17 subset location, which is A1.

18 Q. Okay. Now let's go back to your chart, slide 41,
19 from your opening demonstratives.

20 And just to round this one out, for purposes of
21 your infringement analysis, it was also okay for the subset
22 of one candidate to consist of subset locations that were
23 determined for other candidates, right?

24 A. So that, if I understand correctly, is just what
25 you said earlier as applied to A1 being the subset location.

1 Q. Well, okay. So let me be a little clearer. I
2 want to focus now on B2.

3 So B2 has a subset of two locations, right, A1
4 and B1, right?

5 A. It has a subset corresponding to two spatial
6 locations, A1 and B1.

7 Q. Right. And those subset locations, A1 and B1,
8 those are the locations for other candidates, right?

9 A. That's correct.

10 Q. And that was okay under your infringement
11 analysis, right?

12 A. That's what the standard describes.

13 Q. Well, I'm not -- I'm asking about your
14 infringement analysis, not the standard.

15 So for purposes of your infringement analysis, it
16 is permissible for the subset of one candidate to consist of
17 the subsets determined for other candidates, right?

18 A. For the purpose of my infringement analysis, just
19 like in the H.265 standard, it is okay for a subset location
20 to be used for other candidate locations. We have gone
21 through a couple of examples already.

22 MR. HOUMAND: Okay. We can take that down,
23 Mr. Davis.

24 Your Honor, I'm going to switch topics. I can
25 keep going unless Your Honor would like a break.

1 JUDGE MCNAMARA: I get the sense, Mr. Houmand,
2 that this is -- that you would like a break, and so we're
3 fine with that.

4 MR. HOUMAND: Okay. No. I'm happy to do -- I
5 just wanted to be cognizant of timing.

6 JUDGE MCNAMARA: No, no, I appreciate that. So
7 let's take a break and we'll give Ms. Kinkade a break.

8 MR. HOUMAND: Okay. Thank you.

9 JUDGE MCNAMARA: See you in 15 minutes.

10 (Whereupon, the proceedings recessed at 10:51
11 a.m.)

12 (In session at 11:05 a.m.)

13 JUDGE MCNAMARA: Thank you. Please be seated.

14 MR. HOUMAND: Thank you for the break,
15 Your Honor.

16 JUDGE MCNAMARA: I think that's a nice gentle way
17 of asking.

18 MR. HOUMAND: Thank you. Appreciate it.

19 BY MR. HOUMAND:

20 Q. Dr. Moulin, let's talk now about the '267 patent.
21 Would you agree with me that the '267 patent is about
22 bidirectional prediction?

23 A. It uses bidirectional prediction, yes.

24 Q. And bidirectional prediction has been known since
25 the 1990s, right?

1 A. Maybe even earlier.

2 Q. Maybe even earlier, okay. And interpolation has
3 been known about as long as bi-prediction, right?

4 A. Much longer.

5 Q. Much longer.

6 A. Gauss and Laplace in the 1700s were already doing
7 interpolation in the 1700s.

8 Q. Oh, so -- and you're referring to Carl Friedrich
9 Gauss, the famous mathematician?

10 A. Yes, and Pierre Laplace.

11 Q. The German and the French. It's been known for
12 centuries, right?

13 A. The notion of interpolation, yes, has been known
14 for a long, long time.

15 Q. Okay. And in bidirectional prediction,
16 predictions are calculated from two reference blocks and
17 combined, right?

18 A. That is correct.

19 Q. The predictions can be combined with simple
20 averaging or by weighted averaging, right?

21 A. There are many ways to do -- to combine two
22 predictions.

23 Q. And one of the ways that you can do it is by
24 weighted averaging, right?

25 A. Possibly, yes.

1 Q. And more recently, a weighted averaging of two
2 predictions has become more popular, right?

3 A. Popular where?

4 Q. In general.

5 A. It really depends on the context.

6 Q. Okay. You don't recall writing that in your
7 report?

8 A. There's a context to everything, so, of course,
9 weighted predictions make complete sense in some contexts
10 and simple averaging makes more sense in other contexts. So
11 you need to tell me what the context is.

12 Q. Okay. Let me give you the context, then.

13 Let's pull up paragraph 83 from your opening
14 report.

15 And you wrote in the, let's see, fourth sentence,
16 you write, more recently, a weighted averaging of two
17 predictions have become more popular.

18 That's what you wrote in your report, right?

19 A. That's in the context of bi-prediction for video
20 coding, that is correct.

21 Q. Okay. So in the context of bi-prediction for
22 video coding, a weighted averaging of two predictions has
23 become more popular.

24 A. Yeah. And again, as a more general tool. If the
25 weights are equal, you are back to the basic scheme that is

1 mentioned just above.

2 Q. Okay. And then you go on to say, in the next
3 sentence, when using a weighted averaging, a more accurate
4 prediction can be formed.

5 You wrote that in your report, right?

6 A. That's correct.

7 Q. Okay.

8 Let's take that down, Mr. Davis. Thank you.

9 And, Dr. Moulin, you were here for Nokia's
10 opening statement yesterday, right?

11 A. I was.

12 Q. Okay. Can we pull up slide 93 from Nokia's
13 opening statement, CDX-1.93?

14 Do you see that on your screen, Dr. Moulin?

15 A. Yes, I do.

16 Q. Okay. This is a slide from Nokia's opening
17 statement annotating Fig. 11 from the '267 patent, right?

18 A. I'll take your word for it that is the same
19 annotations. Of course, the figure itself looks familiar.
20 The annotations, I did not remember the way they were
21 presented.

22 Q. Okay. Well, I'll represent to you this is a copy
23 of what we got from Nokia on their opening slides.

24 A. All right.

25 Q. And you can see that on the bottom footer with

1 the CDX-1.93.

2 Now, you discussed Fig. 11 during your testimony,
3 right?

4 A. That's correct.

5 Q. And you agree Fig. 11 illustrates the invention
6 of the '267 patent, right?

7 A. This figure illustrates -- it is using the patent
8 itself. It comes from the patent. It illustrates aspects
9 of the invention.

10 Q. Okay. Let's take this slide down and put up
11 slide 89 from Nokia's opening statement, CDX-1.89, please.

12 And this is a slide from Nokia's opening
13 statement annotating Fig. 10 from the '267 patent, right?

14 A. Fig. 10, I recognize, it comes from the patent.
15 And the notations have been added in later.

16 Q. Okay. And Fig. 10 shows bi-prediction as it
17 existed before the '267 patent, right?

18 A. It illustrates bi-prediction before the
19 invention.

20 Q. Okay. And now let's pull up -- let's put these
21 two slides one on top of each other, Mr. Davis. Let's put
22 slide 89 on top of slide 93, just like that.

23 And I want to talk about some similarities and
24 differences between the two figures. Okay, sir?

25 A. Okay.

1 Q. All right. So let's start with the similarities.
2 As annotated by Nokia's counsel, the processes in Figs. 10
3 and 11 start with the same bit-depth of 8 bits, right?

4 A. Well, that's what is written there. This is an
5 argument presented during the opening statement. I can read
6 like you, yes, 8 bits.

7 Q. Okay. And there's two branches -- you talked
8 about this yesterday. There's two branchers in the figures,
9 right? There's an upper branch and a lower branch, right?

10 A. Correct.

11 Q. The upper branch in Figs. 10 and 11 shows a first
12 prediction, right?

13 A. It leads with P1, which is the first prediction.

14 Q. Right. P1 is the first prediction in these
15 fission figures, right?

16 A. That's correct.

17 Q. Okay. And P2 is the second prediction in the
18 lower branch, right?

19 A. Correct.

20 Q. Okay. And in both figures, P1 and P2 are
21 combined at the circle with a plus in it, right?

22 A. This is a symbolic representation. Again, this
23 is the combined prediction in red was not part of the
24 patent, right? It is an annotation that I saw yesterday,
25 but this annotation there is not present in the patent.

1 Q. Right. That annotation is not present in the
2 patent, I agree with you about that. I was just asking
3 about the black circle with a plus in it. That illustrates
4 the combining of P1 and P2, right?

5 A. It's a conceptual way of combining. So it's a
6 conceptual figure. It's not necessarily as simple as an
7 addition.

8 Q. Okay. But that symbol is symbolizing the
9 combining?

10 A. My understanding is that it is part of combining.

11 Q. Okay. And then at the end of both figures, you
12 finish with a bit-depth that is referred to as N, right?

13 A. Well, not me, the inventors.

14 Q. Yeah. In both figures, right?

15 A. That's correct.

16 Q. Okay, now let's look at the predictions. In both
17 Figs. 10 and 11, Nokia is illustrating that the predicted
18 values are 14 bits, right?

19 A. I'm reading like you, 14 bits, yes. And again,
20 that's not part of the patent.

21 Q. That's not part of the patent. But that's what
22 Nokia's counsel is illustrating here, is that in Fig. 10,
23 prior art, and in Fig. 11, invention, you're getting
24 predictions at 14 bits, right?

25 A. I'm reading like you. This is not part of the

1 patent.

2 Q. Okay. But that's what you see.

3 A. Yeah, that's what I see.

4 Q. Okay. And figures in the predictions in Figs. 10
5 and 11 were both obtained by interpolation, right?

6 A. Through N-tap filter in Fig. 10 and P-tap filter
7 in Fig. 11, both with integer coefficients.

8 Q. Right. And both the N-tap filter and P-tap
9 filter, those are interpolation filters, right?

10 A. They are.

11 Q. Okay. There is an N in Fig. 10 and there's a P
12 in Fig. 11, but you'd agree there's no substantive
13 difference between the N-tap filter and the P-tap filter in
14 these two diagrams, right?

15 A. The N and the P is just a placeholder for
16 integer.

17 Q. Okay. So the prior art taught obtaining
18 predictions at a higher precision through interpolation,
19 right?

20 A. Say again?

21 Q. So the prior art, as we see in Fig. 11, taught
22 obtaining predictions at a higher precision through
23 interpolation.

24 A. The only thing that the prior art shows, as
25 reflected in Fig. 10, is that the filter, the filter has

1 shifted down to the input bit-depth, which is 8 in this
2 demonstrative, and the precision P1 is at 8 bits only. So
3 it is not a higher precision.

4 Q. Okay. Well, the precision, you're right, at the
5 end, right before it's combined, it goes down to 8 bits,
6 right?

7 A. I didn't write anything of this --

8 Q. I know, but I'm just asking -- sorry. Did I cut
9 you off?

10 A. Yeah. There's a figure by the inventors in the
11 patent, there's red notations and not by me. They are from
12 yesterday.

13 So just to be clear, so P1 is a prediction. In
14 this diagram, if I take those numbers, 8 bits is the same as
15 the input precision. So it is agreed that it's at a high
16 precision.

17 Q. Do you agree or disagree in Fig. 10 with the
18 annotations that Nokia's counsel put on this slide that
19 prediction number 1 is at 14 bits and prediction number 2 is
20 also at 14 bits?

21 A. I cannot comment on what is not in the patent.
22 So I do not even think of this illustration. What I can
23 tell you is, from the prior art, which is reflected in
24 Fig. 10, that the P1 is the same precision as inputs.

25 Q. At what point in time?

1 A. So in the prior art, so let's say the input was 8
2 bits, in fact, it says in this example above, input pixel
3 value equals 8 bits, there is 256 values. So if that's the
4 case in Fig. 10 of the patent, P1 will also have 8 bits. In
5 fact, it's shown in red above that box. It shift to input
6 bit-depth 8 bits.

7 Q. Right. And that yellow -- so you just referenced
8 the yellow boxes there colored in Fig. 10, right?

9 A. Yes.

10 Q. Okay. And the yellow boxes that are shown in
11 Fig. 10 and the yellow boxes that are shown in Fig. 11,
12 those are illustrating the difference -- one of the
13 differences between Fig. 10 and Fig. 11, right?

14 A. That's correct. It's a big difference.

15 Q. Yeah. And as you noted, in the yellow boxes in
16 Fig. 10, the predictions are being rounded down to the lower
17 input depth, bit-depth, of 8 bits, right?

18 A. In this example, where the input was 8 bits, then
19 P1 would also be 8 bits.

20 Q. Okay. And in the yellow boxes in Fig. 11, the
21 predictions are instead being maintained at a higher
22 precision.

23 A. Yeah, if the input was 8 bits, now the P1 is at
24 10 bits, which is a higher precision.

25 Q. Right. And the inventors characterized this

1 difference between Fig. 11 and Fig. 10 as the rounding is
2 performed at the last step after both prediction signals
3 have been added, right?

4 A. They describe it in -- not in those terms. There
5 are several contributions, several parts to this invention.
6 One is the one we are discussing here, the higher precision,
7 and the other one is the way rounding is treated.

8 Q. Let's take this down and pull up -- before I do,
9 let me ask you a couple of questions about this.

10 Let's talk about that proposal now. You talked
11 about this on direct, but it's your understanding that Nokia
12 submitted a proposal for the improvement claimed in the '267
13 patent to the JCT-VC, correct?

14 A. Correct.

15 Q. And that proposal was JCT-VC-D321?

16 A. Sounds familiar. I would have to check the
17 numbers.

18 Q. Okay. Well, let's pull it up. It's JX-187.

19 And so, Dr. Moulin, this is the -- this is the
20 proposal that Nokia submitted on the improvement in the '267
21 patent, right?

22 A. Correct.

23 Q. Okay. And it was written -- we see here by the
24 author line it was written by the inventors of the '267
25 patent, right?

1 A. Correct.

2 Q. And in this proposal, the inventors describe the
3 invention that would eventually be patented in the '267
4 patent, right?

5 A. They describe the invention, and the invention
6 was later adopted -- accepted and adopted into the standard.

7 Q. Okay. And you had a couple of slides in your
8 demonstratives about this document during your direct,
9 right?

10 A. Correct.

11 Q. I want to show you some portions that you didn't
12 discuss during your direct testimony.

13 So if we go to the bottom of page 1, there is in
14 the last paragraph, second sentence -- or, excuse me, third
15 sentence, it reads: The rounding is performed at the last
16 step after both prediction signals are added.

17 Do you see that?

18 A. I see what you have highlighted, yes.

19 Q. And you agree that's a fair characterization of
20 the disclosure, right?

21 A. Let me just read the whole paragraph again.

22 Well, this is part of their description of their
23 invention.

24 Q. And you agree that's a fair characterization of
25 the disclosure.

1 A. The sentence you've highlighted describes a part
2 of their disclosure.

3 Q. Okay. But I'm asking you if it's a fair
4 characterization. Do you agree that the sentence that is
5 highlighted is a fair characterization of the disclosure,
6 sir?

7 A. I'd have to check again what they call last step,
8 because I need the context. I mean, definitely the rounding
9 is performed at some point, so I would have to see
10 specifically what they refer to as the last step.

11 Q. You testified in the 1380 investigation?

12 A. I did.

13 Q. Yeah. The answer that you agree -- do you recall
14 agreeing that this is a fair characterization of the
15 disclosure in the 1380 case?

16 A. I don't remember every word I said eight months
17 ago.

18 Q. That's fair. Let's pull it up. 1380 transcript,
19 at 533, 1-7.

20 Question. So in the top excerpt, do you see
21 where it says, "the rounding is performed at the last step
22 after both prediction signals are added"?

23 Answer. I see that, mm-hmm.

24 Question. So that's a fair characterization of
25 the disclosure here, right?

1 Answer. Yes.

2 A. Right. So the additional context I see is that
3 there is a here and that the last step was specified as
4 being after both prediction signals are added, which is what
5 I asked you to clarify.

6 Q. Okay. Let's turn now -- let's go back to '321
7 and go to the paragraph under section 3, Conclusions.

8 And the first sentence says, "This contribution
9 proposes a minor fix on how the bi-directional prediction is
10 generated."

11 Did I read that correctly?

12 A. You did.

13 Q. The inventors wrote that sentence, right?

14 A. Correct.

15 Q. And you did not put it in your slides?

16 A. I don't think so, no.

17 Q. Okay.

18 You can take that down, Mr. Davis.

19 A. Would you like to know why?

20 Q. Your counsel can ask you on redirect, if he
21 wishes to know.

22 I want to switch topics to another hypothetical.
23 So let's assume that you have a value that could be an
24 integer between 0 and 255. Are you with me?

25 A. Yes.

1 Q. Okay. You agree that that value has 256
2 different possibilities.

3 A. Correct.

4 Q. And 256 is 2 to the power of 8, right?

5 A. Correct.

6 Q. Okay. And you agree that you can encode these
7 256 possibilities using 8 bits.

8 A. You can, yes.

9 Q. Okay. Now let's assume that there is a second
10 value that could also be an integer between 0 and 255. Are
11 you with me?

12 A. Yes.

13 Q. Okay. That second value can also be encoded with
14 8 bits, right?

15 A. Correct.

16 Q. Okay. Now let's assume that I multiply the first
17 value and the second value together. Okay?

18 A. Yes.

19 Q. You agree that the number of possible values
20 resulting from the multiplication would be 2 to the power of
21 16, correct?

22 A. At most. It's actually less.

23 Q. That's not the answer you gave at your
24 deposition.

25 A. Yes, and I had to think so I could qualify

1 because some values are missing. It's almost 16 bits but
2 not -- so 16 bits would be -- so 2 to the power of 16, I
3 calculated in my head and I even gave the wrong answer of
4 the product.

5 So there are some values that are not possible.
6 So typically you still need to present using 16 bits. I
7 cannot think how you could do it really with a much smaller
8 number than the number of bits, but 16 bits, for sure you
9 get it.

10 Q. Can you repeat that last sentence? I didn't
11 catch it.

12 A. Let me give you an example, okay? So 2 to the
13 power of 16 -- I would have to redo the calculation. Maybe
14 you've done it. 2 to the power of 16 --

15 Q. Yeah, I've done it. 2 to the power of 16 is
16 65,536.

17 A. Yes. Okay. So let's look at the number,
18 65,000 -- you said 366?

19 Q. 65,536.

20 A. 536. So let's look at the number 65,535 or 34,
21 okay. So that number cannot be represented as the product
22 of two numbers, as you described to me. So there are some
23 values that are missing.

24 Q. Okay. So there are some edge cases where the
25 values might be missing.

1 A. I don't know if we would call them edge cases,
2 but there are some values that are missing.

3 Q. But I think I heard you saying that you would
4 need 16 bits to represent all the possibilities from the
5 product.

6 A. So it is a really specific example. It is
7 multiplication. It is not at all what's in the patent. I
8 would have to think about it to give you the correct answer.

9 Q. Okay. Well, let's read what you wrote at your --
10 let's -- you would need at least -- would you need 15 bits?

11 A. I would have to do the calculation. Again, it's
12 not just multiplication. It has nothing to do with the
13 patent. The patent does not ever multiply two numbers. So
14 that is something I would have to compute. It's not
15 something related to the patent.

16 Q. Well, you would need -- you would need at least
17 more than 8 bits to represent the product.

18 A. Definitely.

19 Q. Okay. You would need more than 8 bits, but the
20 precise number of bits is something you would need to figure
21 out.

22 A. There would have to be a calculation. It is a
23 very, very specific operation. You are multiplying two
24 numbers like this, and so you would end up with a minimum
25 number of bits for that particular operation.

1 Now, if you change your problem and tell me, I
2 want to multiply 3 bits, and so it's an entirely different
3 calculation, right? But, again, this is completely
4 different from the types of operation done in the patents.
5 You never multiply predictions.

6 Q. I want to talk now about the topic of AV1. You
7 are not aware of any ASUS computer that could play back
8 AV1-encoded video when taken out of the box, right?

9 A. You mean for ASUS?

10 Q. For ASUS.

11 A. So if taken out of the box and untouched, it
12 needed a little extension to be able to play AV1 video.

13 Q. And so a user would have to download some type of
14 software in order to play AV1 video on the ASUS accused
15 products, right?

16 A. I mean, it's really very simple. There's a
17 couple of ways to do that. So one, we use, say, something
18 like a KMPlayer or a VC player, they have that ability, or
19 if you want to stick to what was with the original, it is
20 basically a little connection that has to be added to the
21 Windows Media Player.

22 So it's a bit like when you try to play a file on
23 your system and your system doesn't recognize the file type,
24 you click on the button, and you would be connected to a
25 library that would send you that little extension. So it's

1 pretty trivial. And then you would be able to play the
2 file.

3 So in that case a user wants to play -- if you
4 want and cannot, but the system would prompt them, and they
5 would then just click on the button and then be able to
6 download this connector which connects the media player to
7 the driver, right? To the driver that's on the product,
8 that's how the connection would be made.

9 Q. Okay. And the extension is a codec that you'd
10 need to download, right?

11 A. No, no. The codec is hardware. So we're talking
12 about an extension to be able to play the video.

13 Q. Okay. And that extension could be an AV1 codec,
14 browser extension, or a media player?

15 A. No, no, no. The codec is hardware. So I'm
16 talking about -- when I say codec extension or coder
17 extension or decoder extension, it's really what allows you
18 to access the player.

19 So if you have AV1, you need to be able to play
20 it, right? So you need a little connection. So that is an
21 extension in this case. It is just a little piece of
22 software.

23 Q. Now, you had playback testing results in your
24 slides today, right?

25 A. Say again? Sorry?

1 Q. You had playback testing results in your slides
2 today, right?

3 A. Yes.

4 Q. You didn't do the tests yourself, right?

5 A. I did test myself.

6 Q. Well, John Benfatto did the testing for ASUS,
7 correct?

8 A. John Benfatto did testing, that's correct.

9 Q. Okay. And when Mr. Benfatto tested AV1 playback
10 on the ASUS accused products, he had to download an
11 extension or other software in order to test them, right?

12 A. I believe he used a KMPlayer, so he -- that's it.
13 He just used a KMPlayer.

14 Q. A KMPlayer?

15 A. I believe so.

16 Q. Okay. And you didn't discuss with him about what
17 steps he took to install that software on the ASUS accused
18 products, right?

19 A. I didn't discuss the specific steps he did for
20 doing so. It is a pretty standard process.

21 Q. Okay. Thank you, Doctor.

22 MR. HOUMAND: Nothing further at this time.

23 JUDGE MCNAMARA: Thank you, Mr. Houmand.

24 Ms. Ducca?

25

1 EXAMINATION BY COUNSEL FOR ITC STAFF

2 BY MS. DUCCA:

3 Q. Good morning, Dr. Moulin. I'm Marissa Ducca from
4 the Office of Unfair Import Investigations.

5 A. Good morning.

6 Q. Actually just a couple of follow-up questions to
7 the questions you were just asked.

8 Who is John Benfatto?

9 A. He is a consultant.

10 Q. Does he work with you?

11 A. He worked with me, yes, but he is independent of
12 me.

13 Q. Did the tests that he performed, were those
14 performed at your direction?

15 A. Yes.

16 Q. And do you fully agree with all of the results of
17 the tests that he performed?

18 A. Yes, I do.

19 Q. Was there anything that he did that you didn't
20 agree with?

21 A. No. I gave him instructions.

22 Q. Can we turn -- can somebody please put up
23 CDX-3C.7?

24 Dr. Moulin, this is a slide that you testified
25 about a long time ago yesterday. These were the Acer

1 accused products that you looked at, correct?

2 A. These are just three of the accused products,
3 yes.

4 Q. Did you look at additional products as well?

5 A. So the thing is, there are, as you know, I think
6 hundreds of products. So I focused on products that --
7 basically there's no different -- no reason to believe that
8 other products behave any differently.

9 Q. Why is there no reason to believe that the other
10 products behaved any differently?

11 A. The reason really is that they have the same
12 functionality, right? At least when it comes to video
13 decoding. So the users all want to be able to play video,
14 so there are, of course, some differences in other aspects
15 of the devices, like higher power and so on, but this is a
16 pretty basic capability, and there is simply no reason to
17 believe that the other products behave differently.

18 Q. What about for encoding?

19 A. For encoding, again, there's lots of flexibility.
20 So if you have, say, more power, you could do encoding in a
21 different way, but there still has to be an H.265-compliant
22 bitstream or an AV1 bitstream. So what I analyzed is the
23 bitstream that comes out of it.

24 And so even though you could have different
25 products with different levels of power, so some could have

1 better encoded than others, but they really all have to
2 produce a compliant bitstream.

3 Q. Are you confident that the products that you did
4 look at were representative of all of the accused products
5 that you accuse of infringement?

6 A. Yes. I really have no reason to believe
7 otherwise. I mean, it is really a basic function, being
8 able to encode, and it has to be compliant with the
9 standard.

10 So even though a processor may be more powerful
11 or have a larger screen, it would not change my conclusion.

12 Q. If we can go on to slide 8.

13 Dr. Moulin, slide 8 is the Acer accused products
14 that you reviewed, correct?

15 A. Correct.

16 Q. And is the situation the same with respect to the
17 ASUS accused products as with the Acer accused products?

18 A. It is.

19 Q. So you looked at a handful of ASUS accused
20 products, correct?

21 A. Correct.

22 Q. And, in your opinion, are those representative of
23 all of the ASUS accused products?

24 A. In terms of decoding and encoding video, yes.

25 Q. Was there anything that you saw in the ASUS

1 accused products that told you maybe something was different
2 than the other products?

3 A. No.

4 Q. Now, you also looked at a lot of source code,
5 correct?

6 A. Yes.

7 Q. Okay. I'm not going to put up that slide because
8 I don't want to go on the confidential record. I'm not
9 going to ask you specific questions about the source code.

10 Was there -- did you see anything in the source
11 code that you -- that was different from some of the other
12 source code as far as your opinions go?

13 A. As far as?

14 Q. As your opinions go. So that would have a
15 material impact on your opinions.

16 A. So as I mentioned, there are different versions
17 of source code. There is no substantial difference between
18 the different versions I looked at, again, in terms of these
19 functionalities that I'm focusing on.

20 Q. Was there any source code that you wished you had
21 the opportunity to review for your opinions that you didn't
22 have an opportunity to?

23 A. I've reviewed enough code to make me happy for a
24 long time.

25 Q. And so you're confident that the source code that

1 you reviewed was consistent with your opinions across the
2 board?

3 A. Yes, absolutely.

4 Q. Can we put up slide 41, CDX-3C.41?

5 Counsel for Respondents asked you a few questions
6 about this slide in conjunction with the '714 patent. Do
7 you recall that this morning?

8 A. Yes.

9 Q. This slide is referring to the H.265 standard,
10 correct?

11 A. Correct.

12 Q. Is the candidate -- are the candidate pairings
13 that you have identified on slide 41 hard coded into the
14 source code in the accused and domestic industry products?

15 A. Are we talking about decoding or encoding?

16 Q. I think we're talking about decoding here.

17 A. When you say "hard coded" -- so the standard
18 specifies those pairings, right? So every single -- when I
19 showed in my demonstratives these pairings, yes, it's the
20 same pairings for all the products I looked at, all the
21 software code I looked at, because it has to be compliant
22 with the standard.

23 So when one says "hard coded," maybe what that
24 means is that the pairings are fixed as a part of the
25 standards. However, the motion vectors that are associated

1 with these locations, so those change dynamically.

2 Q. So the actual vectors that are in the accused
3 products are going to change dynamically; is that what your
4 opinion is?

5 A. So the motion vectors that are calculated, so
6 they are all function of the input video, right? Like if we
7 have a moving car, there are motion vectors for that car, so
8 that's for that video.

9 So the motion vectors that will reside at those
10 locations, those change dynamically. However, the
11 locations, like A0, A1, are fixed by the standards.

12 Q. So the locations are fixed by the standards, but
13 the pairings are determined dynamically, is that what you're
14 saying?

15 A. Well, by "pairings" here, I mean pairings of
16 location. So the pairing A0, A1, it's a pairing of a
17 spatial location. The claim element speaks about the subset
18 of motion vectors, so those are the ones that change
19 dynamically.

20 So sometimes one can use as a shorthand maybe A0
21 to designate the motion vector associated with A0, but my
22 understanding is that in this litigation it's really
23 important to make a difference. And the claim really speaks
24 about a subset of motion vector candidate, and one should
25 not be confused with the spatial location that's associated

1 with that candidate.

2 Q. I see. I understand. Thank you, Dr. Moulin.
3 That's all the questions I have for you right now.

4 A. Thank you very much.

5 JUDGE MCNAMARA: Mr. Verboncoeur?

6 MR. VERBONCOEUR: Mitch Verboncoeur for Nokia.
7 Nothing further, Your Honor.

8 JUDGE MCNAMARA: Mr. Houmand?

9 MR. HOUMAND: Nothing further.

10 JUDGE MCNAMARA: Ms. Ducca?

11 MS. DUCCA: Nothing further, Your Honor.
12 Thank you, Dr. Moulin. Will you be back again?

13 A. Not this afternoon.

14 JUDGE MCNAMARA: No, no, I understand that. I
15 just want to make sure that --

16 Are you coming back for rebuttal?

17 A. I don't think so.

18 JUDGE MCNAMARA: Okay. Could you provide a
19 little more explanation of the difference between the way in
20 which the Respondents were using the location of the
21 pairings versus the motion vectors? Ms. Ducca just asked
22 you questions about this.

23 Can you explain in a little more detail the
24 difference in the two concepts between the pairings that are
25 required by the standard versus the dynamic nature of the

1 motion vectors?

2 A. Okay. So these little geometric figures we have
3 seen with the big central block and then five adjacent
4 blocks, so these represent locations, just like imagine a
5 big central block is this courtroom and outside are some
6 offices, so they are adjacent locations.

7 Now, what lives in this location is dynamic.
8 Like, we are here, we are people, and tomorrow there will be
9 different people. What's in these offices outside is also
10 dynamic, there are other people.

11 So that's kind of the analogy I would like, that
12 the subsets locations are hard coded in the standard. Like
13 this courtroom is fixed. The offices outside are fixed.
14 But what resides inside changes.

15 For instance, with motion vectors, that really
16 depends directly on the video. Like if you have a car
17 moving in the video, there will be certain motion vectors,
18 and so that depends on the video you're playing.

19 JUDGE MCNAMARA: Thank you.

20 All right. Since there are no other questions,
21 Dr. Moulin, you may step down. Thank you very much.

22 MR. VERBONCOEUR: Your Honor, this is my
23 colleague, Mr. Joseph Micheli, and he will briefly address a
24 question on source code.

25 JUDGE MCNAMARA: Okay. Very good.

1 MR. MICHELI: Your Honor, Joseph Micheli for
2 Nokia.

3 As you saw, we showed a lot of source code in the
4 prior slides, and I wanted to clarify how you'd like receive
5 source code following the hearing.

6 I have a proposal. I think that you might find
7 it most helpful to receive the entire file relied on for
8 each of the citations so that you have context, but I'll do
9 whatever works best for you.

10 JUDGE MCNAMARA: I appreciate that.

11 Mr. Houmand, do you have any thoughts on this?

12 MR. HOUMAND: My thoughts are this is something
13 we can probably meet and confer about and reach an agreement
14 on. I don't think there's going to be a major point of
15 controversy on this.

16 JUDGE MCNAMARA: Thank you.

17 Ms. Ducca, do you have any thoughts about this?

18 MS. DUCCA: I think that's a good idea, to meet
19 and confer. I think it is a good idea to submit the whole
20 file. They are not that big.

21 JUDGE MCNAMARA: That's what I was starting to
22 wonder, it's like what am I going to be receiving.

23 MS. DUCCA: No, you're not looking at a huge
24 amount. Not sure Your Honor is going to want to dig deep
25 into the source code either, but --

1 JUDGE MCNAMARA: Not without more understanding
2 of the commands and legends and so forth, no.

3 All right. So why don't you meet and confer, and
4 then we'll deal with it once you've had an opportunity to
5 talk.

6 MR. HOUMAND: Yeah, I think that makes sense.
7 Also, as someone who has looked at it a fair amount myself,
8 sometimes the entire file is not there. But, anyway, this
9 is something we can work out amongst ourselves and we'll
10 come back to you.

11 JUDGE MCNAMARA: Yes, that would be helpful.
12 Thank you.

13 MR. MICHELI: Thank you.

14 MR. HOUMAND: Thank you, Your Honor.

15 JUDGE MCNAMARA: Again, and this comes up in
16 hearings over and over again, people get so caught in their
17 flow that they forget to tell you that unless you're giving
18 reference points on the slide and telling for the record and
19 describing, people can get lost and say, I'm here, I'm
20 there, and so forth, and you don't know where they are.

21 MR. MICHELI: Thank you, Your Honor.

22 JUDGE MCNAMARA: Yes, not a problem.

23 MR. MICHELI: We'll try our best.

24 JUDGE MCNAMARA: I know. Again, I understand.
25 People get lost in their own heads, their explanations, and

1 that's what happens. Dynamic flow.

2 MR. CAMERON: May I proceed? Matthew Cameron for
3 Nokia, by the way.

4 JUDGE MCNAMARA: Yes. Thank you.

5 MR. CAMERON: Nokia calls Dr. Douglas Chrissan.

6 JUDGE MCNAMARA: Good morning, Dr. Chrissan.

7 Mr. Chrissan, you're up in the witness box.

8 THE WITNESS: I'm sorry, Your Honor?

9 JUDGE MCNAMARA: You're in this witness box.

10 Now, I'm sorry to ask, could you kindly stand and
11 raise your right hand?

12 DOUGLAS CHRISSAN,

13 having been first duly sworn or affirmed on
14 their oath, was thereafter examined and testified as
15 follows:

16 JUDGE MCNAMARA: Please state your full name.

17 A. Douglas Chrissan.

18 JUDGE MCNAMARA: Thank you very much.

19 MR. CAMERON: May I proceed, Your Honor?

20 JUDGE MCNAMARA: Yes, thank you.

21 DIRECT EXAMINATION

22 BY MR. CAMERON:

23 Q. Good morning, doctor. Could you please state
24 your full name for the record?

25 A. Yes. My name is Douglas Chrissan.

1 Q. Are you a Nokia employee?

2 A. No.

3 Q. What do you do for a living?

4 A. I am an engineering and intellectual property
5 consultant.

6 Q. What does that involve?

7 A. Well, a portion of my work involves providing
8 opinions in patent litigations such as this one.

9 Q. Do you have experience reviewing source code?

10 A. Yes.

11 Q. Have you prepared slides to assist with your
12 testimony today?

13 A. Yes, I have.

14 Q. Are those slides shown on the screen?

15 A. Yes.

16 Q. And for the record, your demonstratives are
17 labeled CDX-5?

18 A. Yes.

19 Q. Turning to slide 3, can you preview the issues
20 that you plan to discuss today?

21 A. Yes. I will review my assignment.

22 My assignment for two patents was to opine are
23 the asserted claims essential to decoding H.264, H.265, and
24 AV1 video for the '321, and to decoding H.265 for the '701.

25 Then for both patents, do the accused products

1 infringe the asserted claims? Did Respondents produce
2 modified products that avoid infringement? And do the
3 technical DI products practice the asserted claims?

4 Q. Turning to slide 3, and before we get -- or
5 slide 4, my apologies, and before we get into your opinions,
6 can you tell us a little bit about your educational
7 background?

8 A. Yes. I am an electrical engineer. I have a
9 bachelor's and a master's degree in electrical engineering
10 from the University of Southern California, and I have a
11 Ph.D. in electrical engineering from Stanford University.

12 Q. Turning to slide 5, tell us a little bit about
13 your work experience.

14 A. Logos from four of the companies I have worked at
15 are shown here on this slide. I am going to focus on Maxim
16 and 8x8 because those were the most video centric.

17 Q. Tell us about your time at 8x8.

18 A. At 8x8, I was -- I worked at 8x8 for five-plus
19 years, and for most -- for most of those years I was
20 directly involved in the development of integrated circuits
21 and software for video compression and decompression and the
22 products that those were used in.

23 Q. When you were at 8x8, did you work with anyone
24 that's been mentioned at this trial?

25 A. I don't recall everyone who has been mentioned at

1 this trial. I did work with Bernd Girod and Thomas Wiegand,
2 who were involved in the standards.

3 Q. Tell us about your work with Thomas Wiegand.

4 A. Thomas Wiegand was a consulting employee at 8x8,
5 and he was directly involved in H.264. I believe he was the
6 cochair. But my role at that point, starting from about
7 2000 onwards, I managed the company's patent portfolio and
8 interacted directly with our patent prosecuting attorney.
9 So I was very familiar with his and all of our submissions
10 including those to the ITU with respect to video coding
11 standards.

12 Q. And in moving on to maxim, tell us a little bit
13 about your time at maxim?

14 A. At maxim, we also developed integrated circuits
15 and software that included the functionality of performing
16 video compression and decompression. For that, the primary
17 standard was H.264. The primary products were enterprise
18 security systems as well as, you see on this slide, we
19 developed essentially all of the internal video capacity,
20 the video functionality, plus more of this Wi-Fi
21 internet-connected consumer camera called the "Eyes On" that
22 was sold in the Apple stores.

23 Q. When you said the Eyes On, are you referring to
24 this camera at the top right?

25 A. Yes, I am.

1 Q. While you were in industry, did you gain any
2 experience with video decoding source code?

3 A. Yes, I did.

4 MR. CAMERON: Your Honor, Nokia offers
5 Dr. Chrissan as an expert in the field of video coding.

6 MR. ZHANG: No objection.

7 JUDGE MCNAMARA: Everybody, when you stand up to
8 speak, please identify yourself even if it's repetitive.

9 MS. DUCCA: Marissa Ducca on behalf of Staff. No
10 objection, Your Honor.

11 JUDGE MCNAMARA: Then Dr. Chrissan is accepted as
12 an expert for the subject matter upon which he has been
13 called to testify without objection.

14 MR. CAMERON: Thank you, Your Honor.

15 Q. Turning to slide 6, do you have an opinion
16 regarding the qualifications of a person of ordinary skill
17 in the art?

18 A. Yes, I do.

19 Q. What is your opinion?

20 A. My opinion matches Nokia's and Staff's
21 definition. I'll read it.

22 A person of ordinary skill in the art would have
23 at least a bachelor's degree in electrical engineering,
24 computer engineering, or a related field, with about two
25 years of experience in video decoding or encoding

1 technologies.

2 Q. Is there any dispute between the parties
3 regarding the definition of a POSITA?

4 A. Respondents proposed a different definition
5 that's shown on the right on this slide.

6 Q. In your view, are there any material differences
7 between these two proposals?

8 A. Not with respect to my opinions.

9 Q. And do you qualify as a person of ordinary skill
10 in the art under either definition?

11 A. Yes.

12 Q. Turning to slide 7, what are the accused products
13 in this investigation?

14 A. Products that decode H.264, H.265, and/or AV1
15 specification-compliant coded video bitstreams into a
16 playable video format, in other words, video decoding
17 devices, for '705 -- I'm sorry, for the '701 patent it's
18 only with respect to the H.265 standard.

19 Q. And we covered this a little bit a few minutes
20 ago with Dr. Moulin, but could you give us a sense as to how
21 many accused products are at issue in this case?

22 A. Several hundred.

23 Q. Are you aware of any material differences between
24 the accused products that are relevant to your opinions?

25 A. Generally, no, unless I discuss them specifically

1 later.

2 Q. Okay. And if there are any such differences,
3 will you raise them during your testimony?

4 A. Yes. I will raise any differences during my
5 testimony.

6 Q. Turning to slide 8, please summarize the main
7 categories of evidence you considered in forming your
8 opinions.

9 A. I considered the patents and their file
10 histories, publicly available documents and technical specs,
11 source code that was provided and that was found on the
12 internet that defines how the products operate, litigation
13 materials produced for this litigation, including some
14 deposition testimony from Respondents' fact witnesses and
15 expert witnesses, the H.264 and H.265 and AV1 specification
16 documents themselves, real-world hands-on product testing,
17 and also the claim construction submissions.

18 Q. Turning to slide 9, let's focus on those
19 technical specifications you mentioned.

20 How did these -- how did you take these documents
21 into account in forming your opinions?

22 A. These documents are hundreds of pages long each.
23 We're seeing the face page here. They provide significant
24 technical description about how a decoder would operate and
25 about the required syntax and the information that's

1 included in the coded video bitstream. So they provide
2 significant technical information.

3 Q. In your opinion, do products that decode video in
4 accordance with these technical specifications practice the
5 asserted claims?

6 A. Yes.

7 Q. And do the accused products implement the H.264
8 and H.265 standards and the AV1 specification when decoding
9 video?

10 A. What were the last three words?

11 Q. When decoding video.

12 A. Yes, they do.

13 MR. CAMERON: Your Honor, at this time we need to
14 move to the confidential record. This will be Acer and
15 ASUS, so confidential information from both parties. So
16 representatives from -- essentially everyone would need to
17 exit the courtroom.

18 (Whereupon, the hearing proceeded in confidential
19 session.)

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1 O P E N S E S S I O N

2 BY MR. CAMERON:

3 Q. Turning to slide 18 and switching topics a little
4 bit, can you remind us what the '321 patent is about?

5 A. Yes. The '321 patent is directed to improved
6 random access. The inventor is Dr. Hannuksela, with a
7 priority date of 2002, and the relevant standards are H.264,
8 H.265, and then the AV1 specification.

9 Q. Turning to slide 19, and we have already heard a
10 fair amount about this in this trial, but could you just
11 reorient us as to what random access is?

12 A. Yes. Random access would be, for example, a user
13 viewing a video and having control of a video decoder would
14 jump to a different point in the video in order to restart
15 decoding at that point.

16 Here we have an example where a user holding a
17 remote control would select to jump in at frame 7 and move
18 forward from there.

19 Q. Is there anything special about the order of
20 frames on this slide?

21 A. Yes. In this case, this is a simple example of
22 display order, that's what a viewer sees, it makes sense,
23 that's the order in which the frames are displayed to the
24 viewer such that they look like a video. Here we see eight
25 frames displayed in order of frame 1 to frame 8. We see a

1 horse running across a polo field.

2 Q. Turning to slide 20, does the decoder always
3 decode frames in the same order that they are displayed?

4 A. No, it does not.

5 Q. What's the difference?

6 A. So we've heard about prediction and reference
7 frames. I will discuss them again. We will start with the
8 arrow, the red arrow in the far upper left. Its head
9 originates at -- I'm sorry. Its tail originates at frame 1
10 and its head ends at frame 3.

11 This notation means that frame 3 is predicted
12 from frame 1. It also means frame 1 is used as a reference
13 for frame 3. And we see that frame 3 comes after frame 1.
14 So typically the decoder -- the decoder will -- the decoder
15 will decode frame 1, and then use the information in it to
16 predict portions or all of frame 3.

17 The red arrows are going forward. Those are for
18 frames that are predicted from frames before them.

19 Q. What about the blue arrows, Dr. Chrissan?

20 A. For the blue arrows, the blue arrows represent
21 frames that are predicted from frames that come after them
22 in display order. So here frame 3 predicts frame 2. Frame
23 2 is a bi-predicted frame. We've heard these terms already,
24 so I think we've covered that one.

25 Q. Well, at the risk of putting everyone to sleep,

1 can you provide a brief overview or a refresher as to what
2 these different types of frames are?

3 A. Yes. So an I-frame is wholly self-contained. It
4 can be decoded without prediction from other frames and
5 without using other frames as reference frames.

6 So, in simple terms, an I-frame has no arrows
7 going into it. Then we have P-frames that only, in this
8 notation, only have red arrows going into it. So they are
9 only predicted from earlier frames. And then B, the
10 bi-predicted frames are the ones that have at least one blue
11 arrow.

12 Q. Turning to slide 22, do these different types of
13 frames have anything to do with the difference between
14 display and decoding orders?

15 A. Yes. Because, for example, frame 3 predicts
16 frame 2, it must come before frame 2 in the actual
17 bitstream. So when we talk about the sequence at which
18 these frames are actually represented in the bitstream, they
19 may be out of order with respect to display order. In fact,
20 they typically are, especially for B-frames.

21 So what the -- the order in the coded video
22 bitstream, which we'll say is, quote, what the decoder
23 reads, unquote, as it reads the bitstream, is called decode
24 order.

25 Because frame 3 is used to predict frame 2, frame

1 3 must come before frame 2 in the decode order, the order
2 along the bottom, likewise, frame 5 is before frame 4, and
3 frame 7 is before frame 6 in the bitstream, so that --
4 because the decoder has to have all of the reference
5 pictures before it can decode a frame that those reference
6 pictures reference.

7 Q. Were these various I, P, and B-frames around
8 before the '321 patent?

9 A. Yes.

10 Q. Turning to slide 23, could you summarize the
11 problem that Dr. Hannuksela, the inventor, was trying to
12 solve with the '321 patent?

13 A. Yes. This patent is directed to improved random
14 access. And in addition to improved random access, another
15 feature that's very nice to have is the ability to have a
16 very flexible set of references available for any given
17 frame. That can be referred to as reference picture
18 selection.

19 Q. What is reference picture selection?

20 A. Reference picture selection is the ability for
21 those arrows to jump across many frames, tens of frames, and
22 then also for any given frame to have multiple frames as a
23 reference, flexibility for bi-prediction, et cetera. It
24 just significantly increased flexibility in choice of
25 reference pictures.

1 Q. Does using reference picture selection introduce
2 any problems or challenges related to random access?

3 A. It made random access more difficult from the
4 decoder standpoint.

5 Q. Turning to slide 24, could you help us understand
6 how reference picture selection introduced those challenges?

7 A. Could you repeat the last three words?

8 Q. Sure. Could you help us understand how reference
9 picture selection introduced challenges with random access?

10 A. Yes. So with reference picture selection, it
11 made it challenging for the decoder to understand which,
12 quote, jump-in points, which frames it could jump into. In
13 fact, in a typical coded video bitstream, there aren't that
14 many. Out of the total number of frames, there aren't a
15 whole lot of them that are places where you can jump in and
16 start decoding successfully.

17 So what we see here is a frame B82 that is
18 predicted from four different frames, an I-frame 75, a B77,
19 B79, and a B83. The subscripts on the numbers are -- those
20 refer to display order.

21 Q. And what would happen if a user or if the decoder
22 attempted to start decoding B82 by starting with I81?

23 A. First, I think I said subscripts on the numbers.
24 I mean the subscripts that are numbers within each frame.

25 If the decoder were to start at I81, and I have

1 the laser pointer pointing at I81, I81 is an I-frame. It's
2 an intraframe. The decoder would be able to successfully
3 decode that frame. But then when it moved on in the coded
4 video bitstream to extract B82, it would not be able to
5 decode B82 because the references I75, B77, and B79 that I'm
6 now pointing to were before the point that it jumped in. So
7 it simply wouldn't have them. It wouldn't have every -- it
8 wouldn't have the information it needed to decode B82.

9 Q. Turning to slide 25, what was Dr. Hannuksela's
10 idea to address this problem?

11 A. The instantaneous decoder refresh frame, which
12 I'll refer to as IDR.

13 Q. How do IDR frames address the problem of random
14 access when you're using reference picture selection?

15 A. In several ways. IDR frames are special
16 I-frames. So any IDR frame is an I-frame, but not every
17 I-frame is an IDR frame.

18 IDR is a specialized frame that starts what's
19 called an independently decodable sequence.

20 Q. And what is an independently decodable sequence?

21 A. It's a set of frames that has certain
22 characteristics, but one of the characteristics is that none
23 of the frames in an independently decodable sequence are
24 predicted from or reference frames outside that
25 independently decodable sequence.

1 Q. Turning to slide 26, can you walk us through what
2 the decoder does when it receives one of these IDR frames?

3 A. Yes. Two additional benefits of IDRs are that
4 they reset a numbering scheme, and they enable reference --
5 they enable reference buffer management. So we'll talk
6 about a renumbering -- we'll talk about restarting the
7 numbering scheme first.

8 I'm going to put the laser pointer on these
9 frames from left to right. We see a P72, a B73, a B74, and
10 then with an IDR frame the numbering gets reset to 0 and
11 goes on from there.

12 Q. What is the benefit of resetting the numbering
13 scheme to 0?

14 A. So one benefit is related to error concealment.
15 If in fact there are errors in the coded video bitstream,
16 the decoder has to do its best to play the least glitchy
17 video that it possibly can. I think we've all experienced
18 that sometimes when we're watching our favorite show. And
19 it helps the decoder to, in that regard, if it's a reset of
20 the numbering scheme.

21 Q. And the second action that you mentioned had to
22 do with a decoder buffer.

23 What's that?

24 A. Yes. So decoders have to -- decoders have to
25 store in memory all of the frames that have already been

1 decoded that might possibly be used for future references so
2 that it has them. But frames are big and memory is costly.
3 And it's preferable to use memory as efficiently as
4 possible.

5 So IDR's are beneficial because, by definition,
6 everything that comes -- nothing that comes after an IDR, no
7 frame that comes after an IDR, will refer to any frame that
8 came before the IDR so the decoder knows that it can
9 eliminate, delete, mark as unused those frames and not worry
10 about them anymore.

11 Q. In your opinion, does the '321 patent cover some
12 of this IDR technology that we just discussed?

13 A. Yes, it does.

14 Q. Turning to slide 27, did Nokia contribute this
15 technology to the H.264 standard?

16 A. Yes. We see the JVT-C083 standard submission
17 right here. JVT is joint video team, I believe.

18 Q. And can you remind us, was Nokia's contribution
19 adopted?

20 A. Yes, it was.

21 Q. Turning to slide 29, let's turn to your
22 infringement analysis.

23 What are the asserted claims from the '321
24 patent?

25 A. Claims 8 and claims 10.

1 Q. What is the difference between claims 8 and 10?

2 A. 8 is a method claim and 10 is an apparatus claim.

3 Q. Other than the fact that claim 8 is a method and
4 claim 10 is an apparatus, are there any material differences
5 in your view between these two claims?

6 A. No.

7 Q. Turning to slide 30, are there any disputed claim
8 terms for the '321 patent?

9 A. Yes, there are two.

10 Q. What are the disputed terms?

11 A. The identifier value and reset or resetting.

12 Q. And which interpretations did you apply in your
13 analysis?

14 A. Staff's proposed construction, which matches
15 Nokia's.

16 Q. Let's move on to slide 32.

17 Specifically focusing on the preambles, can you
18 please summarize what is required by these claim
19 limitations?

20 A. The preambles recite a method for decoding or a
21 video decoder. So the claim reads on a video decoder with
22 at least one processor and at least one memory, and some
23 computer program code, and then the preamble has more
24 language, but those are key points.

25 Q. Okay. What evidence did you see in the standards

1 and specifications relevant to this claim limitation?

2 A. So here we see excerpts from the standard H.264
3 and H.265, and the AV1 spec.

4 Counsel, would you like me to read the exhibit
5 numbers?

6 Q. Just this one time, yes.

7 A. CX-2596, CX-5885, and JX-0138.

8 Q. And what did you point to specifically in those
9 standards and specifications?

10 A. So these are the specification documents, and
11 they are specifications for video decoders. So they
12 actually do in fact define coded video sequences and
13 decoding processes. So that's what the claim reads on.

14 Q. Turning to slide 32, what evidence do you have
15 that the accused products comprise processors and memory?

16 A. So these are requests for admission excerpts from
17 Acer and ASUS, and those things are admitted.

18 MR. CAMERON: I believe the next slide has
19 confidential information on it, so, Your Honor, I'd request
20 that we seal the courtroom once again.

21 (Whereupon, the hearing proceeded in confidential
22 session.)

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1 O P E N S E S S I O N

2 BY MR. CAMERON:

3 Q. Turning to slide 37, what is your evidence that
4 H.264 decoders satisfy elements 8 and 10[A]?

5 A. Here we have excerpts from the H.264 standards
6 document with highlights in blue and yellow describing the
7 instantaneous decode refresh and a NAL unit type element.
8 NAL is network abstraction layer. It is information that's
9 contained in a coded video bitstream.

10 Q. And what specifically is the indication that you
11 identified?

12 A. The indication is the NAL unit type and the value
13 of 5. When the NAL unit type is a 5, that indicates an IDR.

14 Q. How does the H.264 standard define these IDR
15 frames?

16 A. It's defined in the yellow highlight at the
17 bottom that I'm pointing to. I won't read the whole thing,
18 but it is a coded picture, and the decoding process marks
19 all reference pictures as unused for reference. That's
20 equivalent to flushing the buffer. And then it begins an
21 independently decodable sequence as described.

22 Q. Do Respondents dispute that a NAL unit type of 5
23 reads on the claimed indication?

24 A. There is a dispute.

25 Q. What is Respondents' argument? I should ask,

1 what is your understanding of Respondents' argument?

2 A. I believe we've heard this already. There's a
3 thing called a slice, and a picture can be divided into
4 slices. Roughly speaking, slices are huge horizontal
5 stripes, although they can have some jagged edges. But
6 imagine -- so to put it simply, a frame is often just one
7 slice, but sometimes a frame can be divided into multiple
8 slices.

9 And the NAL unit type is found in a slice header,
10 in a slice-related header.

11 Q. And why does -- why does that not take the NAL
12 unit type of 5 outside of the scope of the claim language?

13 A. The reason is, by the specification, if there is
14 more than one slice, all of the slices have to have the same
15 value for NAL unit type. So you can have two -- even if you
16 had two slices in an IDR frame, they would both have a NAL
17 unit type of 5, which means either one of them is an
18 indication of the frame that it's -- that it is part of.

19 Q. Turning to slide 38, what evidence did you
20 identify that H.265 decoders practice limitations 8 and
21 10[A]?

22 A. The H.265 specification is excerpted here, much
23 the -- much the same comparable language as H.264. There is
24 a NAL unit type in H.265. There is an instantaneous decode
25 refresh. The main difference is that the NAL unit type in

1 this case is -- either 19 or 20 indicates an IDR as opposed
2 to the value of 5. And the specification excerpt shown here
3 in the blue and yellow highlights correspond to the blue and
4 yellow highlights of the claim language.

5 Q. Are there any material differences between the
6 IDR frames in H.264 and those in H.265 that are material to
7 your opinions?

8 A. Not -- not material to my opinion.

9 Q. Turning to slide 39, what does an AV1 decoder use
10 to practice elements 8 and 10[A]?

11 A. There's a field -- there is information in an AV1
12 coded video bitstream called frame type. We see it shown
13 here on the slide as frame_type. And when that information
14 is decoded having the value 0, that indicates what's called
15 a key frame in AV1.

16 Q. Tell us a little bit more about these key frames.

17 A. So key frames have much the same characteristics
18 as IDRs in H.264 and H.265. We see here, I'm pointing to
19 the lower blue highlight that simply says key frame, and it
20 describes it as an interframe, which resets the decoding
21 process when it is shown.

22 Additionally, and then in the first yellow
23 highlight on the right, which I'm pointing to, a new coded
24 video sequence is defined to start at each temporal unit
25 which satisfies the following conditions, and then we see

1 the first frame header has a frame type equal to key frame
2 and the show frame equal to 1. That's an IDR essentially.

3 Q. Turning to slide 40, what is your evidence that
4 H.264 decoders practice limitations 8 and 10[B]?

5 A. The H.264 specification document is recited here
6 as well. I won't read through this, because we've
7 essentially described to this point that once an IDR frame
8 is identified, that is the frame at which decoding would
9 start and playback would start. That's the whole point of
10 it.

11 So IDR frames do in fact satisfy this claim
12 language, decoding of the video sequence from said first
13 image frame, and then the video sequence is decoded without
14 prediction from any image frame prior to the IDR.

15 Q. Turning to slide 41, what is your evidence that
16 H.265 decoders practice limitations 8 and 10[B]?

17 A. Similar to H.264, we have an excerpt from the
18 specification document here. We see highlights in yellow
19 and blue in the specification matching the claim language.
20 And it's much the same explanation.

21 Q. And how does receiving an indication of an IDR
22 frame start the decoding process?

23 A. That is -- a decoder knows that that is an
24 independently decodable sequence. So when an IDR -- when an
25 IDR frame is recognized, that is the start of the

1 independently decodable sequence.

2 Q. Turning to slide 42, does an AV1 decoder satisfy
3 this limitation as well?

4 A. Yes, it does.

5 Q. What is your evidence?

6 A. Here we have excerpts from the AV1 specification
7 with blue and yellow highlight to match the blue and yellow
8 highlighted claim language. We saw earlier that a key frame
9 resets the decoding process when it is shown. And at the
10 bottom we have the blue -- I'll point the laser pointer --
11 starting at a key frame random access point is trivial,
12 because if the earlier temporal units are dropped, the
13 remaining temporal units still constitute a valid bitstream.

14 So that is the same, you start from a key frame
15 and go forward.

16 Q. Turning to slide 43, what does limitation 8 and
17 10[C] require?

18 A. Decoding identifier values for image frames
19 according to a numbering scheme.

20 Q. And what is your evidence that an H.264 decoder
21 practices this limitation?

22 A. The H.264 specification, again, is excerpted
23 here, reproduced in part here. We see sections 3.94, 7.3.3,
24 and 7.4.3 describing a numbering scheme called picture order
25 count.

1 Q. Tell us a little bit about picture order count.

2 A. It is a numbering scheme that identifies a
3 display order, which is referred here, I'm pointing to the
4 -- I'm pointing to the yellow highlight that says picture
5 position with the laser pointer.

6 Q. And --

7 JUDGE MCNAMARA: Pardon me. That's part of 3.94
8 of the H.264 standard, correct?

9 A. I'm sorry, Your Honor?

10 JUDGE MCNAMARA: That's 3.94, it's identified in
11 your demonstrative as 3.94 of the H.264 picture order.

12 A. So the -- oh. The 3.94 is identifying the
13 number -- at least the numbering scheme. But the picture
14 order count value, we'll get to it later, the picture order
15 count also does satisfy an identifier value.

16 Q. Tell us a little bit about how the decoder
17 decodes the values for picture order count.

18 A. So the -- what the decoder decodes from the coded
19 video bitstream is a field called pic_order_cnt_lsb, which
20 I'll call pic_order_cnt_lsb for short. That field is in the
21 coded video bitstream.

22 Q. What is the relationship between
23 pic_order_cnt_lsb and picture order count?

24 A. Pic order -- well, LSB stands for least
25 significant bits. The corresponding field, which is

1 internal to the decoder, is a thing called pic_order_cnt_msb
2 for most significant bits.

3 Picture order count is a very big number. I
4 believe it can range from -- it spans 32 bits, which is
5 almost four billion possible values. So picture order count
6 can be a very big number. And video coding is all about
7 efficiency.

8 So what happens is picture order count is divided
9 into an upper part and a lower part, and only the lower part
10 is included in the coded video bitstream with each frame.

11 Q. Could you explain why the H.264 standard divides
12 picture order count into an upper and a lower part?

13 A. Yes. I mentioned picture order count can be a
14 very big number. So I'll give an example.

15 Let's say picture order count is 999 million and
16 1 and the next frame is 999 million and 2 and the next one
17 is 999 million and 3. Well, it gets a little redundant to
18 send the 999 million part every time.

19 So what gets put in the bitstream and decoded by
20 the decoder is the 1, 2, 3, and the decoder has ways of
21 inferring the 999 million to put the two pieces together and
22 come up with the full value of picture order count.

23 Q. And do Respondents dispute that elements 8[C] and
24 10[C] are satisfied by H.264 decoders?

25 A. My understanding is that they don't.

1 Q. Turning to slide 44. What is the final
2 limitation of claims 8 and 10 of the '321 patent?

3 A. Resetting the identifier value for the indicated
4 first image frame of the independent sequence.

5 Q. What is your evidence that an H.264 decoder
6 practices this claim limitation?

7 A. This excerpt from the H.264 specification, again,
8 describes picture order count. We've reproduced that here.
9 But it also -- it also shows a section 8.2.1.1, which
10 describes the picture order count processing that occurs in
11 the decoder.

12 And we see highlighted, if the current picture is
13 an IDR picture, PrevPicOrderCntMSB is set equal to 0 and
14 prevPicOrderCntLsb is set equal to 0. Then we see some
15 following math that the decoder performs that is not
16 highlighted.

17 Q. And how specifically does the decoder reset the
18 value to 0 for picture order count when it receives one of
19 these IDR frames?

20 A. I will note that, first I'll note there's a claim
21 construction here, so reset, I used the construction to set
22 for the first time or to set again to restart a numbering
23 scheme, I think to restart the numbering scheme, the
24 identifier value for the indicated first image frame of the
25 independent sequence.

1 So, with that, could you ask your question again,
2 counsel?

3 Q. Sure. Could you please explain how exactly an
4 H.264 decoder resets the numbering scheme when it receives
5 one of these IDR frames?

6 A. Yes. PrevPicOrderCntMSB, prevPicOrderCntLsb and
7 the related math plus internal variables are reset to 0 in a
8 way that the numbering scheme is restarted.

9 Q. Just to make sure we're on the same page, is it
10 the encoder that's performing this reset functionality?

11 A. No. The decoder is what's doing this.

12 Q. All right. Turning to slide 45, what is your
13 evidence that an H.265 decoder practices limitations 8[C]
14 and 10[C] and limitations 8[D] and 10[D]?

15 A. The process in H.265 is much the same. There is
16 a picture order count numbering scheme. There's a picture
17 order count of value that's maintained. There's the MSB and
18 the LSB and the qualification that with an IDR picture,
19 those are reset to 0. The evidence shown is the relevant
20 excerpt from the H.265 specification.

21 Q. And I see on your slide that you've highlighted a
22 new term, PicOrderCntVal.

23 What is that?

24 A. That is the value maintained in the decoder that
25 represents the picture order count numbering scheme.

1 Q. Is PicOrderCntVal directly parsed from the
2 bitstream by an H.265 decoder?

3 A. No, it is not.

4 Q. Is there any information that's directly parsed
5 from the bitstream?

6 A. Yes, there is. Picture order count in H.265 is
7 also a big number that's best divided into its upper and
8 lower components. And the lower component that is in fact
9 decoded from the coded video bitstream is in the lower right
10 blue box near the bottom. I'm going to point the laser
11 pointer at slice_pic_order_cnt_lsb, which I will call
12 slice_pic_order_cnt_lsb.

13 Q. And you were pointing to the blue highlighted
14 text. What does it mean that the pic_order_cnt_lsb is
15 inferred to be 0 for IDR pictures?

16 A. For IDR frames, for most -- for all other frames,
17 it is a field in the coded video bitstream, but for IDR
18 frames the slice_pic_order_cnt_lsb is not, in fact,
19 actually in the coded video bitstream for efficiency.

20 Q. Turning to slide 45, what is your evidence that
21 an AV1 decoder practices claim elements 8 and 10[C]?

22 A. AV1 has a feature and a field and a data -- an
23 element of data that's in the bitstream called OrderHint,
24 and that is noted here as order_hint, all lowercase.

25 Q. And just to make sure the record is clear, what

1 specifically is parsed from the bitstream by an AV1 decoder?

2 A. So what's parsed from the bitstream is what I --
3 the value I mentioned, `order_hint`, all lowercase.

4 Q. And what happens to that value `order_hint` after
5 it's been parsed from the bitstream by a decoder?

6 A. It is used in a number of ways to perform a
7 numbering scheme. For one, the values that are received are
8 stored with the reference frames. It is used -- its purpose
9 is to indicate display order.

10 Q. Is there a name for the variable that stores
11 `order_hint` when it's parsed from the bitstream?

12 A. So we see -- we see a variable, `OrderHints` that
13 is stored according to the specification, and then we'll see
14 on the next slide that there's an array that stores a set of
15 previous order bits.

16 Q. Turning to slide 47, what is your evidence that
17 an AV1 decoder practices limitations 8 and 10[D]?

18 A. Yes. We have the -- we have the AV1
19 specification here, as evidence, again, and here we have an
20 excerpt that shows that there is, in fact, an array of
21 values called `OrderHints`. So `OrderHints` with capital first
22 letters, like capital case, and we see open and closed
23 bracket. That's an array. It's a set of numbers, and it
24 stores the previous values `OrderHint`.

25 Q. And I think you previewed this in your previous

1 answer, but could you give us a bit more information as to
2 what an array is?

3 A. Yes. An array is simply a set of values.

4 Q. What happens to the OrderHints array when an AV1
5 code decoder receives a key frame?

6 A. The key frame causes that array to be nulled out
7 to zero.

8 Q. And how does that satisfy the claim language
9 required by elements 8 and 10[D]?

10 A. It resets the numbering scheme indicated by the
11 IDR of the new independently decodable sequence.

12 Q. In your opinion, are all of the elements of
13 claims 8 and 10 found in the H.264, H.265, and AV1
14 specifications?

15 A. Are all the claims?

16 Q. Elements.

17 A. Yes.

18 Q. All right. Turning to slide 49.

19 MR. CAMERON: We need to go to the third-party
20 confidential record.

21 (Whereupon, the hearing proceeded in confidential
22 session.)

23

24

25

1 O P E N S E S S I O N

2 JUDGE MCNAMARA: And then when it is appropriate,
3 we'll make sure and go back on.

4 MR. CAMERON: Yes.

5 BY MR. CAMERON:

6 Q. Dr. Chrissan, do you have an example of a
7 well-known technology that uses entropy coding?

8 A. Yes. We will use Morse Code. You can move to
9 the next slide.

10 Q. Turning to slide 58, how is Morse Code related to
11 entropy coding?

12 A. Yes. So we saw this example previously. Morse
13 Code has been around for more than 150 years. It is a form
14 of entropy coding whereby symbols, such as letters of the --
15 values of letters of the -- individual letters of the
16 English alphabet are converted to codewords, the dots and
17 dashes. It's well-known E is the most popular letter, so E
18 gets the shortest codeword, the dot, whereas X, Y, and Z get
19 longer codeword, et cetera.

20 Q. In Morse Code does the assignment of codewords to
21 symbols change over time?

22 A. No. That table is static, since its inception,
23 to the best of my knowledge.

24 Q. Do you have an animation to help us understand
25 how changing the probability might affect codeword

1 assignments?

2 A. Yeah. So let's envision that we had the Morse
3 Code novel where there were a lot more As in it than Es. It
4 would be more efficient to have a codeword assignment where
5 the A had the shortest codeword and the E had a longer
6 codeword.

7 And the process, we have an animation on the next
8 slide of the process whereby that could potentially happen
9 dynamically.

10 Q. Turning to slide 59, would you walk us through
11 this animation?

12 A. Yes. We're going to see an animation. Let's say
13 an O comes in. So the codewords are switched so that O has
14 a shorter codeword. Then the L comes in, and its codeword
15 is switched from four symbols, four dots and dashes, to
16 three.

17 Another L comes in, and the L is reassigned an
18 even shorter codeword, a dash and a dot.

19 Then an E comes in, and the E already has a dot,
20 so it will stay that way.

21 And then here the H moves from dot dash dash dash
22 to dash dot dot.

23 Keep in mind both the encoder -- the decoder
24 decodes the symbols that the encoder encodes. So they both
25 know the sequence so they can both track the probabilities

1 of the actual letters as they come in.

2 That is an example of what's called context
3 updating.

4 Q. Turning to slide 64, which type of probability
5 model does the H.265 standard use?

6 A. So H.265 does use context updating. And H.265
7 uses context updating in a mode that's called regular
8 entropy coding, where it does, in fact, keep track of these
9 probabilities.

10 And there's a second mode called bypass mode.

11 Q. What is bypass mode?

12 A. Bypass mode is a shortcut whereby the encoder and
13 the decoder for a given symbol will simply say, okay, it's
14 50-50, I'm just going to call it 50-50 and not try to do all
15 the math to keep track of that's updated probabilities.

16 Q. Turning to slide 65, which of these two modes,
17 context updating or bypass mode, is better?

18 A. It's a tradeoff. Context updating yields better
19 compression. You might get fewer bits in the bitstream for
20 the same original data, but it requires more processing
21 power on the fly. Whereas bypass mode is a little less
22 efficient in terms of data compression, you may end up with
23 some more bits in the bitstream in your coded video
24 bitstream for the same input data, but it requires less
25 processing computation on the fly as the decoder is actively

1 decoding and showing video.

2 Q. And what are you using to illustrate the concept
3 of more processing power versus less?

4 A. So we have the little spinning icons here with --
5 the green one spinning faster means more processing power
6 required, and the one on the right that's more gray and
7 spins slower, that's the less computational power required
8 for the bypass mode. We'll see those repeated here.

9 Q. Turning to slide 66, what is the other background
10 concept that you wanted to walk us through before we can get
11 into your infringement opinions?

12 A. The other concept is transform coding.

13 Q. Turning to slide 67, tell us about transform
14 coding.

15 A. Yes. We've heard about transform coding earlier
16 in this hearing. Before I jump right into transform coding,
17 I'll talk about prediction errors and residuals.

18 We've talked many times about one frame being
19 predicted from the other. What does that really mean?
20 Well, it means, if I have a frame, instead of coding that
21 frame in isolation, I can just code -- go look at -- you
22 know, pull everything from that previous frame and use that,
23 but even that's not perfect.

24 So even after that, you end up with this error or
25 residual that you also have to include in the coded

1 bitstream, and so that the decoder can do that. So the
2 decoder takes the prediction plus the residual and ends up
3 with a final decoded frame.

4 We see here, pointing to the frame in the middle,
5 the advantages, the residual is usually much more uniform
6 and contains much less information than either of the --
7 than the original picture, so that's what enables you to
8 encode it with many fewer bits and get the kind of
9 compression efficiencies that Dr. Richardson was speaking
10 about on one of his first slides.

11 MR. CAMERON: Your Honor, I apologize. We're
12 going to have to go back on the confidential record for a
13 little while.

14 (Whereupon, the hearing proceeded in confidential
15 session.)

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1 O P E N S E S S I O N

2 JUDGE MCNAMARA: Okay.

3 CROSS-EXAMINATION

4 BY MR. ZHANG:

5 Q. So, good afternoon, Dr. Chrissan.

6 A. Good afternoon.

7 Q. So I want to start with video codecs.

8 Do you recall being asked whether you agreed with
9 Dr. Moulin's opinion that video codec implementations are in
10 hardware only?

11 A. I'm sorry. Could you repeat your question?

12 Q. Sure. Do you recall being asked on direct
13 whether you agreed with Dr. Moulin that video codecs are
14 hardware only?

15 A. Yes.

16 Q. And you testified that you agreed with him,
17 correct?

18 A. Yes.

19 Q. And that would put you at odds with Dr. Iain
20 Richardson, correct?

21 A. I don't know.

22 Q. Well, Dr. Richardson is a world renowned expert
23 in video coding, correct?

24 A. Yes.

25 Q. And he's got five books that are published,

1 correct?

2 A. Yes. I've read some of them.

3 Q. Okay. Well, let's take a look at

4 Dr. Richardson's book.

5 Mr. Davis, could we have JX-676, please?

6 Have you read this book, JX-676, Video Codec

7 Design?

8 A. I don't think I have used this one, or it may

9 have been a long time. I'm not sure.

10 What year was this?

11 Q. 2002.

12 A. I don't believe I've used this one of his.

13 Q. Well, Mr. Davis, could we get to 676.295? Sorry.

14 Actually 676.282.

15 What we see here is chapter 13 of

16 Dr. Richardson's book, correct?

17 A. Yes.

18 Q. And it's titled Video Codec Design, correct?

19 A. Yes.

20 Q. And, Mr. Davis, if you could zoom out just a

21 little so we could have the first paragraph.

22 And the last sentence in the first paragraph

23 says, we present strategies for two types of video codec, a

24 software implementation and a hardware implementation,

25 correct?

1 A. Yes.

2 Q. So video codecs could be implemented in software,
3 correct?

4 A. Yes, that's true. There are software -- there
5 are software-based video decoders.

6 Q. And, in fact, there are software-based video
7 decoders for H.265, correct?

8 A. I believe so.

9 Q. And there are software-based video decoders for
10 AV1, correct?

11 A. Yes.

12 Q. And there are software-based video decoders for
13 H.264, correct?

14 A. Yes.

15 Q. And Microsoft offers a software-based video
16 decoder, correct?

17 A. Yes.

18 Q. And with respect to the Microsoft extension that
19 you say you downloaded for the ASUS laptops, that is a
20 software-based video codec, correct?

21 A. To the best of my knowledge, it can be.

22 Q. Well, it's not that it can be, it is a
23 software-based video codec, correct?

24 A. For which standards?

25 Q. For AV1.

1 A. I'm not sure.

2 Q. All right. Mr. Davis, could we have RX-4056,
3 please?

4 A. No, I retract that. I believe it -- I believe it
5 can be.

6 Q. So --

7 A. But, again, I'm not -- my answer is I'm not 100
8 percent sure as I sit here right now.

9 Q. Okay. Well, let's take a look at Microsoft's
10 website and what they say.

11 So the first paragraph here, it says, codecs
12 allow you to play different formats of audio and video
13 files. Media Player supports a wide variety of codec
14 included out of the box, some additional codecs can be
15 installed from the Microsoft Store.

16 Do you see that?

17 A. Yes. I see that.

18 Q. And if we advance to the second page, it lists
19 AV1 as a video codec extension, correct?

20 Mr. Davis, you need to scroll down.

21 A. Could you shrink that? I want to see the whole
22 thing in context.

23 Q. So, for the record, it would be RX-4056.2 on the
24 bottom of the page.

25 A. Yes.

1 Q. And, Mr. Davis, if you scroll up a little bit
2 more, it states, additional codec packs available from the
3 Microsoft Store.

4 A. Yes, we are aligned in our understanding now.

5 Q. And that video codec is what you downloaded onto
6 the ASUS computer, correct?

7 A. Yes, the AV1 video extension.

8 Q. Now, you provided infringement opinions with
9 respect to the '701 and '321 patents, correct?

10 A. Yes.

11 Q. And at a high level, the technology at issue is
12 the encoding and decoding of video using H.264, H.265, and
13 AV1, correct?

14 A. Yes, the decoding of those specifications.

15 Q. And I think we just established video encoding
16 and decoding can be performed using only software, correct?

17 A. That's correct.

18 Q. So, Mr. Davis, you can --

19 And video encoding and decoding can be performed
20 using hardware acceleration, correct?

21 A. Yes, it can.

22 Q. Now, the difference between software only and
23 hardware acceleration is that for software implementations
24 there is a heavier load on the general purpose CPU, correct?

25 A. I agree with that generally, yes.

1 Q. And your infringement opinion applies only to
2 hardware acceleration, correct?

3 A. That's correct.

4 Q. You are not accusing software-only encoding and
5 decoding of H.264, H.265, and AV1, correct?

6 A. That is correct. I'm not -- I'm not accusing any
7 encoding.

8 Q. And someone can use the accused products to watch
9 a video encoded in H.264 without infringing so long as they
10 do not use hardware acceleration, correct?

11 A. I'm sorry. Could you repeat that?

12 Q. Someone can use the accused products to watch
13 video encoded in H.264 without infringing so long as they do
14 not use hardware acceleration, correct?

15 A. I don't know. I only know my opinions apply to
16 hardware -- my infringement opinions apply to hardware-based
17 video decoding.

18 Q. And you are not offering an infringement opinion
19 for software-only playback of H.264, correct?

20 A. That's correct.

21 Q. And you are not offering an infringement opinion
22 for software-only playback of H.265, right?

23 A. That's correct.

24 Q. And you are not offering an infringement opinion
25 for software playback of AV1, correct?

1 A. Software only.

2 Q. Software only, yes.

3 A. That's correct.

4 Q. Now, Mr. Davis, could we pull up Dr. Chrissan's
5 demonstratives, slide 11, please?

6 Now, the testimony -- let me strike that.

7 Dr. Chrissan, slide 11 is testimony you cited
8 from Acer and ASUS representatives in this case, correct?

9 A. Yes.

10 Q. And the testimony you cite say nothing about
11 hardware acceleration, correct?

12 A. Cited on this slide? This slide does not mention
13 hardware -- I'll read it.

14 This slide does not mention hardware versus
15 software.

16 Q. Dr. Chrissan, you performed playback testing as
17 part of your analysis, correct?

18 A. That's correct.

19 Q. And you presented playback testing in slide 15 of
20 your demonstratives, correct?

21 A. That sounds right.

22 Q. And in total, I think we're looking at slide 15
23 of your demonstratives, there are -- you performed playback
24 testing for 23 computers in total?

25 A. Yes. I believe 18, essentially, unique ones.

1 Q. And ten were from Acer, correct?

2 A. Oh, I'm sorry. I might have misunderstood you.

3 What was that?

4 Q. Ten of the computers that you performed playback
5 testing on were from Acer, correct?

6 A. Yeah, they are listed here.

7 Q. Okay. And 13 were from ASUS, correct?

8 A. Acer and ASUS. So what are you pointing to
9 exactly?

10 Q. The right-hand side.

11 A. Okay.

12 Q. I was just counting up the numbers of machines
13 you have.

14 A. Got it. Yes.

15 Q. And you purchased these 23 machines, right?

16 A. Did I personally?

17 Q. Well, did you personally purchase them?

18 A. I did not personally purchase them.

19 Q. Nokia's counsel purchased them, correct?

20 A. Someone did. Mr. John Benfatto tested them.

21 Q. And one of the computers you used was the ASUS
22 Expertbook, correct?

23 A. Yes. Do you want to point it out.

24 Q. So I have an ASUS Expertbook here with me, and
25 I'd like to run through some testing with you that you

1 performed.

2 A. Okay.

3 Q. Just for the record, the ASUS Expertbook I have
4 with me here is plugged into the HDMI and it's being
5 projected onto the screen so everyone can see.

6 And one of the files you used is this file of a
7 boat that moves down the Bosphorus River in slow motion,
8 correct?

9 A. Yes.

10 Q. And that file -- well, let me play it for you.

11 (Video clip played.)

12 This is a file you used and showed in your
13 demonstratives, correct?

14 A. That looks familiar, yes.

15 Q. And for the record, the file is CX-2587C.

16 The file, this particular file, is encoded in
17 H.265, correct?

18 A. I'll take your representation.

19 Q. And it is a 4K video, correct?

20 A. If I recall, yes.

21 Q. Now, we just viewed the file on a player called
22 VLC Player, correct?

23 A. Yes.

24 Q. And you're familiar with the VLC Player, right?

25 A. I have used it.

1 Q. In fact, you used it for your analysis in this
2 case, correct?

3 A. I believe it was at least one of the utilized
4 decoders.

5 Q. And as a piece of open-source software, correct?

6 A. I'm sorry?

7 Q. It's a piece of open-source software?

8 A. I believe that's what Mr. Benfatto used.

9 Q. And you downloaded it and put it onto an ASUS
10 computer, correct?

11 A. I believe that's what Mr. Benfatto did.

12 Q. Now, the video clip we just saw, was that played
13 back with hardware acceleration on or hardware acceleration
14 off?

15 A. Which instance are you talking about
16 specifically?

17 Q. I can replay the video. Let me just replay the
18 video so we're all on the same page. I want you to watch
19 it.

20 (Video clip played.)

21 A. So your question is was that hardware or
22 software?

23 Q. Yeah.

24 A. I don't have enough information.

25 Q. Okay. Well, let's check. So, for the record,

1 I'm going to Tools, Preferences, then Input/Codecs.

2 And here, sir, on the first row, do you see that
3 it indicates that it's hardware accelerated decoding
4 disabled?

5 A. I see that.

6 Q. Now I'm going to enable it. So I'm going to turn
7 to automatic.

8 Would you like me to pick one of these other
9 ones?

10 A. Okay.

11 Q. I'm going to enable it, I'm going to hit Save,
12 and I'm going to replay the file.

13 (Video clip played.)

14 Did you see any differences in the playbacks?

15 A. We all viewed it. As a common viewer, with that
16 scan, I can't point anything out. I would need to view it
17 many times or do further analysis to have a complete answer.

18 Q. But to your naked eye you couldn't tell a
19 difference, correct?

20 A. Let's do it one more time.

21 Q. Sure. So let's try it hardware accelerated
22 decoding on.

23 (Video clip played.)

24 And now we're going to turn it off.

25 (Video clip played.)

1 A. Yes, at a high level, first pass or second pass
2 viewing, I was not able to point out any particular
3 artifacts. Obviously further analysis would be needed to
4 determine the differences.

5 Q. Now let's turn to the '701 patent.

6 The claims of the '701 patent recite syntax
7 elements, correct?

8 A. Yes.

9 Q. And, specifically, the claims recite determining
10 a frequency of occurrence threshold based on an expected
11 frequency of occurrence of syntax elements in a bitstream,
12 correct?

13 A. That's what -- I believe that's what the claim
14 recites.

15 Q. In your infringement analyses you did not apply
16 the definition that syntax elements is an element of data in
17 the bitstream, correct?

18 A. I would disagree with that.

19 Q. Mr. Davis, could we have Dr. Chrissan's
20 deposition transcript, page 45, lines 9-15?

21 Sorry. Lines 9-15.

22 Question. If syntax elements is an element of
23 data in the bitstream, that is not a definition you applied
24 in your infringement opinion, right?

25 That would be correct. The definition of syntax

1 elements that I applied in my opinion is an element of data
2 represented in the bitstream.

3 That was your testimony, correct?

4 A. I think there are two different contexts here.

5 Q. Sir, I'm just asking you if it's your testimony.
6 Your very capable counsel could revisit it with you if you
7 want to.

8 So, Mr. Davis, you can take that down.

9 Instead, for your infringement analysis, you
10 applied what you believed to be H.265's definition of syntax
11 elements, correct?

12 A. I am applying the definition of syntax elements
13 that is found in H.265 standard, yes.

14 Q. And, in fact, you say it's straight from the
15 H.265 standard, correct?

16 A. Well, the H.265 standard does have a line that
17 defines syntax elements as an element of data represented in
18 a bitstream.

19 Q. And so let's pull it up and let's look at that.

20 Mr. Davis, could we have CX-5885.30?

21 Could we just have the definition of syntax
22 elements from the H.265 standard?

23 And, Dr. Chrissan, for the record, we have
24 CX-5885.30 on screen.

25 And the definition of syntax elements is the one

1 that you are using for your infringement analysis, correct?

2 A. 3.153, yes.

3 Q. But H.265 further identifies syntax elements in
4 the bitstream as being in bold type, correct?

5 A. I'm sorry. Could you repeat that?

6 Q. Sure. H.265 further identifies syntax elements
7 in the bitstream as being in bold type, correct?

8 A. Well, it literally has its definition -- every
9 definition in this section is in bold type.

10 Q. Well, let's look at the H.265 standard,
11 CX-5885.36.

12 The first sentence, syntax elements in the
13 bitstream are represented in bold type.

14 Correct, sir?

15 A. The standard does recite that.

16 Q. Now, what you identified as the claimed syntax
17 elements are not what H.265 identifies in bold type,
18 correct?

19 A. There are differences.

20 Q. Rather, your infringement analysis is that
21 non-zero transform coefficients satisfy what is recited as
22 syntax elements in the claims, correct?

23 A. That's correct.

24 Q. So I just want to make sure we're on the same
25 page as to what is and is not a syntax element with respect

1 to your analysis.

2 A. Okay.

3 Q. So, Mr. Davis, could we have CX-5885.73?

4 For the record, we are actually looking at
5 CX-5885.77. My apologies.

6 And so, Dr. Chrissan, what we are seeing here on
7 this slide -- I'm sorry -- on this page of the H.265
8 standard, is a syntax table, correct?

9 A. The standard -- the standards document calls it
10 something like that.

11 Q. Okay. And in the middle of the page here there
12 is a bolded field that's called sig_coeff_flag, correct?

13 A. Yes.

14 Q. And according to H.265, sig_coeff_flag is a
15 syntax element, correct?

16 A. Yes.

17 Q. But it is not a syntax element for purposes of
18 your analysis, correct?

19 A. I disagree with that. I do believe this is a --
20 I do believe sig_coeff_flag is a syntax element. I believe
21 that's cited in my report and deposition, and anywhere that
22 it's not was a one-off slip-up.

23 Q. Okay. You'd agree with -- at least in terms of
24 the categorization of the syntax elements, you are not
25 relying on categorizing sig_coeff_flag, correct?

1 A. No, that is correct. The categorization is of
2 the non-zero transform coefficients.

3 Q. Now let's move on to -- a little bit down on the
4 page, we're still on page 77 of CX-5885, and then there's
5 coeff_abs_level_greater1_flag.

6 You see that, right?

7 A. Yes.

8 Q. Now, that is not a syntax element for purposes of
9 your categorization, correct?

10 A. That is not -- that is a syntax element. It is
11 not -- it is not the syntax element that I accused of
12 getting categorized.

13 Q. And let's move on to page 78, and there's
14 coeff_abs_level_greater2_flag.

15 A. Yes.

16 Q. Do you see that?

17 A. Yes, I do.

18 Q. That is also not a syntax element that you
19 identify as being categorized, correct?

20 A. That's correct.

21 Q. And just a little bit below that there is
22 coeff_sign_flag.

23 A. Yes.

24 Q. Do you see that? And that also is not a syntax
25 element that you identify as being categorized, right?

1 A. That's correct.

2 Q. And finally, if we go down a little more, still
3 on page 78, we see coeff_abs_level_remaining.

4 That is also not a syntax element that you
5 identify as being categorized, correct?

6 A. That's correct.

7 Q. So for purposes of your infringement analysis,
8 you are relying on non-zero transform coefficients as
9 satisfying the syntax element, correct?

10 A. That's correct.

11 Q. And during your deposition, you could not confirm
12 whether H.265 uses the term non-zero transform coefficient,
13 correct?

14 A. I believe that's correct.

15 Q. And when you prepared your infringement report,
16 you didn't look into H.265 standard to see if it defines a
17 syntax element for non-zero transform coefficients, correct?

18 A. That is correct. We discussed that in my
19 deposition. I did not exhaustively search.

20 Q. Now, non-zero transform coefficients, they are
21 just transform coefficients, right?

22 A. I'm sorry. Could you repeat your question?

23 Q. Non-zero transform coefficients are just
24 transform coefficients that are non-zero, correct?

25 A. Yes, they are also called significant

1 coefficients. I believe we've seen that.

2 Q. And H.265 defines syntax elements and transform
3 coefficients differently, correct?

4 A. I didn't understand that.

5 Q. Sorry. Let me do it one more time.

6 H.265 identifies syntax elements and transform
7 coefficients differently, correct?

8 A. Well, yes. They're not synonymous. They're not
9 synonymous terms.

10 Q. So let's pull up the H.265 standard again, and
11 it's the definition for transform coefficient.

12 For the record, we're on page 30 of CX-5885.

13 And you see the definition of transform
14 coefficients says it's a scalar quantity, considered to be
15 in a frequency domain, that is associated with a particular
16 one-dimensional or two-dimensional frequency index in a
17 transform in the decoding process.

18 Do you see that?

19 A. I do see that.

20 Q. It says nothing about the transform coefficient
21 being a syntax element in the bitstream, correct?

22 A. Not in this definition.

23 Q. Now, we touched on this already a little bit, but
24 you can agree that asserted claims require that the '701
25 patent -- strike that.

1 You can agree that the claims of the '701 patent
2 require categorizing syntax elements, correct?

3 A. Yes.

4 Q. And, specifically, they require categorizing
5 syntax elements into a first category and a second category,
6 correct?

7 A. Yes.

8 Q. And now, when you performed your infringement
9 analysis, you only conducted it from the point of view of a
10 decoder, correct?

11 A. That's correct.

12 Q. And for your infringement analysis, the syntax
13 elements being categorized are non-zero transform
14 coefficients, right?

15 A. Yes.

16 Q. And specifically for your analysis, the first
17 category is the first 8 non-zero transform coefficients in a
18 4x4 block, correct?

19 A. The first up to 8 non-zero transform coefficients
20 in a 4x4 block.

21 Q. The second category is the remaining non-zero
22 transform coefficients after the first 8 non-zero transform
23 coefficients in a 4x4 block, correct?

24 A. That's correct.

25 Q. The asserted claims also require entropy coding

1 symbols that correspond to the first category of syntax
2 elements and that have been subjected to a context update,
3 correct?

4 A. Yes.

5 Q. And the claims also require entropy coding
6 symbols that correspond to the second category of syntax
7 elements that have bypass context update, correct?

8 A. Yes. That's my recollection of the claim
9 language.

10 Q. Now, a single non-zero transform coefficient may
11 be represented by one or more of the bolded entries we saw
12 in H.265, correct?

13 A. Sorry. Please ask that again?

14 Q. Sure. So you know how we went through the syntax
15 table just now in H.265?

16 A. Yes.

17 Q. And we called out a few of the bolded entries
18 within that table, correct?

19 A. Called them out as non-zero transform
20 coefficients or as something else?

21 Q. As syntax elements identified by that H.265
22 standard.

23 A. Like the coeff -- could you give me some specific
24 examples?

25 Q. We called out the absolute level remaining

1 flag -- strike that.

2 We called out absolute level remaining as a
3 syntax element as identified in H.265, correct?

4 A. Yes, we did.

5 Q. And we also called out sig_coeff_flag, correct?

6 A. Yes.

7 Q. And you'd agree with me that those bolded entries
8 that we called out a non-zero transform coefficient may be
9 represented by one or more of those bolded entries that we
10 called out, correct?

11 A. Yes, a non-zero transform coefficient may be
12 represented by one or more of those other --

13 Q. So let's look at your example that you presented
14 to Her Honor.

15 Mr. Davis, could we have slide 83 from
16 Dr. Chrissan?

17 So here in your slide 83 you show in the top
18 left-hand corner a 4x4 block, correct?

19 A. Yes.

20 Q. And that 4x4 block is filled with transform
21 coefficients, correct?

22 A. It's filled with transform coefficient values,
23 yes.

24 Q. Okay. And if you -- if we zoom in, we'll see
25 zigzags through that 4x4 block, correct?

1 A. Yes.

2 Q. And that zigzag defines the scan order, correct?

3 A. Yes.

4 Q. And the scan order determines where the scanning
5 starts and where it ends, correct?

6 A. That's correct.

7 Q. And it determines -- it could impact what is the
8 first 8 non-zero coefficients and the second 8, well, the
9 remaining non-zero coefficients, right?

10 A. It is possible for the scan order to affect which
11 of these squares are categorized one way or the other.

12 Q. And in H.265, there are different scan orders,
13 correct?

14 A. There are different scan modes, yes.

15 Q. And this one that we're looking at from your
16 slide 83, that's a diagonal scan order.

17 A. Yes.

18 Q. But there are horizontal scan orders, correct?

19 A. Yes, that mode is possible.

20 Q. And just so we're on the same page, Mr. Davis,
21 could we have Dr. Chrissan's report Appendix C-1 at page 81?

22 And for the record, that's CX-6378.81.

23 And, Mr. Davis, do you mind zooming into the 4x4
24 block here?

25 This is a horizontal scan order, correct?

1 A. I believe that's correct. I believe that's what
2 horizontal scan looks like.

3 Q. And this is what came out -- strike that.

4 This came out of your expert report, correct?

5 A. Yes.

6 Q. And there's a vertical scan order as well, right?

7 A. Yes.

8 Q. And instead of running left -- zigzagging left
9 and right, it is going to zigzag up and down, correct?

10 A. Yes. Actually, right to left.

11 Q. Now let's go back to slide 83. Could we go back
12 to Dr. Chrissan's slide 83? Thank you.

13 Now, for claim element 1[D], entropy coding
14 symbols that correspond to the second category, you're
15 relying on the coding of coeff_abs_level_remaining, correct?

16 A. Could you give me that question again?

17 Q. Sure. For the limitation, entropy coding symbols
18 that correspond to the second category, you're relying on
19 the coding of coeff_abs_level_remaining, correct?

20 A. I would want to see my report, but I believe
21 that's generally correct. The claim recites symbols, and I
22 discuss symbols.

23 Q. Mr. Davis, could I have slide 94, please,
24 Dr. Chrissan's slide 94?

25 So just so we're on the same page, this is what

1 you showed Her Honor, right?

2 A. Yes.

3 Q. And when you highlighted it, in your example are
4 values for the coeff_abs_level_remaining, correct?

5 A. Yes.

6 Q. Now, for coeff_abs_level_remaining, that always
7 bypasses context updating, correct?

8 A. Yes, that's my understanding.

9 Q. Okay. So could we go back to slide 81, please?
10 Sorry, 83. Could we go back to slide 83, please?

11 And I just want to make sure we're on the same
12 page here.

13 You drew a red dotted line down and you labeled
14 left of the red dotted line less than 8 and right of the red
15 dotted line greater than 8.

16 Do you see that?

17 A. Yes.

18 Q. And there are values -- there are four values
19 left of that line for coeff_abs_level_remaining, correct?

20 A. That's correct.

21 Q. And those four values, when -- they would bypass
22 context updating, correct?

23 A. That's correct.

24 Q. And right of the red dotted line there are four
25 values as well, correct?

1 A. Yes.

2 Q. And those four values also bypass context
3 updating, correct?

4 A. That's correct.

5 Q. So we can agree that context update is bypass for
6 the coeff_abs_level_remaining field regardless if it's
7 associated with a non-zero transform coefficient in the
8 first 8 or the remaining non-zero transform coefficients,
9 correct?

10 A. That's correct. It is used for some of category
11 1.

12 Q. Now, Mr. Davis, could we have slide 57 from
13 Dr. Chrissan?

14 And here, do you remember presenting this slide
15 to Her Honor about symbols and how they turn into compressed
16 bits?

17 A. Yes.

18 Q. And in terms of your analysis, do you see on the
19 left-hand side what's labeled symbols, that comes from the
20 very left-hand side, there's S1 through S5 there?

21 A. Yes.

22 Q. Those would be, in terms of your infringement
23 analysis, the absolute level remaining, the coeff_sig_flag,
24 and the coeff greater than 1 flag, correct?

25 A. They would be symbols related to those syntax

1 elements, yeah. They would be symbols related to those
2 other things you mentioned.

3 Q. And upstream, so if we go further left of these
4 symbols, are the non-zero transform coefficients.

5 A. Correct.

6 Q. So the non-zero transform coefficients turn into
7 symbols that are also related to the syntax elements
8 identified in H.265, correct?

9 A. You asked that fairly generally, but I think I
10 know -- I think I know what you're referring to enough that
11 I can say, yes, the non-zero transform coefficients are
12 represented by those other syntax elements, and then those
13 syntax elements and the non-zero transform coefficients are
14 represented by the symbols that would be -- that would then
15 be converted into the bitstream.

16 Q. And the symbols, they are data elements
17 represented in the bitstream, right?

18 A. I'm sorry. What was that?

19 Q. The symbols you identify on slide 57, on the very
20 left-hand side of your slide, S through 5, those are data
21 elements represented in the bitstream, correct?

22 A. In this context I wouldn't call them data
23 elements.

24 Q. The data represented in the bitstream, right?

25 A. Yeah, they are symbols. They are data. They are

1 data.

2 Q. And you have this -- the symbols go into an
3 entropy encoder.

4 Do you see that, sir?

5 A. Yes.

6 Q. Now, the entropy encoding involves two steps,
7 correct?

8 A. It depends on the entropy encoding.

9 Q. Well, for H.265 it involves binarization and then
10 arithmetic coding, correct?

11 A. That's generally correct.

12 Q. And the output of binarization are bins, correct?

13 A. That's generally correct. I'd want to look
14 through the details, but that sounds generally correct.

15 Q. And bins represent syntax elements, correct?

16 A. It's a hierarchy, so, yes, the bins would
17 represent the syntax elements that are represented by the
18 symbols that are then represented by the bins.

19 Q. And the bins, then, are also data, right?

20 A. They could be considered data.

21 Q. And they are represented in the bitstream,
22 correct?

23 A. Yeah, you can say that bins are represented in
24 the bitstream.

25 Q. Now, let's move on to the '321 patent.

1 Now, for AV1 you rely on something called
2 order_hint and upper case OrderHint, correct?

3 A. I remember that.

4 Q. Now, so lowercase order_hint appears in the
5 bitstream, correct?

6 A. With an underscore?

7 Q. Yeah, with an underscore.

8 A. Yes. That is represented in the bitstream.

9 Q. And because it is in the bitstream, it means that
10 it came from the encoder, correct?

11 A. It came from the bitstream.

12 Q. Well, the encoder creates the bitstream, correct?

13 A. An encoder creates the bitstream.

14 Q. Now, it's your position that order_hint causes
15 OrderHint to be reset, correct?

16 A. For a particular value of -- wait. No, it's the
17 receipt of -- the receipt of a key frame causes the reset.

18 Q. All right. You mentioned that IDR frames and key
19 frames are -- denote the same idea essentially, correct?

20 A. They're the same idea.

21 Q. And for the -- for purposes of your infringement
22 analysis, an independent sequence can begin with an IDR
23 frame with respect to -- well, strike that. Let me restart.

24 For purposes of your infringement analysis for
25 H.264, an independent sequence can begin with an IDR frame,

1 correct?

2 A. An independently decodable sequence?

3 Q. Yeah.

4 A. Yeah, it does. It starts with an IDR.

5 Q. So, in fact, an IDR is the first picture of the
6 independent sequence, correct?

7 A. Yes.

8 Q. And that holds true for H.264 and H.265, correct?

9 A. Please ask me that question again, the whole
10 question.

11 Q. Sure. An IDR frame, so let me just make sure the
12 record is clear. So let me restart.

13 For H.264, an IDR is the first picture of the
14 independent sequence, correct?

15 A. Yes.

16 Q. And for H.265, an IDR is the first picture of the
17 independent sequence, correct?

18 A. For the -- yes, I mentioned two NAL unit types
19 that are decoded. H.265 has a couple of other minor
20 possibilities, but I point to IDRs, and those are recognized
21 by NAL unit type, I think it's 19 and 20.

22 Q. And for AV1, the key frame is the first picture
23 in the independent sequence, correct?

24 A. Yes, that's correct.

25 Q. Now, an independent sequence could be a single

1 frame, correct?

2 A. I haven't considered that case.

3 Q. Let me ask you again. An independent sequence --
4 sorry.

5 For H.264, an independent sequence could be a
6 single frame, correct?

7 A. An independently decodable sequence. I can't say
8 off the top of my head. I'd want to look into it.

9 Q. Okay. Mr. Davis, could we have Dr. Chrissan's
10 testimony, his deposition transcript, page 143, lines 15-21?

11 Question. And for H.265 in this claim element of
12 the '321 patent, what is the independent sequence that
13 you're referring to?

14 That would be the start -- that would be the
15 occurrence of an IDR followed by zero or more non-IDR
16 pictures up to the next IDR. That would be one example.

17 A. Okay. So, thank you. It is possible, although I
18 would think quite unlikely, for every frame to be an IDR.

19 Q. But in terms of your opinion, for H.264, an
20 IDR -- strike that.

21 In terms of your opinion for H.264, an
22 independent sequence could be a single IDR frame, correct?

23 A. I state it here. I can't deny what I said. As I
24 sit here right now, I'd still want to go back and check.

25 Q. For H.265 you'd agree an independent sequence can

1 be made of a single IDR frame, correct?

2 A. It would apply under this same statement here
3 with the same disclaimer that I'd like to double-check that.

4 Q. And for AV1, an independent sequence could be a
5 single key frame, correct?

6 A. By the same hypothesis, it could potentially.
7 I'd want to check -- I'd want to check the AV1 specification
8 before I -- I would have to look at the AV1 specification
9 before I gave you a 100 percent final answer on that.

10 Q. Mr. Davis, you can take that down.

11 Now, I want to move on to the redesign products.

12 A. Okay.

13 Q. You provided opinions related to the ASUS and
14 Acer redesigns, correct?

15 A. Yes.

16 Q. And during your deposition you did not know if
17 there were any appreciable differences between the ASUS and
18 Acer redesigns, correct?

19 A. I believe that's correct.

20 Q. And during your deposition you did not know
21 whether Intel, AMD, NVIDIA, or Qualcomm provided source code
22 with respect to the ASUS and Acer redesigns, correct?

23 A. That would be in the transcript. If you
24 represent that I did not mention those suppliers
25 individually, then I'll take your representation.

1 Q. And you did not cite any source code from ASUS
2 and Acer -- strike that. Let me restart.

3 You did not cite any source code for the ASUS and
4 Acer redesigns in your expert report, correct?

5 A. I would need to review the report.

6 Q. Well, in fact, with respect to the ASUS and Acer
7 redesigns, you had no idea what's going on under the hood,
8 correct?

9 A. I wouldn't say that.

10 Q. All right. Well, let's have Dr. Chrissan's
11 transcript, page 178, lines 17-22.

12 Question. You'd agree with me that there are no
13 appreciable differences in terms of how the design-around
14 operates with respect to Acer and ASUS?

15 Answer. At a high -- at a high level. I don't
16 know what's going on under the hood.

17 That was your testimony, correct?

18 A. Yes, that's true. That was true at that time.

19 Q. Now, the redesigns disable hardware acceleration,
20 correct?

21 A. I'm sorry. Could you -- I'd like to see some
22 testimony above this.

23 Q. You can visit that with your counsel. I have
24 limited time.

25 A. Good point. Thank you.

1 Q. And the redesigns disable specifically hardware
2 acceleration for H.264, H.265, and AV1, correct?

3 A. Could you repeat that question?

4 Q. Sure. The redesign products disable hardware
5 acceleration for H.264, H.265, and AV1, correct?

6 A. Yes.

7 Q. And because your opinions are hardware-based, the
8 accused products would still be able to play back H.264,
9 H.265, and AV1 video by just using a software
10 implementation, correct?

11 A. Presumably they could.

12 Q. Now, one thing I want to make sure we're on the
13 same page on is the redesign isn't that little checkbox that
14 we saw in VLC, correct? It's not the equivalent of just a
15 little switch that you could toggle in software on the
16 computer, correct?

17 A. You're referring to the VLC?

18 Q. Yeah, the demonstration we looked at earlier.

19 A. Yeah, the example we looked at where you pulled
20 up the settings of the VLC Player?

21 Q. That's correct.

22 A. Okay. So what's your question regarding that?

23 Q. The ASUS and Acer redesign, that's not just
24 changing a toggle in some piece of software in Windows,
25 correct?

1 A. That's already on the machine.

2 Q. Yeah.

3 A. That's correct. I testified it was a download.

4 Q. And ASUS made 11 redesign machines available for
5 inspection, correct?

6 A. ASUS was 11.

7 Q. And Acer made 3 machines available for
8 inspection, correct?

9 A. Yes, that's correct.

10 Q. And I think you testified to this, but your
11 analysis is to try to revert the disablements, correct?

12 A. Yes. My work included reverting the redesign.

13 Q. And what you did personally in terms of trying to
14 do that is you visited Fish & Richardson's offices once,
15 correct?

16 A. I visited Fish once and Morgan Lewis once on
17 October 3rd.

18 Q. But beyond what you did, you understand Nokia's
19 counsel also visited Fish & Richardson's offices and Morgan
20 Lewis's offices, correct?

21 A. Yes, that's correct.

22 Q. Now I want to pull up your demonstrative slide,
23 slide 103.

24 And do you see in the lower right-hand side you
25 have Bates numbers RPX-ACER-1 through 3, RPX-ASUS-1 through

1 8, and RPX-ASUS-10 through 12? Do you see that?

2 A. Yes.

3 Q. You're not suggesting you were successful in
4 disabling hardware acceleration for all those products,
5 correct?

6 A. Your question is am I suggesting I could
7 re-enable all of them?

8 Q. I'm saying you're not suggesting that you were
9 successful in disabling hardware acceleration in all those
10 products, correct?

11 A. For the record, those refer to literal laptop --
12 literal computing devices, correct.

13 Q. Yeah.

14 A. I was not able to re-enable hardware acceleration
15 on all of them.

16 Q. In fact, you were only able to re-enable hardware
17 acceleration on four of them, correct?

18 A. I believe five. Are you talking about me
19 personally or me and counsel?

20 Q. I'm asking about what you disclosed in your
21 report, sir. You disclosed four machines being -- having
22 hardware acceleration reverted or disablement reverted,
23 correct?

24 A. Okay. If that's what's -- if that's what I
25 reported, that's fine. As I sit here -- as I sit here right

1 now, I believe there are five, but I'll stick to four if
2 that's what's on the record.

3 Q. Well, let's look at your expert report, sir.

4 Could we have -- Mr. Davis, could we have
5 Dr. Chrissan's expert report at paragraph 467, please?

6 In paragraph 467 you talk about your work with
7 respect to the Viola design around, correct?

8 A. Allow me to read this.

9 Q. Sure.

10 A. Okay. What was your question, counsel?

11 Q. In paragraph 467 you talk about how you were able
12 to revert the design-around for the Viola product, correct?

13 A. Yes. I said I reviewed -- I viewed the testing
14 results performed by counsel. Counsel updated the Viola
15 design, yes.

16 Q. And counsel was the one that updated the BIOS and
17 then updated the Intel graphics driver, correct?

18 A. Generally speaking, yes. It may have been one
19 step.

20 Q. It wasn't a single download, correct?

21 A. I don't recall as I sit here right now.

22 Q. Well, you don't recall because you weren't there,
23 correct?

24 A. I can only say I don't recall. Yes, and I -- I
25 was not there at that time. I know that the one I did it

1 was a one-step process.

2 Q. All right. Well, let's go to paragraph 470.

3 And here you are talking about reversion of
4 RPX-ASUS-7, that particular laptop, correct?

5 A. Yes.

6 Q. And then in paragraph 472 -- well, yeah, 472 --
7 you're talking about the RPX-ASUS-12 laptop, correct?

8 A. Yes.

9 Q. And, again, this was performed by counsel,
10 correct?

11 A. This was before?

12 Q. This was performed by counsel, right?

13 A. Yes. Yes.

14 Q. Not performed by you?

15 A. 12 -- yes, that's correct.

16 Q. And then, let's go to paragraph 473.

17 You talk about RPX-ASUS-4, correct?

18 A. Yes.

19 Q. And, again, that's performed by counsel, not by
20 you, correct?

21 A. That's what's literally in the report.

22 Q. And you'd agree that out of the six times that
23 Nokia sent someone, Nokia was only able to revert four
24 redesign products, correct?

25 A. Could you repeat your question?

1 Q. Sure. Out of the six times that Nokia sent
2 someone to Fish & Richardson or Morgan Lewis offices, Nokia
3 was only able to revert four redesign products, correct?

4 A. I disagree with the premise of your question.

5 Q. Well, you understand Nokia, you or Nokia's
6 counsel, visited Fish & Richardson or Morgan Lewis at least
7 six times, correct?

8 A. I'd have to check.

9 Q. You don't know if Morgan -- sorry. You don't
10 know if Nokia's counsel visited us 20 times, correct?

11 A. I'm confident it was fewer than 20.

12 Q. But you don't know how many times, correct?

13 A. On the order of six. I wouldn't say you're
14 wrong, but I would still want to -- I still would want to
15 review information before I answered here conclusively.

16 Q. Now, let's turn to CDX-5.100, which is your
17 opinions on indirect infringement.

18 A. Yes.

19 Q. And this is a slide you presented to Her Honor,
20 correct?

21 A. Yes.

22 Q. And let's start on the right-hand side, you
23 cite -- you claim to be an advertisement from ASUS, JPX-10.

24 Do you see that?

25 A. It is on Acer's website, yes.

1 Q. So, again, I want to make sure we're clear and on
2 the same page.

3 I want to start on the right-hand side, not the
4 left-hand side, the right-hand side.

5 A. You want to start on the right-hand side. Sorry.
6 Go ahead.

7 Q. On the right-hand side you see a screenshot of a
8 video that's found in JPX-10, correct?

9 A. Yes.

10 Q. And that is the basis of your indirect
11 infringement opinion with respect to ASUS, correct?

12 A. It is one example presented here.

13 Q. Okay. And you presented -- you selected the best
14 example to present to Her Honor, correct?

15 A. I can't say that. I presented one example.

16 Q. You watched JPX-10, correct?

17 A. I believe I did.

18 Q. And so you'd agree with me that, if we go to
19 JPX-10 at the time markers 5:20, all it does is play a
20 video, correct?

21 A. We can see it.

22 Q. Sure. Let's watch it.

23 (Video clip played.)

24 Q. Mr. Davis, could we start at time marker -- the
25 5-minute time marker just for the sake of time?

1 (Video clip played.)

2 Dr. Chrissan, what you cite to JPX-10 is just the
3 clip showing ASUS computer playing Captain America, Brave
4 New World, right?

5 A. I would disagree that it's just that. It is a
6 video. It is from YouTube. It is from -- that was ASUS,
7 right? It was from a sponsored influencer. And I don't
8 know. We cut away from the first part of that video very
9 quickly, but it looked like it would have useful information
10 in it to me.

11 Q. Well, you cited the time marker 5:20, correct?

12 A. Yes. I don't know if the cite -- the timestamp
13 was for anyone who wanted to confirm that that image really
14 did come from the internet. But that timestamp is just one
15 timestamp. The video as a whole is an advertisement.

16 Q. Now, the video that's shown in the video, that's
17 JPX-10, you don't know how it was encoded, correct?

18 A. As I sit here right now, I don't.

19 Q. You don't know if it was encoded in VP-9,
20 correct?

21 A. As I said, I don't -- I can't recall as I sit
22 here right now.

23 Q. You don't know if it was encoded in VP-8,
24 correct?

25 A. That's correct.

1 Q. Now let's look at the left-hand side, the Acer
2 advertisement.

3 A. Yes.

4 Q. Mr. Davis, could we pull up JX-146, please?

5 And what you show you claim to be from Acer's
6 website is just a posting about the best sports streaming
7 services for PC in 2022, correct?

8 A. Yes, that's correct.

9 Q. And if we scroll down we'll see various streaming
10 services being mentioned. I think there is ESPN, maybe
11 Fubo, if I recall. Mr. Davis, if you could.

12 Now, Dr. Chrissan, at the time of your
13 deposition, you had no opinion as to how streaming providers
14 choose video encoding to serve up to its users, right?

15 A. I kind of like this blog post.

16 I'm sorry. What was your question again?

17 Q. Sure. At the time of your deposition you had no
18 opinion about how streaming providers choose to encode video
19 that it serves up to its users, correct?

20 A. We discussed this at my deposition. I think it
21 was a slightly different question. There are different
22 possibilities controlled by different entities.

23 Q. Well, let's have your deposition, page 190, lines
24 4-7.

25 But your opinion doesn't describe how a

1 particular video codec is chosen to serve -- to be served up
2 to the user, right?

3 I don't believe --

4 A. Oh, yes, I missed part of your question. Yeah,
5 regarding my opinions, that statement is true.

6 Q. And the streaming services could be serving up
7 VP-9 video, correct?

8 A. It's possible.

9 Q. Could be serving up VP-8 video, correct?

10 A. It's possible.

11 Q. Could be serving up H.266, correct?

12 A. I suppose it's possible.

13 Q. Now let's move on to customization -- strike
14 that.

15 Let's move on to your slide at 106.

16 And you provided domestic industry opinions,
17 correct?

18 A. Yes, I did.

19 Q. And you opine that the Xbox DI products are the
20 Xbox Series X and Xbox Series S, correct?

21 A. Yes.

22 Q. And the Xbox DI products, they were released on
23 November 10th, 2020, correct?

24 A. I would need to check. That date sounds close
25 enough, that if you represent it, then I will accept it.

1 Q. And the Xbox DI products make use of chips from
2 AMD, correct?

3 A. I'm sorry. Could you repeat that question?

4 Q. The Xbox DI products make use of chips from AMD,
5 correct?

6 A. That's correct.

7 Q. And prior to 2020 AMD had chips that were
8 compliant with H.264, H.265, and AV1, correct?

9 A. That's generally correct, yes.

10 Q. And you cannot make a specific connection between
11 any AMD customization and the asserted products, correct?

12 Sorry. Let me restart that. I misspoke.

13 And you cannot make a specific connection between
14 any AMD customization and the asserted patents, correct?

15 A. I did not provide an opinion that there is one.

16 Q. And you also opined that Microsoft worked with
17 AMD to create a custom processor for the Surface Laptop 3,
18 correct?

19 A. Yes, that's correct.

20 Q. But you don't know whether all Surface Laptop 3
21 products use AMD chips, right?

22 A. That's correct.

23 Q. And, in fact, certain Surface Laptop 3s may
24 include off-the-shelf Intel chips, correct?

25 A. That may be correct.

1 Q. Now, you also opined about Samsung Galaxy
2 devices, correct?

3 A. Yes.

4 Q. And you opined that Qualcomm created custom chips
5 for Samsung Galaxy devices, correct?

6 A. Correct.

7 Q. And I think in terms of your demonstratives today
8 you talked about the Samsung Galaxy S24, correct?

9 A. The Samsung Galaxy --

10 Q. S24.

11 A. Yes, that was one of them.

12 Q. Specifically, you called out Qualcomm Snapdragon
13 8 Gen 3, correct?

14 A. Yes.

15 Q. We can agree that the Qualcomm Snapdragon 8 Gen
16 3, that's used in products other than Samsung Galaxy
17 devices, correct?

18 A. The noncustomized version?

19 Q. Well, the Qualcomm Snapdragon -- strike that.
20 Let me ask you this.

21 You'd agree that ASUS phone makes use of the
22 Snapdragon 8 Gen 3, correct?

23 A. ASUS phones?

24 Q. Yeah.

25 A. There may be.

1 Q. And, finally, I think you provided opinions about
2 the Android OS, correct?

3 A. Yes.

4 Q. And I know you presented this on your -- in your
5 slides.

6 The Android OS code that you rely on are open
7 source code, right?

8 A. You'll have to be more specific.

9 Q. Well, you downloaded them from the internet,
10 correct?

11 A. Give me your question again.

12 Q. Okay. Well, let me try this one more time.

13 The Android code for Samsung that you relied on,
14 it's open source code, correct?

15 A. It's publicly available. I believe it's open --
16 I believe it's open source code.

17 Q. Okay. Well, sir, I believe you have six binders
18 in front of you, maybe more, and each of them have an index
19 of the exhibits you are trying to put in with you. And
20 they -- the Samsung code is labeled open source in those.

21 A. Okay.

22 Q. You're welcome to look at it and confirm.

23 A. No, that's fine. I'll take your representation.

24 Q. And open source means you can download them off
25 the internet, correct?

1 A. Generally that's true.

2 Q. And Android operating system generally is open
3 source, correct?

4 A. That's true.

5 MR. ZHANG: I'll pass the witness.

6 JUDGE MCNAMARA: Thank you, Mr. Zhang.

7 Ms. Ducca?

8 EXAMINATION BY COUNSEL FOR ITC STAFF

9 BY MS. DUCCA:

10 Q. Good afternoon, Dr. Chrissan. I'm -- did I
11 pronounce your name right?

12 A. It's Chrissan.

13 Q. Sorry. My name is Marissa Ducca. I'm from the
14 office of the OUII. We met before.

15 A. Thank you, Ms. Ducca.

16 Q. I'm going to start by asking you some questions
17 about the '701 patent.

18 A. Okay.

19 Q. Can you explain for me in the context of the '701
20 patent the difference between a syntax element and a symbol?

21 A. Symbols -- yes. Symbols represent syntax
22 elements. So a syntax element will have a value. It will
23 be represented by a number of symbol values.

24 Q. Now, in your infringement allegations for the
25 '701 patent, your infringement re the '701, you point to

1 non-zero transform coefficients as the syntax elements,
2 correct?

3 A. Yes, that's correct.

4 Q. Can you explain why those are syntax elements?

5 A. Can I explain why with regards to what?

6 Q. In your infringement evaluation, why do you think
7 those are syntax elements?

8 A. They are data elements represented in a
9 bitstream. They are -- first, they are data elements, and,
10 secondly, they are represented in the bitstream.

11 Q. Do you have any response to the questioning that
12 you got from Respondents where they asked you about the fact
13 that the syntax elements are bolded yet the non-zero
14 transform coefficients in the standard are not bolded?

15 A. Yes. I remember that.

16 Q. What's your response to that?

17 A. So my response is, the standards document came
18 after and is somewhat separate from the '701 patent. Just
19 because the H.265 standard happened to have a literal
20 definition of syntax elements in it that matched a person of
21 skill's understanding of syntax elements for the '701, but
22 that doesn't mean that the literal nomenclature of the H.265
23 standard should be applied to the claims of the '701.
24 That's my explanation.

25 The other explanation is that it's, as I

1 discussed, it's perfectly acceptable for a syntax element to
2 be represented by other syntax elements.

3 Q. Is the definition of syntax elements broader in
4 the '701 patent than in the H.265 standard?

5 A. Well, the -- the definition of H.265 for a syntax
6 element is an element of data represented in the bitstream.
7 So I would say they are equivalent. There's nothing --
8 there's nothing in the -- let me put this way. There's
9 nothing in the H.265 standard, to the best of my knowledge,
10 that says the things in this table are syntax elements and
11 anything that's not in this table is not a syntax element.

12 Q. Can we put up slide 15, CDX-5C.15?

13 I want to ask you some questions about the AV1 --
14 the use of AV1 in the ASUS computers.

15 A. Okay.

16 Q. First of all, you tested 13 ASUS computers; is
17 that correct?

18 A. Yes.

19 Q. For any of these ASUS computers, did AV1 work
20 right out of the box without any modifications?

21 A. My recollection is that none of them worked
22 straight out of the box. I would want to double-check on
23 the NUC, the second one from the bottom. I mentioned that
24 at least some, if not all, recent ASUS NUCs work out of the
25 box, so I would want to double-check on that one.

1 For all but the ASUS NUC, they did not work
2 straight out of the box. For the NUC I would want to
3 double-check the data.

4 Q. Okay. For the ones that didn't work straight out
5 of the box, can you explain precisely what you needed to do
6 to get the AV1 capability to work on the machines? And if
7 you need to use one as an example, that's fine.

8 A. Okay. So the goal was to use the Microsoft video
9 decoder application that came with the ASUS computer out of
10 the box. And that video decoder -- Microsoft's native video
11 decoder application that works out of the box does not have
12 its -- does not have use of AV1 hardware acceleration
13 enabled, even though the computer can in fact do it.

14 So that's why what needed to be downloaded was an
15 extension to the player, not some driver or some BIOS. It
16 was an extension to the player that would then allow the
17 player, the native Microsoft player out of the box, to
18 utilize the hardware accelerated AV1 decoding.

19 There are other players -- alternatively, could
20 have accessed a different player.

21 Q. Did you need to download anything in order to get
22 the AV1 functionality to work?

23 A. It was that AV1 extension from the Microsoft
24 website.

25 Q. Did you do anything to verify that, when you were

1 playing back AV1 video, that you were using the hardware
2 acceleration?

3 A. Yes. I believe the -- the evidence does indicate
4 that.

5 Q. What evidence told you that?

6 A. It would have been screenshots and --

7 Q. So are you a hundred percent sure that you were
8 using AV1 hardware acceleration as opposed to software AV1
9 playback?

10 A. To the best of my recollection, reviewing the
11 data, yes, Mr. Benfatto confirmed that hardware acceleration
12 was being used.

13 Q. How long did it take to download the AV1
14 extension to be able to utilize the hardware acceleration?

15 A. It's fairly quick. It's a straightforward
16 download.

17 Q. And did you verify that for each of these 13
18 products on slide 15?

19 A. Did I verify that for each of the 13 products?

20 Q. Used the hardware acceleration for AV1 playback.

21 A. Yeah, same answer.

22 Q. Okay. How confident are you that the tests that
23 you performed on the products on slide 15, both Acer and
24 ASUS, are representative of the rest of the products that
25 are accused of infringement in this case?

1 A. I'm confident that those represent substantially
2 all of the rest.

3 Q. Why are you confident?

4 A. Things like, well, for one, we covered a number
5 of actual hardware -- hardware acceleration GPUs. We
6 covered Intel, NVIDIA, and AMD, and we covered a span of
7 products and types.

8 So, with that in mind, I believe that these are
9 substantially representative of the rest.

10 Q. I want to switch topics a little bit, and I want
11 to ask you about design-arounds. And I'm going to stay on
12 the public record. I think that my questions are in line
13 with Respondents' questions, so they are all public.

14 If you feel the need to say something that you
15 think might be confidential, please don't say it and we'll
16 go on the confidential record.

17 A. Okay.

18 Q. First of all, I think you testified that there
19 were 14 design-around computers produced by ASUS and Acer.

20 Is my recollection correct?

21 A. Yes, 11 and 3.

22 Q. Okay. And I think you also testified that it was
23 either four or maybe five that you were able to re-enable;
24 is that correct?

25 A. Yes.

1 Q. So am I correct that nine computers were unable
2 to be re-enabled; is that correct? At least nine, nine or
3 ten?

4 A. I don't know how many others were attempted at
5 all. I only know of six that were attempted. Four were
6 successful, and those were the four that counsel updated,
7 and then two I tried when I was at Fish, and one I
8 successfully downloaded the driver, but it did not change --
9 I successfully downloaded some driver, and it did not change
10 the hardware enablement, and I successfully downloaded a
11 different driver, and it did change the hardware
12 acceleration.

13 So I had proof -- I have personal proof of
14 concept -- personal proof of concept for both Acer and ASUS.
15 Acer was three for three.

16 Q. Okay. So you personally were able to activate
17 one Acer and one ASUS computer, correct?

18 A. That's correct.

19 Q. And then counsel was able to activate two to
20 three additional computers, correct?

21 A. Two from Acer and four from ASUS. And I don't
22 know how many of the other ASUS ones were even attempted.

23 Q. Okay. That's six. So were one of those
24 unsuccessful?

25 A. I thought I said -- oh, I was only -- I was

1 talking only -- so there's three Acer and six ASUS. So
2 let's talk about the three Acer.

3 Two were updated by counsel and one was updated
4 by me.

5 Q. Okay.

6 A. Of the 11 ASUS, I only know of an attempt made on
7 six of them.

8 Q. Okay.

9 A. Counsel updated four, and I was one and one in
10 the time that I was there.

11 Q. So I'm sorry. I'm very confused by the testimony
12 here.

13 So are you saying that nine computers were
14 updated?

15 A. One, two, three -- eight.

16 Q. Eight computers were updated. Three Acer
17 computers?

18 A. Yes. And --

19 Q. Five from ASUS.

20 A. Yes, that's correct.

21 Q. And counsel tested one additional ASUS computer
22 and was unsuccessful; is that correct?

23 A. Well, I did. I did the one additional ASUS
24 computer and was unsuccessful.

25 Q. I see. So eight computers were updated, one was

1 attempted and was unsuccessful, and you're not sure about
2 the other three computers, correct?

3 A. Yes.

4 Q. Okay. Let's talk about the ones that you -- the
5 one that you updated, the Acer and the ASUS.

6 Were the steps that you took the same for both
7 the Acer and the ASUS computers?

8 A. To the best of my recollection, yes. It was to
9 find one driver and download it. In each case -- in each
10 case it was one install step.

11 Q. Okay. Let's talk about the Acer one first.

12 A. Yes.

13 Q. How long did it take you to find and download the
14 driver?

15 A. On the order of 15 minutes or less.

16 Q. How did you find the driver?

17 A. Searching for it on the internet.

18 Q. Like using Google?

19 A. I believe so.

20 Q. And where did you find the driver?

21 A. We may have -- it may have just been going
22 straight to Acer's website. For Acer, it may have just been
23 going straight to Acer's website.

24 I don't recall exactly.

25 Q. Where did you -- was the Acer driver update on

1 Acer's website?

2 A. To the best of my recollection it was, but I
3 don't recall 100 percent.

4 Q. Do you recall what you looked for on Acer's
5 website to be able to find the correct driver?

6 A. It would have been GPU, a GPU driver download for
7 as close as we could get to the model number.

8 Q. Did you have to make multiple attempts in looking
9 for it to find the right one?

10 A. I don't recall.

11 Q. Did you take any other additional steps to
12 install that new driver and get the video functionality to
13 work?

14 A. Not that I recall. It was a fairly
15 straightforward download.

16 Q. So after you downloaded that driver and you got
17 the Acer computer to work, did you verify that you were
18 using hardware acceleration on the Acer computer?

19 A. Yes, we checked the performance monitors.

20 Q. And did you verify that for H.264, H.265, and
21 AV1?

22 A. I would need to go back and look at the data for
23 that.

24 Q. Are there any of those three that you're sure
25 about?

1 A. I believe at least H.264 or H.265.

2 Q. Now let's talk about the ASUS computer that -- I
3 want to talk about the ASUS computer that you were able to
4 update.

5 A. Okay.

6 Q. How long did it take you to update the ASUS
7 computer that you were able to update?

8 A. That was about 15 or 20 minutes as well.

9 Q. And how did you find the driver that you needed
10 for the ASUS computer?

11 A. For that one we did -- when we were there, I
12 believe I downloaded one driver that -- I downloaded one
13 driver possibly from ASUS that did not re-enable hardware
14 acceleration, and then went and found another driver from
15 AMD that did.

16 Q. So you had to -- you went to the ASUS website,
17 downloaded a driver from ASUS website, it didn't work, and
18 then did you go to the AMD website and download a driver?

19 A. And that worked, yes.

20 Q. Do you know why the driver that you downloaded
21 from ASUS didn't work?

22 A. No, I wouldn't have been able to debug that
23 within the amount of time we had.

24 Q. How long --

25 A. I don't know.

1 Q. Okay. How long did you spend at the law firm
2 looking at the computers and examining them?

3 A. I believe Morgan Lewis was perhaps between one
4 and two hours, and I believe -- that was for Acer. And I
5 believe Fish, for ASUS, was three -- on the order of three
6 hours perhaps.

7 Q. All right. Let me ask you about the ASUS
8 computer that you tried to update and were unable to.

9 A. Yes.

10 Q. What did you do for that computer?

11 A. One attempt at driver download, no more than one.

12 Q. How long did you spend on that attempted driver
13 download?

14 A. The same, 10 or 15 minutes. We didn't -- I
15 didn't sit there trying to figure it out.

16 Q. Was the driver download from ASUS's website?

17 A. I believe it was.

18 Q. Was it a different driver download than the one
19 that worked on the ASUS computer?

20 A. I don't recall.

21 Q. Do you know how long counsel spent updating the
22 drivers on the five computers that they were able to update?

23 A. We discussed that before. I only know ballpark,
24 but I don't know the total number of days or hours exactly.

25 Q. And I forgot to ask you, with respect to the ASUS

1 computer that you were able to update, did you verify that
2 the hardware acceleration was working after you installed
3 the new driver?

4 A. I'm sorry. I don't understand the question.

5 Q. Yes. I'm sorry. I'll rephrase it.

6 So with respect to the ASUS computer, after you
7 downloaded the driver from the AMD website and enabled or at
8 least you thought you enabled the hardware acceleration, did
9 you verify that it was indeed using hardware acceleration?

10 A. Yes. Thank you. I misheard one word.

11 Q. And so the answer is yes?

12 A. Yes.

13 Q. Okay. And did you verify that it was using
14 hardware acceleration for H.264, H.265, and AV1?

15 A. I don't recall. Same answer as before. I
16 believe it was at least H.264 or H.265.

17 Q. Okay. Let's switch topics.

18 Can you put up slide 30, please? CDX-5C.30.

19 I think with respect to this slide, if I recall
20 correctly, you testified that you applied Staff's proposed
21 construction, which you said was similar to Nokia's proposed
22 construction, in your infringement opinions; is that
23 correct?

24 A. Yes.

25 Q. Did you have any opinions with respect to

1 Respondents' proposed construction?

2 A. No.

3 Q. So you have no opinions as to whether there's
4 infringement under Respondents' proposed construction,
5 correct?

6 A. That's correct.

7 Q. Let's go to slide 75.

8 The same questions here. So if I recall
9 correctly, you testified that you applied Staff's and
10 Nokia's proposed constructions with respect to your
11 infringement opinions; is that correct?

12 A. Yes.

13 Q. Did you have any opinions with respect to
14 infringement under Respondents' proposed constructions?

15 A. No.

16 MS. DUCCA: Now, Your Honor, I think we have to
17 go on the confidential record, and this is third-party
18 confidential record.

19 (Whereupon, the hearing proceeded in confidential
20 session.)

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1 O P E N S E S S I O N

2 JUDGE MCNAMARA: Would you kindly raise your
3 right hand?

4 RYAN N. HERRINGTON,
5 having been first duly sworn or affirmed on
6 their oath, was thereafter examined and testified as
7 follows:

8 JUDGE MCNAMARA: Thank you. Please be seated.
9 And just state your name for the record.

10 A. Ryan N. Herrington, H-E-R-R-I-N-G-T-O-N.

11 JUDGE MCNAMARA: We have certainly met before.

12 MR. NEWCOMER: May I proceed, Your Honor? Josh
13 Newcomer for Complainants.

14 JUDGE MCNAMARA: Yes, Mr. Newcomer.

15 DIRECT EXAMINATION

16 BY MR. NEWCOMER:

17 Q. I'll start over again, Mr. Herrington.
18 What were you retained to do in this
19 investigation?

20 A. Yes. I was retained by Nokia to assess the
21 economic prong of the domestic industry requirement.

22 Q. Have you prepared a slide deck to assist with
23 your testimony today?

24 A. I have.

25 Q. Is that at CDX-6C?

1 A. It is.

2 Q. And that's what's on the screen now?

3 A. Yes.

4 Q. What is your title at FTI?

5 A. So I'm a senior managing director at FTI
6 Consulting.

7 Q. And can I have slide 1, please?

8 What do you do at FTI?

9 A. I routinely provide accounting, economic, and
10 financial -- I apply those principles to complex business
11 disputes, specifically including at the ITC. At this point
12 I think I've participated in over 70 Section 337
13 investigations.

14 Q. What educational background allows you to provide
15 such testimony?

16 A. So I have a BBA in finance from Texas A&M
17 University, and I subsequently went on to receive my MBA
18 from the University of Texas at Dallas.

19 Q. You mentioned prior ITC investigations.

20 Did any of those investigations involve the
21 products and investments at issue in this case?

22 A. Yes. So I actually served as the Complainant's
23 economic expert in both the 1379 investigation as well as
24 the 1380 investigation, which had an overlap in time period
25 and the products here in this investigation.

1 I also served as the Respondents' economic expert
2 in the 1351 investigation, which I understand the
3 Respondents think has some significance here.

4 MR. NEWCOMER: Your Honor, at this time I tender
5 Mr. Herrington as an expert in economic, financial, and
6 market analysis including as it relates to domestic
7 industry.

8 MR. RIZZOLO: Matt Rizzolo for Respondents. No
9 objection.

10 MS. DUCCA: No objection from Staff, Your Honor.

11 JUDGE MCNAMARA: All right. Then Mr. Herrington
12 is accepted as an expert on the topics for which he has been
13 called to testify without objection.

14 BY MR. NEWCOMER:

15 Q. Mr. Herrington, what was your overall opinion
16 related to domestic industry in this case?

17 A. So overall it's my opinion that there was
18 significant investment, both quantitatively and
19 qualitatively, by Nokia's licensees, both Microsoft and
20 Samsung, as related to the DI products across all of the
21 asserted patents.

22 Q. And which prongs of the domestic industry test
23 did you look at?

24 A. So I specifically was looking at sub-prongs A and
25 sub-prongs B, so I was looking at plant and equipment

1 investments and labor investments.

2 Q. Does your analysis vary at all by patent?

3 A. No. It's my understanding that all the patents
4 are asserted to -- all the products are asserted to practice
5 all the patents. So if one patent falls out, it wouldn't
6 change my analysis.

7 Q. If we could have slide 2, please.

8 What were the domestic industry products you
9 analyzed specifically?

10 A. So specifically I was looking at the end-user
11 devices, which I understand are the products that practice
12 the patents. I was looking at the Xbox products,
13 specifically Series S and Series X. I was looking at
14 Microsoft Surface products, and which are laptops, tablets.
15 And then I was looking at the Samsung Galaxy products, which
16 are mobile devices.

17 Q. If ALJ McNamara wanted to find a list of all the
18 DI products, what exhibits would she look to?

19 A. So she could actually look to exhibits from my
20 expert report. That's found at CX-6407C and CX-6422C.

21 Q. If we could have slide 3, Mr. Moreno.

22 I suspect that ALJ McNamara is familiar, but can
23 you tell us a little bit about Microsoft USA?

24 A. Certainly. Quintessential American company,
25 headquartered in the state of Washington. The majority of

1 their property holdings are actually in the United States.
2 They have 30-owned facilities in the United States, 20
3 leased, and the majority, over 50 percent, of their
4 worldwide 228,000 employees are actually located in the
5 U.S., and they actually have a license here to the asserted
6 patents.

7 Q. If we could go to slide 4, please.

8 Let's talk about the Xbox. What are Microsoft's
9 Xbox products?

10 A. So the Xbox products, as I previewed a little bit
11 earlier, are the Series S and Series X, and then there is
12 also mid Gen releases that you can see in 2023 and 2024
13 related to those products.

14 And so an Xbox, as you may know, Your Honor, is a
15 gaming console that people can use at their home to play
16 video games or online gaming.

17 Q. And for the product information in this case,
18 could you identify the exhibits you're relying on?

19 A. Yes. So this is from JX-0717, CX-6970, and
20 CX-2312.

21 MR. NEWCOMER: Your Honor, at this point we need
22 to go on the third-party confidential record, so it may be a
23 good time to stop.

24 JUDGE MCNAMARA: Good call.

25 MR. NEWCOMER: All right. We'll do that.

1 JUDGE MCNAMARA: Yes, please. Thank you.

2 Mr. Herrington, thank you for stepping up. Now
3 you can step down.

4 So I'm afraid we're finished for the night.

5 Mr. Rizzolo?

6 MR. RIZZOLO: Nothing more from us, Your Honor.

7 JUDGE MCNAMARA: Okay. Just wanted to be sure.

8 Ms. Ducca?

9 MS. DUCCA: Nothing from Staff, Your Honor.

10 JUDGE MCNAMARA: Okay. Very good.

11 Thank you very much, everyone. Again, we're just
12 trying to adhere to the requirements to make sure that our
13 security folks aren't held over and that sort of thing.
14 You're aware.

15 MR. NEWCOMER: Thank you, Your Honor.

16 JUDGE MCNAMARA: So if we have to make up time,
17 why don't you let me know how and when you might do that, if
18 there's going to be a rearrangement.

19 MR. NEWCOMER: Will do, Your Honor. Thank you.

20 JUDGE MCNAMARA: Thank you very much, everyone.
21 Have a good evening.

22 //

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24 (Whereupon, at 5:30 p.m., the proceedings
25 adjourned, to reconvene the following day, March 6, 2026, at

1 9:30 a.m.)
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1 C O N T E N T S

2 INDEX OF WITNESSES

3

	WITNESS	DIRECT	CROSS	RE- DIRECT	RE- CROSS	STAFF
5	PIERRE MOULIN.....	286	314			360
6	DOUGLAS CHRISSAN.....	370	458	519	524	503
7	RYAN N. HERRINGTON.....	533				

8

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11

12 AFTERNOON SESSION.....414

13

14

15

16

17 CONFIDENTIAL SESSION.....293- 313

18 CONFIDENTIAL SESSION.....378- 383

19 CONFIDENTIAL SESSION.....394- 395

20 CONFIDENTIAL SESSION.....408- 417

21 CONFIDENTIAL SESSION.....423- 457

22 CONFIDENTIAL SESSION.....517- 532

23

24

25

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
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- 12
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1 EXHIBIT LISTS SUBMITTED FOR ADMISSION:
2 LIST OF NO SPONSORING WITNESS EXHIBITS
3 Exhibit No.
4 CX-0447C
5 CX-0469C
6 CX-0855C
7 CX-0860C
8 CX-0989C
9 CX-0996C
10 CX-1917C
11 CX-1921
12 CX-1922
13 CX-2453C
14 CX-2454C
15 CX-2455C
16 CX-2456C
17 CX-2457C
18 CX-2458C
19 CX-2459C
20 CX-2941C
21 CX-3581C
22 CX-6266C
23 CX-6267
24 CX-6268
25 CX-6270

1	CX-6683C
2	CX-6684C
3	CX-6687C
4	CX-6688C
5	CX-6689C
6	CX-6707C
7	CX-6708C
8	CX-6709C
9	CX-6710C
10	CX-6712C
11	CX-6718C
12	CX-6719C
13	CX-6720C
14	CX-6721C
15	CX-7125C
16	CX-7126C
17	CX-7142C
18	JX-0001
19	JX-0002
20	JX-0003
21	JX-0003
22	JX-0004
23	JX-0005
24	JX-0006
25	JX-0007

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3	JX-0010
4	JX-0011
5	JX-0012
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15	JX-0070C
16	JX-0071C
17	JX-0072C
18	JX-0081C
19	JX-0083C
20	JX-0084C
21	JX-0096
22	JX-0098C
23	JX-0099C
24	JX-0100C
25	JX-0101C

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9	JX-0213
10	JX-0214
11	JX-0215
12	JX-0221C
13	JX-0320C
14	JX-0360C
15	JX-0394C
16	JX-0403C
17	JX-0418C
18	JX-0419C
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20	JX-0424C
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23	JX-0430C
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25	JX-0435C

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5	JX-0705C
6	JX-0706C
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8	JX-0708C
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12	JX-0714
13	JX-0715
14	JX-0716
15	JX-0717
16	JX-0747
17	JX-0748
18	JX-0751
19	JX-0752
20	JX-0757
21	JX-0759
22	JX-0760
23	RX-0014
24	RX-0062C
25	RX-1943C

1 RX-2448C
2 RX-2486C
3 RX-2487C
4 RX-2488C
5 LIST OF EXHIBITS ADMITTED ON MARCH 4, 2026
6 RICHARDSON EXHIBITS
7 Exhibit No.
8 CX-1964
9 CX-2596
10 CX-5885
11 CX-6084
12 CX-6090
13 CX-6091
14 CX-6093
15 CX-6097
16 CX-6101
17 CX-6102
18 CX-6289
19 CX-6294
20 CX-7149
21 JX-0187
22 JX-0191
23 JX-0207
24 JX-0211
25 JX-0676

C E R T I F I C A T E

TITLE: CERTAIN VIDEO-CAPABLE LAPTOP, DESKTOP COMPUTERS,
HANDHELD COMPUTERS, TABLETS, TELEVISIONS, PROJECTORS, AND
COMPONENTS AND MODULES THEREOF

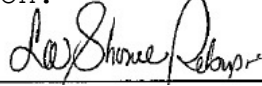
INVESTIGATION NO.: 337-TA-1448

HEARING DATE: March 5, 2026

LOCATION: Courtroom A

NATURE OF HEARING: Evidentiary Hearing

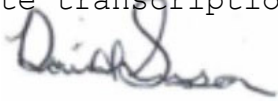
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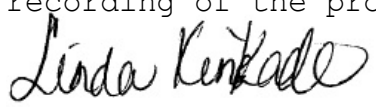
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UNITED STATES INTERNATIONAL TRADE COMMISSION

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In the Matter of

Investigation No.

337-TA-1448

CERTAIN VIDEO-CAPABLE LAPTOP, DESKTOP
COMPUTERS, HANDHELD COMPUTERS,
TABLETS, TELEVISIONS, PROJECTORS, AND
COMPONENTS AND MODULES THEREOF

-----x

OPEN SESSIONS

Pages: 551 through 878 (with excerpts)

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Date: March 6, 2026

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1 UNITED STATES INTERNATIONAL TRADE COMMISSION
2 Washington, D.C.
3 Before the Honorable MaryJoan McNamara
4 Administrative Law Judge
5 -----x
6 In the Matter of Investigation No.
7 337-TA-1448
8 CERTAIN VIDEO-CAPABLE LAPTOP, DESKTOP
9 COMPUTERS, HANDHELD COMPUTERS,
10 TABLETS, TELEVISIONS, PROJECTORS, AND
11 COMPONENTS AND MODULES THEREOF
12 -----x
13
14 International Trade Commission
15 500 E Street, SW
16 Washington, D.C.
17
18 Evidentiary Hearing
19 Friday, March 6, 2026
20 Volume III
21
22 The parties met pursuant to notice of the
23 Administrative Law Judge at 9:30 a.m. Eastern.
24
25 Reported By: Linda S. Kinkade RDR CRR RMR RPR CSR

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13 *** Index appears at end of transcript ***

14

15 PLEASE NOTE: Quotations from documents are reflected in the
16 transcript as read and may not constitute a verbatim quote.

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1 P R O C E E D I N G S

2 (In session at 9:30 a.m.)

3 JUDGE MCNAMARA: Good morning, everyone. Please
4 be seated. Thank you.

5 Good morning, Mr. Newcomer.

6 MR. NEWCOMER: Good morning, Your Honor.

7 JUDGE MCNAMARA: So is there any business that
8 you'd like me to address before you get started again with
9 Mr. Herrington?

10 MR. NEWCOMER: We have two housekeeping issues we
11 would like to address. I'm going to introduce Arden Seavers
12 to admit yesterday's exhibits.

13 JUDGE MCNAMARA: Okay.

14 MS. SEAVERS: Good morning, Your Honor. Arden
15 Seavers. The parties have agreed on the exhibits and we
16 would like to move them into evidence.

17 JUDGE MCNAMARA: All right.

18 Is there any objection from Respondents?

19 MR. RIZZOLO: Matt Rizzolo, Your Honor, no
20 objections.

21 JUDGE MCNAMARA: Okay.

22 Ms. Ducca?

23 MS. DUCCA: No objection from the Staff,
24 Your Honor.

25 JUDGE MCNAMARA: Thank you.

1 Would you please identify the exhibits by group
2 that you are seeking to have admitted into evidence?
3 Presumably you have a list.

4 MR. NEWCOMER: We have a list, Your Honor.

5 JUDGE MCNAMARA: You don't have to read them all.
6 Who are they from?

7 MS. SEEVERS: Moulin and Chrissan, Your Honor.

8 JUDGE MCNAMARA: Then those exhibits are entered
9 into evidence. And please be sure that Ms. Kinkade has a
10 copy of the list.

11 MS. SEEVERS: Of course, Your Honor.

12 (Whereupon, the exhibits as recited by counsel
13 and reflected in the attached index were submitted and
14 received in evidence.)

15 JUDGE MCNAMARA: Thank you very much.

16 MR. NEWCOMER: Second housekeeping matter,
17 Your Honor, the parties have a proposal regarding time.
18 Obviously we're behind time across the board so far. We
19 have been considering options. Obviously both sides have
20 cut down some of the time they are going to use going
21 forward, but we think for a full and fair presentation we
22 were trying to find ways to get some additional time.

23 One proposal we have is starting a half hour
24 earlier, which I don't know if that would be, you know -- we
25 don't know if that's acceptable to you or not, but it's one

1 proposal we thought we could do. Obviously we can't extend
2 the day later, but the building's open earlier.

3 Recognizing your commute and everything, we
4 wouldn't want to put you out too far, but at the same time
5 we're trying to ensure you have a full record.

6 So that's a joint proposal I believe we have, or
7 at least a common proposal.

8 JUDGE MCNAMARA: Ms. Ducca?

9 MS. DUCCA: Your Honor, if you're okay with that,
10 the Staff is okay with that. I would prefer to stay on
11 track, of course. We do have two extra days in this trial.
12 But given the circumstances, if Your Honor is okay with the
13 extra half hour in the morning every day, the Staff is okay
14 with the extra half hour.

15 I will say, Your Honor, I'm usually here by
16 8 a.m., so it's not too much of a hardship for me. But,
17 again, you know, they're behind, but they're not unusually
18 behind.

19 JUDGE MCNAMARA: Boy, that's something to define,
20 isn't it. What is unusually behind? That's a good one.

21 MS. DUCCA: It seems to be common in these cases
22 and time is made up. Parties always make it in the end,
23 so...

24 JUDGE MCNAMARA: Have you had any other proposals
25 other than -- let me think about this, but have you had any

1 other proposals, by any chance, like shaving time off lunch?

2 MR. NEWCOMER: So just to be candid, Complainants
3 proposed shaving 15 minutes off of lunch each day, but I
4 understand, for logistical reasons, getting in and out of
5 security and everything, so that's an issue for Respondents.

6 JUDGE MCNAMARA: Oh, sure.

7 MR. NEWCOMER: I'll let them speak to that.

8 JUDGE MCNAMARA: Go ahead, Ms. Roberts.

9 MS. ROBERTS: Stephanie Roberts. We were
10 generally opposed to that. We understand we need -- that
11 additional time would be preferred, just logistically the
12 45-minute lunch is difficult.

13 JUDGE MCNAMARA: It is. Let me think about this.
14 I will probably do it. It's just that my days end up being
15 really long and it's a long commute. And I love my coffee
16 in the morning. That's a personal thing, that I just like
17 having that little extra time in the morning.

18 Let me think about that, and if there is another
19 way -- is there maybe another way to do this where maybe we
20 take -- well, you've already got all your experts scheduled,
21 don't you?

22 MR. NEWCOMER: We have our experts scheduled.
23 Some of them are obviously coming in from other countries.

24 JUDGE MCNAMARA: Right.

25 MR. NEWCOMER: And we had thought about extending

1 to Friday, but I understand Ms. Ducca has a prescheduled
2 time off next Friday, I think, or...

3 MS. DUCCA: I have prescheduled leave next
4 Friday.

5 JUDGE MCNAMARA: Got it.

6 MR. NEWCOMER: So that wasn't an option.

7 JUDGE MCNAMARA: Fair enough. All right. I will
8 probably do this, but somebody's going to owe me a cup of
9 coffee.

10 MR. NEWCOMER: If we were allowed to bring coffee
11 in here, we'd arrange to have coffee for everyone,
12 Your Honor.

13 JUDGE MCNAMARA: No, no. I am not doing this,
14 don't worry. I am not doing this. It was just one of those
15 things.

16 Let me think about this, and if there is another
17 way of doing it -- what popped into my head but it might not
18 be doable is that maybe we take remedy and bond at a
19 different time on a different scheduled day. But I am
20 seeing faces kind of scrunched up on that one, and I'm not
21 sure that that's a good alternative because you've got
22 people scheduled.

23 MR. NEWCOMER: I think we would have to -- I
24 actually don't have a conceptual issue with that. We've
25 done it before in, I think 1388, or one of them, but the

1 only issue is I think we're starting our remedy case this
2 afternoon, potentially.

3 JUDGE MCNAMARA: Fair enough. Okay. That's
4 done. All right. I'll come in early.

5 MR. NEWCOMER: Thank you, Your Honor.

6 JUDGE MCNAMARA: We'll start earlier. Actually,
7 did you check with Ms. Kinkade?

8 All right. Then we'll start at 9:00.

9 MR. NEWCOMER: Thank you, Your Honor.

10 JUDGE MCNAMARA: You're welcome.

11 MR. NEWCOMER: I think we're ready to proceed.
12 We need to be on the confidential record, as I said at the
13 end of the day yesterday, so this will be third-party
14 confidential information.

15 (Whereupon, the hearing proceeded in confidential
16 session.)

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1 O P E N S E S S I O N

2 MR. RIZZOLO: This is Matt Rizzolo, Your Honor,
3 for Respondents.

4 JUDGE MCNAMARA: Thank you.

5 CROSS-EXAMINATION

6 BY MR. RIZZOLO:

7 Q. Mr. Herrington, as you just heard, I'm going to
8 try and do this on the public record. We're going to have
9 cross binders passed out. I'll try to keep them pretty
10 brief for you.

11 On that note, it's a lot of yes-or-no questions.
12 To the extent you can answer yes or no, I'd appreciate that,
13 so we can keep it on the public record.

14 You didn't opine today on the public interest,
15 correct?

16 A. That is correct.

17 Q. And you've offered no opinions here on remedy or
18 bond concerning Acer and ASUS?

19 A. That is correct.

20 Q. You're offering no technical opinion on the
21 article of commerce?

22 A. Yes. I'm offering only economic opinions here.

23 Q. For your technical understanding, you relied
24 solely on Complainants' experts, correct?

25 A. Yes.

1 Q. You didn't speak with anyone at Microsoft?

2 A. No.

3 Q. You didn't speak with anyone at Samsung?

4 A. No. I thought there was plenty of deposition and
5 declaration testimony for both.

6 Q. And you didn't speak with anyone at the various
7 component makers, AMD, Qualcomm, Google?

8 A. No.

9 Q. You haven't quantified any domestic investments
10 in the components, have you?

11 A. Certainly my calculations include investments
12 that went into making those custom components, both for
13 Microsoft and Samsung, but I don't have a calculation
14 specific to components only, if that's what you're asking.

15 Q. You have not separately quantified any
16 investments in those components?

17 A. They are inclusive, but I have not separately
18 quantified them.

19 Q. And you haven't separately offered an opinion on
20 the significance of any investments in those components,
21 correct?

22 A. That's correct.

23 Q. Now, if we could bring up CDX-6.37.

24 This is the summary of your opinions on the
25 articles of commerce.

1 You opined that it's the Microsoft and Samsung DI
2 products, the Xbox, Surface, and Galaxy products?

3 A. Those are the DI products, yes.

4 Q. I think you said you testified over 70 times or
5 you've been involved in 70 investigations; is that right?

6 A. I've been -- I've participated in over 70. I
7 think I've testified in over 50, but it may not be specific
8 to just the ITC for those 50.

9 Q. Do you understand that in evaluating domestic
10 industry the ITC applies a realities of the marketplace
11 test, right?

12 A. I understand it can.

13 Q. Okay.

14 A. I don't think it always does.

15 Q. Well, the ITC has said time and again that in
16 evaluating domestic industry it looks at the facts of each
17 investigation and the realities of the marketplace, right?

18 A. It certainly -- I would certainly agree that the
19 Commission considers each investigation on a fact-by-fact
20 basis. And I think the Commission has even made that clear
21 in the appeal for the 1351 investigation, where they called
22 out that the facts in 1351 were very different from the
23 facts in 1379 and 80.

24 Q. Well, if we could just bring up paragraph 61 of
25 Mr. Herrington's report, maybe this will refresh your

1 recollection.

2 And there you say, I further understand that the
3 article protected by the patent under Section 337(a)(3) is
4 not determined by a rigid formula but by an examination of
5 the facts in each investigation, the article of commerce,
6 and the realities of the marketplace, right?

7 A. Yes. Could I see what that footnoting right
8 there? Or maybe I can look at it in my binder here.

9 So, again, it's citing case law.

10 Q. You know, in fact, we have that case law. We can
11 put that up there if you want.

12 A. So, again, to me that's saying that that's
13 something the Commission may look at when they are trying to
14 determine whether you're going to expand investments past
15 the article that practices the patent, which, again, I don't
16 think that's the case here and why you don't necessarily
17 need to look at this test.

18 Q. I mean, Mr. Davis, we could bring up the 546
19 Commission Opinion at paragraph 39, if that would help.
20 Page 39.

21 And you see right at the second sentence, it
22 says, the determination is made by an examination of the
23 facts in each investigation, the article of commerce, and
24 the realities of the marketplace, right?

25 A. Yes. And it's citing the 215 investigation.

1 Q. But your opinion here is that there's no need for
2 the ALJ to even look at the realities of the marketplace;
3 isn't that right?

4 A. I think it would be my opinion that the domestic
5 industry article is the end-user device. I think there are
6 technical reasons for that as well as marketplace reasons
7 that I gave. So I don't think it's necessary to go to the
8 Magnetic Tapes factor test. But if you did go there, it's
9 my opinion that you could still extend the investments to
10 the end-user device.

11 Q. I understand you don't think the Magnetic Tape
12 factor should apply and we'll get to that, but I asked about
13 the realities of the marketplace.

14 The Commission says here that that's to be
15 considered, right?

16 A. That's what the page says.

17 Q. Okay. And but your opinion is that there is no
18 need to get into the realities of the marketplace test,
19 correct?

20 A. There is no need to get into the Magnetic Tapes
21 factors, and that's what I think of when I think of
22 realities of the marketplace.

23 Q. Could we bring up Mr. Herrington's deposition at
24 page 44, 43 to 44, just for full context here.

25 And this is where you were asked questions about

1 the application of factor 3 of Magnetic Tape, but you
2 answered, at the bottom, and made very clear, in my expert
3 report I think the appropriate DI products here are the
4 end-user devices. There's no real need to go into the
5 realities of the marketplace test.

6 That was your testimony, correct?

7 A. Yes, as related to --

8 Q. Okay. Thank you.

9 A. Okay.

10 Q. And you mentioned during your testimony that the
11 Commission instituted this investigation into end-user
12 devices, right?

13 We could bring CDX-637 back up.

14 Do you see that?

15 A. Yes.

16 Q. And you said that this supports your opinion that
17 the relevant article of commerce here are the Xbox and
18 Surface and Galaxy devices.

19 A. I think it's something you can definitely
20 consider, yes, and the Commission has considered in the
21 past.

22 Q. You actually referred to the Notice of
23 Institution on slide 42 of your demonstratives.

24 This doesn't say anywhere all end-user devices,
25 does it?

1 A. I don't think it uses that exact language.

2 Q. It lists different categories of end-user
3 devices, correct?

4 A. Are you asking if it says different categories of
5 end-user devices?

6 Q. No. It lists different categories.

7 A. Oh, it certainly lists what I would consider
8 end-user devices.

9 Q. And components and modules thereof, which you
10 left the highlighting off of, correct?

11 A. The highlighting may not be there, but I
12 explained it on my direct.

13 Q. Okay. There's no mention of gaming consoles in
14 the Notice of Institution, is there?

15 A. That's true.

16 Q. The Xbox is a gaming console?

17 A. Yes.

18 Q. There's no mention of smartphones in here, is
19 there?

20 A. I don't see specifically smartphones listed.

21 Q. Samsung Galaxy is a smartphone?

22 A. Yes.

23 Q. And I know you talked about the components and
24 modules, and you said it was included in here because the
25 Commission didn't want someone to get around the exclusion

1 order, something to that effect. I don't want to paraphrase
2 but...

3 A. Yeah, I mean, you're paraphrasing.

4 Q. Okay. But you didn't discuss why the Commission
5 instituted on this particular language, right? You didn't
6 discuss with anyone at the Commission their reasoning for
7 instituting on this particular language, did you?

8 A. No, I did not have discussions with the
9 Commission.

10 Q. And elsewhere on CDX-6C.42, at the top, you talk
11 about the ALJ's ID in the 1138 investigation where the ALJ
12 found that the Samsung smartphones were the relevant article
13 of commerce.

14 A. Yes.

15 Q. But in that investigation the Notice of
16 Institution didn't include components or modules; isn't that
17 right?

18 A. I don't recall.

19 Q. Could we bring up the Notice of Institution for
20 1138?

21 And do you see the caption up there says, certain
22 LTE- and 3G-compliant cellular communications devices?

23 A. That's what it -- well, it went off my screen.

24 Could you repeat your question?

25 Q. The caption says certain LTE- and 3G-compliant

1 cellular communications devices?

2 A. That is what the caption says on the slide I'm
3 looking at.

4 Q. And then down below -- Mr. Davis, if you would
5 scroll down a little further, I believe it's on page 2 -- it
6 says that the plain language description is personal
7 electronic devices that are compliant with the LTE or 3G
8 3GPP specifications and which enable LTE and/or 3G data
9 transferring communications.

10 Do you see that?

11 A. I see what's on the screen.

12 Q. I want to step back to your opinion about "I
13 don't think the Magnetic Tape factors should be used."

14 Is that a legal opinion?

15 A. Again, I'm not trying to offer a legal opinion.
16 From an economic perspective, and what I've seen done, as
17 you pointed out, I've been involved in over 70 of these
18 investigations, the vast majority of investigations do not
19 require the use of the Magnetic Tapes factors.

20 I've testified to the Magnetic Tapes on a few
21 occasions, but it's not every case that needs it or needs
22 that applied, and because it's not every case that the
23 Complainant trying to expand investments to a product that
24 doesn't practice the patent.

25 And I think here it's clear that the Complainant

1 is not trying to do that. It's looking at investments in
2 the product that practice the patent, which is the end-user
3 device.

4 Q. But we can agree that whether to apply that test
5 is a decision for the ALJ and the Commission, right?

6 A. Oh, absolutely.

7 Q. So let's focus on your analysis regarding the
8 Magnetic Tape factors. I know you talked a bunch about
9 Nokia's licensing practices.

10 The Complainants' licensing practices is not one
11 of the Magnetic Tape factors, right?

12 A. Again, I think the licensing practices gets to
13 whether you have the right DI article.

14 Q. But it's not one of the Magnetic Tape factors?
15 Yes or no?

16 A. I mean, I don't think one of the Magnetic Tapes
17 factors specifically says licensing practices. I would
18 agree with that.

19 Q. Okay. Could we bring up CDX-6.47?

20 This is your summary slide about factor 1, and
21 this factor concerns whether the patented technology is sold
22 as a separate entity or article of commerce, correct?

23 A. That's what that slide says.

24 Q. Now, when the patented technology is sold as a
25 separate article of commerce, that suggests that investments

1 in a downstream product may have less of a connection to the
2 patented technology, right?

3 A. I think that may be what the Commission has said
4 in the past.

5 Q. Okay. And this 1351, I know you were involved in
6 that and you discussed that on your direct.

7 The Commission's opinion in 1351 was released
8 after the IDs in 1379 and 1380, correct?

9 A. Yes. Certainly Magnetic Tapes was in play for
10 many, many cases before that, three, four hundred cases
11 before that.

12 Q. But my question was about 1351.

13 A. Again, 1351 was released, I think, after those
14 IDs, but certainly Magnetic Tapes factors were applied in
15 those cases.

16 Q. Now, you testified a bunch about custom
17 components not being available except through the DI
18 products.

19 But you acknowledge that not all of the DI
20 products here contain custom components, right?

21 A. I would agree.

22 Q. There's a number -- the Surface products, for
23 example, don't contain any custom components?

24 A. I don't have an opinion that they contain custom
25 components.

1 Q. Relevant to this case.

2 A. Relevant to this case.

3 Q. And regarding -- you talked a bit about the
4 Samsung customization, and I want to keep this on the public
5 record, so I'm not going to show the particular documents,
6 but you referenced that the customization rendered these
7 products superior to and that they there were key
8 differences between the Samsung customized Qualcomm products
9 and other Qualcomm products.

10 Do you recall that?

11 A. Yes. I recall the slide you're speaking of.

12 Q. You didn't explain what any alleged key
13 differences or what rendered them superior, did you?

14 A. I don't recall testifying about that
15 specifically. That might be something more a technical
16 expert would testify to.

17 Q. The ITC has said that the first Magnetic Tape
18 factor should focus on the patented technologies, right?

19 A. That's what the factor says, whether the patented
20 technology is sold as a separate entity or article of
21 commerce.

22 Q. You're not claiming that the patented technology
23 here is only available through the DI products, are you?

24 A. No, I don't think I'm making that particular
25 opinion.

1 Q. You're not claiming that consumers can only
2 encode or decode H.264, H.265, or AV1 through Galaxy, Xbox,
3 and Surface only, right?

4 A. No, but for certain of the products that have the
5 custom chips, what I would say is that absolutely is only
6 able to be experienced or exploited if you actually have the
7 custom chipsets.

8 Q. But the video coding standards here are utilized
9 in other products beyond the Microsoft and Samsung DI
10 products, right?

11 A. I don't disagree that the standards may be used
12 in other products.

13 Q. A wide variety of different types of products?

14 A. I don't have an opinion one way or the other on
15 that.

16 Q. You don't know whether there are a lot of
17 products that use video streaming?

18 A. I know there's a lot of products that use video
19 streaming. I also know that there's a lot of licenses that
20 Nokia has entered into.

21 Q. Okay. But does that render the availability of
22 the patented technologies different, whether it's licensed
23 or unlicensed?

24 A. Not necessarily.

25 Q. You've opined that the components here are

1 central to enabling the practice of the video coding
2 standards in the Microsoft and Samsung devices, right?

3 A. The components -- can you repeat the question?

4 Q. You've opined that the components are central to
5 enabling the practice of these video coding standards in the
6 Microsoft and Samsung DI products, correct?

7 A. That's my understanding.

8 Q. And you agree that these components are sold
9 separately by third parties, by AMD, by Qualcomm, by Google?

10 A. I would say they are obviously -- there's obvious
11 collaboration. I gave lots of evidence today about the
12 collaboration. So to the extent they are sold underneath
13 these development agreements that are entered into, that may
14 be true.

15 Q. You have no reason to believe that they are given
16 away for free to Microsoft or to Samsung?

17 A. I don't have evidence to say they are given away
18 for free. Certainly they are part of the development
19 agreement between the two entities.

20 Q. The customization that's done by AMD and
21 Qualcomm, you've seen evidence that those parties do similar
22 customization work for other entities, right?

23 A. It wouldn't surprise me if they do other
24 customization work, but, again, if you want the specific
25 custom chips, you have to buy the specific end-user devices,

1 and that creates that exclusive relationship.

2 Q. And to be clear, you haven't offered an opinion
3 that the patented technology here, the video coding
4 standards, was itself customized, right?

5 A. I don't think I've offered that specific of an
6 opinion, although certainly I've shown evidence that they
7 are working related -- that the work that's being done to
8 customize the chip between the two entities includes work
9 related to the ability to encode and decode video.

10 Q. Whether the patented technology was customized or
11 not is irrelevant to your opinion; isn't that true?

12 A. Whether the patented technology is customized or
13 not? Again, I think my opinion gets back to how do you
14 exploit the patented technology, and to exploit the patented
15 technology you need the end-user device.

16 Q. Do you acknowledge that the Microsoft and Samsung
17 DI products are not the only use for chips that are made by
18 AMD and Qualcomm? And I'm not talking about the specific
19 custom chips. AMD and Qualcomm sell to other customers,
20 right?

21 A. AMD and Qualcomm certainly sell to other
22 customers.

23 Q. So, in other words, even though -- even though
24 Samsung sells a specific Snapdragon 8 for Galaxy to --
25 sorry -- even though Qualcomm sells a specific Snapdragon 8

1 for Galaxy to Samsung, Qualcomm also sells other Snapdragon
2 8 chips that use video-coding technology to other customers,
3 right?

4 A. I haven't reached an opinion on whether they can
5 encode and decode video and whether they are practicing the
6 patents. What I would say is I would agree that they do
7 sell other Snapdragon chips, but they are not for Galaxy,
8 and for all the other reasons I gave, they are not
9 customized and exclusive to those DI products.

10 Q. You have no reason to believe that the other
11 Snapdragon 8 chips lack H.264 or H.265 or AV1
12 functionalities, do you?

13 A. I don't have an opinion one way or the other on
14 that.

15 Q. And same for AMD, you have no reason to believe
16 that AMD's other chips that are sold to other customers
17 suddenly lack H.264 or H.265 or AV1?

18 A. I don't have an opinion one way or the other.

19 Q. Nokia has another -- you talked about Nokia's
20 licensees earlier. You said there were other licensees.

21 Those licensees presumably also practice these
22 patents?

23 A. I haven't formed an opinion on that.

24 Q. You would assume Nokia wouldn't seek to license
25 entities that aren't practicing the patents, right?

1 A. Again, I don't have an opinion.

2 Q. But you'd agree consumers have access to H.264,
3 H.265, and AV1 outside of the Microsoft and Samsung DI
4 products here, right?

5 A. I don't have any information to suggest that
6 consumers don't have access, but if they want access to the
7 custom chipsets, they have to buy the custom products
8 including if they want the custom Android OS.

9 Q. If we could bring up CDX-6.60. This is your
10 opinions regarding Magnetic Tape factor 2.

11 Here you have, whether it is an essential
12 component of the downstream product.

13 The "it" here refers to the patented technology,
14 right?

15 A. Yes. I believe that's embodied in the component
16 for this test.

17 Q. And you said your understanding is that the
18 components do not practice the asserted patents by
19 themselves, right?

20 A. That they must be embedded into an end-user
21 product, that's my understanding.

22 Q. And I believe you said that -- I don't want to
23 put words in your mouth -- it's because the patents require
24 some sort of processor or memory?

25 A. I think we heard that from the technical experts

1 actually.

2 Q. Is that your understanding?

3 A. It's my understanding that, again, the
4 components, to be able to encode or decode video, have to be
5 put or incorporated into an end-user device, and an end-user
6 device is not going to function without the component.

7 Q. But your understanding isn't informed by an
8 element-by-element walkthrough with the technical experts,
9 right?

10 A. Again, it's my understanding -- I'm receiving
11 that understanding from the technical experts who have
12 already testified.

13 Q. So you have --

14 A. Or yet to testify.

15 Q. You have no opinion on how the claims allegedly
16 read on the DI products, right?

17 A. I don't have opinions as to the claims.

18 Q. You have no idea whether the AMD or Qualcomm
19 chips include a processor and memory, do you?

20 A. I don't have an opinion.

21 Q. Is it fair to say that your technical discussions
22 here are assumptions rather than an understanding?

23 A. No. These are understandings based on my
24 discussions that I had at the time of my expert report with
25 the technical experts, and now there's been testimony about

1 that. I don't think my understanding is any different from
2 any other economic expert who is asked to apply the Magnetic
3 Tape factors. They have to reach some understanding from
4 the technical experts; otherwise, they would be a technical
5 expert and not an economic expert.

6 Q. Well, you didn't review Respondents' expert
7 reports, did you?

8 A. No.

9 Q. You don't doubt Respondents' technical experts'
10 qualifications, right?

11 A. I don't have an opinion one way or the other on
12 their qualifications.

13 Q. Fair to say Respondents' technical experts
14 probably have more technical qualifications than yourself?

15 A. That wouldn't surprise me.

16 Q. You have no reason to doubt the veracity of their
17 opinions?

18 A. Again, to the extent that their opinions are
19 different than the opinions that I've received from my
20 technical -- or from the technical experts for Nokia, I'm
21 sure the experts disagree. That's pretty common in these
22 types of cases, that experts are going to disagree.

23 Q. But you chose to only review Complainants'
24 experts' opinions and not Respondents' experts' opinions;
25 isn't that right?

1 A. I relied on discussions with the technical
2 experts that I had access to, and the only technical experts
3 I have access to to have a discussion with are Nokia's
4 technical experts.

5 Q. You were here for Dr. Chrissan's testimony
6 yesterday?

7 A. Yes, for most of it.

8 Q. And you're aware that Complainants' experts here
9 have primarily relied on an analysis of the components'
10 source code for infringement and domestic industry, right?

11 A. Again, I don't know exactly all the technical ins
12 and outs, so I'm probably not the one that's going to be
13 able to testify about that.

14 Q. I think I saw you in the back of the courtroom
15 yesterday.

16 Do you recall when Dr. Chrissan put up a slide
17 that showed all of the different source code from the
18 various -- from the various different component makers? It
19 was CDX-5, page 111. We don't need to throw that up.

20 A. I was going to say, I saw 120 slides yesterday.
21 Since I'm not a technical expert, it's hard for me to keep
22 track of exactly which one you're speaking of.

23 Q. I want to turn to the 1379 and 1380
24 investigations. I know you were involved in both of those.

25 And you referenced during your direct that ALJ

1 Elliot in 1380 disagreed with you, at least in part, in his
2 opinion; isn't that right?

3 A. I think ALJ Elliot agreed with me in the sense
4 that there was a domestic industry and the domestic industry
5 was on the Xbox.

6 Q. But isn't it true that ALJ Elliot in 1380 found
7 that the patents were practiced by the source code in the
8 components themselves, not the downstream products?

9 A. I don't recall.

10 Q. You don't recall?

11 Could we bring his report at page 93, note 219?
12 Sorry. Paragraph 93, note 219, so down at the bottom.

13 Do you see, I understand that, in the 1380
14 investigation, ALJ Elliot concluded that the patented
15 technology was practiced by the source code in the chipsets
16 based on the specific presentation of the technical claims'
17 limitations in that case?

18 Do you see that?

19 A. I do see that.

20 Q. You have no reason to doubt that ALJ Elliot was
21 correct in that finding, do you?

22 A. I don't, but I would note that, if you read the
23 rest of that footnote, it gets back to what my direct
24 testimony was, that my understanding is in this
25 investigation the technical experts will provide evidence

1 showing the entire product practices the patent and thus
2 that the investments in their products are necessary for the
3 patented technology.

4 Q. But you didn't explain what evidence was
5 allegedly missing from the 1380 investigation, did you?

6 A. No. I think -- but, again, I didn't specifically
7 explain it, because I knew it was going to be presented by
8 the technical experts, which it has.

9 Q. The patents could be practiced by both the
10 chipsets and the end-user devices; isn't that right?

11 A. I don't have an opinion one way or the other on
12 that.

13 Q. Isn't that what was true in the 1351
14 investigation?

15 A. I have to be careful about talking specifically
16 about the facts of the 1351 investigation given the CBI
17 requirements, especially if you're going to keep me on the
18 public record.

19 Q. Fair enough. Nokia's relying here on the same DI
20 products that it did in the 1380 investigation, right?

21 A. Are they relying on the same products? Is that
22 what you're saying?

23 Q. Same DI products?

24 A. I think generally it's the same sets of products.
25 There may be additional products or some products that fell

1 out. Depends on when the products were launched obviously,
2 but it's the same categories of products.

3 Q. Three of the four patents at issue here were also
4 asserted in 1380?

5 A. I believe that's correct.

6 Q. You testified that the components here are not
7 capable of encoding or decoding video on their own and need
8 to be physically connected or integrated to the DI products;
9 is that right?

10 A. Can you repeat that question? I'm sorry.

11 Q. You said that the components here aren't capable
12 of encoding or decoding video on their own and they need to
13 be connected or integrated with the DI products?

14 A. That's my understanding, that the components need
15 to be integrated or embedded into an end-user device in
16 order for those end-user devices to function as intended.

17 Q. And you said customers expect to see video
18 streaming in these products?

19 A. Customers expect these products to have the
20 ability to stream video.

21 Q. The market expects devices to decode video
22 according to particular video coding standards, correct?

23 A. Again, I don't have an exact opinion on whether
24 they expect them to decode video. I would say to the extent
25 decoding video is necessary to have a streaming product in

1 the marketplace, again, from a consumer perspective, it
2 expects those device to be able to stream video.

3 Q. And the marketplace also expects the devices to
4 encode bitstreams that are standards-compliant, right?

5 A. Again, I think that's more of a technical
6 opinion, when you're going to get into whether it encodes
7 and decodes. Again, for my purposes and my understanding,
8 these components are necessary and they are necessary to be
9 embedded, and once they are embedded, then the end-user
10 device can stream video. And how it encodes and decodes, I
11 leave that to the technical experts.

12 Q. Mr. Davis, can we bring up Mr. Herrington's
13 report at paragraph 97? Maybe we could refresh his
14 recollection.

15 And do you see the bottom, the last full sentence
16 there, due to the nature of standardized decoding
17 technologies, I understand that the marketplace expects
18 devices to decode according to the Standards and encode
19 bitstreams that are standard-compliant?

20 A. Yeah. And if you look at footnote 233, I'm
21 relying on my discussion with Dr. Chrissan and Dr. Moulin.

22 Again, that gets back to what I was saying
23 before. I have an understanding of the technical background
24 based on my discussions with the technical experts at the
25 time of my report, and certainly now the technical experts

1 have testified, and, again, that supports my understanding
2 for my analysis.

3 Q. And your understanding is also that the ability
4 to both encode and decode video is extremely important to
5 the downstream product; isn't that right?

6 A. Again, you would have to show me where that is in
7 my report.

8 Q. I can show you in your deposition, if you'd like.

9 We can bring up Mr. Herrington's deposition at
10 231, 24, to 232, 2.

11 JUDGE MCNAMARA: While he is looking, what's the
12 date of the deposition?

13 MR. RIZZOLO: I believe it is December 4th.
14 December 4th, 2025. Your Honor, you asked that question
15 yesterday and I meant to write it down.

16 JUDGE MCNAMARA: At least I'm consistent in some
17 things.

18 Q. Here it says, certainly the patented technology
19 here or the ability to encode and decode video is extremely
20 important to the downstream product, or in this case, the
21 end-user device.

22 Do you see that?

23 A. So when I'm speaking of encoding and decoding
24 video, again, it's the ability to stream. That's my
25 understanding of it from an economic perspective. I'm not

1 here to offer technical opinions.

2 Q. And on that note, I know you're not a technical
3 expert, but you understand that the video coding standards
4 at issue here aren't the only video coding standards
5 available, right?

6 A. It wouldn't surprise me if there's other
7 standards.

8 Q. You're aware of alternatives like VP8, VP9, VVC?

9 A. Again, I don't -- I don't know of all the other
10 standards. I know here these standards -- there's a reason
11 that you standardize something and there's a reason that the
12 market wants that standard and wants those -- the ability to
13 stream video. If the standards here are the best way to
14 stream video, that's what consumers want.

15 Q. You mentioned YouTube during your direct.

16 You don't know what codec video streaming
17 technology is used by YouTube, do you?

18 A. As I sit here I would not.

19 Q. And yes or no, you haven't offered the opinion
20 that H.264, H.265, and AV1 are the only video streaming
21 standards that can be used by the Microsoft or Samsung DI
22 products?

23 A. I don't have an opinion on that.

24 Q. And you don't dispute that Microsoft or Samsung
25 could use different components to enable H.264, H.265, or

1 AV1, do you?

2 A. I don't have an opinion except for the fact that
3 the custom components are customized for those products and
4 they spent lots of time, lots of money, making sure that
5 they have these custom components. So I don't think
6 that's -- that's not what either those companies want to do,
7 is use a different chipset.

8 Q. Fair enough. If they were to use a different
9 chipset, they would require modification or customization,
10 right?

11 A. I don't know what they would require. They have
12 spent years developing these chips.

13 Q. So a modification or customization was required
14 to use these particular Qualcomm and AMD chipsets within the
15 Xbox and the Galaxy products, right?

16 A. I think what I'd say is that these chips were
17 customized, and as they were doing that work to customize
18 them, I'm sure they had an eye towards how these would be
19 integrated into the downstream or the end-user device.

20 Q. If Microsoft were to stop selling the Xbox and
21 Surface, and Samsung were to stop selling the Galaxy,
22 consumers could still get access to the patented
23 video-coding technologies through other devices, couldn't
24 they?

25 A. I don't have an opinion one way or the other on

1 that.

2 Q. I could still stream video through my iPhone if
3 Microsoft stops selling the Xbox, right?

4 A. You could still stream video. I would agree you
5 could stream video. To what quality, I'm not sure.

6 Q. I want to turn to your opinion regarding factor
7 3, and I know we had a bit of a colloquy there during your
8 direct.

9 Could we bring up CDX-6.63?

10 Sorry. 6.63.

11 This factor concerns whether the domestic
12 activities are directly related to the exploitation of the
13 patented technology.

14 I want to be clear here. The domestic
15 investments and activities that you quantified during your
16 direct testimony concern the Microsoft Xbox products,
17 Surface products, and Samsung DI products as a whole, right?

18 A. The investments are related to producing and
19 commercializing a product that can be sold in the
20 United States. So they are all critical and necessary, yes.

21 Q. So those activities and investments don't
22 necessarily have a direct relationship to the exploitation
23 of the patented technology; isn't that right?

24 A. I would say it's direct in the sense that, if you
25 don't have an end-user product, you cannot exploit the

1 patented technology.

2 Q. So to create a Microsoft Xbox, you need to put a
3 housing around the electronics, right?

4 A. I can agree with that. I'm not a technical
5 expert or an expert in manufacturing, but I would tend to
6 agree that the Xbox has some sort of housing around it.

7 Q. So the plastic housing, investments in the
8 plastic housing, that's directly related to the patented
9 video-coding technologies here? That's your testimony?

10 A. I would say it's directly related to exploiting
11 the patented technology, because it's my understanding you
12 can't exploit the patented technology unless you have an
13 end-user device.

14 Q. And the screws that are used to hold the housing
15 together, those are directly related to the exploitation of
16 the video-coding technology here?

17 A. They are exploitation of the patented technology
18 to the extent that you cannot exploit the patented
19 technology unless you have an end-user device.

20 Q. If you have an end-user device; isn't that right?
21 You don't need to exploit the patented technology through
22 the Microsoft or Samsung DI products, correct?

23 A. You certainly do for all the customized chips for
24 the Xbox, the customized chips for the Qualcomm and Samsung
25 Galaxy, and for all Galaxy products that have the customized

1 OS.

2 Q. You did not express any opinion that Microsoft or
3 Samsung customized the video-coding functionality in the DI
4 products, did you?

5 A. Again, I think I walked through evidence that
6 made it very clear that Microsoft is directly investing in
7 the ability to encode and decode video in the Xbox and that
8 Samsung is directly investing in the Android OS, and that's
9 the evidence I've put forward in my direct.

10 Q. My question was a little different though.

11 You didn't express any opinion that Microsoft or
12 Samsung customized or changed the video-coding functionality
13 in the DI products, right?

14 A. Are you asking if they have changed the standard?
15 I don't think I've seen evidence that they changed the
16 standard. I think it's -- again, what I understand is what
17 they have done is that the exploitation -- that they are
18 working on ways to exploit that standard. In other words,
19 how is that standard going to be -- how is that standard
20 done within the product. That's my understanding.

21 Q. You didn't quantify any Microsoft or Samsung
22 investments in customizing video encoding technology,
23 correct?

24 A. Again, I think they are included within my
25 analysis and with my investments, but there is no breakout

1 that's specific just to that.

2 Q. You didn't quantify any amount of customization
3 related to investments by Microsoft or Samsung, did you?

4 A. Again, I think it's included in my analysis, as
5 I've already testified to.

6 Q. But you didn't separately quantify any amount of
7 customization related to investments by Microsoft or
8 Samsung, did you?

9 A. I didn't separately break that out.

10 Q. And you didn't express any opinion that Microsoft
11 or Samsung invests significantly in the customization of any
12 components, did you?

13 A. I don't have a significance opinions on just
14 component investments.

15 Q. Thank you.

16 MR. RIZZOLO: I have no more questions. Pass the
17 witness.

18 JUDGE MCNAMARA: Thank you, Mr. Rizzolo.

19 MS. DUCCA: Your Honor, the Staff has no
20 questions for Mr. Herrington at this time, but I'm wondering
21 if this would be a good time for our break.

22 JUDGE MCNAMARA: It sure would be. We'll come
23 back and Mr. Newcomer will have an opportunity to redirect,
24 if he likes. See you in 15 minutes.

25 (Whereupon, the proceedings recessed at 11:32

1 a.m.)

2 (In session at 11:50 a.m.)

3 JUDGE MCNAMARA: Thank you, everyone. Please
4 take your seats.

5 Mr. Newcomer? I see you're ready to redirect.

6 MR. NEWCOMER: I actually am not, Your Honor.
7 Unless you have questions for him, we will leave the record
8 as it stands.

9 JUDGE MCNAMARA: All right. Very good. Then
10 we're finished.

11 Mr. Herrington, you're free to go.

12 MR. NEWCOMER: My colleague, Erik Fountain, is
13 going to come up to introduce the next witness. My
14 apologies to Respondents' counsel. We actually -- I had a
15 miscommunication about the witness order, but we've got it
16 cleared up and are all ready to go.

17 JUDGE MCNAMARA: Good.

18 So here is what I would appreciate. I was just
19 reminded of this. Sometime at the end of the day, since
20 you -- again, you've rearranged some time and witness order,
21 would you make sure that you put it in print and send us a
22 copy so we can see how time has changed and what the order
23 is now?

24 MR. NEWCOMER: Absolutely.

25 JUDGE MCNAMARA: By the end of the day maybe?

1 MR. NEWCOMER: Thank you.

2 JUDGE MCNAMARA: Thank you.

3 MR. FOUNTAIN: Good morning, Your Honor. Erik
4 Fountain from McKool Smith. Nokia's next witness that we'll
5 call is Dr. Susanna Martikainen.

6 JUDGE MCNAMARA: Thank you.

7 Good morning.

8 SUSANNA MARTIKAINEN,

9 having been first duly sworn or affirmed on
10 their oath, was thereafter examined and testified as
11 follows:

12 JUDGE MCNAMARA: Please state your name.

13 A. My name is Susanna Martikainen.

14 JUDGE MCNAMARA: Thank you very much.

15 DIRECT EXAMINATION

16 BY MR. FOUNTAIN:

17 Q. Good morning, Ms. Martikainen. Will you please
18 take a moment and introduce yourself?

19 JUDGE MCNAMARA: Ms. Martikainen, Mr. Fountain is
20 going to help you. The microphone should be in green and it
21 is very temperamental.

22 A. So my name is Susanna Martikainen. I work as a
23 chief licensing officer of wireless technologies at Nokia.

24 JUDGE MCNAMARA: Thank you.

25 Q. And, Ms. Martikainen, is English your first

1 language?

2 A. No, it is not.

3 Q. Where did you fly in from?

4 A. I flew in from Finland.

5 Q. And do you have a flight out later today?

6 A. Yes, I do.

7 Q. Okay. We'll make sure you get your flight.

8 Ms. Martikainen, what is your role at Nokia?

9 A. I am responsible for Nokia's smartphone licensing
10 program and also for the automotive and technology licensing
11 programs, and I also took over the responsibility for
12 consumer electronics licensing program in March 2025.

13 Q. How long have you been at Nokia?

14 A. Over 26 years.

15 Q. And over the course of your 26 years at Nokia,
16 how many licensing negotiations -- or licenses have you
17 concluded?

18 A. I think that I have been involved somehow in over
19 100 licensing negotiations.

20 Q. Were you here for opening statements?

21 A. Yes. Yes, I was.

22 Q. And did you hear an argument from counsel for
23 Respondents that Nokia uses litigation injunctions to
24 extract supra-FRAND or supra-RAND royals?

25 A. I did hear that allegation, yes.

1 Q. Do you agree with that?

2 A. Absolutely not.

3 Q. In your experience, do most of Nokia's licenses
4 get done in litigation or outside of litigation?

5 A. Most of the licenses get concluded outside of
6 litigation. At some point we calculated that clearly over
7 90 percent of our license agreements have concluded outside
8 the litigation context.

9 Q. And here has Nokia asked for higher royalty rates
10 in litigation than it did outside of litigation?

11 A. No, we have not.

12 Q. With respect to Acer and ASUS, what has your
13 involvement been in those negotiations?

14 JUDGE MCNAMARA: Pardon me just a moment. Should
15 we be on the confidential record?

16 MR. FOUNTAIN: Briefly we will transfer. I will
17 announce that.

18 JUDGE MCNAMARA: Thank you. I appreciate that.

19 MR. FOUNTAIN: Absolutely, Your Honor.

20 A. So I have overseen the team that is responsible
21 for the negotiations, and I was also directly in person
22 involved in them, in the negotiations in the end of 2025 and
23 also in the beginning of 2026.

24 Q. What are you here to testify about?

25 A. I'm here to testify about Nokia's video licensing

1 program and also to give an overview on Nokia's licensing
2 negotiations with Acer.

3 Q. And who from Nokia will be addressing the ASUS
4 negotiations?

5 A. Mr. Robert Gray.

6 Q. Now, your presentation that we have pulled up on
7 CDX-9 contains emails and offers from the negotiation record
8 between Acer and Nokia.

9 In your role as chief licensing officer, have you
10 reviewed the negotiation record with Acer?

11 A. Yes, I have.

12 Q. And are those negotiation records information
13 that Nokia keeps in the regular course of business?

14 A. Yes. Yes, we do that.

15 Q. When you started at Nokia 26 years ago, what was
16 Nokia's primary business at that time?

17 A. So Nokia was a leading mobile phone vendor at
18 that time.

19 Q. And today what is the biggest business at Nokia?

20 A. Networks business is the biggest business today.

21 Q. And does that include base stations that we see
22 near cell towers?

23 A. Yes, it does include those products as well.

24 Q. And what is Nokia's worldwide market share in
25 base stations?

1 A. It is approximately 20, 25 percent.

2 Q. How much does Nokia spend on research and
3 development every year?

4 A. Over four billion euros per year.

5 Q. Based on your work in Nokia licensing and
6 alongside Nokia engineers, do you have a high-level
7 understanding of Nokia's involvement in the development of
8 video standards?

9 A. Yes, I have a high-level understanding of that.

10 Q. We're going to slide 3 here, Ms. Martikainen.
11 Will you tell everyone here how Nokia came to be involved in
12 the video standards?

13 A. So in late 1990s, Nokia was a leading mobile
14 phone vendor, and we wanted to incorporate camera
15 functionalities in our products and also video
16 functionalities. And these are some examples of early Nokia
17 phones that incorporated cameras and also video
18 technologies.

19 Q. Did you own any of these phones?

20 A. I owned this Nokia 6680 phone.

21 Q. Did these phones use video codecs?

22 A. Yes, these products used, according to my
23 recollection, the early H.263 standard.

24 Q. Moving on to slide 4, in addition to developing
25 camera phones, was Nokia also working on its own codec?

1 A. Yes. Yes, we were. So we were developing our
2 own proprietary codec called mobile video codec, MVC.

3 Q. How did Nokia come to get involved in the
4 development of the H.264 standard?

5 A. So ITU development standardization organization,
6 they issued a call for proposals in 1998, and Nokia
7 submitted its own proprietary codec as a contribution to the
8 standardization work.

9 Q. And what happened to Nokia's proposal and
10 contributions of its internal work?

11 A. So that contribution was then combined together
12 with the contributions from a company called Telenor, and
13 together these contributions became the foundation for the
14 H.264 codec.

15 Q. Did Nokia also participate later in the
16 development of the H.265 standard?

17 A. Yes, we continued to be involved also in the
18 H.265 standardization work.

19 Q. Moving to slide 5, has Nokia been recognized for
20 its special contributions to the standards?

21 A. Yes, we have. So, for example, Judge Robart
22 concluded in his Microsoft v. Motorola decision that Nokia
23 was one of the entities that made possible much of the
24 innovation associated with the H.264 Standard.

25 Q. Let's talk about the size of Nokia's portfolios.

1 In your experience licensing standard-essential
2 patents, do those patent portfolios remain the same size
3 over time?

4 A. No, it's quite natural that the portfolios evolve
5 over time.

6 Q. And today how big is the H.265 standard?

7 A. H.265 portfolio, I think that we have close to
8 380 individual patents.

9 Q. And at its peak, when Nokia began negotiating
10 with Acer, for instance, in around 2019 or so, how big was
11 the 264 portfolio at that time?

12 A. It was close to the same number, so I think it
13 was close to 300 individual patents at that time.

14 MR. FOUNTAIN: At this point, Your Honor, we are
15 going to go on to the CBI record, so this is Nokia and
16 third-party CBI.

17 (Whereupon, the hearing proceeded in confidential
18 session.)

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1 O P E N S E S S I O N

2 JUDGE MCNAMARA: Good afternoon, Mr. Gray.

3 A. Good afternoon.

4 JUDGE MCNAMARA: Would you kindly, once you're
5 settled or in your space here, would you kindly stand and
6 raise your right hand, without falling off the witness
7 stand.

8 ROBERT GRAY,

9 having been first duly sworn or affirmed on
10 their oath, was thereafter examined and testified as
11 follows:

12 JUDGE MCNAMARA: Please state your full name.

13 A. Robert Martin Gray.

14 JUDGE MCNAMARA: Thank you very much.

15 MR. CHERN: May I proceed, Your Honor?

16 JUDGE MCNAMARA: Yes.

17 DIRECT EXAMINATION

18 BY MR. CHERN:

19 Q. Good afternoon, Mr. Gray.

20 A. Good afternoon.

21 Q. Could you please just reintroduce yourself to the
22 Court?

23 A. Sure. My name is Robert Gray.

24 Q. Where do you work, Mr. Gray?

25 A. In Finland, near Helsinki, in Espoo, Nokia

1 corporate headquarters.

2 Q. And you work for Nokia?

3 A. Nokia Technologies, yes.

4 Q. What's your role at Nokia?

5 A. I'm one of the directors of patent licensing for
6 consumer electronics.

7 Q. Have you ever testified at trial like this
8 before?

9 A. I have not. Happy to be here.

10 Q. Okay. Let's just start easy with your
11 background. What do you do as part of your everyday job for
12 Nokia?

13 A. I have two roles. One of them is I'm the
14 negotiator -- I'm one of the negotiators on the negotiation
15 teams. And then, more broadly, I'm an advisor. I've been
16 around quite a while, so people have questions they come to
17 me and I try to give them my perspective.

18 Q. How long have you been negotiating patent
19 licenses for Nokia?

20 A. Well, I've been -- I've worked for Nokia since
21 2006, and shortly after moving to Finland in 2007 I
22 started -- I started being part of the negotiation teams.

23 Q. So about 20 years?

24 A. Almost 20 years.

25 Q. Almost 20. How many licenses in those 20 years

1 have you helped negotiate?

2 A. Dozens.

3 Q. Is there anyone at Nokia who has negotiated more
4 video licenses than you have?

5 A. Patrik HammarOn, our head of Nokia Technologies,
6 might have, but I'm up there.

7 Q. And when might you be personally brought in to
8 lead a negotiation?

9 A. Quite often when -- my role increases or I become
10 lead negotiator when the negotiations have come to a
11 loggerhead, there's some problem with moving forward, and
12 I'm brought in to bring in some new energy.

13 Q. Were you personally brought in to lead the ASUS
14 negotiations for Nokia?

15 A. I was.

16 Q. When was that?

17 A. Around the beginning of 2025.

18 Q. Why did you take over as lead negotiator in the
19 ASUS negotiations?

20 A. Well, this was another one of those cases where
21 the negotiations had been hung up for a while and they
22 really weren't going anywhere. So I was brought in to see
23 if -- as I say, new energy, new thinking, new feel, try to
24 see if we could break through and come to an agreement.

25 Q. I think we're going to look at some negotiation

1 correspondence. Before you took over as lead, were you
2 providing advice internally at Nokia on the ASUS
3 negotiations?

4 A. I was.

5 Q. Are you familiar with the ASUS Nokia
6 correspondence?

7 A. I am.

8 Q. Before getting into the ASUS negotiations, I want
9 to talk about some of Nokia's licensees.

10 MR. CHERN: And at this time it probably makes
11 sense to go on the Nokia confidential record.

12 (Whereupon, the hearing proceeded in confidential
13 session.)

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1 O P E N S E S S I O N

2 JUDGE MCNAMARA: Good afternoon.

3 A. Good afternoon.

4 JUDGE MCNAMARA: Would you kindly raise your
5 right hand.

6 BIJAN DASTMALCHI,

7 having been first duly sworn or affirmed on
8 their oath, was thereafter examined and testified as
9 follows:

10 JUDGE MCNAMARA: Please state your name.

11 A. I'm Bijan Dastmalchi.

12 JUDGE MCNAMARA: Very nice to meet you.

13 DIRECT EXAMINATION

14 BY MR. NEWCOMER:

15 Q. Good afternoon, Mr. Dastmalchi.

16 A. Good afternoon.

17 Q. Can you please tell the Court what you're here to
18 do?

19 A. Hi. I'm Bijan Dastmalchi, and I'm here on behalf
20 of Nokia to provide an opinion on whether or not there would
21 be a shortfall of products if Respondents' products were
22 excluded from the market or subject to a cease-and-desist
23 order.

24 Q. Have you prepared some demonstrative materials to
25 assist with your testimony today?

1 A. Yes, I have.

2 Q. Are they here at CDX-7C?

3 A. That's correct.

4 Q. If we could have CDX-7C.1?

5 Let's talk a bit about your background. Can you
6 please walk us through your education?

7 A. Yes. I have a Bachelor of Science in mechanical
8 engineering from UC Berkeley and an MBA from Santa Clara
9 University.

10 Q. How long have you worked in the electronics
11 industry?

12 A. Over 30 years.

13 Q. I see down here on the left side there are some
14 acronyms, ODM, CM, and OEM. Could you explain those to ALJ
15 McNamara before we proceed further?

16 A. Yes, absolutely. So OEM stands for original
17 equipment manufacturer. These are companies like HP and
18 Dell and Lenovo. These are the companies whose logos
19 basically appear on the product.

20 ODMs are entities, manufacturing entities with
21 deep design experience that design and manufacture.

22 And contract manufacturers, or CM, are
23 effectively like ODMs except with less design capability.

24 Q. Where do you currently work?

25 A. I'm cofounder and senior consultant at Symphony

1 Consulting.

2 Q. What do you do at Symphony?

3 A. So Symphony has two practice areas. One is in IT
4 and the other one is in supply chain.

5 In the supply chain part of our business, I
6 engage primarily in helping clients, OEM clients select
7 ODMs, negotiate contracts, put together demand management
8 programs, forecasting practices, putting together processes
9 and mechanisms for responding to unexpected fluctuations in
10 demand. Those are a few examples.

11 Q. How many companies -- excuse me. How many audits
12 have you conducted of the supply chain companies?

13 A. Yeah, so that's a large part of what we do in
14 supplier selection and qualification. I've done over 200
15 site audits of various companies internationally.

16 Q. Before Symphony where did you work?

17 A. So I worked at ODMs, OEMs. So Selectron
18 Corporation, for example, is an ODM. I worked for three
19 OEMs, NetSchools, Trimble, Navigation, and HP. NetSchools
20 and HP are computer manufacturers. NetSchools is in the
21 educational sector, and I think we're all familiar with HP's
22 broad line of products.

23 Q. Have you served as an expert in the field of
24 electronics supply chain for litigation before?

25 A. Yes, I have.

1 Q. Does that include investigations in the ITC?

2 A. Yes.

3 MR. NEWCOMER: Your Honor, at this time I tender
4 Mr. Dastmalchi as an expert in the field of electronics
5 industry supply chain.

6 MR. MILLER: Zach Miller for Respondents,
7 Your Honor. No objection.

8 JUDGE MCNAMARA: Okay. Thank you. Then
9 Mr. Dastmalchi is accepted as a witness on the topics for
10 which he has been called to testify without objection.

11 MR. NEWCOMER: Thank you, Your Honor.

12 Q. Mr. Dastmalchi, what did you conclude about
13 whether completing suppliers can meet consumer demand if
14 Respondents' accused products are excluded from the market?

15 A. Yeah, so as we can see in the next slide, slide
16 number 3, I've concluded that there would absolutely be no
17 shortfall, and I have taken the extreme position that we're
18 going to, without notice and in the form of a surprise,
19 literally flip a switch and all of a sudden supply stops.

20 That's because of the reasons that you see stated
21 here. We're talking about very small market shares here, 10
22 to 12 percent. That's noise for the competitors to respond
23 to.

24 There's inventory that's in the channel. These
25 are products that are boxed up and ready to be put on the

1 market.

2 There are contractual flexibility programs that
3 require ODMs to ramp up capacity to be able to meet
4 fluctuations, and the components that are used in this
5 industry are, by and large, standard components.

6 Q. If we could have slide 4, please.

7 To provide some context, can you explain to us at
8 a high level the supply chain for the PC industry?

9 A. Yes. And, again, this is a very high-level
10 depiction of what this supply chain looks like.

11 On the left side we have component suppliers.
12 These are the standard components, like micron memory or
13 Intel microprocessors, Seagate disk drives, Samsung
14 displays.

15 These components are shipped into ODMs, and the
16 ODMs receive these products, they integrate them, they test
17 them, they box them up and make them ready, and they ship
18 them either directly to the OEMs or they send them to
19 value-added resellers and retailers, like, you know, we have
20 all been to Best Buy and Costco and seen these products on
21 the shelf, and from there obviously they end up in the hands
22 of the end users.

23 Q. What advantage does this ODM model provide to the
24 supply chain?

25 A. The ODM model provides flexibility and economies

1 of scale. So think of it like a latex glove, where you're
2 blowing air and, you know, inflating the fingers, and each
3 of the fingers represents an ODM -- an OEM, excuse me -- and
4 you press one finger and air just flows into the other ones.

5 That's really effectively how the ODM model
6 works.

7 Q. In what part of this process are the inputs, the
8 components you talk about on the left side, assembled into
9 finished goods that are dedicated to one of the OEM brands
10 on the right side?

11 A. Yeah, so there's a model in the electronics
12 industry called postponement manufacturing. That's where
13 you delay the customization of the product at the very end
14 of the manufacturing process. So it's very late stage, and
15 much of the differentiation takes place with software.

16 Q. If we could have slide 5, please.

17 Do the ODMs that particular OEMs have overlap
18 throughout the industry?

19 A. Absolutely. And that's why I use that latex
20 glove analogy, because you can see the commonality here.
21 Look at the OEMs that are listed on the left column and then
22 all the X's that we have in this table. This is very common
23 in this industry.

24 Q. And the exhibits down there at the bottom, are
25 those the documents that you used to create this table?

1 A. That is correct.

2 Q. Based on your experience in the electronics
3 supply chain, what will actually happen if an exclusion
4 order is entered here?

5 And if we could have slide 6, please.

6 A. Yeah. So what really happens is the central part
7 of all of this is forecasting, forecasting mechanisms to the
8 suppliers. So what will happen is that the forecast for
9 competitors, like Dell and HP, will increase and the
10 forecast for the Respondents will decrease, and they are fed
11 upstream into the ODMs, and those numbers are entered into
12 the ERP systems, which are complicated software packages
13 inside these companies. And that information gets loaded in
14 there and passed upstream into the supply chain.

15 Q. What will happen to these component suppliers if
16 there was an exclusion order?

17 A. So they will just see demand shift from one OEM
18 to another, again, because these are standard suppliers that
19 serve all the different OEMs.

20 Q. Now, Dr. Phiroz, who is Respondents' expert, says
21 that you have failed to account for long lead time inputs,
22 like I believe he identifies microprocessors or CPUs.

23 Could you explain how -- if and how your model
24 accounts for that?

25 A. Yeah. So forecasting, as I said, is really the

1 foundation of all this, and I'll explain a little bit later
2 through flexibility parameters how those forecasts are
3 adjusted upward to provide a cushion for demand increases.

4 But all of this is baked into the supply chain.
5 All these different lead time considerations are put into
6 MRP systems or ERP systems, and lead time is one of the
7 inputs into these ERP systems that drives how supply gets
8 pipelined upstream in the supply chain.

9 Q. And this deals with the U.S. market. We heard
10 earlier today about the fact that ASUS and Acer supply
11 computers worldwide. Could they still after an exclusion
12 order build and supply computers to the rest of the world?

13 A. Absolutely.

14 Q. All right. Let's go to slide 7, please.

15 Let's turn to how the OEMs are going to meet the
16 demand that will be occasioned by an exclusion order here.
17 What factors did you consider in your analysis?

18 A. So I looked at multiple layers of protection,
19 and, again, there's a lot of flexibility in the supply
20 chain, and I don't believe there's going to be any type of a
21 shortfall. And I'll explain these six factors here in a
22 minute.

23 Q. Have you used some of these factors to quantify
24 how the industry will meet demand?

25 A. Yes. I used the first three, actually, if we can

1 go to the next slide, the first three are really the ones
2 where I have done some quantitative analysis.

3 Q. Could you explain how each of those three factors
4 impacts your analysis?

5 A. Yes. Absolutely. So the first one is product
6 that is readily available in the supply chain, and this is
7 based on the financial statements of companies as reported
8 publicly.

9 This is inventory that is a one-time shot in the
10 arm, immediately available, on the shelves, that they can
11 put on the market.

12 Then we've got flexibility parameters on the
13 production line of the ODMs. This is where it's built into
14 the system to be able to ramp up to meet unexpected surges
15 in demand. And then you have manufacturing capacity, which
16 really means it's their capacity to be able to enable these
17 flexible parameters on the production line of the ODMs.

18 Q. If we could go to the next slide, slide 9,
19 please.

20 Can you briefly describe what conclusion you've
21 reached before we show the details of your analysis?

22 A. Absolutely. So, again, bottom line, we'll
23 explain all the information on the top, but if you look at
24 the bottom row, you'll see that there's going to be
25 absolutely no shortfall. In fact, there is going to be

1 anywhere from a 7 percent surplus in the first month, 20
2 percent in the second month, and 55 percent in the third
3 month. That's what the market is capable of doing.

4 MR. NEWCOMER: Your Honor, at this time we need
5 to go on the party CBI record. So it would only be third
6 parties, non-Nokia and nonrespondents.

7 (Whereupon, the hearing proceeded in confidential
8 session.)

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1 O P E N S E S S I O N

2 BY MR. NEWCOMER:

3 Q. Can you walk us through the calculation you did
4 of the existing inventory that's already in channels that
5 could satisfy any unmet demand?

6 A. Absolutely. So this is number one on the list
7 that we were looking at earlier. That's inventory in the
8 channel.

9 The way we come up with that is we look at
10 inventory turns. Inventory turns is one of the most
11 fundamental KPIs in supply chain management, and it is
12 measured by -- it's calculated by dividing cost of goods
13 sold or cost of revenue by actual inventory level. And,
14 again, remember, both the numerator and the denominator are
15 recorded in dollars. Inventory is in dollars, not units.

16 So we take that ratio and we work through the
17 math to calculate weeks and months of supply. And in the
18 end, if we go to the next slide, we'll see that we end up
19 with approximately 1.2 months of channel inventory that is
20 available and on the shelf, like I said, as a one-time shot
21 in the arm to be placed in the market to absorb any type of
22 a shortfall that might result here.

23 Q. To be clear, this is inventory that's ready day
24 one?

25 A. Yes, exactly.

1 Q. Now, do the COGS and inventory numbers that you
2 use here include goods other than PCs?

3 A. Yeah, exactly, they do. So, for example, if you
4 look at the inventory figure, it's reported in aggregate in
5 the financial statement of companies, but then COGS is also
6 reported in aggregate.

7 So if you start carving out different types of
8 products, say we want to carve out the non-accused products
9 from inventory because the inventory is inflated, well, then
10 you have to proportionately carve out the cost of goods sold
11 associated with those non-accused products from the
12 numerator. You effectively end up with the same ratio of
13 inventory turns.

14 Q. In your experience in the industry, is this a
15 reasonable method to figure out the inventory turns?

16 A. Absolutely.

17 Q. Now, Dr. Phiroz criticizes you for not applying
18 other metrics potentially to calculate these types of
19 quantitative metrics. What's your response to that?

20 A. Yeah. I mean, this is the -- in terms of
21 inventory and the supply that is needed to absorb an
22 immediate response, this is the most fundamental, and I
23 don't agree with Dr. Phiroz. There are flexibility
24 parameters, obviously, that we can look at.

25 Q. Let's go to those next. If we could have slide

1 14, please.

2 What are flexibility parameters?

3 A. Okay. So now we're moving one step up in the
4 supply chain into the ODMs. Flexibility parameters are
5 percentages that are tied to the forecast to provide a
6 cushion.

7 So, for example, let's say we have demand for a
8 thousand units of a product on a monthly basis, and we have
9 the flexibility parameters that I've conservatively used
10 here in my calculations, 10 percent within a month, 25
11 percent within two months, and 50 percent within three
12 months.

13 What this means at the ODM is that the ODM needs
14 to be able to respond to shipping the 1,100 units one month
15 out, 1,250 units two months out, and 1,500 units three
16 months out. That's the flexibility parameter, and that's
17 what the cushion is.

18 Q. What is the basis of your knowledge about these
19 types of flexibility parameters in the electronics supply
20 chain?

21 A. So these flexibility parameters are common
22 contractual provisions that are included in OEM/ODM
23 agreements. And they are not just words on paper. I mean,
24 these get implemented into the ERP systems that I was
25 telling you about, and they are backed up by

1 institutionalized business processes.

2 I have audited these processes. I have
3 implemented them myself throughout my years of experience.
4 So these numbers and these percentages are put into these
5 software packages that are made by SAP, Oracle, Microsoft,
6 reputable companies.

7 MR. NEWCOMER: We need to go on the Acer CBI
8 record now.

9 (Whereupon, the hearing proceeded in confidential
10 session.)

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1 O P E N S E S S I O N

2 JUDGE MCNAMARA: Thank you.

3 BY MR. NEWCOMER:

4 Q. Do you have other documentary evidence of
5 inventory, excuse me, of flexibility parameters that you've
6 looked at in this investigation?

7 A. Yes. I mean, these are two examples from public
8 sources that I pulled from the internet. The one on the
9 left is between Flextronics, my former employer, and one of
10 their customers. The one on the right has percentages that
11 are very similar to the numbers that I've used.

12 But what's really important to point out here,
13 too, is that flexibility parameters are floors. They are
14 not ceilings. ODMs are expected to bend over backwards to
15 meet the requirements of OEMs, and they are happy to do so
16 because the more the product they ship, the more money they
17 make. But what's highlighted in yellow speaks to that.

18 Q. Are flexibility parameters designed to address
19 exclusion orders?

20 A. Flexibility parameters are designed to address
21 anything, any type of a fluctuation: product obsolescence,
22 product introduction, market changes, competitive pressures.
23 Demand is constantly in a state of flux in this industry.

24 Q. If we could have slide 18, please.

25 The third factor you mentioned was manufacturing

1 capacity. How does that fit into your equation here?

2 A. So manufacturing capacity is effectively
3 contributing to this, because there's always spare capacity
4 in a manufacturing environment. Nobody runs at a hundred
5 percent capacity. And they can always add even further
6 capacity beyond their official spare level by adding
7 additional shifts.

8 So that helps enable flexibility parameters.

9 Q. So here on this slide can you explain to ALJ
10 McNamara what your calculation shows about the impact of an
11 exclusion order for the Respondents' personal computers?

12 A. Okay. Yeah, I mean, this is where all of this is
13 coming in for a landing, right, those first three attributes
14 that we were looking at. Remember we said 10 percent market
15 share roughly for the Respondents. So that's ten units
16 that's now being taken out of the first row. So there's
17 only 90 units by competitors.

18 The inventory, that one-time shot in the arm that
19 we were talking about, the extra 1.2 months of supply of
20 cushion, that's the 108 units you see.

21 And then those conservative flexibility
22 parameters at 10 percent, 25, 50 percent, are playing out in
23 month one, two, and three in the third row.

24 So once you work out all this math and you deduct
25 the monthly consumer demand from each month, you'll see that

1 there's going to be a surplus at the end of the first three
2 months. And actually, it's trending upward at the end of
3 the third month.

4 Now, this doesn't mean that they are going to
5 basically turn on the supply chain to this level. Nobody
6 likes to have excess inventory. This is what the market has
7 the capability of doing, not necessarily what they will do.

8 Q. Dr. Seth, who is another expert Respondents are
9 presenting here, has subsegmented the market into smaller
10 and smaller segments to show larger market shares of Acer
11 and ASUS in areas like education and low-cost devices.

12 That will come out later in trial, but I wanted
13 to find out if you've addressed that in your analysis and
14 what your conclusion showed.

15 So can we have slide 19, please?

16 A. Yeah. So, first of all, I'll say that that type
17 of segmentation is not really reasonable or accurate from a
18 supply chain standpoint, because the supply chain isn't
19 really tailored to those specific subsegments in that level
20 of granularity.

21 So I don't agree with that segmentation, first,
22 but to the extent that we want to push these market shares
23 to new limits, you can see that, I've done the calculation,
24 even at 47 percent market share, we're still not going to
25 end up with a negative number in that bottom row, and we

1 actually get to an inflection point in month two where it
2 start increasing again.

3 Q. Now, you raised a good point there. You said you
4 worked for an educational PC company a while ago. Was it
5 using a different supply chain than other PCs or the same
6 supply chain?

7 A. Fundamentally the same supply chain.

8 Q. We're going to turn now to the other -- the
9 remaining three of the six factors you've identified, but
10 just to be clear, do you need to -- does the market need to
11 even use any of these other factors, in your opinion, to
12 satisfy any demand?

13 A. No, the market doesn't really need those. Again,
14 they are just there as extra layers of protection or extra
15 tools in the toolkit that you're not going to need, but it's
16 there.

17 Q. If we could have slide 7.21, please.

18 You mentioned on your list "off balance sheet
19 inventory." Could you briefly explain what that is?

20 A. Yeah. When it comes to inventory in the
21 electronics supply chain, as reported by the OEMs, what you
22 see is not what you get. There's a lot more than meets the
23 eye.

24 That's because OEMs don't like to keep inventory
25 on their balance sheets. They try to push it upstream and

1 downstream on other people's books as much as they can.

2 So that means there is inventory, sizeable
3 inventory, sitting at the ODMs or the contract manufacturers
4 or even at the retailers and resellers. I mean, we all go
5 to Best Buy and Costco and we look on the shelf, and there's
6 product right there available for us to purchase. So that's
7 inventory.

8 Q. And what does that mean for your calculation that
9 you did earlier that you showed ALJ McNamara?

10 A. Yeah, so my calculations don't even factor this
11 inventory in. This is substantial inventory. Again, based
12 on my experience, I could see it being equal to or higher
13 levels than the buffer inventories that I was talking about
14 earlier.

15 Q. The next factor you mentioned -- slide 22,
16 please -- is standardized components, if we go to the next
17 slide. What are standardized components and how do they
18 impact your analysis?

19 A. Yeah, so standardized components is really
20 whatever you -- all the things that you see on the left side
21 of the page. Again, these companies are sharing memory
22 suppliers, microprocessor suppliers, disk drive and display
23 suppliers.

24 So what this really enables is, it enables
25 movement of supply from one OEM to another OEM when these

1 forecasts are constantly in a state of flux. It contributes
2 to that flexibility that we were talking about.

3 Q. Does that mean that Acer and ASUS have to sell
4 components that they have already consigned to other OEMs to
5 satisfy this demand?

6 A. No, because whatever they have bought and is
7 sitting in their warehouse, that's fine. Nobody really
8 needs that inventory. Although they could actually sell it
9 back to the suppliers, if they needed to, if they have
10 negotiated return privileges as long as the product package
11 hasn't been opened. That's very common in this industry.

12 But what we're talking about is supply that is
13 not within the four walls of the Respondents. So upstream
14 in distribution channels are the components suppliers.

15 Q. What about downstream from all this, before we
16 turn to the last factor, do Acer and ASUS have some kind of
17 unique distribution warehousing in their supply chain?

18 A. No, there's really nothing unique here. They
19 might use -- they might be contracted with one warehousing
20 service provider versus another warehousing service provider
21 or one transportation company versus another one that HP or
22 Dell may use, but structurally there's nothing unique here.
23 There's nothing here that's going to impact the market or
24 the customers.

25 Q. And I may see later in the hearing geographic

1 distribution mentioned. Is there anyplace in the U.S. you
2 can't get a PC today?

3 A. No, there's nothing unique. And if there is
4 going to be something unique, I can tell you that the larger
5 companies probably have a stronger means of meeting that
6 versus the smaller ones.

7 Q. Let's go to your sixth factor, which were
8 business continuity plans. If we could have slide 26,
9 please.

10 What are business continuity plans?

11 A. Yeah. So if we can go to the next slide,
12 business continuity plans are effectively a playbook for
13 what happens when there is a major disruption in the market
14 or in the supply chain.

15 And all the companies, all the OEMs and their
16 suppliers have it in place. It is confidential information.
17 This is what I was able to pull from the website of these
18 companies. And, effectively, it means you need to have
19 backup sites and you need to have capacity and supply to be
20 able to ramp up immediately if you have a site that goes
21 offline due to any event.

22 Q. In your opinion, are we even going to get this
23 far down the options necessary to meet the demand occasioned
24 by an exclusion order here?

25 A. Not at all. We're not going to go to this level

1 at all. The first three are more than enough to cover any
2 type of a shortage that we might even think about.

3 Q. Finally, I'd like to discuss timing, if we could
4 have slide 28.

5 So up to this point, I think you were talking
6 about an immediate exclusion order that hits tomorrow. Is
7 an exclusion order here going to come out of nowhere, as a
8 surprise?

9 A. No, I don't think so. I mean, there's a
10 six-month runway here from the time of the initial
11 determination to the end of the Presidential Review Period.
12 And to your point, I made the assumption that we're just
13 going to flip a switch, with no notice. Well, there's a
14 six-month notice here. And, gosh, companies, at a minimum,
15 run their MRP systems once a week. That's 24 runs of the
16 MRP system with revised forecasting that can take place as
17 notice to the supply chain.

18 Q. And, in your experience, if an exclusion order is
19 recommended, are these companies in the supply chain, Acer,
20 ASUS, Dell, HP, Apple, Lenovo, are they all going to
21 actually start adjusting their forecasts?

22 A. I would expect them to, yeah, at some point along
23 this continuum.

24 Q. If we could go to the final slide.

25 What's your overall conclusion, Mr. Dastmalchi?

1 A. My overall conclusion for all the reasons that
2 are listed here and we discussed, there's absolutely not
3 going to be any type of a shortfall even if we do the
4 extreme flip-of-the-switch scenario.

5 MR. NEWCOMER: Pass the witness.

6 JUDGE MCNAMARA: Thank you, Mr. Newcomer.
7 Mr. Miller?

8 MR. MILLER: Thank you, Your Honor. May I
9 approach to pass out binders?

10 JUDGE MCNAMARA: Sure.

11 MR MILLER: Zach Miller, Your Honor, for
12 Respondents. Can I proceed?

13 JUDGE MCNAMARA: Yes. Thank you.

14 CROSS-EXAMINATION

15 BY MR. MILLER:

16 Q. Nice to meet you, Mr. Dastmalchi.

17 A. Likewise.

18 Q. My name is Zach Miller. You talked a little bit
19 about your background and mentioned that you worked at HP.

20 You last worked at HP in 1996; is that right?

21 A. That is correct, yes.

22 Q. And when you worked at HP, you were working in
23 the disk storage products sector?

24 A. No, I was working at THE network server division
25 that built Intel-based servers, and my primary

1 responsibilities was for the supply chain of mass storage
2 devices and disk drives that supported those Intel-based
3 servers.

4 Q. Understood. But not on PCs, correct?

5 A. Not directly. We had a sister division, MCD,
6 mobile computing division, that we collaborated with. We
7 used the same internal ODM. So we worked hand in glove with
8 them because we made the servers, they made the laptops.

9 Q. Let's pull up CDX-7C.7.

10 And you said your opinion is there will not be a
11 shortfall if Respondents' products are excluded, correct?

12 A. That is correct.

13 Q. The first factor you have listed here is
14 buffer/channel product inventory, right?

15 A. Yes.

16 Q. If you pull up CDX-7C.13, this is where you
17 talked about your calculation for weeks and months of supply
18 on hand, right?

19 A. That's correct.

20 Q. Now, in this table, you referred to the cost of
21 goods sold in the inventory columns, right?

22 A. Yes.

23 Q. That data, that's from the Yahoo Finance website,
24 that's where you got that?

25 A. Yes. And those were pulled from the publicly

1 released information of the -- these public companies, yeah.

2 Q. And you mentioned that those columns, cost of
3 goods sold and inventory, include products other than just
4 PCs, correct?

5 A. That is correct.

6 Q. And you didn't have the specific data to know
7 what proportion of the cost of goods sold column was -- for
8 each company was actually related to PCs, correct?

9 A. Cost of goods sold and inventory, yes, they are
10 all reported in aggregate.

11 Q. And so in your calculation of average weeks of
12 supply and average months of supply, you didn't separate
13 that out to look at only the products at issue in this
14 investigation, correct?

15 A. That is right. There was really not a need to do
16 that, because they are corresponding. If you carve out one
17 from inventory, you have to carve it out of cost of goods
18 sold. You end up with the same number.

19 Q. Well, you assert you end up with the same number,
20 but you don't have any actual data for PC specifically for
21 any of these columns to know what those numbers would be,
22 right?

23 A. That is correct. That data is not available or
24 necessary, yes.

25 Q. And the competitors you have listed here, Lenovo,

1 Dell, HP, Apple, you don't -- you didn't consider whether
2 those competitors were licensed to practice the Nokia
3 patents, did you?

4 A. No, that was outside the scope of my assignment.

5 Q. Let's go back to CDX-7C.7.

6 We'll go to the third factor. That was
7 manufacturing -- additional manufacturing capacity, right?

8 A. Yes.

9 Q. You didn't cite to any specific capacity data
10 from any PC or component manufacturer, correct?

11 A. No, I relied on my own personal experience.

12 Q. And then your fourth factor was off balance sheet
13 inventory?

14 A. Yes.

15 Q. And you would agree that there can be a whole
16 host of different contractual arrangements on how inventory
17 is reported on balance sheets, correct?

18 A. Can you please restate your question? I want to
19 make sure I understand.

20 Q. You agree that there can be a whole host of
21 different contractual agreements or arrangements on how
22 inventory can be reported on a balance sheet, whether it's
23 an ODM or a retailer, correct?

24 A. Well, there are accounting principles that
25 dictate how OEMs report inventory on their balance sheets.

1 So there's not a lot of flexibility there. But I think what
2 you're mentioning is there may be variations in how much
3 OEMs contractually put on the balance sheet of their
4 suppliers, like ODMs, and their value-added resellers, that
5 based on those contracts, they may end up with less
6 inventory or more inventory on their balance sheet.

7 If that's what you mean, then that's correct.

8 Q. Thank you. And that is what I mean. You didn't
9 look at any of those specific contractual relationships in
10 this case, correct?

11 A. No, I did not.

12 Q. The fifth factor you had here was standardized
13 components that can be rerouted to the different parts of
14 the supply chain, right?

15 A. That is correct.

16 Q. Again, whether components can be rerouted would
17 depend on the contractual relationship between the parties
18 at issue?

19 A. Partially, it can be, but I can tell you that
20 companies -- if demand drops, they are not -- OEMs are not
21 motivated to keep that inventory or continue to remain
22 exposed to it.

23 Q. Right. But it would depend on the contractual
24 relationship, how or what percentage of that could be
25 rerouted.

1 A. It could. It could, yes.

2 Q. And, again, you didn't have those specific
3 contracts as part of your analysis in this investigation,
4 right?

5 A. No, I relied on my experience.

6 Q. The sixth factor you identified, that was
7 business continuity plans?

8 A. Yes.

9 Q. And I think you mentioned business continuity
10 plans, those are confidential, correct?

11 A. That is correct.

12 Q. Right. And so you didn't look at any specific
13 business continuity plans for your analysis in this case,
14 correct?

15 A. Not in this case. I have personally developed
16 business continuity plans for the electronics -- OEMs in the
17 electronics industry, but not related to this investigation,
18 yes.

19 Q. And then we'll jump back up to flexibility
20 parameters. That's the second factor on this list. It's
21 the one I skipped earlier.

22 A. Yes.

23 Q. Now, you relied on flexibility parameters to
24 support your calculations, right?

25 A. Yes.

1 Q. And I'm going to pull up RDX-15C.1.

2 And I think you had a similar slide in your
3 demonstratives. This is one of the calculations you did,
4 correct?

5 A. Yes.

6 Q. And I think you mentioned this. For this
7 calculation, you assumed that Acer and ASUS had 10 percent
8 market share while the competitors would have 90 percent
9 market share, correct?

10 A. That is correct.

11 Q. And then the flexibility parameters you used for
12 this calculation were at 10 percent for the first month, 25
13 percent for the second month, and 50 percent for the third
14 month, right?

15 A. Yes.

16 Q. And if we pull up CDX-7C.17, you included some
17 public sources, you said, for those flexibility parameters
18 you used, right?

19 A. Those flexibility parameters are based on my own
20 experience as kind of a minimum threshold that we would use
21 in the electronics industry. These percentages here to the
22 right are validation that those are reasonable.

23 Q. Now, these percentages on the right here -- and
24 both of these contracts, actually, those are electronics
25 generally, not specific to PCs, correct?

1 A. That is correct.

2 MR. MILLER: And at this time, Your Honor, we
3 need to go on the Acer confidential record.

4 (Whereupon, the hearing proceeded in confidential
5 session.)

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1 O P E N S E S S I O N

2 MS. DUCCA: I want to try to stay on the public
3 record, but let me reask the question.

4 BY MS. DUCCA:

5 Q. How long would it take an ODM to shift their
6 manufacturing for the approximate, I think it's
7 approximately 10 percent of the U.S. inventory from Acer and
8 ASUS to the other manufacturers that you studied?

9 A. So there's a two-pronged answer to that question.
10 One prong has to do with production scheduling, which takes
11 place -- usually production schedules are frozen about one
12 to two weeks in advance at ODMs. It varies. But they call
13 it a frozen window. And during that frozen window, they try
14 to stay according to that production plan.

15 But once they have planned for it through their
16 production, the actual change over time on a Surface --
17 board assembly Surface Mount line, I have measured it with a
18 timer, as short as eight minutes. That's how quickly they
19 can pivot.

20 If they have staged the inventory and if they
21 have prepared the supply and they have brought it here, when
22 they turn off one machine and they move some tools around
23 and they turn on the other program, I've timed it on the
24 Surface Mount line as small as eight minutes.

25 Q. That's short.

1 A. That's short.

2 Q. Now, I believe you testified in your direct
3 testimony that once an initial determination comes out,
4 there's a three-month period until a final determination,
5 and another three-month period, which is the Presidential
6 Review Period.

7 You had testified that these manufacturers and
8 ODMs would likely start taking actions to address the
9 potential shortfall. Did I understand your testimony
10 correctly?

11 A. Yes. So what will happen -- remember, the ODMs
12 will do what the forecast of the OEMs tell them to do. So
13 it's really the OEMs who are in the driver seat to look down
14 and say, okay, I see these market trends and conditions, be
15 it exclusion order, be it a new product introduction, be it
16 whatever, you know, large deals that they want, for example,
17 if they have multiple big deals that suddenly lead to a
18 spike in demand, all of these are blended into the forecast.

19 And it's the forecast that, once they see an
20 exclusion order on the horizontal, they might -- you know,
21 six months out they might plan for it a little bit, and then
22 if it just continues and it looks like there's no settlement
23 and we're starting to get to the Presidential Review Period,
24 you bet, they are really going to ramp things up and they
25 are going to adjust those forecasts, both up and down, for

1 the competitors and the Respondents to be able to respond to
2 these changes.

3 Q. In your experience, would those OEMs be following
4 a case like this?

5 A. I would expect them to, particularly when it
6 gets -- I mean, they've got people that are constantly
7 monitoring market conditions, and if it does get to that
8 late stage in the game, particularly, again, I would say if
9 it's getting to the Presidential Review Period, it's going
10 to end up on their radars.

11 Q. So then in your opinion, and given that
12 eight-minute time frame that it might take to shift
13 production, do you believe that the ODMs would be able to
14 shift production by the time an exclusion order comes into
15 place, given the hints that it's coming?

16 A. Absolutely. ODMs exist and -- to do that. Their
17 value proposition is flexibility in economies of scale.
18 That's why they are present. That's why the OEMs don't do
19 this themselves, because ODMs do it so much better.

20 Q. Thank you, Dr. Dastmalchi. That's all my
21 questions for you today.

22 JUDGE MCNAMARA: Thank you very much.

23 Mr. Newcomer, re-redirect?

24 MR NEWCOMER: Just a few questions, Your Honor.

25 And, unfortunately, I think -- I want to be

1 careful, because I wanted to ask about a couple of those
2 calculations that I think you did on the confidential
3 record, so we need to go back on the confidential record,
4 then.

5 (Whereupon, the hearing proceeded in confidential
6 session.)

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1 O P E N S E S S I O N

2 JUDGE MCNAMARA: Okay.

3 MR. NEWCOMER: At this time, Your Honor, we've
4 got one of our NEXT Advocates, Jamie Levien, who is going to
5 be presenting the next witness.

6 JUDGE MCNAMARA: Very good. When you have a
7 chance, Mr. Newcomer, may I have a copy of the
8 demonstratives from Mr. Dastmalchi's testimony?

9 MR. NEWCOMER: Yes, Your Honor.

10 JUDGE MCNAMARA: Oh, I've got it. Thank you.

11 MS. LEVIEN: May I proceed?

12 JUDGE MCNAMARA: Yes. Thank you very much,
13 Levien.

14 MS. LEVIEN: Jamie Levien for Nokia. Our next
15 witness is Dr. Keith Botner.

16 JUDGE MCNAMARA: Very good.

17 Good afternoon, Dr. Botner. How are you?

18 A. I'm well.

19 JUDGE MCNAMARA: Good. All right, would you
20 kindly raise your right hand?

21 KEITH BOTNER,

22 having been first duly sworn or affirmed on
23 their oath, was thereafter examined and testified as
24 follows:

25 JUDGE MCNAMARA: Please state your full name.

1 A. Keith A. Botner.

2 JUDGE MCNAMARA: Thank you very much.

3 DIRECT EXAMINATION

4 BY MS. LEVIEN:

5 Q. Good afternoon, Dr. Botner. Could you please
6 introduce yourself again to the Court?

7 A. Good afternoon, everyone. I'm Dr. Keith Botner.

8 Q. Why are you here to testify today?

9 A. So I'm here today to talk about two surveys that
10 I conducted in this matter, and we'll be talking about these
11 in greater detail, but at a very high level, both surveys
12 measure specific consumer behaviors with relevant devices,
13 which I understand are relevant to the infringement
14 allegations in this matter.

15 Also, one of my surveys measures the degree to
16 which certain functionalities are considered to be essential
17 to the consumer in the use of their device.

18 Q. Have you prepared a set of slides to assist with
19 your testimony?

20 A. Yes, I have, and they are labeled here as CDX-4.

21 Q. Before we discuss your findings, can you please
22 tell us a bit about your background?

23 A. Yes. In my current role as a senior vice
24 president at MMR Strategy Group, I engage in marketing
25 research and consulting for clients in both litigation and

1 non-litigation contexts. I primarily serve as a survey
2 expert in that capacity.

3 I have over 25 years of experience in marketing
4 and consumer behavior, both as a marketing practitioner for
5 various Fortune 500 companies and as an academic with
6 doctoral training, focusing on such areas as marketing
7 research, consumer behavior, and research design.

8 Q. Have your opinions as a survey expert been
9 accepted by any court in the past?

10 A. Yes.

11 MS. LEVIEN: Your Honor, I tender Dr. Botner as
12 an expert in surveys including survey design and survey
13 interpretation.

14 JUDGE MCNAMARA: Are there any objections?

15 MS. XUE: Your Honor, Claire Xue for Respondents.
16 No objection.

17 MS. DUCCA: No objection from Staff, Your Honor.

18 JUDGE MCNAMARA: Then Dr. Botner is accepted as
19 an expert witness on the topics for which he has been called
20 to testify without objection.

21 BY MS. LEVIEN:

22 Q. Now you said you conducted two surveys for this
23 investigation.

24 Can you give us a high-level summary of them?

25 A. Yes. And this is included here on slide 3.

1 As I noted, I conducted two surveys, and this is
2 comprised of the consumer behavior survey in the domestic
3 industry survey, which today I'll just refer to as the DI
4 survey for short.

5 At a high level, based on both of these surveys,
6 I find that a meaningful number of accused and domestic
7 industry product users are engaging in behaviors that are
8 relevant to the at-issue patents.

9 Additionally, for the DI survey, I find that
10 Microsoft or Samsung users perceive these relevant behaviors
11 as being essential to the use of their device.

12 Q. Let's talk about survey methodology first.

13 How did you conduct your surveys?

14 A. Well, the surveys were conducted online, and in
15 accordance with best practices as established by survey
16 authorities and treatises. And each survey incorporated a
17 number of quality control procedures to ensure valid and
18 reliable measures.

19 And we see some of those on the left-hand side of
20 slide 4 here. The most important of which is that
21 qualifying respondents for the survey must have used certain
22 relevant products in the past two years.

23 Also, as we see on the right-hand side of this
24 slide, after progressing through various qualification,
25 quality controls, data cleaning filters, the final datasets

1 in the consumer behavior and DI surveys are 1,697 and 789
2 survey respondents respectively.

3 Q. Do you feel confident about the reliability of
4 your surveys?

5 A. Yes, I do. The quality control procedures and
6 the size of the datasets that we just discussed give me
7 confidence in the surveys' reliability.

8 Also, my findings are reliable in that they
9 provide conservative measures of the focal behaviors that
10 we'll be discussing today.

11 For example, key measures in my survey include
12 control measures that essentially subtract out or account
13 for possible extraneous influences on some of the behaviors
14 that we'll be talking about.

15 Q. Let's start with your consumer behavior survey.

16 Can you describe the behaviors that it measures?

17 A. The consumer behavior survey included four focal
18 behaviors measuring ways consumers use certain accused and
19 domestic industry products.

20 And we see them here on slide 5. At a high
21 level, these behaviors pertain to streaming service viewing
22 behavior, which we'll talk about today as question 5,
23 interaction with one or more recorded videos on select
24 devices, which we'll talk about as both questions 8 and 12,
25 and also consumer use of video or media programs or

1 applications on relevant computers, which span from
2 questions 19 through 40.

3 Q. What products did you measure for your consumer
4 behavior survey?

5 A. The products measured in the survey are included
6 here on slide 6, and this consists of select devices from
7 Acer, ASUS, Microsoft, and Samsung.

8 Q. Turning to slide 7, can you take us through what
9 you found for your first focal behavior?

10 A. Yes. Question 5 of the consumer behavior survey
11 measured whether consumers watched one or more focal movies
12 and/or TV shows on their device using certain relevant
13 streaming services. And after accounting for the control,
14 the net measures are 54.1 percent for Acer, 47.8 percent for
15 purposes of ASUS, 58.6 percent for Microsoft, and 25.6
16 percent for Samsung.

17 Q. Taking 54.1 percent for Acer as an example, does
18 that mean that the inverse of that 45.9 percent of consumers
19 have not used their devices in a relevant way?

20 A. No, it does not. The 54.1 percent that we see
21 here would reflect the percentage of survey respondents who
22 indicated they engage in a behavior that my survey asked
23 about.

24 So if we think of question 5, since my survey did
25 not include all possible video titles that may be relevant

1 in the marketplace, my findings are conservative.

2 Q. Now to slide 8. Can you take us through your
3 next focal measure?

4 A. Yes. Question 8 of the consumer behavior survey
5 measured whether consumers watched one or more Acer, ASUS,
6 or Microsoft computer recorded videos on that device. The
7 net measures are 11.2 percent for Acer, 26.8 percent for
8 ASUS, and 18 percent for Microsoft.

9 And just to clarify that measure, these
10 individuals recorded a video on that computer and then
11 watched that recorded video.

12 Q. Turning to slide 9 for your next focal measure,
13 will you please describe the behavior you measured?

14 A. Yes. Question 12 measured whether Acer, ASUS, or
15 Microsoft computer users transferred a video that was
16 recorded on a Samsung Galaxy phone to that computer using a
17 USB cable. And after accounting for the control, the net
18 measures are 18.6 percent for Acer, 19.5 percent for ASUS,
19 and 18.8 percent for Microsoft.

20 Q. Moving to slide 10, I see there's a list of
21 questions up at the top of this slide.

22 Can you describe what those questions are?

23 A. Yes. All of these questions that we see here on
24 slide 10 measure relevant behaviors that importantly were
25 asked about after survey respondents were validated or

1 verified as working with a relevant video format using one
2 or more focal programs or applications, which we see in the
3 second column here of this table on slide 10, with the
4 corresponding relevant behavior appearing in the third
5 column.

6 And just to provide one example for this, in the
7 consumer behavior survey, for question 30, the focal program
8 or application is Handbrake, and the relevant behavior is
9 encoded all or some H.265 videos using hardware accelerated
10 encoding.

11 Q. What did you find for your focal behaviors asked
12 about for questions 19 to 40?

13 A. We see the findings here on slide 11. After
14 accounting for the control, the net measures are 8.4 percent
15 for Acer, 13.9 percent for ASUS, and 11.2 percent for
16 Microsoft.

17 Q. Are you surprised to see a net measure as low as
18 8.4 like there is for Acer here?

19 A. That's not at all surprising. My understanding
20 with these programs or applications, they are tailored to
21 more of a narrow or niche audience of, I'll say, more
22 advantaged users who may specialize in such areas as video
23 editing, visual effects, or media conversion. So these
24 aren't what I would call mass market, everyday software
25 packages.

1 Q. Now, based on everything we just discussed for
2 your consumer behavior survey, what are your overall
3 conclusions?

4 A. The overall conclusions are noted here on slide
5 12. And I conclude that a meaningful number of accused and
6 domestic industry product users are engaging in behaviors
7 that are relevant to the asserted functionalities.

8 Specifically, I find that between 8.4 and 54.1
9 percent of Acer users, between 13.9 and 47.8 percent of ASUS
10 users, and between 11.2 and 58.6 percent of DI product users
11 are using their devices in these relevant ways.

12 Q. Transitioning to your DI survey now, can you
13 preview your findings for the Court?

14 A. Yes, I'll preview the two questions at a very
15 high level here on slide 13.

16 I find that DI product users engage in one or
17 more behaviors that are relevant to the asserted
18 functionalities and that those behaviors are perceived by
19 consumers as being essential to their use of their device.

20 Q. What products did you measure for your DI survey?

21 A. The products tested are noted here on slide 14,
22 consisting of the Surface and Surface Pro computers for
23 Microsoft, Microsoft Xbox, and Samsung Galaxy phones.

24 Q. Can you describe what you found for your question
25 1 of your DI survey?

1 A. Yes. Question 1 of the DI survey measured
2 whether consumers used their devices, used their Microsoft
3 or Samsung devices in ways that I understand are relevant to
4 the asserted functionalities.

5 Question 1, among other measures, included four
6 focal uses, consisting of played back a recorded video,
7 watched a streaming video service, livestreamed video
8 content, and recorded or shot a video.

9 And I find that between 62.1 and 89.8 percent of
10 DI product users are using their device in one or more of
11 these relevant ways.

12 Q. Moving to question 2 of your DI survey, can you
13 tell us what it measures and what you found?

14 A. Yes. For the four focal uses that we saw in
15 question 1, question 2 measures how essential those uses are
16 to the consumer, in other words, how consumers rely on their
17 device for those focal uses that we just discussed.

18 And I find that between 37.2 percent and 56.9
19 percent perceive one or more of those focal behaviors as
20 being absolutely, highly, or moderately essential, meaning
21 that consumers are relying on their device for behaviors
22 that are relevant to the asserted functionalities.

23 Q. Based on everything we just discussed for both of
24 your surveys now, can you summarize your overall findings?

25 A. Yes. The summary of findings appear here on

1 slide 17. I conclude that a meaningful number of accused
2 and domestic industry product users are engaging in
3 behaviors that are relevant to the at-issue patents, and for
4 the DI survey I find that Microsoft or Samsung users engage
5 in one or more relevant behaviors and that these behaviors
6 are perceived as being essential to the use of their device.

7 Q. One final question for you, Dr. Botner.

8 Have your opinions been challenged by any
9 rebuttal expert in this investigation?

10 A. I'm not aware of any expert challenge to my
11 opinions.

12 Q. Thank you, Dr. Botner.

13 MS. LEVIEN: I pass the witness.

14 JUDGE MCNAMARA: Thank you, Ms. Levien.

15 CROSS-EXAMINATION

16 BY MS. XUE:

17 Q. Good afternoon, Your Honor. Claire Xue for
18 respondents. May I proceed?

19 JUDGE MCNAMARA: Yes, please. Thank you.

20 Q. Good afternoon, Dr. Botner.

21 A. Good afternoon.

22 Q. You are a survey expert, correct?

23 A. Yes, that's correct. I'm a survey expert,
24 consumer behavior expert.

25 Q. You're not a technical expert, correct?

1 A. No, I'm not a technical expert.

2 Q. And you did not analyze the patents that are
3 asserted in this investigation, correct?

4 A. Can you describe by analyze patents?

5 Q. Sure.

6 Mr. Davis, can we pull up CX-2462.11 at page 40,
7 lines 7-11? Page 40, lines 7-11.

8 Mr. Botner, at your deposition you were asked:
9 So you didn't analyze the patents that are asserted in this
10 case in this investigation, right?

11 There was an objection.

12 And you answered, no, and I don't purport to. I
13 don't claim to in my report.

14 Did I read that correctly?

15 A. Yes, you did.

16 Q. So you did not analyses the patents that are
17 asserted in this investigation, correct?

18 A. I did not.

19 Q. What you did do was you conducted a survey of
20 consumers who had used certain electronic devices in the
21 past two years; is that right?

22 A. Yes. The surveys -- surveys plural that I
23 discussed.

24 Q. Yes. And the electronic devices you asked about
25 included products at issue in this case, correct?

1 A. Yes.

2 Q. And you asked the consumers who qualified for
3 your survey whether they had performed certain actions using
4 a particular device, correct?

5 A. Yes, that's correct.

6 Q. And the survey results you ultimately report are
7 the percentage of consumers with certain Acer and ASUS
8 devices -- sorry. I should start over.

9 In your consumer behavior survey, the survey
10 results you ultimately report are the percentages of
11 consumers with certain Acer and ASUS devices who use their
12 devices to perform these specific actions, correct?

13 A. Yes, that's a fair representation.

14 Q. You are not offering an opinion that any of the
15 use you report on in your consumer behavior survey practices
16 any claims of the asserted patents, correct?

17 A. As a survey expert, I am not.

18 Q. And your survey did not ask what operating system
19 was being used when the relevant actions were being
20 performed, correct?

21 A. No. My survey measured brand and model name.

22 Q. So fair to say one can't discern from your survey
23 what operating system was being used when the relevant
24 actions were performed?

25 A. My survey didn't ask about operating system.

1 Q. Question 7 of your survey asked consumers whether
2 they had recorded a video with their Acer or ASUS device,
3 correct?

4 A. Yes.

5 Q. And question 8 asked whether they had played back
6 that video, correct?

7 A. Correct.

8 Q. Your survey did not ask what software they used
9 to record that video, correct?

10 A. It did not.

11 Q. And it certainly did not ask what settings were
12 used in whatever software was being used to record the
13 video, correct?

14 A. That section of the survey did not ask about
15 specific settings.

16 Q. Your survey did not ask whether hardware
17 acceleration was being used to view recording, correct?

18 A. I'm sorry. I didn't hear that. Can you repeat
19 the question, please?

20 Q. Of course. Your survey did not ask whether
21 hardware acceleration was being used during recording,
22 correct?

23 A. For that particular question?

24 Q. Yes. In questions 7 and 8.

25 A. No, it did not.

1 Q. And your survey did not ask whether hardware
2 acceleration was being used during playback with respect to
3 to questions 7 and 8, correct?

4 A. It did not.

5 Q. You also asked consumers about their usage on
6 their devices of certain software that you called focal
7 programs or applications, correct?

8 A. Yes, that's correct.

9 Q. And you asked qualifying respondents about a
10 total of eight pieces of software, right?

11 A. I believe it was eight.

12 Q. You understand that the infringement allegations
13 in this investigation relate to hardware accelerated
14 encoding and decoding, right?

15 A. Yes, that's my understanding.

16 Q. You would agree with me that all eight pieces of
17 software you asked about can encode and decode video without
18 hardware acceleration, correct?

19 A. I don't know specifically if all of them, but I
20 know that's a capability of many software packages, yes.

21 Q. And you would agree with me that for each piece
22 of software in your survey you asked whether hardware
23 acceleration-related settings were enabled during use,
24 correct?

25 A. Yes. And to confirm, my survey confirmed

1 specific settings were in place within each of those focal
2 programs or applications.

3 Q. Right. And you asked that question because
4 there's a possibility those settings could be turned off,
5 correct?

6 A. I asked the questions to measure whether they
7 were enabled.

8 Q. Understood.

9 Mr. Davis, could you please pull up CDX-4.11?

10 Dr. Botner, this slide from your demonstratives
11 reports the percentage of qualifying users who engaged in
12 any relevant behavior across any of the eight focal programs
13 or applications, correct?

14 A. Yes, it does, slide 11 from my slides.

15 Q. Yes. And you're reporting a debt measure of 13.9
16 percent of 224 validated ASUS users engaged in a
17 qualifying -- or sorry -- engaged in a relevant behavior,
18 correct?

19 A. Yes, that's correct.

20 Q. So for those 224 ASUS users, for 86.1 percent of
21 them did not reliably report any relevant behavior across
22 any of the eight focal programs or applications, correct?

23 A. Yes, but it's very important to note the context
24 of the questions that preceded that, if I may explain, the
25 funnel of questions that led or culminated in these focal

1 measures.

2 Q. I think your counsel is welcome to explore that
3 on redirect, but 86.1 percent of them did not reliably
4 report any relevant behavior, correct?

5 A. That percentage reflects the percentage of all
6 respondents in my survey --

7 Q. Understood.

8 A. -- who either were not asked this question or
9 didn't engage in a behavior.

10 Q. Okay. And, similarly, for Acer users you
11 reported that 8.4 percent of the 228 Acer users engaged in a
12 relevant behavior, correct?

13 A. Did they engage in the relevant behaviors that my
14 survey asked about.

15 Q. Yes. That is what I mean by relevant behavior.

16 8.4 percent of the 228 Acer users engaged in a
17 behavior that your survey asked about, correct?

18 A. Yes, and again I just wanted to emphasize what my
19 survey asked about.

20 Q. And so 91.6 percent of them did not engage in a
21 behavior that your survey asked about, correct?

22 A. For these focal programs or applications, no.

23 Q. And we wouldn't know anything about behaviors
24 that your survey didn't ask about, correct?

25 A. No, we wouldn't.

1 Q. Let's look at those focal programs and
2 applications.

3 So, first of all, I believe you said on direct
4 that these are not mass market, everyday software packs,
5 correct?

6 A. Yes, that's correct. And I'm happy to explain
7 contextually what I mean by that, if that's okay.

8 Q. I feel comfortable with what you said.

9 A. Okay. As long as that makes sense.

10 Q. It makes sense to me.

11 A. Thank you.

12 Q. You asked about media player, right?

13 A. VLC Media Player, correct.

14 Q. VLC is made by a nonprofit organization called
15 VideoLAN, right?

16 A. I don't know for certain, but I believe -- I
17 believe you are correct.

18 Q. You asked about DaVinci Resolve, correct?

19 A. That is correct.

20 Q. And DaVinci Resolve was developed by Blackmagic
21 Design, correct?

22 A. That name rings a bell through my use of these
23 programs.

24 Q. You asked about Adobe After Effects?

25 A. Correct.

1 Q. Adobe After Effects is made by Adobe, right?
2 A. Yes, it is.
3 Q. You asked about Adobe Premier Pro, correct?
4 A. Correct.
5 Q. Adobe Premier Pro is also made by Adobe, correct?
6 A. Yes.
7 Q. It's not made by Acer, right?
8 A. I just answered it's made by Adobe.
9 Q. And it's not made by ASUS?
10 A. I would assume not.
11 Q. You asked about VEGAS Pro, correct?
12 A. That's correct.
13 Q. VEGAS Pro is made by VEGAS Creative Software,
14 right?
15 A. I'm not certain of the creator's name.
16 Q. You asked about CyberLink PowerDirector?
17 A. Yes. That was one of the focal programs or
18 applications.
19 Q. CyberLink PowerDirector is made by CyberLink,
20 right?
21 A. Again, you're asking me about the manufacturers.
22 I'll trust you with that.
23 Q. You asked about Handbrake, correct?
24 A. Yes.
25 Q. Handbrake is free and open-source software built

1 by volunteers, right?

2 A. I didn't know who built it, but I am aware of its
3 open-source nature.

4 Q. And you asked about OBS, correct?

5 A. That is correct.

6 Q. And OBS is also free and open-source software,
7 correct?

8 A. I don't know for certain, but I believe it is.

9 Q. So none of these eight pieces of software is made
10 by Acer, correct?

11 A. No.

12 Q. And none of these eight pieces of software is
13 made by ASUS, correct?

14 A. No. These are used on computers. They would
15 include Acer or ASUS.

16 Q. For consumers with a Samsung Galaxy phone,
17 question 12 of your survey also asked whether they
18 transferred via USB cable and watched on their Acer or ASUS
19 device videos recorded on their Samsung Galaxy phone,
20 correct?

21 A. Correct.

22 Q. It's your understanding that the Samsung Galaxy
23 phone is a Samsung product, correct?

24 A. Yes.

25 Q. It's not an ASUS product, correct?

1 A. It is a Samsung product.

2 Q. Right. And it is not an Acer product, right?

3 A. No.

4 Q. Question 5 of your survey asked about whether the
5 consumers viewed certain videos on certain streaming
6 platforms, correct?

7 A. Yes, and, again, after a series of questions,
8 yes.

9 Q. And that list of video titles that you asked
10 about was provided to you by someone else, correct?

11 A. I'm sorry. Provided by who?

12 Q. By someone else, correct?

13 A. Through my discussions with counsel and technical
14 input in my own research of those videos, I would like to
15 note, but yes.

16 Q. And what you asked consumers about these titles
17 was whether they had watched all or part of it or watched
18 any preview, correct?

19 A. That's correct.

20 Q. You did not ask consumers whether they watched
21 these videos in an app or in a browser, correct?

22 A. No, it asked specifically about on the computer.

23 Q. You asked about on the computer, but you did not
24 ask through what software on the computer they watched those
25 videos?

1 A. I believe I answered that. I'm sorry. On the
2 computer, and I did not isolate that.

3 Q. Understood. And you did not ask consumers
4 whether they watched those videos with hardware
5 acceleration, correct?

6 A. No, I don't believe the everyday consumer would
7 be able to relay that.

8 MS. XUE: Nothing further. Pass the witness.

9 JUDGE MCNAMARA: Okay. Thank you very much.

10 Ms. Ducca?

11 MS. DUCCA: No questions from Staff, Your Honor.

12 JUDGE MCNAMARA: Ms. Levien, anything more?

13 REDIRECT EXAMINATION

14 BY MS. LEVIEN:

15 Q. I have just a few questions.

16 Dr. Botner, did you speak to Nokia's technical
17 experts to determine which relevant behaviors to measure?

18 A. Yes, I did. I spoke to them, interacted with
19 software with them, and discussed at length the various
20 focal measures from the survey.

21 Q. Now let's go to --

22 Mr. Moreno, can you please pull up CDX-4.11?

23 Can you explain how survey respondents were
24 funneled or qualified to see the questions between 19 and
25 40?

1 A. Yes. And I'll speak to this at a high level, but
2 we can think of it, as I noted earlier, a funnel, if you
3 will. So it starts at a high level as to whether people
4 even work with certain types of video or media programs on
5 their computer. This is before we get into certain brands,
6 if you will.

7 Then consumers are vetted or qualified as having
8 knowledge of working with specific video types.

9 So, for example, this consumer who answers these
10 focal questions would have knowledge that they have worked
11 with an H.265 video. And I must admit, I myself, I've
12 worked with VLC Media Player. I couldn't tell you which
13 particular type of video format I may have been working
14 with.

15 And so those questions then got to the specific
16 brands of media or video programs or applications. And
17 then, based on their selections, respondents saw one or more
18 questions asking whether specific settings were in place on
19 their device.

20 And, again, just to clarify, even then, if an
21 individual did not know if a certain setting was in place,
22 they are counted in this denominator as simply not engaging
23 in the relevant behavior.

24 And so this funnel, so it was, you know, several
25 questions, I will say, that led to that focal measure or

1 focal measures, plural.

2 Q. Thank you, Dr. Botner.

3 MS. LEVIEN: I have nothing further.

4 JUDGE MCNAMARA: Anything more?

5 MS. XUE: Nothing further from me, Your Honor.

6 JUDGE MCNAMARA: Thank you.

7 MS. DUCCA: Nothing from Staff.

8 JUDGE MCNAMARA: Dr. Botner, you may step down.

9 Thank you very much.

10 A. Well, thank you.

11 MR. CHERN: Good afternoon again, Your Honor.

12 Alex Chern for Nokia.

13 JUDGE MCNAMARA: Good afternoon, Mr. Chern.

14 MR. CHERN: At this time, Your Honor, Nokia calls

15 Dr. Mike Akemann.

16 JUDGE MCNAMARA: Will we be starting on public?

17 MR. CHERN: We can start on the public, yes,

18 Your Honor.

19 JUDGE MCNAMARA: Good afternoon, Dr. Akemann.

20 MICHAEL PATRICK AKEMANN,

21 having been first duly sworn or affirmed on

22 their oath, was thereafter examined and testified as

23 follows:

24 JUDGE MCNAMARA: Thank you. Please state your

25 name.

1 A. Michael Patrick Akemann.

2 JUDGE MCNAMARA: Thank you very much.

3 DIRECT EXAMINATION

4 BY MR. CHERN:

5 Q. Good afternoon, Dr. Akemann.

6 A. Good afternoon.

7 Q. I think you already did, but could you please
8 introduce yourself to the Court?

9 A. My name is Michael Patrick Akemann, Your Honor.

10 Q. And please tell us at a high level what you were
11 retained to do in this case?

12 A. I was asked to address two sets of issues here.
13 First, to assess from an economic perspective whether
14 Nokia's offers and Respondents' counteroffers were
15 consistent with RAND principles, and, secondly, I was asked
16 to assess the four statutory public interest factors.

17 Q. Were you analyzing the parties' negotiation
18 conduct or just the offers from an economic perspective?

19 A. I reviewed documents and data related to the
20 conduct, but I was primarily focused on the offers
21 themselves. As an economist, I think that's where my
22 expertise is most relevant.

23 Q. And, Mr. Moreno, if we could get the slide deck
24 pulled up for Dr. Akemann, please.

25 Before we get into your opinions, let's talk a

1 little bit about your background.

2 Looking at slide CDX-10.2, just tell us a little
3 bit about your education.

4 A. I have a BA in economics and political science
5 from the University of California at San Diego, and then I
6 went on to get a master's degree and a Ph.D. in economics
7 from UCLA.

8 Q. Where do you currently work?

9 A. I work at a firm called Berkeley Research Group,
10 or BRG, where I'm a managing director of the firm.

11 Q. Looking at slide CDX-10.3, is this the CV
12 attached to your report in this case?

13 A. It is.

14 Q. Have you served as an economic expert in
15 litigation involving standard-essential patents before?

16 A. I have. I've worked on numerous district court
17 actions where I assessed RAND or FRAND considerations in the
18 context of patent damages matters, and then I've also worked
19 on now several matters, many matters here at the ITC where I
20 address RAND issues.

21 Q. Do you have any written publications?

22 A. I have. As shown on the screen here, I've
23 published a dozen or so articles.

24 Q. Do any of these publications discuss patent
25 valuation or licensing?

1 A. Yes, several of them do.

2 MR. CHERN: Your Honor, at this time I tender
3 Dr. Akemann as an expert in the economics of patent
4 licensing, RAND compliance, and economic issues of public
5 interest.

6 JUDGE MCNAMARA: Mr. Colaianni?

7 MR. COLAIANNI: Joseph Colaianni for Respondents.
8 No objection, Your Honor.

9 JUDGE MCNAMARA: Ms. Ducca?

10 MS. DUCCA: No objection from Staff, Your Honor.

11 JUDGE MCNAMARA: Thank you.

12 Then Dr. Akemann is accepted as a witness, an
13 expert witness, to testify on the topics for which he has
14 been called to testify without objection.

15 MR. CHERN: Thank you, Your Honor.

16 Q. Dr. Akemann, starting at a high level, what does
17 RAND stand for?

18 A. It stands for reasonable and nondiscriminatory.

19 Q. What is your understanding of whether the patent
20 claims in this investigation are subject to a RAND
21 commitment?

22 A. Well, I understand that some are and some aren't.
23 The decoding claims related to H.264 and H.265 are subject
24 to a RAND encumbrance but not the encoding claims. And none
25 of the claims, as I understand it, related to the AV1

1 specification are subject to RAND.

2 Q. We'll talk about your opinions in more detail
3 later, but just as a high-end conclusion, what did you
4 conclude about whether Nokia's offers to Respondents were
5 RAND?

6 A. I concluded that they are consistent with RAND.

7 Q. And, on the other hand, what did you conclude
8 about whether Respondents' offers to Nokia were consistent
9 with RAND?

10 A. From an economic perspective, their offers are
11 well below my RAND benchmarks and, therefore, not consistent
12 with RAND from my vantage point as an economist.

13 Q. I want to talk briefly about Nokia's portfolio.

14 As an economic expert, I take it you didn't do a
15 technical evaluation of the portfolio?

16 A. That's definitely correct.

17 Q. Were you here in court today when Ms. Martikainen
18 testified?

19 A. I was.

20 Q. And what did she say about the number of patent
21 families that Nokia has in its video portfolio?

22 A. Well, she described hundreds of patents earlier
23 in time, more H.264 patents, and now more H.265, which you
24 would expect in terms of the evolution of the portfolio over
25 time.

1 Q. Going to slide CDX-10.4, have you seen any
2 information about the quality of Nokia's patent portfolio?

3 A. I have. And I've highlighted on the screen here
4 something Your Honor has already seen, I think, a couple
5 times in this investigation, that Judge Robart made some
6 complementary comments about Nokia's contribution to the
7 H.264 standard, describing them as one of the entities that
8 made possible much of the innovation associated with that
9 standard.

10 Q. Let's get into your analysis on the economics.

11 As an initial matter, can you just explain what
12 comparable license is in this context?

13 A. Absolutely. Comparable licenses are, from an
14 economic perspective, the gold standard for purposes of
15 creating a RAND benchmark. When I use the phrase
16 "comparable licenses," I'm focused primarily on arm's length
17 bilateral negotiations ideally for the portfolio that we
18 care about. So that's what we describe as economists as
19 comparable licenses as applied to this circumstance.

20 Q. You mentioned that comparable licenses are the
21 gold standard. What do you mean by that?

22 A. Well, it's the best available evidence. As an
23 economist, what you want to look at, where you have it, are
24 datapoints that reveal the preferences and information of
25 actual market participants.

1 So when we see a transaction consummated in the
2 marketplace at arm's length by two self-interested parties,
3 that tells us a lot about how informed market participants
4 think about the value of the technology at issue and what
5 they are willing to pay for it and what they are willing to
6 sell it for. So it's really good evidence to an economist.

7 Q. So when you have these comparable licenses, how
8 do you use them to formulate a RAND benchmark?

9 A. Well, we look at the rates that were assigned
10 under that. We look at the other terms to see if there are
11 other adjustments. We often see both running royalty rate
12 agreements and lump sum agreements. We may have to make
13 some estimates in that circumstance.

14 And we create what's known as a RAND benchmark,
15 sort of a range of rates and terms that we can use to take
16 an offer and compare and say is this consistent with a RAND
17 benchmark. If it is, from an economic perspective, we say
18 you're complying with RAND. If it's far off from that
19 range, it's a problem, you're not consistent with RAND
20 principles.

21 Q. You mentioned two types of different royalty rate
22 structures.

23 Are there some types of comparables that are
24 maybe more probative than others?

25 A. Typically the very most useful information is

1 when it's expressed in a license agreement on a running
2 royalty rate basis, because then we can just look at the
3 per-unit rate. It might be expressed in dollars or
4 percentage terms or euros in this case, but we can look at
5 it directly. So those are typically the most useful
6 datapoints.

7 Q. What about the other type, lump sum agreements,
8 how do those factor in and compare to running royalty
9 agreements?

10 A. They can be useful to consider, too, to
11 complement the information you can find in running royalty
12 rate agreements, but they typically require further
13 information, because companies vary in size, some companies
14 have a lot of sales, some have few sales.

15 So if you have a lump sum deal, you have to think
16 carefully about how many units are at issue and how might we
17 translate or estimate an effective or implied rate from that
18 lump.

19 Q. And what's that process called when you have a
20 lump sum and you translate it into an effective rate?

21 A. We call that an unpacking exercise.

22 Q. Some of Nokia's licenses, we've heard, concern
23 multiple different technology areas, like cellular and video
24 in the same patent license.

25 How can that impact the analysis?

1 A. It's typically a complicating factor. When you
2 have multiple patent portfolios at issue, there can be
3 bundled discounts, there can be difficulties in ascertaining
4 how the parties might have thought about value across
5 cellular versus video coding versus Wi-LAN.

6 And so typically those multi-technology deals are
7 a lot harder to work with. We prefer to work with simpler
8 arrangements when we have them, simpler agreements that
9 involve only the portfolio we care about, if that's the
10 circumstances we confront.

11 Q. In addition to kind of these bundled technology
12 deals, are there any other factors that can complicate an
13 unpacking analysis?

14 A. Sure. Another very common circumstance is
15 cross-license arrangements where both parties have valuable
16 technology and the payment that we observe is not for just
17 the technology. It's a balancing payment. Because I, as
18 the licensor, say I'm getting your valuable technology,
19 Your Honor, and some money. But it might be hard to put a
20 dollar measure on the technology that you convey in that
21 cross-license.

22 There can also be things like business deals that
23 complicate. We might have a joint venture arrangement or
24 engage in other cooperative behavior as part of the deal.

25 Q. So when you looked at the license evidence from

1 Nokia in this case, what did you conclude about whether
2 there are comparable licenses?

3 A. There are many comparable licenses. In
4 particular, there are a lot of running royalty rate
5 agreements, as Your Honor has heard, at Nokia's program
6 rates that are very good benchmark for my purposes.

7 Q. And did you also find that some lump sum
8 agreements were useful for the comparable analysis?

9 A. I did. We have some lump sum offers here. I
10 thought where possible I would bring some of that lump sum
11 evidence to bear as well.

12 Q. And these comparable licenses you looked at, were
13 those for individual patents or were those portfolio
14 licenses?

15 A. In all instances they are portfolio licenses,
16 which is extremely common in a technology licensing context.

17 MR. CHERN: At this time, Your Honor, we're going
18 to be discussing the Nokia licenses, so I'll need to go on
19 the Nokia and third-party confidential record.

20 (Whereupon, the hearing proceeded in confidential
21 session.)

22

23

24

25

1 C O N T E N T S

2 INDEX OF WITNESSES

3

	WITNESS	DIRECT	CROSS	RE- DIRECT	RE- CROSS	STAFF
5	RYAN N. HERRINGTON.....	565	628			
6	SUSANNA MARTIKAINEN.....	660	686	721	726	716
7	ROBERT GRAY.....	730	755	776		
8	BIJAN DASTMALCHI.....	780	806			819
9	KEITH BOTNER.....	832	841	852		
10	MICHAEL PATRICK AKEMANN.....	855				
11						
12						
13	AFTERNOON SESSION.....					716
14						
15						
16	CONFIDENTIAL SESSION.....	565-	627			
17	CONFIDENTIAL SESSION.....	667-	729			
18	CONFIDENTIAL SESSION.....	734-	779			
19	CONFIDENTIAL SESSION.....	790-	791			
20	CONFIDENTIAL SESSION.....	796-	797			
21	CONFIDENTIAL SESSION.....	814-	821			
22	CONFIDENTIAL SESSION.....	826-	830			
23	CONFIDENTIAL SESSION.....	864-	end			
24						
25						

1 EXHIBIT LISTS SUBMITTED FOR ADMISSION:
2 LIST OF EXHIBITS ADMITTED ON MARCH 5, 2026
3 MOULIN EXHIBITS
4 Exhibit No.
5 CX-1964
6 CX-2541
7 CX-2547
8 CX-2557
9 CX-2560
10 CX-2563
11 CX-2564
12 CX-5922
13 CX-6450C
14 CX-6451C
15 CX-6452C
16 CX-6453C
17 CX-6454C
18 CX-6952
19 CX-7194
20 CX-7195
21 CX-7196
22 JPX-0001SC
23 JPX-0003SC
24 JPX-0004SC
25 JPX-0005SC

1	JPX-0006SC
2	JPX-0007SC
3	JX-0138
4	JX-0201
5	JX-0451
6	JX-0452
7	JX-0454
8	JX-0455
9	CX-2596
10	CX-5885
11	CX-6084
12	CX-6090
13	CX-6091
14	CX-6093
15	CX-6097
16	CX-6101
17	CX-6102
18	CX-6289
19	CX-6294
20	CX-7149
21	JX-0187
22	JX-0191
23	JX-0207
24	JX-0211
25	JX-0676

1 LIST OF EXHIBITS ADMITTED ON MARCH 5, 2026
2 CHRISSAN EXHIBITS
3 Exhibit No.
4 CX-2337
5 CX-2464C
6 CX-2531
7 CX-2534
8 CX-2537
9 CX-2538
10 CX-2552
11 CX-2587C
12 CX-2638
13 CX-5953
14 CX-6039
15 CX-6043
16 CX-6058C
17 CX-6094
18 CX-6378C
19 CX-6379C
20 CX-6716C
21 CX-6903
22 CX-7055
23 CX-7066
24 CX-7148
25 CX-7199C

1 CX-7200C
2 JPX-0010
3 JX-0146
4 JX-0453
5 RX-4056
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C E R T I F I C A T E

TITLE: CERTAIN VIDEO-CAPABLE LAPTOP, DESKTOP COMPUTERS,
HANDHELD COMPUTERS, TABLETS, TELEVISIONS, PROJECTORS, AND
COMPONENTS AND MODULES THEREOF 4

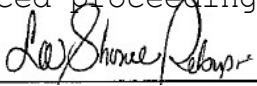
INVESTIGATION NO.: 337-TA-1448

HEARING DATE: March 6, 2026

LOCATION: Courtroom A

NATURE OF HEARING: Evidentiary Hearing

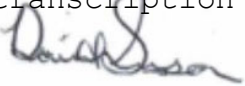
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Signature of the Contractor or the Authorized Contractor's Representative

I hereby certify that I am not the court reporter and that I have proofread the above-referenced transcript of the proceedings of the U.S. International Trade Commission against the aforementioned court reporter's notes and recordings for accuracy in transcription in the spelling, hyphenation, punctuation and speaker identification and did not make any changes of a substantive nature. The foregoing/attached transcript is a true, correct and complete transcription of the proceedings.

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Signed:

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UNITED STATES INTERNATIONAL TRADE COMMISSION

-----x
In the Matter of

Investigation No.

337-TA-1448

CERTAIN VIDEO-CAPABLE LAPTOP, DESKTOP
COMPUTERS, HANDHELD COMPUTERS,
TABLETS, TELEVISIONS, PROJECTORS, AND
COMPONENTS AND MODULES THEREOF

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Pages: 879 through 1202 (with excerpts)

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UNITED STATES INTERNATIONAL TRADE COMMISSION

Washington, D.C.

Before the Honorable MaryJoan McNamara

Administrative Law Judge

-----x

In the Matter of Investigation No.

337-TA-1448

CERTAIN VIDEO-CAPABLE LAPTOP, DESKTOP

COMPUTERS, HANDHELD COMPUTERS,

TABLETS, TELEVISIONS, PROJECTORS, AND

COMPONENTS AND MODULES THEREOF

-----x

International Trade Commission

500 E Street, SW

Washington, D.C.

Evidentiary Hearing

Monday, March 9, 2026

Volume IV

The parties met pursuant to notice of the
Administrative Law Judge at 9:00 a.m. Eastern.

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13 *** Index appears at end of transcript ***

14

15 PLEASE NOTE: Quotations from documents are reflected in the
16 transcript as read and may not constitute a verbatim quote.

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1 P R O C E E D I N G S

2 (In session at 9:00 a.m.)

3 JUDGE MCNAMARA: Good morning, everyone. I hope
4 you had a good weekend. Please be seated. Thank you.

5 Looks like we have a nice packed house again this
6 morning.

7 So I have the time. Thank you for printing this
8 out for me. So by starting at this point, are we going to
9 make your goals?

10 Good morning, Mr. Newcomer.

11 MR. NEWCOMER: Good morning. Josh Newcomer for
12 Nokia.

13 Yes, we believe both parties have now budgeted
14 and we'll stick to our times and we'll be able to finish up
15 the hearing on Thursday.

16 JUDGE MCNAMARA: Good. Okay. Is there anything
17 that you would like me to address this morning before we get
18 started?

19 MR. NEWCOMER: Two things, Your Honor. First, I
20 would like to introduce NEXT Advocate Emily Tannenbaum, just
21 to do the exhibits from last week, and then Respondents have
22 one objection that we will need to address.

23 JUDGE MCNAMARA: All right.

24 Good morning.

25 MS. TANNENBAUM: Good morning, Your Honor. Emily

1 Tannenbaum for Complainants.

2 I'd like to move to admit the exhibits that the
3 parties have agreed upon from -- into evidence that were
4 read into the record on Friday during the testimony of
5 Dr. Botner, Mr. Dastmalchi, Mr. Herrington, Mr. Gray, and
6 Ms. Martikainen.

7 JUDGE MCNAMARA: Okay.

8 Is there any objection from the Respondents?

9 MR. COLAIANNI: No objection, Your Honor.

10 JUDGE MCNAMARA: Thank you, Mr. Colaianni.

11 Then all of the -- and I assume you have a list
12 of the exhibits that you can hand up?

13 MS. TANNENBAUM: Yes, Your Honor.

14 JUDGE MCNAMARA: Okay. So would you be sure that
15 Ms. Kinkade has a list as well, and, with that, we will
16 admit into evidence all of the groupings of identified
17 documents that Ms. Tannenbaum mentioned. Thank you.

18 (Whereupon, the exhibits as recited by counsel
19 and reflected in the attached index were submitted and
20 received in evidence.)

21 MS. TANNENBAUM: Thank you.

22 JUDGE MCNAMARA: Okay.

23 MR. NEWCOMER: Now Respondents' objection, Your
24 Honor.

25 JUDGE MCNAMARA: Okay.

1 Good morning, Ms. Roberts.

2 MS. ROBERTS: Good morning, Your Honor.

3 Stephanie Roberts for Respondents.

4 Nokia this weekend identified a rebuttal witness
5 for the first time, Mr. Gray.

6 We don't agree that -- he testified on direct --
7 or in their case-in-chief, but we don't agree that he can be
8 a rebuttal witness in the prehearing statements. They never
9 identified him as a rebuttal witness, and we don't think he
10 should be a rebuttal witness at this point.

11 JUDGE MCNAMARA: Mr. Newcomer?

12 MR. NEWCOMER: A couple things, Your Honor, to
13 address that.

14 First, he obviously testified in the
15 case-in-chief, so they are familiar with him. He is not a
16 surprise witness here at all.

17 Second, based on the arguments that we see them
18 to be setting up, we think that they are going to try to
19 elicit testimony from their witnesses on negotiations
20 particularly related to Canon, which may need factual
21 testimony to rebut, to the extent there is an inaccuracy or
22 something like that.

23 If there's not, then it's kind of a conditional
24 designation. It probably is never going to come to a head.
25 But, if it does, we believe you should have the fact

1 evidence coming from Mr. Gray to rebut that.

2 And there's actually no really temporal or scope
3 issue here, because we had originally designated
4 Ms. Martikainen as a rebuttal witness again, but she had to
5 fly back to Finland. He would address the same facts she
6 did.

7 We have all had scheduling issues, of course --

8 JUDGE MCNAMARA: Sure.

9 MR. NEWCOMER: -- with some of their witnesses.
10 So it seems that there is absolutely no prejudice here
11 related to the facts that would be elicited on rebuttal.

12 JUDGE MCNAMARA: Okay. Thank you.

13 Ms. Ducca?

14 MS. DUCCA: Your Honor, I'm a little split here.
15 It is technically the rules that they should have disclosed
16 him as a rebuttal witness. However, ultimately I don't
17 think there is any prejudice here.

18 He was disclosed as a witness. They did already
19 cross him on direct. He is going to only be rebutting
20 testimony that the Respondents offer in their case-in-chief.

21 So, ultimately, because there's no prejudice, I
22 think he should be allowed to testify.

23 JUDGE MCNAMARA: Okay.

24 So when is he scheduled, Mr. Newcomer?

25 MR. NEWCOMER: He would not come back until

1 Thursday, according to the current schedule, and their
2 testimony presumably that he would be rebutting would be
3 Wednesday.

4 So, you know, we could -- obviously they want to
5 know, but we could take it up at a later time.

6 JUDGE MCNAMARA: Let me think about it and let me
7 get back to you later today or early tomorrow morning, if
8 you don't mind. I want to look some things up and see what
9 has been done in the past that I have done, that others have
10 done under these circumstances, and then I will get back to
11 you.

12 MR. NEWCOMER: Thank you.

13 JUDGE MCNAMARA: Thank you.

14 Good morning.

15 A. Good morning.

16 MR. CHERN: Good morning, Your Honor. Alex Chern
17 for Nokia.

18 MICHAEL PATRICK AKEMANN,
19 having been previously duly sworn or affirmed
20 on their oath, was thereafter examined and testified further
21 as follows:

22 MR. CHERN: We were in the middle of the
23 Dr. Akermann examination, and I just will note that we were
24 on the Nokia and third-party CBI confidential record.

25 (Whereupon, the hearing proceeded in confidential

1 session.)
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1 O P E N S E S S I O N

2 JUDGE MCNAMARA: Thank you.

3 BY MR. CHERN:

4 Q. Let's talk about the public interest.

5 What are the four statutory public interest
6 factors?

7 A. As shown on my slide CDX-10C.39, competitive
8 conditions in the U.S. economy, U.S. consumers, public
9 health and welfare, and production of like or directly
10 competitive articles in the U.S.

11 Q. Respondents first argue that an exclusion order
12 would hurt the public interest. Do you agree?

13 A. Not at all.

14 Q. Let's start with competitive conditions, looking
15 at slide CDX-10.40.

16 Why do you disagree with Respondents?

17 A. Well, critically, the U.S. PC industry, indeed
18 the global computer industry is highly competitive. There
19 are many competing suppliers. In my research, I identified
20 more than 120, I think, different branded computer suppliers
21 in the U.S.

22 Many substitute products. All of these large
23 competitors, in particular, have many different model types.
24 They compete in all different segments of the market.

25 Importantly, there are no significant barriers to

1 entry or expansion in the computer market. We see companies
2 expanding rapidly. We see sales shares shifting over time
3 in short order. They're very consistent with what we heard
4 from Mr. Dastmalchi last week.

5 Q. And what do Respondents believe about whether the
6 PC market is highly competitive? Do they agree?

7 A. Their fact witnesses certainly seem to agree.

8 Q. Let's look at slide CDX-10.41.

9 What did Acer say about its competitors?

10 A. Well, referencing Ms. Cruts' testimony, she
11 agreed that the PC market is highly competitive. She
12 identified, as you would expect, large competitors such as
13 Lenovo, HP, Dell.

14 Q. And does ASUS have similar testimony?

15 A. They do. Mr. Morquecho testified that ASUS's
16 main competitors in the PC market would include, as you'd
17 expect, companies such as Dell, HP, Lenovo, Acer, and Apple.

18 Q. Looking at slide CDX-10.43, can you just tell us
19 about Respondents' market share, both separately and
20 together?

21 A. Well, if we look at the bottom of the slide, the
22 blue and green lines, we see that Acer and ASUS have middle
23 single digit shares of the U.S. PC industry. They are both
24 big enough to appear as names on this chart, but they are
25 relatively small overall, certainly compared to HP, Dell,

1 Lenovo, and Apple.

2 Q. Is this chart reflecting the entire U.S. computer
3 market?

4 A. It is, in the sense that the "others" category
5 captures those other more than 100 branded computer
6 suppliers.

7 Q. Would it be appropriate to slice and dice the PC
8 market up into different smaller segments for this public
9 interest analysis?

10 A. No, I don't think so.

11 Q. Why not?

12 A. Well, I won't repeat all of Mr. Dastmalchi's
13 testimony from last week, and not qualified to do so, but
14 his supply chain analysis is very consistent with my
15 economic analysis.

16 There's a great deal of flexibility on the supply
17 side. All of these branded suppliers make very expensive
18 computers, but they make cheap computers too. They make
19 full-powered PCs and they make simple Chromebooks, and they
20 supply across education, health care, and general everyday
21 use.

22 Importantly, on the demand side, from an economic
23 perspective, the functionality across these segments is very
24 similar. An everyday business computer really isn't very
25 different than a simple gaming computer, something that

1 might be used in an education or health care setting.

2 The functional similarities are very, very
3 similar.

4 Q. And if Respondents' computers were excluded from
5 the market, would their competitors be able to quickly fill
6 a void?

7 A. I think so. Mr. Dastmalchi explained the supply
8 chain perspective. When I look at economic evidence such as
9 that on this screen, we can see that companies are able to
10 really shift share, increase their share rapidly from
11 quarter to quarter, year over year.

12 Q. Looking at slide CDX-10.44, has there been a
13 recent example where PC makers have done just that?

14 A. Yeah, this is sort of the same data but presented
15 in a similar -- or different format, rather, to emphasize
16 the aggregate reaction of the market in response to the
17 COVID shock in 2020, where there was a significant uptick in
18 demand for computers.

19 And if we look on the left side of the supply --
20 or the chart, rather, we see that units were running at
21 about 18 million a quarter, and then when COVID hit, demand
22 for computers rapidly increased because we all had to work
23 from home. Within just a couple of quarters, the quarterly
24 share had increased by more than 50 percent, and almost 100
25 percent another quarter or two later.

1 Q. At the risk of asking a silly question, were we
2 able to predict COVID and this spike?

3 A. We were not. That was what we would call an
4 unforeseen or unforeseeable supply shock -- demand shock.

5 Q. Is that different from what would happen here if
6 an exclusion order were entered?

7 A. It's very different. The relief sought here is
8 both forward-looking and foreseeable. We all know when the
9 ID will come down when Your Honor finishes her work. We
10 know when the Presidential Review Period will take place, at
11 least approximately.

12 So there's a lot of visibility into when any
13 exclusion order would actually bite in this context.

14 Q. Would consumers lose out on any unique features
15 if Respondents' computers were excluded from the market?

16 A. No. All of the computers that the branded
17 suppliers provide are functionally very similar. And it's
18 also important to emphasize that all of the existing
19 computers that people have are durable goods. They will
20 remain in place for use.

21 Unlike, say, a bottle of water that would be
22 consumed after I use it, this computer monitor in front of
23 me will still be here tomorrow for the next witness that's
24 going to sit in this chair.

25 Q. Looking at CDX-10.45, how would third-party

1 component manufacturers be impacted by an exclusion order?

2 A. I wouldn't expect any significant adverse impact
3 on those. This is a slide that I think Mr. Dastmalchi
4 showed as well, and it emphasizes the fact that the ODMs are
5 the entities that are making all these computers, at least
6 in any volume. Companies like Compal, Quanta, Wistron.

7 And if for some reason Acer and ASUS end up
8 selling fewer computers in the U.S., those companies would
9 be making more computers for HP, Dell, and Lenovo, and
10 component suppliers would continue to sell chips, memory
11 modules, screens to Wistron and Compal and so forth for use
12 in HP and Dell computers instead.

13 Q. Looking at slide CDX-10.46, would U.S. consumers
14 be impacted by excluding Respondents' products?

15 A. Not in any adverse way that's significant from an
16 economic perspective. As mentioned, the accused products
17 are durable goods. No computer is going to be taken out of
18 anybody's household.

19 The relief being sought is forward-looking and
20 foreseeable. Most importantly, the market is highly
21 competitive, with no significant barriers to entry or
22 expansion. There is every reason to expect a very rapid
23 supply side reaction of the sort that Mr. Dastmalchi
24 explained last week. Plenty of functionally similar
25 computers would be available in short order.

1 Q. And are there any unique public health safety or
2 education uses of these accused products?

3 A. I'm not aware of any, and Respondents haven't
4 pointed to any in their contention responses or their expert
5 reports in this investigation.

6 Q. Looking at slide CDX-10.48, what is the impact on
7 U.S. production of like articles, if any, of excluding the
8 accused products?

9 A. Well, as Your Honor's heard last week, there is
10 really no significant production of computers in the U.S.
11 The Respondents don't make any products here. And all of
12 the large manufacturers source the manufacturing out of
13 those ODMs that we've heard about.

14 Q. Now, there are a few accused tablets in this
15 case, moving on to CDX-10.49.

16 First, just tell us, what are Respondents' market
17 share for tablets?

18 A. They are small. So as shown on this slide, there
19 are three big tablet suppliers in the U.S. and indeed
20 worldwide -- Apple, Samsung, and Amazon.

21 Respondents appear somewhere in that red line at
22 the top, the "other" bucket. They are very small players in
23 the tablet segment of the computer industry.

24 Q. Is your analysis and conclusion on the public
25 interest factors the same for Respondents' tablets as it was

1 for their computers?

2 A. It is generally the same, and certainly my
3 conclusion is the same. There would be no economically
4 significant adverse impact on any of the four statutory
5 public interest factors in the tablet market.

6 Q. Okay. So to just wrap all your testimony up,
7 Dr. Akemann, what did you conclude about whether Nokia's
8 offers to Respondents were RAND?

9 A. They are consistent with RAND from an economic
10 perspective.

11 Q. And what did you conclude about whether
12 Respondents' counteroffers to Nokia were RAND?

13 A. They are not consistent with RAND principles from
14 an economic perspective.

15 Q. And, finally, what did you conclude about whether
16 an exclusion order in this case would hurt the public
17 interest?

18 A. With respect to both computers and tablets, I
19 concluded that there would be no economically significant
20 adverse impact on any of the four public interest factors.

21 Q. Thank you, Dr. Akemann.

22 MR. CHERN: I'll pass the witness, Your Honor.

23 JUDGE MCNAMARA: Thank you, Mr. Chern.

24 Mr. Colaianni?

25 MR. COLAIANNI: Yes, Your Honor.

1 We can stay on the public record, Your Honor, for
2 a while, and then I'm going to switch over, but I think for
3 the beginning we can stay on the public record.

4 JUDGE MCNAMARA: Thank you. Sounds good.

5 CROSS-EXAMINATION

6 BY MR. COLAIANNI:

7 Q. Good morning, Dr. Akemann.

8 A. Good morning.

9 Q. We met virtually at your deposition. Nice to see
10 you in person.

11 A. Good to see you as well.

12 Q. Thank you. During your direct testimony you
13 identified a number of license agreements Nokia has entered
14 into, correct?

15 A. That's correct.

16 Q. You identified some of them as being what you'd
17 characterize as running royalty agreements, right?

18 A. I did.

19 Q. Others were identified as tiered running royalty
20 agreements, right?

21 A. That's correct.

22 Q. The tiered running royalty agreements specified
23 different rates based on volume of sales or the end device
24 price, correct?

25 A. That's correct.

1 Q. The ViewSonic agreement, for example, that we
2 heard about last week on Friday during the testimony, that
3 would be an example of a tiered running royalty agreement,
4 correct?

5 A. I think it was, yes.

6 Q. You also identified some agreements that you
7 characterized as lump sum agreements, correct?

8 A. I did.

9 Q. And in your opinion, all of the Nokia agreements
10 that you testified about are RAND-compliant; is that
11 correct?

12 A. I don't know that I expressed exactly that
13 opinion, but I'm not aware of any licenses or licensing
14 behavior by Nokia that I would describe as inconsistent with
15 RAND.

16 Q. But you don't consider any of the agreements that
17 we heard about this morning in your testimony to be not
18 compliant with RAND; is that fair?

19 A. I don't think I've reached a conclusion in that
20 regard.

21 Q. You testified that Nokia's prior license
22 agreements are what you characterize as the gold standard
23 for determining a RAND benchmark; is that correct?

24 A. Yes, or more generally comparable licenses, I
25 would view, as a gold standard for establishing a RAND

1 benchmark.

2 Q. And by the "gold standard," you're referring to
3 agreements that are negotiated at arm's length, correct?

4 A. Typically we try to focus on arm's length
5 negotiations as the best evidence in this context.

6 Q. An arm's length negotiation is a deal between two
7 independent, unrelated parties, correct?

8 A. That's generally how we use that term, yes.

9 Q. Each party acting in its own self-interest to
10 negotiate the best price and terms, correct?

11 A. Yes.

12 Q. No collusion, coercion involved. So the final
13 price that's determined represents a true fair market value;
14 is that fair?

15 A. In general, the idea is that that's a good
16 indicator of fair market value or the value of the asset
17 that you're trying to measure. Obviously there can be
18 idiosyncratic circumstances in any particular negotiation
19 that could influence how things play out.

20 Q. But, generally, what I described would be
21 characterized as an arm's length transaction; is that fair?

22 A. I just didn't quite hear that.

23 Q. Generally, what I've just described in my
24 questions would be described as an arm's length transaction;
25 you would agree with that, right?

1 A. Yes. When the parties are not related in some
2 fashion, we call that an arm's length transaction.

3 Q. You're not a technical expert, right?

4 A. I'm definitely not a technical expert.

5 Q. Not offering any technical opinions in this
6 investigation, correct?

7 A. That's certainly correct.

8 Q. You personally did not perform any sort of
9 technical analysis to determine Nokia's contribution to the
10 H.264 or H.265 standards; is that correct?

11 A. That's correct.

12 Q. You did speak with Nokia's technical experts as
13 part of your analysis in this case; is that correct?

14 A. I did.

15 Q. You spoke with Dr. Moulin and Dr. Chrissan; is
16 that right?

17 A. I did.

18 Q. And you spoke with them about the technical
19 benefits of the asserted Nokia patents, right?

20 A. At a high level, yes.

21 Q. You didn't ask them to describe Nokia's technical
22 contributions to the H.264 or H.265 standards, though,
23 correct?

24 A. Not beyond how the four Asserted Patents relate
25 to video coding. Not the portfolio as a whole, if that's

1 what you're asking about.

2 Q. Well, you didn't ask them for any information
3 about Nokia's technical contributions to the H.264 and H.265
4 standards, correct?

5 A. That's true.

6 Q. All right. And they didn't tell you anything
7 about how Nokia's patents compared to the patents of other
8 parties in the H.264 or H.265 standards, right?

9 A. That's correct.

10 Q. You didn't perform or rely on any analysis to
11 determine the strength or value of Nokia's H.264 or H.265
12 patents versus patents in any patent pools; is that correct?

13 A. I'm sorry. Could you just ask that again? I
14 want to make sure I followed the whole question.

15 Q. Certainly. You didn't perform or rely on any
16 analysis to determine the strength or value of Nokia's H.264
17 and H.265 patents compared to patents in any patent pools;
18 is that correct?

19 A. I think that's correct. I don't rely on, say, a
20 technical comparison of Nokia's patents to the MPEG LA
21 portfolio or set of patents.

22 Q. Would you agree that the H.264 standard was
23 published for the first time in 2004?

24 A. That sounds about right.

25 MR. COLAIANNI: At this point, Your Honor, I'd

1 like to go on the confidential record.

2 (Whereupon, the hearing proceeded in confidential
3 session.)

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1 O P E N S E S S I O N

2 JUDGE MCNAMARA: Thank you.

3 BY MS. DUCCA:

4 Q. Dr. Akemann, there was some discussion about
5 patent pools. My only question regarding patent pools for
6 you is, what are some of the reasons that patent pools are
7 not as useful as benchmarks, as the comparable licenses in
8 this case?

9 A. Well, at a high level, the two most important
10 reasons are they are different patents if you're talking
11 about a portfolio that's not part of the pool, and that's
12 what we're talking about here. Nokia had the option to join
13 the patent pool and chose not to.

14 Secondly, as I alluded to in my testimony, patent
15 pools are very often set up to engender or facilitate
16 low-price cross-licenses, and there is nothing wrong with
17 that. If I were a large implementer and had video coding
18 patents, I would probably think about joining a patent pool
19 for purposes of getting patent peace with other large
20 implementers who might have relevant patents.

21 But that creates very different economic
22 dynamics, and it's very hard to think about how to properly
23 adjust for pool rates, to use them to benchmark what would
24 come out of a bilateral arm's length negotiation for an
25 entity such as Nokia who chose not to join a pool.

1 Q. If an entity had weaker, less significant
2 patents, are they more likely to engage in arm's length
3 negotiations or to join a patent pool?

4 A. Well, all else equal, the economic evidence and
5 literature on these points makes it clear that people who
6 have relatively weak patents are more likely to join pools
7 rather than attempt to negotiate arm's length deals.

8 And there's also an incentive to sort of inflate
9 the number of patents or patent families you have within the
10 pool given how the proceeds are typically distributed. In
11 particular, they tend to do counting exercises for purposes
12 of allocating the proceeds collected under the pool rates.
13 So that, again, gives pool participants incentives to goose
14 up the number of patents that they might have.

15 Q. Turning to your non-RAND public interest
16 opinions, your opinions with respect to public interest were
17 from an economic perspective, correct?

18 A. Absolutely. I'm only offering economic opinions
19 here.

20 Q. So you didn't consider public interest
21 considerations from a noneconomic perspective, correct?

22 A. I think that's true. I don't think I would be
23 qualified to do that.

24 Q. You testified regarding certain -- whether there
25 were certain substitutes in the market for the Acer and ASUS

1 machines.

2 A. I did.

3 Q. What about specifically gaming machines? So if
4 Acer and ASUS say they have specific computers made for
5 gaming, are there substitutes for those?

6 A. There are. And I think it's primarily ASUS who
7 is relatively large in the gaming segment, and there are
8 many other computer companies that supply gaming computers,
9 including all the big companies here. Dell, HP, Lenovo sell
10 gaming-oriented computers, which typically just means that
11 they have a lot of GPUs in there so they process things very
12 quickly.

13 Q. What about computers used in the education
14 sector? Anything specific with regard to computers in the
15 education sector that would be unique to Acer or ASUS?

16 A. Not to my knowledge. Obviously Chromebooks are
17 very large in the education sector, for example, and the
18 whole point of a Chromebook is to be essentially hardware
19 agnostic, and even the operating system and other things
20 operate in the cloud.

21 And with respect to non-Chromebooks, all of the
22 large suppliers and many small suppliers sell computers that
23 are branded or marketed as education-oriented computers, and
24 they are frankly very similar to other everyday computers.
25 It's more of a marketing exercise than any meaningful

1 distinction from a functional perspective.

2 Q. Are you aware that ASUS and Acer argue that there
3 should be a delay in the remedial orders with respect to
4 education because there's a long lead time for them to order
5 computers for use in the education?

6 A. I am aware of that argument.

7 Q. Do you have any response to that argument?

8 A. I don't think it makes a lot of sense to me.
9 First, importantly, the remedial orders here won't displace
10 any computer or any school. They are forward-looking
11 remedies. And these are durable goods, so in the main they
12 are going to last for three to five years, if not longer.

13 And, importantly, as we heard Mr. Dastmalchi
14 explain, there's every reason to expect that the market from
15 a supply side perspective would react very quickly to make
16 sure there were ample computers available.

17 I'm not aware of any contractual prohibition that
18 would prevent a school district or other educational
19 institution from shifting if their current supplier somehow
20 didn't have computers but there were six others that had
21 computers available. I'm certain that, even though
22 bureaucracies can be bureaucratic, that most educational
23 institutions would not have a lot of the trouble shifting
24 their focus if they needed to.

25 Q. Is there anything unique about computers that are

1 used in the government that would be specific to Acer and
2 ASUS?

3 A. Not that I'm aware of, and certainly the
4 Respondents haven't pointed to any unique use or unique
5 function that the Acer and ASUS accused products perform
6 that competing products wouldn't be able to perform equally
7 well.

8 Q. And I have an HP computer here, right?

9 A. It appears you do.

10 Q. How about inexpensive computers? So Acer and
11 ASUS claim that they make computers that are available to
12 those who want a very inexpensive machine. Is that unique
13 to Acer and ASUS?

14 A. They do make that argument.

15 Q. Is that unique to Acer and ASUS?

16 A. Oh, I'm sorry.

17 No, not at all. All of the computer suppliers
18 make low-priced computers, some \$500, some \$200.
19 Interestingly, I even read over the weekend that Apple has
20 now introduced a \$600 notebook competing for the first time
21 in what we might call the low-priced segment.

22 Q. I saw that as well.

23 Lenovo and HP are competitors of ASUS and Acer,
24 correct?

25 A. Yes, they are.

1 Q. And they are licensed to Nokia's patents; is that
2 correct?

3 A. They are.

4 Q. Thank you, Dr. Akemann.

5 MS. DUCCA: I have no more questions at this
6 time. I'll pass the witness.

7 JUDGE MCNAMARA: Thank you.

8 Mr. Chern?

9 MR. CHERN: Alex Chern for Nokia, Your Honor, and
10 I believe we need to go on the Nokia and third-party
11 confidential record.

12 (Whereupon, the hearing proceeded in confidential
13 session.)

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1 O P E N S E S S I O N

2 (In session at 11:05 a.m.)

3 JUDGE MCNAMARA: Thank you, everybody.

4 All right. Please be seated.

5 Ms. Seavers, are you ready?

6 MS. SEEVERS: Yes, Your Honor. If we could just
7 briefly go on the public record?

8 JUDGE MCNAMARA: Sure.

9 And if, before you get started, of course, you
10 introduce the witness.

11 MS. SEEVERS: Yes, Your Honor. We would now like
12 to proceed with playing the deposition testimony of Kate
13 Shang, Acer's lead negotiator.

14 JUDGE MCNAMARA: Yes.

15 MS. SEEVERS: And if we could now go on the Acer
16 confidential record.

17 JUDGE MCNAMARA: Sure.

18 (Whereupon, the hearing proceeded in confidential
19 session.)

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1 O P E N S E S S I O N

2 MR. HOUMAND: Good morning, Your Honor. Corey
3 Houmand from Morgan Lewis on behalf of Respondents.

4 JUDGE MCNAMARA: Yes.

5 Before we get started, I just want to confirm on
6 the record, since it is showing up in the video, that
7 Ms. Shang was deposed on September 26, 2025?

8 MR. HOUMAND: I believe so, Your Honor. We can
9 check on that.

10 JUDGE MCNAMARA: Just so it is on the record.

11 MR. HOUMAND: And we will get you a confirmation
12 very soon.

13 JUDGE MCNAMARA: Thank you. And the other
14 question is -- well, the other two questions are, I assume
15 the parties agreed on a translator, which is typical.

16 MR. HOUMAND: So I have confirmation that
17 Your Honor has the correct date.

18 On the translation, I believe -- we will confirm
19 that. We'll confirm separately and I'll get back to you as
20 soon as we can.

21 JUDGE MCNAMARA: Yes. And two other questions,
22 the name of the translator and also that he or she was
23 sworn, took an oath.

24 MR. HOUMAND: Understood, Your Honor.

25 JUDGE MCNAMARA: All right.

1 MR. RIZZOLO: Your Honor, Matt Rizzolo for
2 Respondents.

3 JUDGE MCNAMARA: Yes, Mr. Rizzolo.

4 MR. RIZZOLO: Also for the record, Ms. Shang's
5 testimony is in deposition designations as well. The vast
6 majority of what you just heard, part of those designations,
7 I think there may be 12 to 15 questions that weren't in the
8 prior designations, but now they are part of the record.

9 JUDGE MCNAMARA: That is great. And if they were
10 not part of the previous designation that I have already
11 said informally would be allowed, we have not put the orders
12 up on EDIS, would you make sure that you include any of the
13 added deposition designations as a separate filing so that
14 it is really clear?

15 MR. RIZZOLO: We can do that.

16 JUDGE MCNAMARA: Great. And you have some time
17 to do that.

18 MR. HOUMAND: And with that, Your Honor,
19 Respondents call Dr. Sheila Hemami as their first witness.

20 JUDGE MCNAMARA: Very good. Thank you.

21 MR. HOUMAND: Your Honor, just as a point of
22 procedure, because Acer is only pursuing an invalidity case
23 on the '714 patent, I will be handling the direct
24 examination of Dr. Hemami on the '714 patent, and my
25 colleague, Mr. Lawrence Jarvis, ASUS's counsel, will be

1 handing the '321 examination.

2 We have given prior notice to Nokia and received
3 no objection.

4 JUDGE MCNAMARA: That is fine.

5 Dr. Hemami, it is good to see you. Would you
6 kindly raise your right hand.

7 SHEILA HEMAMI,

8 having been first duly sworn or affirmed on
9 their oath, was thereafter examined and testified as
10 follows:

11 JUDGE MCNAMARA: Please state your full name.

12 A. Sheila Hemami.

13 JUDGE MCNAMARA: Thank you very much. Please be
14 seated.

15 DIRECT EXAMINATION

16 BY MR. HOUMAND:

17 Q. Good morning, Dr. Hemami.

18 A. Good morning.

19 Q. Would you please introduce yourself to the ALJ.

20 A. Good morning, Your Honor. My name is Sheila
21 Hemami.

22 JUDGE MCNAMARA: Yes.

23 Q. Did you work with us to prepare some slides to
24 assist with your testimony?

25 A. Yes, I did.

1 Q. And are we seeing them on the screen just now?

2 A. Yes, we are.

3 Q. And do you have a printed copy of the slides in
4 front of you as well?

5 A. I do.

6 Q. And for the benefit of the record, RDX-4C is
7 being presented.

8 We'll advance to slide 2.

9 Dr. Hemami, will you please give us an overview
10 of your educational background and your professional
11 accomplishments, particularly in the field of video
12 processing.

13 A. Yes. I have a bachelor's degree in electrical
14 engineering from the University of Michigan. I received
15 that in 1990. And I have two degrees from Stanford
16 University, a master's and a Ph.D. in electrical engineering
17 in 1994, ultimately. Both of those were in electrical
18 engineering.

19 The topic of my Ph.D. thesis at Stanford
20 University involved transmission of images in video over
21 networks where not everything might get there, and how does
22 one successfully decode and display materials when the
23 transmission channel is not robust.

24 During the last year that I was at Stanford
25 University, I was also a member of the technical staff at

1 Hewlett-Packard Labs in Palo Alto, which is just across the
2 street from Stanford, and when I was there I was a member of
3 a new team at HP Labs that was called the interactive video
4 initiative.

5 And at the time we were working on something that
6 was very cutting-edge and far off in the future. It was to
7 deliver digital video over fiber-optic to the home, which I
8 will point out is something that nearly all of us who have
9 fiber to the home now enjoy, but in 1994 this was a very
10 radical concept.

11 So following my graduation from Stanford and that
12 year at Hewlett-Packard Labs, I went on to Cornell
13 University. I joined as a faculty member in 1995, and I was
14 on the Cornell faculty as a professor of electrical and
15 computer engineering from 1995 through 2013.

16 During that time period I was not only doing
17 research and teaching, the responsibilities that one has
18 with an ordinary faculty position, but I also had several
19 leadership positions, both in the department and then also
20 in the university.

21 In 2013 I left Ithaca, which I still am sad
22 about, and moved to Boston, where I became department chair
23 of electrical and computer engineering at Northeastern
24 University.

25 Now, I served in that role for three years, and

1 then I left academia and I spent eight years working in the
2 private sector, four years at a not-for-profit defense
3 contractor and four years at a smallish company in Silicon
4 Valley. What I worked on over that time period were
5 technologies for large-scale environmental challenges and
6 medical devices for underserved populations.

7 Q. During your time at Cornell and Northeastern, did
8 you teach any courses dealing with video processing and
9 video-coding standards?

10 A. While I was at Cornell, I taught a very popular
11 one-credit seminar course entitled Image and Video
12 Compression Standards. And I also incorporated those
13 standards and learning about the signal processing in those
14 standards into both my undergraduate and my graduate courses
15 on signal processing.

16 Q. And have you previously been qualified as an
17 expert witness in cases involving video-coding standards?

18 A. Yes, I have.

19 MR. HOUMAND: Your Honor, at this point
20 Respondents tender Dr. Hemami as an expert in image and
21 video processing, including the subject matter of the '714
22 and '321 patents.

23 JUDGE MCNAMARA: Any objection from Nokia?

24 MR. VERBONCOEUR: Mitch Verboncoeur for Nokia.
25 No objection.

1 JUDGE MCNAMARA: Thank you, Mr. Verboncoeur.

2 Ms. Ducca?

3 MS. DUCCA: No objection from Staff, Your Honor.

4 JUDGE MCNAMARA: All right. Then Dr. Hemami is
5 accepted as an expert witness on the topics for which she
6 has been called to testify without objection.

7 Q. Let's advance to slide 3, Dr. Hemami.

8 What materials did you analyze in reaching your
9 opinions in this investigation?

10 A. So in this investigation I started off with the
11 asserted patents and the related materials. I looked at
12 quite a bit of technical documentation and prior art,
13 including technical video codec specifications, assorted
14 technical documentation that was produced in this case,
15 source code for the accused products, and prior art patents
16 and publications.

17 I also relied on sworn testimony, testimony from
18 ASUS and Acer engineers, testimony of patent inventors, and
19 then I've also been in the courtroom for some of the hearing
20 testimony.

21 Q. Moving to slide 4, are you aware that both
22 Complainants and Respondents have proposed slightly
23 different levels of ordinary skill in the art?

24 A. Yes.

25 Q. At the time of the '714 and '321 patents, did you

1 qualify as a person of ordinary skill under both
2 definitions?

3 A. Yes.

4 Q. Did you apply these definitions in arriving at
5 your opinions in this case?

6 A. Yes.

7 Q. And are the opinions you are about to provide the
8 same under both proposed definitions?

9 A. Yes, they are.

10 Q. Through your work in this matter, have you formed
11 any opinions relating to the '714 and '321 patents?

12 A. Yes.

13 Q. And if we move to slide 5, can you briefly
14 describe the opinions that you have reached?

15 A. Yes. I will do that.

16 So my first opinion is that the asserted claims
17 of the '714 and the '321 patents are not infringed by the
18 Acer and ASUS products.

19 Secondly, it's my opinion that the asserted
20 claims of the '714 and '321 patents are obvious in view of
21 the prior art.

22 Thirdly, it's my opinion that there is no
23 evidence of a technical domestic industry practicing the
24 claims of the '714 and '321 patents, and additionally,
25 there's no evidence of customization.

1 It's also my opinion that AV1 on the ASUS accused
2 products is not functional out of the box and thus does not
3 infringe.

4 And, lastly, it is my opinion that the Acer and
5 ASUS redesign products do not infringe the '714 and the '321
6 patents.

7 Q. Let's move to slide 6.

8 Can you give the ALJ a roadmap of the testimony
9 that you intend to provide today?

10 A. Yes. So, first, I will review background, and
11 then noninfringement and invalidity for the '714 patent.

12 Next I will do the same thing for the '321
13 patent.

14 And then, lastly, I will address the last three
15 points on my previous slide, technical domestic industry,
16 that there is no AV1 on the ASUS products, and the redesign
17 products.

18 Q. So let's advance forward and discuss the
19 background of the '714 patent. We are now on slide 8, where
20 we can actually see the '714 patent or excerpts of it.

21 Did you prepare just a couple of slides to
22 illustrate the technology that is relevant to the '714
23 patent?

24 A. Very few slides, yes, I did.

25 Q. So let's advance to slide 9. And can you

1 describe what you are illustrating here?

2 A. Yes. So we heard quite a bit last week about
3 motion compensation and what this entailed, and I trust that
4 everybody here was paying careful attention and has learned.

5 So what I'm going to do is just remind Your Honor
6 what a motion vector is and how that might look in a
7 particular video frame.

8 So what I'm showing here is a single frame of
9 video from a football game, and I have broken that video
10 into uniform size blocks, and I have performed a motion
11 estimation operation on it.

12 And what you will see is that each block has an
13 arrow in the block, and that arrow indicates the result of a
14 motion estimation procedure that represents the coder's best
15 effort in identifying the motion of the block.

16 And we can see that, for example, in player
17 number 82, who is in the front and in the foreground and
18 looks to be perhaps moving up and down, we have motion
19 vectors that have a vertical direction and are somewhat
20 short, and that player 41, who appears to be moving from
21 side to side, and perhaps up a little bit in the frame
22 because of his trajectory, we have a collection of vectors
23 that look approximately like that.

24 And you'll see that there are a couple vectors
25 here that look a little bit wonky, and this is just the

1 result of how motion estimation works. The coder tries its
2 best and sometimes it gets something that doesn't look like
3 the motion, but it can still proceed and work.

4 Q. Let's move to slide 11.

5 Can you please explain how the motion vectors
6 you've just described relate to a motion vector prediction
7 list?

8 A. Yes. Now, for the '714 patent, we will be
9 speaking quite a bit about motion vector prediction lists.
10 And the idea of a list is that when one is attempting to
11 select the right vector for that red block in the middle,
12 which is the current block being coded, one would like to
13 have a collection from which one can choose. And the motion
14 vector list is the collection from which one can choose the
15 best matched vector.

16 And what I have illustrated here is a situation
17 when perhaps the selection choices, the list, comes from the
18 blocks that are in green. So there would be five choices,
19 and the current block at the coder would be coded using one
20 of those motion vectors.

21 Q. Moving to slide 11, what was the state of the art
22 regarding motion vector prediction lists at the time of the
23 '714 patent? Were these lists known or did the '714 patent
24 invent them?

25 A. These lists were known, as we see in the

1 background.

2 Q. Let's now move to slide 12 and talk about the
3 candidates that go on a motion vector prediction list.

4 Did the '714 patent invent the candidates that we
5 are seeing on slide 12, or did they also pre-exist?

6 A. These candidates with these specific names also
7 existed prior to the '714 patent.

8 Q. Now, with regard to the candidates we're seeing
9 in yellow on slide 12, can those candidates take on
10 different sizes than what we're seeing on this slide?

11 A. Yes. This figure is a general representation
12 from the '714 patent, taking into account the idea that the
13 blocks to which the -- in which the frame is decomposed can
14 be unequal size.

15 And I've just shown an example of a motion vector
16 field on uniform size blocks.

17 So if we take these locations and this general
18 teaching and say, what does this look like on uniform
19 blocks, we see what I think you'll see on the next slide, if
20 you advance, please.

21 Q. So we're now on slide 13.

22 Can you just explain how this rendering relates
23 to the prior one?

24 A. Yes. So the labels on the five adjacent blocks
25 here are exactly the same labels as we saw in Fig. 9. They

1 are simply corresponding to the specific blocks that Fig. 9
2 refers to in the case when all the blocks are the same size.

3 Q. We are now on slide 14.

4 And the '714 patent discusses the concept of
5 removing duplicate candidates.

6 Did the '714 patent come up with this removal
7 concept or did it also pre-exist?

8 A. This also -- the idea of removing redundancy also
9 existed prior to the '714 patent.

10 Q. So let's move to slide 15.

11 And let me ask you, given that the lists were
12 known, the candidates that go on the lists were known, and
13 that removing candidates from the list was known, what is
14 your understanding of the '714 patent's invention?

15 A. So the alleged invention of the '714 patent is to
16 perform a limited number of motion information comparisons
17 between pairs to remove the redundant candidates, rather
18 than comparing every available pair.

19 So if I paraphrase that, the alleged invention is
20 performing a limited number of comparisons rather than
21 exhaustive comparisons.

22 Q. Let's move to slide 16 and talk about ways in
23 which you can reduce a motion vector prediction list.

24 And if we move one slide forward, to slide 17,
25 what are the three examples of list reduction that you plan

1 to discuss?

2 A. So, first, just for a baseline, I will describe
3 very briefly exhaustive comparison. Then I will go through
4 a reduced -- an example of reduced comparisons. This is an
5 example from Rusert, which is one of the pieces of prior art
6 that I'll be describing. And then I will look at what I
7 call a special case of Rusert, which is actually Nokia's
8 H.265 proposal.

9 Q. So let's now -- we're going to advance to
10 slide 19 and talk about the first example, exhaustive
11 comparisons.

12 What are you illustrating on slide 19?

13 A. So on slide 19 I have simply given the five
14 adjacent blocks very explicit English names, and I have
15 provided on the right the set of comparisons that must be
16 performed in order for everybody to be compared with
17 everybody else. And I think we saw something similar in
18 opening statements from Nokia's counsel.

19 And in this case, if we have five neighbors and
20 we're going to compare everybody to everybody else, there
21 will be a total of ten comparisons.

22 Q. Let's move to slide 21 and talk about your second
23 example, which is reduced comparisons under Rusert.

24 So let's start by letting me ask you to explain,
25 what is Rusert's set of candidates?

1 A. So what I have drawn here, first off, I'd like to
2 explain. On the left, in Rusert's patent application,
3 blocks of pixels in image frames are represented using
4 courier font with dashes or numbers in them. So this is a
5 little bit of a leap.

6 So what I have done is I have redrawn Rusert's
7 courier ASCII representation of blocks in a video frame on
8 the right-hand side on a regular grid like we're used to
9 seeing them for blocks in a video frame.

10 And I have simply copied exactly everything over
11 there.

12 Now, in this drawing I have colored the current
13 block, that's the block that is going to be coded, in orange
14 in the middle. And the other blocks that have numbers or
15 letters in them, which are also colored beige, that is the
16 set of candidates from which Rusert is going to construct
17 the list.

18 Q. And if we move to slide 22, can you explain how
19 Rusert processes its set of candidates to build a list?

20 A. Yes. So Rusert has labeled these blocks with
21 numbers and letters. The numbers go from 1 to 9, and then
22 the letters start at A and go up to F.

23 And Rusert teaches that these candidates will be
24 processed in an order. And all I've done on the right-hand
25 side is just unrolled that order to make it explicitly clear

1 that those are not just labels for block locations, they are
2 also indicating an order of operations.

3 Q. So let's dive into this a little bit further with
4 an example. On slide 23, can you please explain how Rusert
5 processes Candidate 2?

6 A. So in this example, I am considering that the
7 candidate labeled 2, that's the blue candidate on the
8 left-hand side of the current block, is currently being
9 considered for the processing in potential addition to the
10 set.

11 And in Rusert, that Candidate 2 will be compared
12 to a subset that consists of Candidate 1.

13 Now, importantly, that Candidate 2, when it is
14 being processed, is not going to be compared with any of the
15 candidates that are in beige. So we see that there are a
16 lot of candidates that it's not compared with and one
17 candidate that it will be compared with.

18 So visually we can see this is not an exhaustive
19 search. There is no complete set of comparisons here.

20 Q. And let's go to slide 24 and talk about another
21 example.

22 Can you explain how Rusert processes Candidate 6?

23 A. So my words for this example would be exactly the
24 same as before, the only difference being that now we're
25 talking about Candidate 6.

1 So Candidate 6 subset will be, at most,
2 Candidates 1, 2, 3, 4, 5. Again, Candidate 6 will never be
3 compared with 7 through F. So this is not an exhaustive
4 comparison.

5 And just to really hit that home, the largest
6 number of compares that will happen for Candidate 6 is 5.
7 Now, I say "largest" because it could be fewer, but the
8 largest number is 5. Were this to execute exhaustive
9 comparison for Candidate 6 or for any other candidate, there
10 would be 105 comparisons, because there are 15 members of
11 the set, and exhaustive comparison for 15 is 105.

12 Q. Let's now move to the third example, slide 26,
13 and you've labeled this third example as a special case of
14 Rusert.

15 Can you explain -- let's first start out with,
16 just can you explain what's on the slide here?

17 A. Yes. So what I have shown here, first on the
18 left, is exactly the same block version of Rusert without
19 the colors. And I have highlighted just the first five
20 candidates, those numbered 1 through 5.

21 On the right-hand side, I have presented the set
22 that is proposed in Nokia's proposal to H.265 with the
23 labeled candidates, the letters on the labeled candidates.

24 Q. And so my follow-up question to you is, is why
25 are you calling Nokia's H.265 proposal a special case of

1 Rusert?

2 A. So what we can see here, first off, is that
3 Rusert's first five candidates are exactly the same as the
4 full set of candidates for Nokia's proposal.

5 Secondly, there are subsets which are equivalent
6 for some of the candidates.

7 And, thirdly, neither of them does an exhaustive
8 search -- sorry, exhaustive comparison.

9 Q. Thank you.

10 Let's move to slide 27 and transition to talking
11 about the claims of the patent.

12 On slide 28, can you give us an overview of
13 encoding claim 15 that we're seeing on the slide?

14 A. So what I have put on this slide is claim 15 in
15 its entirety on the left. There's a lot of text, and I have
16 highlighted the verbs that begin each limitation.

17 And on the right I have shortened those a little
18 bit just to highlight the verbs as to what's going on.

19 So, first, there is the selection of a candidate
20 for potential inclusion in the list. That's in the blue.

21 Next, for 15[C], for that candidate there is
22 determination of a -- or to determine a subset of other
23 candidates based on the location of the selected candidate
24 from 15[B].

25 Next, there is a comparison between the selected

1 candidate from 15[B] and the candidates in the subset from
2 15[C].

3 Step 15[E] uses that comparison to determine
4 whether to include or exclude the specific candidate from
5 15[B] on the list.

6 And, lastly, 15[F] indicates that then the list
7 will be used. So we have a single passthrough processing a
8 candidate, and then that ultimately the list will be used.

9 Q. Moving to slide 29, which claims of the '714
10 patent are asserted in this investigation?

11 A. So we have claims 1, 9, 15, and 23, which
12 collectively cover two method claims, two apparatus claims,
13 two encoder claims, and two decoding claims.

14 Q. And moving to slide 30, what is your
15 understanding of the differences between the encoding claims
16 that are asserted and the decoding claims that are asserted?

17 A. So that very last element that I talked about
18 previously involved use of the list. So in an encoder
19 claim, "use of the list" means that the encoder will select
20 which member of the list it wants to indicate, and it will
21 send an index to the decoder.

22 So the encoder transmits the index relative to
23 the list.

24 The decoder receives the index that the encoder
25 has transmitted, and it then uses that index.

1 Q. Let's now turn to the topic of '714
2 noninfringement.

3 And on slide 32, Dr. Hemami, what are your
4 noninfringement opinions?

5 A. So my opinions are as summarized on this slide.

6 First of all, there is no subset that is
7 determined based on the location of the first spatial motion
8 vector prediction candidate.

9 Secondly, there is no first spatial motion vector
10 prediction candidate.

11 Thirdly, Nokia has conflicting interpretations on
12 determining a subset.

13 And, lastly, I found insufficient evidence of
14 encoder functionality.

15 Q. Now, before we dive into each one of these, I
16 want to ask you at the outset, did you recycle your
17 noninfringement opinions from the 1380 investigation, or did
18 you arrive at them after performing your own analysis?

19 A. I performed my own analysis, and it's my
20 understanding that 1 through 3 are different arguments than
21 were previously presented.

22 Q. Let's move to slide 33 and discuss your first
23 noninfringement opinion.

24 We'll go down to slide 34, and here on this slide
25 you've highlighted the claim language "based on the location

1 of the block associated with the first spatial motion vector
2 prediction candidate."

3 What do you understand this claim language to
4 require?

5 A. So to orient us again, I've put Fig. 9 on the
6 right-hand side, the current block being coded is in red,
7 and in this case I've highlighted a candidate block that
8 could be selected in the claim as B1. And I understand this
9 to mean that what B1 is going to be compared with, that
10 location for B1 subset must be based upon the location of
11 B1.

12 So I know where B1 is. And in the case of H.265,
13 B1 subset is A1. So that A1 must be defined relative to B1.

14 Q. With that understanding in mind, do the Acer and
15 ASUS accused products meet the claim language that we're
16 seeing on this slide?

17 A. They do not.

18 Q. And why is that your opinion?

19 A. That's my opinion because the accused products,
20 H.265, defines the locations of the subsets relative to the
21 current block, to the red block, not relative to the blue
22 block, B1.

23 Q. And did you prepare a demonstrative illustrating
24 this?

25 A. Yes, I did.

1 Q. Let's move to slide 35 now.

2 And right now we have -- for the benefit of the
3 record, we have a current block in blue and we have a red
4 dot with the coordinates xPb and yPb in the upper left
5 corner.

6 What is that referring to?

7 A. So, again, the current block is the block being
8 coded, and that red dot, as described in the standard, is
9 the pixel in the upper left-hand corner of the current
10 block. So that pixel has a name in the standard, and the
11 name is as the text indicates in red here.

12 Q. And how does the H.265 standard use that pixel
13 location to define the candidates?

14 A. So if you move to the next slide, please, here I
15 have put one of the candidates, A1, where it sits, and you
16 also notice that I have indicated a red dot in the lower
17 left-hand corner of the block A1.

18 And H.265 specifically calls out that pixel, so
19 the lower right-hand pixel in A1, it gives it a name, which
20 I'm not going to read but which is shown underneath the red
21 pixel, and H.265 defines that red dot in A1 according to --
22 if we were to describe it in English, it says we're going to
23 start at the upper left corner of the current block, that is
24 the xPb yPb, we're going to go down to the bottom pixel row
25 of the current block, so I think I've animated this -- thank

1 you -- and then, so we're going to go down, stay inside the
2 block, and then we're going to hop one pixel left.

3 And when we follow those instructions, we get
4 exactly to the indicated A1 pixel, which is exactly how
5 H.265 defines it.

6 Q. Let's move now to slide 37.

7 Does the H.265 standard define B1 in a similar
8 manner?

9 A. It does. In B1, we see also that B1's pixel is
10 in the lower right-hand corner, which is the same as A1, and
11 I call that out because we'll see something different in a
12 minute. And following the same directions in English, H.265
13 tells us -- if you could please show the animation -- to
14 start at the upper left-hand corner of the current block, go
15 to the rightmost pixel column in the current block but still
16 stay inside the block, and then hop one pixel up.

17 And that is how that red pixel in B1 is defined
18 in the H.265 standard.

19 Q. Moving to slide 38, is B1, or, excuse me, B0
20 defined in a similar manner?

21 A. It is. The only difference I point out here is
22 that the pixel that is called out in the B0 block is now in
23 the lower left-hand corner of the block.

24 So, colloquially, the instructions sound the
25 same. We walk to the right some distance, but now we hop

1 one pixel outside of the block, the rightmost column, and
2 then we go one up and we land exactly on the B0 specified
3 pixel.

4 Q. And if we move to slide 39, is there a similar
5 hopping outside of the blocks for defining the candidate A0?

6 A. It is. The only difference here being you'll see
7 that A0's pixel is defined in its upper right-hand corner.

8 Q. And, finally, are similar directions provided in
9 H.265 for getting to and defining the B2 candidate?

10 A. Yes. And B2 is clearly the easiest. We go up
11 one and over one, and there we are.

12 Q. So with all of this in mind, let's move to
13 slide 41.

14 Can you help us translate the opinions you've
15 just provided to the equations we're now seeing on the
16 screen?

17 A. Yeah. So before I talk about the equation, I
18 just need to point out two variables that I'm going to use.

19 So on the left-hand side I've provided the very
20 first picture from the first block A1. And then you'll see
21 that I have specifically labeled the width and the height.
22 So these are the variable names that are given to the width
23 and the height of the block in H.265.

24 And you may look at this and say, why are there
25 two different variables because the block is square. But

1 H.265 does permit a triangular block. So there are two
2 different variables for width and height.

3 Now, in the middle of this slide, the only place
4 where you see the yellow highlighting, I have provided
5 exactly the equation, which is written in words, for the
6 location of the pixel in the A1 block.

7 And what I've done is written that equation below
8 in larger font.

9 So what we have is A1's location, which is the
10 coordinates that are given in red underneath the A1 pixel,
11 is equal to the X coordinate is the width minus one. That
12 corresponds to going one pixel left. And the Y coordinate
13 is the upper left-hand corner of the current block
14 increased, so increasing is down in frames, increased by the
15 height minus 1. And it's that minus 1 that keeps us inside
16 the block and prevents us from going outside.

17 So this equation has taken me a lot more words to
18 give the English directions on how to get there, but it's
19 doing the same thing.

20 Q. And does the H.265 standard provide similar
21 equations for candidates A0, B1, B0, and B2?

22 A. Yes. All of the candidates are defined relative
23 to the location of the current block.

24 Q. And why do these equations support your
25 noninfringement opinions?

1 A. Well, I guess for the sentence I just said. All
2 of these equations are defined relative to the location of
3 the current block. But what we saw in the claim is that the
4 subset locations -- and let me remind you that the subsets
5 will be some of those -- one or more of those labeled
6 blocks. The subset locations must be defined relative to
7 the candidate, and the candidate will also be one of those
8 five blocks.

9 Q. Now, we've been going through and discussing the
10 2016 version of the standard, which is CX-5885, for the
11 benefit of the record.

12 Is there any additional evidence that supports
13 your first noninfringement opinion?

14 A. Yes, there is.

15 Q. And if we move to slide 42, can you explain what
16 that is?

17 A. Yes. So this is from deposition testimony of one
18 of the '714 inventors that was given in this investigation.
19 He was asked:

20 So each of the spatial candidates is determined
21 based on the location of the current block?

22 And his response was: I believe that is the
23 case.

24 And then he is asked to clarify: Okay. They're
25 not determined based on the location of some other spatial

1 candidate? Which I will point out is the claim language.

2 And he says, I believe that is correct.

3 Q. And for the benefit of the record, those
4 designations are JX-25C.

5 Let's now transition to your second
6 noninfringement opinion, Dr. Hemami, and can you please
7 explain what this is?

8 A. Yes. So my second noninfringement opinion
9 relates to use of the word "first" in relating to the
10 selected candidate. And it is my opinion that H.265 does
11 not provide for a first spatial motion vector prediction
12 candidate which meets the claims.

13 Q. Let's move to slide 44. And here on this slide
14 there's the table of the parties' proposed constructions for
15 first spatial motion vector prediction candidate.

16 Which of the parties' constructions is your
17 second noninfringement opinion based upon?

18 A. It is based on the Respondents' constructions --
19 construction which uses "first" as an ordinal ordering.

20 Q. And if the ALJ were to adopt Respondents'
21 construction of first spatial motion vector prediction
22 candidate, why is it your opinion that there is no
23 infringement?

24 A. Well, the first candidate that is processed in
25 H.264 -- pardon me -- H.265 is not compared to anything.

1 Q. Let's move to slide 45. And just to sort of set
2 the table on this, is there any dispute -- let me rephrase.

3 Does Nokia dispute the fact that A1 is not
4 compared to any other candidate and doesn't meet the
5 language of the claims?

6 A. No.

7 Q. And is there anything on this slide that supports
8 your opinion in that regard?

9 A. Yes. So this is from Dr. Pierre Moulin's
10 infringement report, and this paragraph 195 states that the
11 candidate from location A1, if available, is not compared
12 with another candidate before being added to the merge list.

13 Q. So does Nokia agree with you that there is
14 noninfringement under the H.265 standard under Respondents'
15 construction?

16 A. They do not.

17 Q. And how do you understand the disagreement?

18 A. So I understand that Nokia has asserted that any
19 of the candidates, the five candidates, can be processed
20 first in that they -- you know, Nokia asserts that they can
21 be processed in parallel and, therefore, when they are
22 processed in parallel, either everybody is first or nobody
23 is first. But the "first" term is an indicator rather than
24 an ordinal interpretation.

25 Q. And how do you respond to those arguments?

1 A. I don't agree with them.

2 Q. And why not?

3 A. Because the H.265 standard as written very
4 clearly teaches sequential processing of candidates.

5 Q. If we move to slide 46, why is it your opinion
6 that the H.265 standard processes candidates sequentially?

7 A. So first, before I provide the punch line here,
8 I'd like to orient what's on this slide so that we can see
9 where my support is coming from.

10 What I have included here are three pages from
11 section 8.5.3.2.3 of the H.265 standard, and this is the
12 section that describes the processing of the candidates to
13 form the list.

14 Now, I haven't put this up here such that we will
15 be able to read it, but what I would like to show is that
16 there are three pages that start with processing A1 and end
17 with processing B2. I have indicated the separate sections
18 in color. B1 flows from the bottom of one page to the top.
19 A0 does the same thing. And within each one of those
20 sections is where the processing of a particular candidate
21 happens.

22 And, in particular, there are internal variables
23 that are computed, for example, in the A1 section which are
24 propagated downwards. There is an information flow. And
25 those internal variables are required for the processing,

1 for example, of B1. So if B1 is done first, it cannot
2 complete its processing because that internal variable
3 doesn't exist.

4 So I'll make that clear, if you go to the next
5 slide.

6 Q. So let's go to slide 47 now. And can you give us
7 an illustration of the internal variables that you were just
8 referring to?

9 A. So what I have excerpted here is a section from
10 A1. So I've removed the yellow background, but we see the
11 A1 in yellow on the right. So this is from the A1
12 processing section.

13 And, in particular, I would like to point out
14 that there is a bullet point here, which is four lines long,
15 and the beginning of that bullet point states out that --
16 states that clause 6.4.2 is invoked with the current block
17 location, current block sizes, and with the location of A1.

18 Okay. So there are -- there's an input to that
19 process, which is just the current block location and A1.
20 And what comes back is this variable availableA1.

21 Now, this variable is internal to the section in
22 the standard that I excerpted on the previous slide, okay.
23 It does not -- it's not used elsewhere, it's just used
24 within this section.

25 So now after processing A1, this internal

1 variable availableA1 has been set. And at the risk of
2 sounding tongue-tied, I would remind us that there is
3 something called availableFlagA1, and this is not
4 availableFlagA1. This is availableA1.

5 Q. And if we move to slide 48, can you explain how
6 the internal variable availableA1 is used in the processing
7 of other candidates?

8 A. So after processing A1, which was the big yellow
9 chunk on the colored slide, the next chunk written in the
10 standard is for B1's processing.

11 And if we look in that orange section for B1,
12 what we see is the processing of B1. In other words, in
13 order to figure out that availableFlagB1, there is what's
14 indicated as line 2 here. It's the last line that I have
15 excerpted from the standard. And it starts off by using
16 that variable availableA1.

17 And condition 2 essentially says, if this
18 internal variable is true, then there will be a comparison
19 between Nokia's alleged subset and Nokia's alleged
20 candidate. But that comparison does not occur until there
21 is a value for availableA1, and that gets set in the section
22 for A1.

23 Q. Now, did you prepare a flowchart analyzing how
24 the internal variables in section 8.5.3.2.3 in the H.265
25 standard are used to process the candidates?

1 A. Yes, I did.

2 Q. And if we advance to slide 49, can you please
3 explain how your flowchart works?

4 A. So what I have done on this flowchart is I have
5 referred to each of the processing sections for the
6 candidates simply as a colored block with the candidate name
7 in it. We have just discussed availableA1, and the arrow
8 going from the yellow A1 block to the orange B1 block is
9 indicating that that availableA1 variable is needed in
10 processing B1.

11 Now, there are other available flags -- available
12 internal variables that also propagate. There is an
13 availableB1 that is determined in the processing of
14 candidate B1 that is required to process B0. The
15 availableA1 internal variable that we just saw is
16 additionally needed to process candidate B2 on the far
17 right, and also to process candidate A0. And, lastly, there
18 is the available B1 internal variable must be propagated to
19 process candidate B2.

20 Q. So let me focus on the B2 candidate for a moment.
21 So you've identified these internal variables on this slide.
22 Are there additional variables that need to be processed
23 before B2 is processed?

24 A. Yes.

25 Q. And if we move to slide 50, can you please

1 explain the significance of the H.265 text that you're
2 enlarging here?

3 A. Yes. So the background here is the processing
4 section for B2. So this is taken from that section. And
5 what I have enlarged and highlighted and underlined here is
6 a specific criteria which is needed to process the B2
7 candidate.

8 And this criteria uses not the internal variables
9 that we've just spoken about, but, in fact, the output
10 variables for the previous four candidates, A0, A1, B0, and
11 B1. Those must be computed in order to complete the
12 processing of B2.

13 Q. Let's now turn -- or let me -- I'm going to
14 transition to something else in a moment, and I want to ask
15 you, does H.265 also place the candidates on the merging
16 candidate list in a specific order?

17 A. Yes, it does.

18 Q. And if we move to slide 51, what is the order of
19 candidates that the H.265 standard requires?

20 A. So what I've excerpted here is exactly the
21 merging candidate list being constructed. Those are the
22 words from the standard. And the candidates are walked
23 through in a prescribed order.

24 Q. And which candidate is first?

25 A. A1 is first.

1 Q. Let's move now to your third noninfringement
2 opinion. And let me ask you, Dr. Hemami, what is your third
3 noninfringement opinion?

4 A. My third opinion is that Nokia has conflicting
5 interpretations on determining a subset.

6 Q. Okay. So let's advance to slide 53. What is
7 your understanding of Nokia's validity argument against the
8 prior art of Rusert?

9 A. So I understand Nokia's argument against Rusert
10 is to be that the subset is determined prior to considering
11 the location of the selected candidate.

12 Q. In your opinion, is Nokia's validity argument
13 consistent with its infringement read?

14 A. It is not.

15 Q. And what, to your understanding, is the
16 inconsistency?

17 A. Well, I understand that Nokia's infringement read
18 refers to subsets in H.265, which were not just
19 predetermined, but determined at least going back to 2013
20 when the standard was first adopted.

21 Q. And why are you flagging this inconsistency as
22 one of your noninfringement opinions?

23 A. Well, it's my opinion that the H.265 standard
24 doesn't infringe.

25 Q. For the same reasons we've just been discussing?

1 A. Yes.

2 Q. Okay. Let's move now to slide 54. What is your
3 fourth noninfringement opinion?

4 A. My fourth opinion is that I have seen
5 insufficient evidence of encoder functionality.

6 Q. And moving to slide 55, this looks like you have
7 an excerpt of someone else's slide here.

8 Can you explain what we're seeing?

9 A. Yes. This is a slide from Professor Moulin's
10 testimony, and on this slide he has excerpted sections of a
11 screenshot of running VQ Analyzer, which is a software tool
12 that allows one to exactly see what has been extracted from
13 the decoded bitstream in terms of variables, and it presents
14 them in a very nicely visualized way.

15 Q. Let me ask you this: Can you learn anything of
16 interest as it relates to the '714 patent just by looking at
17 this screenshot?

18 A. The short answer is no. The '714 patent recites
19 operations that must be performed in order to construct a
20 motion vector prediction list.

21 And what we see on this screenshot is a specific
22 motion vector prediction list, but we do not know the steps
23 that were followed to construct that list.

24 Q. Do the VQ Analyzer screenshots provide you with
25 any indication as to the list construction process that is

1 taken by an encoder?

2 A. The encoders are not standardized, so the decoder
3 is what is in the standard. So what we can see in
4 VQ Analyzer is the result of the encoding choices.

5 Q. And in your opinion are VQ Analyzer screenshots
6 like this sufficient to show that an encoder performs the
7 claimed operations?

8 A. They are not.

9 Q. Let's now transition to the topic of invalidity
10 for the '714 patent. We are now on slide 57.

11 What prior art did you analyze, Dr. Hemami, in
12 coming to your obviousness opinions?

13 A. So I analyzed the combination of the Rusert
14 reference to which I have previously referred and a
15 reference I will refer to as Karczewicz '721.

16 Q. On slide 58, what is your understanding of the
17 prior art status of Rusert and Karczewicz '721?

18 A. They both predate the '714 patent.

19 Q. And for the benefit of the record, we are seeing
20 RX-1976, which is the Rusert reference, and RX-1977, which
21 is the Karczewicz '721 reference.

22 Let's move to slide 59.

23 Did you work with us to prepare some animations
24 on this slide?

25 A. I did.

1 Q. Okay. So giving -- directing me as to when I
2 should click, can you provide us with an overview of what
3 Rusert teaches?

4 A. Yes. So, first off, I will say that Rusert
5 creates a motion vector prediction list. It gives that list
6 a name, which is highlighted in blue here, PMV_CANDS, and it
7 selects and processes candidate, and it refers to those as
8 PMV candidates.

9 Now, down below I have shown two figures from
10 Rusert. Actually I guess I've shown three. So in the box
11 on the left I have shown Figs. 2a and 2b, and I have
12 annotated them. 2a is the encoder and 2b is the decoder.

13 So I think if we can go to the next slide, what
14 Rusert does, again, is builds a motion vector prediction
15 list, and we see that that motion vector prediction list is
16 indicated both in the encoder and in the decoder in what
17 I've highlighted in blue.

18 Now, if you move to the next slide, I've
19 explicitly called out the list. We see on the figures that
20 there are a bunch of little boxes. Those each correspond to
21 a vector on the list.

22 And moving ahead again, the encoder will select
23 one vector from the list that it thinks is the best vector
24 for a particular block.

25 It then takes the index, so in this case it's the

1 second one over, so let's call it index 2 -- it's labeled as
2 2 -- and it will transmit that index to the decoder. The
3 decoder will receive the index, it will go to the list it
4 has constructed, it will pull out the vector at location 2,
5 and then move forward with decoding the block.

6 Q. So you've explained Figs. 2a and 2b on slide 59.
7 Can you now turn to explain how the process works with
8 Fig. 3n?

9 A. Yes. So Fig. 3n, recall, is that Courier font
10 character representation of blocks of pixels. In this case
11 the current block is in the center, and I think I've labeled
12 that in orange. And the other blocks, which are the
13 candidates that Rusert will consider in creating that list
14 that is shown in yellow on the left-hand side, are shown in
15 beige.

16 Now, Rusert teaches that the candidate order has
17 been created, so the 1, 2, 3, 4, 5, and so on, all the way
18 through f, by considering a spiral that starts on the
19 current block -- and we have an amazing animation here;
20 thank you -- starts on the current block and actually walks
21 through all of those annotated blocks in an increasing order
22 of distance from the current block.

23 Q. And so we'll wait for the spiral to conclude.
24 It's taking its time.

25 Moving to slide 59, what is your understanding of

1 Karczewicz '721?

2 A. So Karczewicz '721 is a reference that teaches
3 what are called prediction units, and prediction units are a
4 type of coded block from the emerging HEVC standard. So in
5 spite of the typo in paragraph 59 which refers to the HVEC
6 standard, we understand that Karczewicz is directed to the
7 emerging HEVC standard.

8 And paragraph 35 informs us that there are units
9 called prediction units, first underlined in red, and then
10 the bottom highlighting in paragraph 35 tells us that when
11 the prediction unit is inter-mode coded, then that means
12 essentially motion-compensated, and it can include data
13 defining a motion vector for that prediction unit.

14 Q. So you mentioned the emerging HEVC standard here.
15 How does that relate to the H.265 standard?

16 A. HEVC was the terminology that was used for what
17 became the H.265 standard. Typically we don't refer to
18 standards using their assigned numerical name until they are
19 actually adopted.

20 Q. And moving to slide 61, how do the disclosures of
21 Rusert compare to the '714 patent?

22 A. So these disclosures are essentially the same. I
23 have highlighted two sentences here, the first from Rusert
24 which states that, the methods and apparatuses described
25 herein improve coding efficiency for motion vector

1 prediction schemes that use signaling of motion vector
2 predictor, and that signaling is referring to signaling from
3 a list.

4 The '714 patent summary begins with the sentence
5 that states, the present invention introduces a method for
6 generating a motion vector prediction list for an image
7 block.

8 Q. Now, let's move to slide 62, and given the
9 similarities between Rusert and the '714 patent, can you
10 please explain to the ALJ how you are combining Rusert with
11 Karczewicz '721?

12 A. So Karczewicz '721 is directed to the emerging
13 HEVC standard. At that time the emerging HEVC standard
14 incorporated motion vector predictions using a list. So
15 there was a list that was created, an index that was sent.

16 Rusert teaches creating a motion vector
17 prediction list and that the index into that list would be
18 sent.

19 So this is simply applying Rusert's processing of
20 candidates and building of that list to the emerging HEVC
21 standard, and specifically to these pre- -- what are called
22 in HEVC prediction units what are called in Rusert motion
23 compensation blocks or motion prediction blocks.

24 Q. And moving to slide 63, why would a person of
25 skill have been motivated to combine Rusert with

1 Karczewicz 721 in the manner that you're proposing?

2 A. So, first off, this is a very straightforward
3 combination to make. One has the emerging standard. It has
4 a module that creates a list. This is simply a matter of
5 creating that list in a different way, so very
6 straightforward to put in.

7 Secondly, Rusert presents the argument that it's
8 taking the set from this -- rather, it's taking the
9 candidates from this larger set. We remember there are 15
10 candidates. The spiral went way out. Rusert processes a
11 greater diversity of candidates to try to give the encoder a
12 list with more interesting choices.

13 So if there are a whole bunch of motion vectors
14 that are very similar, there's not a lot of diversity in
15 choice, and you might be missing a good opportunity.

16 By going farther out, okay, perhaps we get more
17 options, and the encoder has a better chance of getting the
18 best prediction possible.

19 This combination was very within the knowledge
20 and skill of a person of ordinary skill. As I mentioned,
21 it's a very straightforward insertion of one module into
22 another.

23 And, additionally, researchers commonly used to
24 the teaching of prior standards to improve standards that
25 were under development. If we did everything from scratch

1 from the get-go for every single standard, we probably
2 wouldn't have standards that worked nearly as well as they
3 do today.

4 Q. Let me ask you, Dr. Hemami, have you ever
5 performed a modification like the one you are proposing for
6 Rusert right now?

7 A. I have. This was a regular thing that I did with
8 my graduate students in my research group. Our research was
9 generally around trying to create interesting and novel or
10 new and different ways to do things.

11 And the best way I think to assess these things
12 is not in a vacuum, but to stick it into a working system
13 that has been proven to -- you know, choices have been made
14 around it, and to see how well does it work within that
15 system. It's a much easier and, frankly, I think a fairer
16 comparison than coding up a personal coder from scratch to
17 test it. That's not -- that's an apples-and-oranges
18 comparison.

19 So this allows me to keep everything constant but
20 what I really want to tweak and give it a try.

21 Q. And do you think that a person of skill would
22 have been successful in making the combination that you're
23 describing?

24 A. Yes. It's simply sticking one in -- sticking one
25 module in for creating a list for another. One would end up

1 with a working coder and would get output.

2 Q. Let's move to slide 64.

3 And do you understand Nokia to agree with your
4 motivation to combine analysis?

5 A. I understand that Nokia does not agree.

6 Q. And how do you understand -- why do they
7 disagree?

8 A. So I've highlighted here from the pre-hearing
9 brief, their disagreement is that, because Rusert uses a
10 distance metric to determine a scanning order assuming a
11 constant block size, then the Karczewicz reference, which is
12 directed to prediction units which are split into
13 potentially nonuniform blocks -- this is a fundamental
14 incompatibility is their argument.

15 Q. And do you agree with their incompatibility
16 argument?

17 A. I do not.

18 Q. Okay. So let's kind of take each one of these
19 points that Nokia is making in turn.

20 First of all, let me ask you, does Rusert
21 disclose only using a distance metric?

22 A. Not exclusively.

23 Q. And so what else does it disclose?

24 A. So Rusert scan, as explained, was inspired by a
25 distance metric. Rusert imposes some tie-breaking rules to

1 impose an order on the distance metric. And the comparisons
2 that Rusert does are based upon the location of the
3 candidate being considered.

4 Q. Let's move to slide 65 and talk about Nokia's
5 second argument.

6 Does Rusert assume a constant block size?

7 A. Rusert clearly does not assume a constant block
8 size.

9 Q. And how do we know this?

10 A. So, first of all, we see in paragraph 17 there is
11 an explicit reference to motion compensation partition size.
12 And a couple lines later we see that larger partitions and
13 smaller partitions are specifically called out.

14 Q. And let's move now to slide 66 and talk about
15 Nokia's argument about incompatibility.

16 Do you think Rusert's teachings are incompatible
17 with HEVC because prediction units can be split into varying
18 sizes?

19 A. No.

20 Q. Why not?

21 A. So for this I go to what's nearly at the end of
22 the Rusert application, paragraph 116, and Rusert states
23 there that the examples that are given are not intended to
24 be the limit of the coding standards to which the disclosed
25 method and apparatus may be applied.

1 And then we're told, while specific examples have
2 been given in the context of H.264, or AVC -- AVC is simply
3 another name for H.264 -- the principles disclosed can be
4 applied to an MPEG-2 system, other coding standard, and
5 indeed any coding system which uses predicted motion
6 vectors.

7 Q. And so from these disclosures of Ruser, is it
8 your opinion that Ruser would be applicable to H.265?

9 A. Yes, it would.

10 Q. And why is that?

11 A. Well, Ruser clearly states that this was
12 presented and applicable to H.264. H.264 uses variable
13 partition size, and H.265's prediction units also use
14 variable partition size.

15 Q. So you mentioned that H.264 uses variable
16 partition size. If we move to slide 67, how does what
17 you're showing on slide 67 relate to variable partition
18 sizes in H.264?

19 A. So this is a figure directly from the H.264
20 standard that is exactly illustrating the variable partition
21 sizes. You see that we have squares; we have short, fat
22 rectangles; and we have tall, skinny rectangles.

23 Now, at first glance, this looks like there are
24 only four ways to partition, but I have annotated this with
25 the reminder that the top row is for 16x16 blocks and the

1 bottom row is for 8x8 blocks.

2 So, in fact, we have eight different unique ways
3 that individual blocks and subblocks can be chopped up.

4 Q. And in your opinion are Rusert's teachings
5 applicable to the partitions in H.264?

6 A. Yes.

7 Q. Now, before we get into your
8 limitation-by-limitation analysis, are you fine if I refer
9 to the combination of Rusert and Karczewicz '721 as the
10 Rusert combination?

11 A. Yes.

12 Q. And to streamline your obviousness opinions, did
13 you work with us to prepare slides that analyze the common
14 limitations of the encoding and decoding claims together?

15 A. Yes, I did.

16 Q. And if we move to slide 68, can you explain why
17 you structured your analysis in this manner?

18 A. Yes. So as we previously observed, we have
19 encoder and decoder claims for both method and apparatus.
20 And Rusert tells us that the encoder and decoder, quote,
21 "follow the same rules."

22 So in paragraph 35, Rusert tells us that the
23 methods that are disclosed are performed in the encoder
24 during encoding and also in the decoder during decoding.

25 So the methods are equally applicable, and I'm

1 just going to not go through both encoder and decoder
2 separately.

3 Q. So let's move to slide 69.

4 Can you preview for the ALJ which limitations you
5 believe to be in dispute?

6 A. Yes. So the specific limitations in dispute are
7 15[C] and 23[C] and 15[D] and 23[D] for the apparatus
8 claims.

9 Q. Thank you.

10 So now let's move to the limitation-by-limitation
11 analysis starting on slide 70.

12 In your opinion does the Rusert combination
13 disclose limitations 15[A] and 23[A]?

14 A. Yes, it does.

15 Q. Can you please explain why?

16 A. So 15[A] and 23[A] recite apparatus comprising a
17 processor and a memory including computer program code, the
18 memory and the code configured to, with the processor, to
19 cause the apparatus to do stuff.

20 And Rusert teaches us that there is provided
21 video encoding apparatus comprising a processor. And,
22 further, we learn that there is a computer-readable medium
23 carrying instructions, which one would understand as memory
24 with computer program code, which, when executed by computer
25 logic, causes the computer logic to carry out the methods.

1 Q. Let's move now to slide 71. And this slide
2 contains the language of 15[B] and 23[B].

3 Can you explain the highlighting that is on this
4 slide?

5 A. Yes. So this is a very lengthy part of the
6 claim. It has a lot of pieces of it. So I've tried to
7 color-code it and break it up in sort of shorter English so
8 we can orient ourselves as to what we're going to be talking
9 about. Both --

10 Q. And, sorry, I didn't mean to interrupt you.
11 Please continue.

12 A. Both 15[B] and 23[B] select a first candidate
13 from a set. That's the purple part.

14 That candidate is described as being included in
15 a list. We see that in blue.

16 That candidate is further described as being for
17 prediction unit of a block of pixels. That's in green.

18 We're told a little bit of information about the
19 list, that it has motion information.

20 And, lastly, 15[B] states that the list is going
21 to be used to signal a candidate.

22 Q. So to your knowledge, is any of this claim
23 language disputed?

24 A. I understand this is not in dispute.

25 Q. Okay. So let's quickly walk through it in some

1 detail. Let's do part 1, which is on slide 72.

2 Does the Rusert combination select a first
3 spatial motion vector prediction candidate from a set?

4 A. It does. Rusert teaches that there is something
5 called a PMV candidates list. It teaches that the set is
6 going to be -- actually let me go back and say that list is
7 dynamically generated specifically for the current motion
8 compensation block, so it's a personal list for the current
9 block.

10 The set from which those candidates will be drawn
11 came out of that spiral thing that we saw, so the beige
12 candidates that are shown in the middle.

13 And that list can be initialized, and then it
14 will be filled following the process.

15 Q. Let's go now to slide 73, which is part 2 of
16 15[B] and 23[B].

17 So we've covered this already. Can you just
18 remind us what the motion vector prediction list is in
19 Rusert?

20 A. Yes. So, again, Rusert is going to use a list to
21 pick a candidate to indicate a motion vector. And when I
22 walked through the encoder and the decoder, I pointed out
23 that the specific yellow boxes are the personal lists that
24 will have been created for a particular block, and the one
25 that's signaled is shown in pink, both the encoder and the

1 decoder.

2 Q. So let's move to slide 74 and talk about part 3.

3 And this deals with prediction units. Can you
4 explain what the prediction units are in the Rusert
5 combination?

6 A. Yes. So Rusert mentioned that it was for --
7 directed toward, first off, H.264 and then other partition
8 units. Rusert specifically says that the list can be
9 dynamically generated specifically for the current motion
10 compensation block.

11 So, again, that is language in Rusert that a
12 person of skill would understand, within the context of
13 applying it to the HEVC emerging standard, is the
14 corresponding prediction unit.

15 Q. And moving to slide 75, we have part 4, which
16 is -- it deals with the list having motion information of
17 the candidates.

18 How is this disclosed in the Rusert combination?

19 A. So in Rusert we have a very straightforward
20 sentence that says, each candidate corresponds to a motion
21 vector used for coding of a previous block.

22 In the emerging HEVC reference, we have data
23 defining a motion vector for the prediction unit, and the
24 data defining the motion vector may describe, and we start
25 off with a horizontal and a vertical component of the motion

1 vector, in other words the motion vector, and then there's
2 some additional information.

3 Q. And, finally, on slide 76, can you please explain
4 how Rusert discloses the final portion of 15[B] that we're
5 seeing on this slide?

6 A. Yes. So this final portion suggests that the
7 candidate is signaled as the selected motion vector, so it's
8 going to be sent to the decoder.

9 And we see in Rusert's encoder diagram that that
10 index 250 is being sent off the page to the right-hand side.
11 That's going to the decoder. And the description says a
12 code index is sent to select a particular candidate.

13 Q. So let's now move to the next limitation, which
14 is disputed and is 15[C] and 23[C].

15 And I want to talk about the first part of this
16 limitation, and then we'll go to the second one.

17 So focusing on the bold language that's on the
18 slide in the claims, does the Rusert combination determine a
19 subset of spatial motion vector prediction candidates?

20 A. Yes, it does.

21 Q. Can you explain why?

22 A. So here, again, I have taken the Rusert Courier
23 font depiction of blocks of pixels, and Rusert's set from
24 which the candidates will be potentially selected are shown
25 in beige. And, again, those are numbered from 1 through f.

1 Rusert describes these as a set of previously coded motion
2 vectors that were used before.

3 And what I have specifically illustrated here is,
4 one example, when the selected candidate -- the one being
5 considered is Candidate 3, which is blue -- then the
6 determined subset for Candidate 3 will be at most
7 candidates 1 and 2.

8 And Rusert refers to these as candidates already
9 in the list, which is a natural result of Rusert's
10 sequential processing.

11 Q. So now that we've addressed the first portion of
12 the claim language, I want to now talk about the second
13 portion. Let's move to slide 78.

14 I want to ask you, are Rusert's subsets based on
15 the location of the block associated with the first spatial
16 motion vector prediction candidate?

17 A. Yes, they are.

18 Q. And can you explain why?

19 A. Yes. So I have three reasons.

20 The first is that Rusert's subsets include
21 candidates that are at a similar or smaller distance from
22 the current block of pixels, so that is similar or smaller
23 distance relative to the candidate.

24 Secondly, Rusert's subsets are based on the
25 location of the selected candidate.

1 And, lastly, Rusert is consistent with Nokia's
2 infringement read.

3 Q. Let's move to slide 79 and discuss your first
4 reason.

5 Can you please explain why it's your opinion that
6 Rusert's subsets include candidates at a similar or smaller
7 distance from the current block of pixels?

8 A. So what I have done here is, again, I have taken
9 Rusert's 15 candidates in the set and I have colored them
10 according to what Rusert considers to be constant distance.

11 So any two candidates, any two numbered positions
12 on this figure, Rusert considers to be at the same distance.
13 So we can see that 1 and 2 are sort of a pinky-red. Those
14 are considered to be at the same distance. 3, 4, and 5 are
15 also considered to be at the same distance.

16 And I have colored those -- I've tried to do this
17 sort of in a ROYGBIV heatmap. So the warmer colors
18 represent blocks that are at a closer distance to the center
19 blocks, and the cooler colors represent candidate locations
20 that are at a farther distance.

21 And, in particular, when Rusert forms a subset
22 for any candidate, that subset will only have warmer colors
23 in it. It will not have cooler colors.

24 Q. Let's move to slide 80 and discuss your second
25 reason.

1 Can you explain why Rusert's subsets are based on
2 the location of the selected candidate?

3 A. So, again, here I've taken the Rusert grid. I
4 have highlighted the whole set in beige and then looked at
5 processing of a particular candidate.

6 Now, in this case I have selected Candidate 4.
7 So Candidate 4 is some distance -- and you can think of that
8 as a heatmap color. Candidate 4 is some distance from the
9 center block. And Rusert is going to select a subset that
10 will include, at most, candidates that are the same distance
11 from the current block as block 4 or a shorter distance.
12 Okay?

13 So in this case Candidate 4 will be compared
14 with, at most, Candidates 1, 2, and 3. Candidate 4 will not
15 be compared, just to keep reminding us, with everything
16 that's off to the right-hand side here.

17 Q. So now let's move to slide 81 and discuss your
18 third reason.

19 I want to break this up a little bit. So let me
20 first ask you, what are you illustrating on the right-hand
21 portion of slide 81 with respect to H.265?

22 A. So what I have illustrated here is the H.265
23 candidate set drawn for constant size blocks, and I have
24 used the same coloring and the same terminology for Rusert.

25 So the current block that is to be coded is in

1 red. The overall set and the candidates we're not going to
2 pay any attention to right now are shown in beige. And the
3 selected candidate in this case is B1. I've selected B1 as
4 the first candidate.

5 In H.265, the selected -- or the determined
6 subset for that B1 candidate is A1, which I've shown in
7 green.

8 Q. And now if we go to the left-hand portion of
9 slide 81, what are you illustrating here with respect to
10 Ruser?

11 A. So, again, I've shown Ruser's entire set, the
12 large grid with the set going from 1 to f, and then I've
13 zoomed in on the center five. So we've seen this before
14 without colors. These are Ruser's first five candidates.

15 In Ruser, the second -- I've highlighted
16 Candidate number 2 as the selected motion vector prediction
17 candidate. In the evaluation of Candidate 2 there will be a
18 determined subset, and that determined subset will be
19 Candidate 1, which is colored green.

20 Q. Now, in your opinion, are the illustrations of
21 Ruser in H.265 on slide 81 an example of how Ruser is
22 consistent with Nokia's infringement read?

23 A. They are.

24 Q. Can you explain why?

25 A. Well, in both of these examples, when B1 is the

1 selected candidate in H.265 and when 2 is the selected
2 candidate in Ruser, the comparison that will be performed
3 is between the motion vectors in the top block and the left
4 block.

5 Q. Let's move on to slide 82.

6 And what are the reasons why Nokia does not think
7 the Ruser combination discloses this limitation?

8 A. So Nokia contends that the subset, the content of
9 PMV_CANDS, is determined prior to the selection of the first
10 candidate.

11 So if we -- Nokia contends that if we pick that
12 candidate to be considered, the subset has already been
13 determined, it's predetermined, and, therefore, it cannot be
14 based on the location associated with the first spatial
15 motion vector prediction candidate.

16 Q. Do you agree with Nokia?

17 A. I do not agree.

18 Q. And why do you not agree?

19 A. I don't agree in that if this is the case -- so,
20 first off, Ruser teaches sequential processing of
21 candidates. Okay? So Ruser starts the process, walks
22 through, takes a specific candidate.

23 When that candidate is going to be evaluated,
24 Ruser teaches that it will be compared with candidates that
25 are at a similar or smaller distance.

1 Now, Rusert does not say it will be compared with
2 candidates with ordinal numbers less than this. And the
3 reason Rusert doesn't say that is because there is
4 processing that has occurred before then, there is an
5 interim list, Rusert is comparing with candidates on the
6 interim list. There is no guarantee that that interim list
7 is always going to be 1, 2, 3, 4, 5. It might be 1, 2, 3.
8 It might be 1, 4. It is dynamic based upon the actual data
9 for a particular block that's being coded.

10 Q. Let me ask a follow-up. Is the determination of
11 a subset in Rusert -- is it before or after the selection of
12 a candidate?

13 A. The determination of a subset as a particular
14 block is coded is after a specific candidate is identified.

15 Q. Now let's move to slide 83.

16 And before the evidentiary hearing, what did you
17 understand Dr. Moulin's opinions to be regarding the
18 determination of subsets?

19 A. I understood that Dr. Moulin agreed or stated
20 that the subsets in H.265 are predetermined. Effectively
21 they were defined at least by the time the standard was
22 released, version 1, in 2013.

23 Q. What did Dr. Moulin say about determining the
24 subset at the evidentiary hearing?

25 A. So I've included his quote here. There are two

1 sentences. I'm going to read them because I want to talk
2 about each one of them separately.

3 The first sentence is, so when one says 'hard
4 coded,' maybe what that means is that the pairings are fixed
5 as part of the standards.

6 So let me stop there for a moment. I think that
7 that statement is essentially saying subsets are
8 predetermined, they can be predetermined since 2013, right?
9 The pairings in H.265 are hard-coded in the standard.

10 His second sentence, however, the motion vectors
11 that are associated with these locations. So those change
12 dynamically, okay?

13 So I understand him to be saying here that, okay,
14 H.265 says the motion vector candidate in A1 will be
15 compared with the motion vector candidate in B1. That is a
16 statement of fact that the standard says.

17 His second sentence says, you know, if you look
18 at any specific block, A1 is going to have some motion
19 vector, 14, 7, 92, 6, whatever VQ Analyzer has shown us, for
20 example.

21 The motion vector in B1 will also have its own
22 personal value for what's being considered, right? On a
23 block-by-block basis the motion vectors themselves change.

24 And those motion vectors, right, are whatever we
25 have there. And this is how video coding works.

1 Now, this is also exactly why Rusert's subsets
2 are not predetermined, because that subset -- I keep saying
3 it's at most, but is it always going to be all five for the
4 sixth candidate? No. That subset is going to change
5 depending on what the actual values are in a particular
6 block.

7 Q. So just to summarize, does any part of
8 Dr. Moulin's hearing testimony about determining a subset
9 change your invalidity opinions with respect to Rusert?

10 A. No.

11 Q. And why not?

12 A. I think for the reason I just explained.

13 Q. Okay. Fair.

14 Let me now move to slide 84. Let's talk about
15 limitation 15[D] and 23[D], which, just as a reminder, is
16 also disputed. And let's touch upon the bolded language in
17 this claim first.

18 Let me ask you, does the Rusert combination
19 compare motion information as required by the first part of
20 this limitation?

21 A. Yes, it does.

22 Q. And you've written here Comparison 1. What is
23 that referring to in Rusert?

24 A. So Rusert actually provides for two ways in which
25 the comparison can be done. Rusert first suggests that

1 redundancy should be removed by removing duplicates. So,
2 you know, are the candidates equal, right? Let's remove the
3 duplicates. And we see that highlighted here.

4 Q. And if we move to slide 85, is there another
5 comparison of motion information that Rusert does?

6 A. Yes. So Rusert not only looks at are the
7 candidates equal, Rusert also basically asks, are they
8 almost equal. Recall that Rusert is interested in getting
9 the best diverse choice of motion vectors, and Rusert then
10 removes vectors that are within some threshold of vectors
11 that are already on the list.

12 Q. So now let's move to the second half of 15[D] and
13 23[D] that's on slide 86. And that language is, without
14 making a comparison of each possible candidate pair from the
15 set of spatial motion vector prediction candidates.

16 Does the Rusert combination meet this portion of
17 the limitation as well?

18 A. Yes, it does.

19 Q. Can you explain why?

20 A. Yes. So I think we've gone through this quite a
21 few times.

22 In this example I have selected Candidate 4 as
23 the potential candidate that's being processed. Rusert
24 teaches us that the subset for Candidate 4 will be at most
25 the Candidates 1, 2, 3. Again, reminding that depending on

1 what the actual values of the motion vectors are when this
2 is processed, the subset may be 1 or 2, the subset may be 1
3 and 3, the subset may be 2 and 3. The subset will never
4 have 5 all the way through f.

5 Q. Let's move to slide 87 and discuss limitations
6 15[E] and 23[E].

7 In your opinion does the Rusert combination
8 disclose these limitations?

9 A. Yes, it does.

10 Q. And can you explain why?

11 A. Yes. Rusert clearly states that unnecessary
12 candidates, again, where "unnecessary" is defined as
13 duplicates or close enough, are removed.

14 Q. And now let's move to slide 88. Here we have the
15 final limitation of both 15 and 23[F].

16 And can you explain why the Rusert combination
17 discloses these limitations as well?

18 A. Yes. So I think we've gone through this.

19 Rusert discloses that at the encoder and the
20 decoder we have first a code index that is generated and
21 sent at the encoder, and then that index is used at the
22 decoder.

23 Q. Let's move now to slide 89. Thus far we did our
24 analysis and we focused our analysis on the apparatus
25 encoding and decoding claims. Now I want to touch upon the

1 method claims.

2 Did you reach any opinions as to whether encoding
3 method claim 1 is also rendered obvious by the Rusert
4 combination?

5 A. It's my opinion that the Rusert combination also
6 invalidates encoding method claim 1.

7 Q. And why is that your opinion?

8 A. So what I've done here is I've put claim 15,
9 which is the apparatus claim, and claim 1 side by side. And
10 I have highlighted, first of all, the verbs in the apparatus
11 claim and the gerunds in the method claim, and we see a
12 direct correspondence there at the beginning of each of the
13 limitations.

14 I've also included additional highlighting which
15 are differences between the two, and I don't find what's in
16 the additional highlighting to change my opinion.

17 Q. Let's move to slide 90.

18 Let me ask you, did you reach any opinions as to
19 whether decoding method claim 9 is also rendered obvious by
20 the Rusert combination?

21 A. I did. I believe that the Rusert combination
22 also invalidates decoding method claim 9.

23 Q. And are you performing a similar -- is the
24 highlighting on slide 90, is that illustrating the
25 differences in claim language that you flagged?

1 A. That's correct.

2 Q. And as before, do the differences in claim -- do
3 the highlighted differences on this slide have any impact on
4 your validity opinions?

5 A. They do not.

6 Q. Let me move now to the topic of secondary
7 considerations on slide 91.

8 Did you consider Nokia's alleged secondary
9 considerations of non-obviousness?

10 A. Yes, I did.

11 Q. And what opinions did you reach as to those?

12 A. So I believe that they are, first of all, not
13 supported by evidence, and, secondly, I find them to not
14 really be connected to the '714 patent.

15 Q. What conclusions -- to be a bit more specific,
16 what conclusions did you reach regarding Nokia's allegations
17 of praise?

18 A. I did not see any evidence of praise of the '714
19 patent.

20 Q. Did you see -- what conclusions did you reach
21 regarding Nokia's allegations of long-felt need?

22 A. Well, I feel that there's invalidating prior art,
23 so I see that everything is in the Rusert combination, and I
24 don't see a long-felt need then.

25 Q. Did you see any connection between sales of the

1 accused and domestic industry products in the '714 patent?

2 A. I did not see any evidence connecting the sales
3 with the patent.

4 Q. And moving to the last one, why is it your
5 opinion that adoption into HEVC is not an alleged secondary
6 consideration?

7 A. So I actually find adoption into the standards to
8 be irrelevant. There is no guarantee that because something
9 is in a standard it was novel.

10 Q. Thank you, Dr. Hemami.

11 Mr. Jarvis will handle the remaining topics of
12 your examination.

13 JUDGE MCNAMARA: Very good. It's now 12:58, so
14 it might be a good time to break for lunch.

15 MR. HOUMAND: Yes, Your Honor.

16 JUDGE MCNAMARA: I'm seeing nods.

17 All right. I'll see you in an hour.

18 (Whereupon, the proceedings recessed at 12:56
19 p.m.)

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21

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25

1 AFTERNOON SESSION

2 (In session at 2:00 p.m.)

3 JUDGE MCNAMARA: Thank you, everybody. Please be
4 seated.

5 MR. GETTLEMAN: Good afternoon, Your Honor.

6 JUDGE MCNAMARA: Good afternoon.

7 MR. GETTLEMAN: Jason Gettleman on behalf of the
8 Acer Respondents. This morning you had some questions about
9 the interpreter at Ms. Kate Shang's deposition?

10 JUDGE MCNAMARA: I did. Thank you for that.

11 What I would simply like to know, just to be
12 sure, the name of the interpreter, of course, and I'm
13 assuming, of course, that she was also placed under oath.
14 And I am also assuming that both sides agreed to her as a
15 translator, but I would still like that on the record.

16 MR. GETTLEMAN: Sure. The court reporter has
17 been provided all of that information. The interpreter's
18 name is I-Ching Ng, that's I hyphen C-H-I-N-G, last name Ng,
19 N-G. She was sworn in at the start of Mr. Shang's
20 September 26, 2025 deposition.

21 And the page and line is page 7, line 3, and the
22 parties agreed to that interpreter.

23 JUDGE MCNAMARA: Thank you for confirming that.

24 MR. GETTLEMAN: Thank you, Your Honor.

25 MR. JARVIS: Good afternoon, Your Honor.

1 Lawrence Jarvis on behalf of the ASUS Respondents here to
2 continue Dr. Hemami's direct.

3 JUDGE MCNAMARA: Yes, Mr. Jarvis. Go ahead.

4 And you had lunch?

5 THE WITNESS: I did, yes. Thank you.

6 JUDGE MCNAMARA: Good. There's not a lot around
7 here. This is kind of a tough place.

8 BY MR. JARVIS:

9 Q. Good afternoon, Dr. Hemami. I would like to now
10 transition to discussing your '321 patent opinions.

11 Let's start with discussing the background of the
12 '321 patent here on slide 94.

13 Could you explain some of the background
14 technology relevant to the '321 patent, starting with this
15 slide?

16 A. Yes. So I spent the morning talking about frames
17 and motion vectors in frames. This is a perspective on
18 video coding from completely the 10,000 foot view, what's
19 happening.

20 So encoding, in an encoder, the raw video frames
21 go into an encoder. That encoder implements a video
22 compression algorithm. And what comes out of the encoder is
23 the compressed bitstream.

24 So this bitstream has the binary representation
25 of the video sequence and other information that the decoder

1 needs to decode, things like the width and the height of the
2 frames, the color space, this type of thing.

3 The decoder receives, takes that compressed
4 bitstream, decodes it, and ends up producing decoded video
5 frames which are typically presented to the user on their
6 viewing device.

7 Q. And moving to the next slide, can you explain
8 what the '321 patent's asserted claims are directed to?

9 A. Yes. So the '321 asserted claims are only on the
10 decoder side. So we're not going to be speaking about the
11 encoder side.

12 Q. And did Dr. Richardson agree with that
13 interpretation?

14 A. Yes, I believe he did.

15 Q. I'd now like to transition to discussing your
16 noninfringement opinions, but before we get started, I would
17 like to first ask you, were you present for all of
18 Dr. Chrissan's testimony?

19 A. Yes, I was.

20 Q. And do you understand that Dr. Chrissan testified
21 about the proposed construction of the resetting term?

22 A. Yes.

23 Q. And moving to slide 97, is it your
24 understanding -- or did Dr. Chrissan testify to only
25 offering opinions under Staff and Nokia's proposed

1 constructions?

2 A. Yes.

3 Q. And just so the record is clear, did Dr. Chrissan
4 testify that he did not offer any opinions as to whether
5 there is infringement under Respondents' proposed
6 construction?

7 A. Yes.

8 Q. If Respondents' proposed construction is adopted,
9 what is your opinion?

10 A. If Respondents' proposed construction is adopted,
11 it is my opinion that there is no infringement.

12 Q. Moving to slide 98, could you please explain your
13 opinion as to why Respondents' products would not infringe
14 if their construction was adopted?

15 A. Yes. So in slide 98, I have used one of
16 Dr. Chrissan's slides in which he first explains the idea of
17 an IDR frame, which is indicated at the left, with the first
18 frame at the left with the arrows coming out of it.

19 And he states in the title that the decoder
20 begins decoding at IDR frame to enable playback of selected
21 picture. And this is an accurate description of what
22 happens when a decoder begins decoding at an IDR frame.

23 Now, he has labeled some labels underneath the
24 frames at the bottom that end with 94, and then we see a red
25 0, and he has labeled that as reset.

1 So I would like to start with what happens at
2 that IDR frame, okay? So I believe Dr. Chrissan used the
3 terminology that the decoder is flushed. And this is I
4 think a colloquial term that we often use.

5 And what does that actually mean at the decoder?
6 So how can we put that in some words that are a little bit
7 easier to understand in the context of what's going on here.

8 So when an IDR frame is received, the decoder
9 behaves as if the IDR frame is the very first frame it has
10 ever decoded. It has no knowledge or understanding that any
11 frames even existed prior to that frame.

12 The decoder cannot differentiate between the
13 very, very first frame it's ever decoded in a Seinfeld
14 episode, and the very first IDR of the last group in a
15 Seinfeld episode. As far as the decoder is concerned, time
16 begins at each IDR frame.

17 So by definition, because of the behavior of the
18 decoder, the value of every variable must be set for the
19 very first time, because this is a complete initiation of
20 the decoding process.

21 Q. And sticking with slide 98, can you explain what
22 happens when a key frame in an AV1 stream is received?

23 A. Yes. So this slide uses the terminology IDR,
24 both on Dr. Chrissan's slide and also in my explanation, and
25 we heard from Dr. Chrissan that, in fact, the term IDR frame

1 or IDR picture is something that exists in the H.264 and the
2 H.265 standards.

3 Now, in the AV1 standard, the name for the frame
4 that performs the same function that holds the same role in
5 the compression algorithm is called a key frame.

6 Q. Okay. Before we move on, did you apply all of
7 the proposed constructions for reset or resetting in your
8 analysis?

9 A. No, I did not. Well, the next slide explains
10 what I did.

11 Q. Could you explain your opinions?

12 A. Yes. So in my opinion, first off, under
13 Respondents' proposed construction for resetting, an IDR, or
14 key frame, causes the variables to be set for the first
15 time, for the uber reasons I have just explained, not set
16 again.

17 Now, I have a second opinion, which is not
18 reliant on constructions, and that is that none of the
19 alleged identifier values meet the resetting limitation.

20 Q. Moving to slide 100, are these the identifier
21 values that it seemed Dr. Chrissan presented during his
22 direct testimony shown here on slide 100?

23 A. Yes. So it wasn't entirely clear to me exactly
24 if Dr. Chrissan was accusing everything he mentioned, but I
25 have attempted to represent to my best understanding from

1 his testimony what the identifier values that he pointed to
2 are for the three different standards.

3 Q. Okay. And is it your opinion that none of the
4 alleged identifier values satisfy the resetting limitation?

5 A. Yes.

6 Q. Let's discuss why.

7 Moving to slide 101, can you explain why you
8 believe the identifier value terms on this slide are not --
9 or do not satisfy the resetting limitation?

10 A. Yes. So the previous slide had quite a long list
11 of variables, but for H.264 and H.265, two of them share the
12 same name, and they all start with the first four letters
13 "prev." And in the standard, that actually refers to the
14 previous picture.

15 Now, the claim term, which is highlighted on the
16 right-hand side, refers to the first image frame of the
17 independent sequence. So as a reminder, referring back to
18 that slide we saw before, that might be the IDR frame, or
19 the key frame.

20 These variables have "prev" in front of them, so
21 they are not identifier values for the first image frame in
22 an independent sequence. They generally refer to the
23 previous frame.

24 Now, in this case, we actually have an excerpt
25 here. So on the left-hand side, the first box down from the

1 top, I have highlighted a sentence that says, "If the
2 current picture is an IDR picture, PrevPicOrderCntMsb is set
3 equal to 0 and PrevPicOrderCntLsb is set equal to 0."

4 Now, I want to be very clear. These variables
5 exist in both H.264 and H.265. I'm only quoting from H.264
6 here, but the same analysis applies to H.265.

7 Now, we see that sentence that says those two
8 variables are set equal to 0. So why is that? So, first
9 off, as an aside, I mentioned that it doesn't say "reset,"
10 but, more importantly, the equation below in the box,
11 equation 8-3, exists and is used in the H.264 standard to do
12 some computations.

13 And that equation is general. It's not a special
14 case equation that says we don't do this for an IDR frame,
15 we do do this for another frame. And in order for the
16 equation to work, well, everything that is in the equation
17 needs to have some value; otherwise, it doesn't make any
18 sense to compare something or to add or subtract something.

19 So that line referring to if the current picture
20 is an IDR picture, these variables are set equal to 0, is
21 simply putting values in those variables such that the
22 equations will not generate garbage.

23 Q. Moving on from the previous picture, order count
24 variables, I'd now like to talk to you about
25 slice_pic_cnt_lsb on slide 102.

1 Can you explain your opinions as to why
2 slice_pic_order_cnt_lsb does not satisfy the resetting
3 limitation?

4 A. Yes. So this variable, slice_pic_order_cnt_lsb,
5 is a syntax element. It is identified as a syntax element
6 in H.265, which is where it appeared in the table of the
7 alleged identifier values, and H.265 very clearly delineates
8 between things that occur in the standard that it refers to
9 as variables and things that are syntax elements.

10 And, in particular, this slice_pic_order_cnt_lsb
11 is a syntax elements, and the syntax element is decoded from
12 the bitstream. In other words, it's set at the encoder,
13 it's part of the bitstream that's transmitted, and it is
14 decoded at the decoder.

15 So it is not -- it's set by the encoder.

16 Q. And I note you have -- you mentioned that it's
17 typically set by the encoder. Do you mind explaining that
18 to Her Honor?

19 A. Yes. So what I've just said about
20 pic_order_cnt_lsb is all correct. Now, I say typically
21 here, because, in fact, this particular syntax element does
22 not exist for an IDR frame.

23 Q. And could you explain the basis for saying it
24 does not exist for an IDR frame, and is that what is shown
25 here on slide 103?

1 A. Yes. So the top box on slide 103 is exactly the
2 same as the bottom box on slide 102, but I have highlighted
3 a different line. Instead of highlighting the line that has
4 the syntax element, I have highlighted the line before it,
5 and I'm going to translate that line into plain English.

6 It says if the frame is not an IDR frame, then
7 the next syntax element in the bitstream is
8 slice_pic_order_cnt_lsb.

9 So when an IDR frame is coded, this syntax
10 element will not even be in the bitstream.

11 Now, in the second, box I have shown equation 8-2
12 from the H.265 standard. You can see there's use of that
13 syntax element in the equation. Again, just like what I
14 explained previously, this is a general equation. It holds
15 for all frames. And the standard notes specifically that in
16 the use of this equation, all IDR pictures will have the
17 equation equal to 0 since slice_pic_order_cnt_lsb is
18 inferred to be 0 for IDR pictures.

19 And it needs that inference in order for the
20 equation to not have a garbage-in/garbage-out situation.

21 Q. And does Dr. Chrissan agree that
22 slice_pic_order_cnt_lsb is not present in the bitstream for
23 IDR frames?

24 A. Yes.

25 Q. And is that the testimony where he says that here

1 on slide 103?

2 A. That's correct.

3 Q. Okay. Moving on to another identifier value
4 identified by Dr. Chrissan, on slide 104, can you explain
5 your opinions as it relates to OrderHints from AV1?

6 A. Yes. So OrderHints is a variable in AV1, and I
7 will say AV1 uses the same nomenclature as the H.264 and
8 H.265 standards. So it's not something that arrives in the
9 bitstream.

10 And OrderHints is a seven-element array, but no
11 element of OrderHints ever refers to the key frame.

12 Q. And does AV1 -- does the AV1 specification
13 illustrate that no element of the OrderHints array refers to
14 the key frame?

15 A. Yes. So I read the entire AV1 specification, and
16 there is no place where the index in OrderHints actually
17 will take on a value that refers to the key frame.

18 What's highlighted here is the equation that
19 Dr. Chrissan pointed to as the reset for the identifier
20 value, and in this case that -- the argument for OrderHints
21 never takes on a value that corresponds to the key frame.

22 Q. And that's what's shown here on slide 105?

23 A. That's correct.

24 Q. Moving on to slide 106, can you summarize your
25 opinions for why the identifier values fail to satisfy the

1 resetting limitation?

2 A. Yes. So I have already discussed everything
3 that's highlighted in red. So I'm not going to mention
4 those.

5 That gives two remaining variables, identified
6 variables in the left-hand column.

7 The first is the last row for H.264. This is an
8 English phrase, picture order count, and Dr. Chrissan showed
9 us a definition of the English phrase from the H.264
10 standard.

11 But there is no variable in H.264 which
12 corresponds to picture order count that has been identified
13 by Dr. Chrissan.

14 So there's no equation for that word and no
15 corresponding variables that have been pointed to to
16 correspond to it.

17 Now, the second line is under H.265. It is a
18 variable called PicOrderCntVal, and if you were paying
19 attention -- I shouldn't say that -- anybody who wants to
20 wake up in the middle of the night and look back at these
21 slides will see that that shows up on a previous slide.

22 So this fails because it is a derived variable
23 that is based on decoded syntax elements. So it is not
24 reset by the decoder. Again, I mentioned that H.265 clearly
25 delineates between syntax elements and -- syntax elements

1 that are decoded and variables that are derived, and this is
2 a derived variable.

3 Q. And just so the record is clear, is it your
4 opinion that none of the accused -- none of the Respondents'
5 accused products infringe under any proposed construction --
6 excuse me. Allow me to restate.

7 Just so the record is clear, is it your opinion
8 that under any -- the Respondents' accused products do not
9 infringe under any of the proposed constructions for
10 resetting?

11 A. Yes.

12 Q. And do your noninfringement opinions apply
13 equally to asserted claim 10 of the '321 patent?

14 A. Claim 10 is an apparatus claim, and the answer is
15 yes.

16 Q. Did you also review source code as part of your
17 noninfringement analysis?

18 A. I did.

19 Q. Okay. Were you also here for Dr. Chrissan's
20 discussion of source code evidence?

21 A. Yes, I was.

22 Q. Moving to slide 107, could you briefly explain
23 your opinions as it relates to Dr. Chrissan's source code
24 analysis?

25 A. Yes. It is my opinion that Dr. Chrissan has

1 failed to connect the source code analysis that he performed
2 with the accused products.

3 So what I've illustrated on this slide is that
4 Acer accused products contain hardware components
5 corresponding to the manufacturers whose logos are shown in
6 the box that is on the other side of the wall from the Acer
7 accused products. And the same thing holds for ASUS. We
8 see primarily the same third-party manufacturers there with
9 a little bit of a difference.

10 And Dr. Chrissan limited his analysis to entirely
11 the right-hand side of this wall. So while he looked at
12 assorted source code for most, I think, but not all of these
13 third-party hardware components, he has not mapped which of
14 those components are inside which of the accused products
15 such that there's an understanding that those accused
16 products are actually infringing using what he analyzed.

17 Q. Moving on, I'd now like to transition to
18 discussing your invalidity opinions for the '321 patent.
19 And we'll start on slide 110.

20 If you could, for Her Honor, could you please
21 summarize your invalidity grounds?

22 A. Yes. So it is my opinion that the '321 patent is
23 obvious in view of, first, MPEG-1 alone; secondly, MPEG-1 in
24 combination with a reference that I'll call Adolph; and,
25 lastly, in view of some public software that was available

1 implementing H.264 called VLC.

2 Q. And let's start with MPEG-1. Is it your
3 understanding that MPEG-1 -- excuse me.

4 Was MPEG-1 before ALJ Elliot in the 1380
5 investigation?

6 A. Yes.

7 Q. What did ALJ Elliot find about MPEG-1 in the 1380
8 investigation?

9 A. So I understand that Judge Elliot found that
10 MPEG-1 met every limitation of the asserted claims except
11 for the resetting by the decoder claims or elements or
12 limitations.

13 Q. And have you presented new opinions for how
14 MPEG-1 satisfies each claim limitation of the asserted
15 claims?

16 A. Yes, I have.

17 Q. Is it your opinion that MPEG-1 renders claims 8
18 and 10 of the '321 patent obvious?

19 A. Yes.

20 Q. Were you here for opening and Dr. Chrissan as
21 well as Dr. Richardson's testimony last week?

22 A. Yes, I was here.

23 Q. Did you hear Nokia refer to MPEG-1 as rigid?

24 A. I did.

25 Q. Just so the record is clear, let's move to

1 RDX-114. Does MPEG-1 support random access?

2 A. Not only does MPEG-1 support random access, but,
3 in fact, providing random access was a significant
4 motivation for the MPEG-1 standardization committee as it
5 began to consider what would ultimately become MPEG-1.

6 Up until MPEG-1, the video compression standards
7 or H.261, which was most commonly known, did not support
8 random access, and as it became clear that digital video, we
9 had CD-ROMs at the time, started to become clear that
10 digital video could be put on a CD-ROM replacing a VCR tape,
11 that consumers would expect random access if video came on a
12 disk or in digital format just as they did with the VCR.

13 So this was a very, very important aspect that
14 MPEG-1 considered. And, in fact, the resulting structure of
15 MPEG-1, the groups of pictures that we'll talk about in a
16 little bit, are a direct consequence of the desire for the
17 MPEG-1 standardization committee to make sure that what they
18 came up with provided random access.

19 Q. I'd now like to talk to you about some other key
20 concepts disclosed by MPEG-1.

21 Moving to slide 15, can you explain to Her Honor
22 what is shown here with respect to frame types and
23 predictions?

24 A. Yes. Now, again, I think we heard a lot about
25 this last week, so perhaps I don't have to put too much time

1 into this, but MPEG-1 discloses coding three types of
2 frames. Frames are either coded as still images, those are
3 called I-frames. That shows up here in the figure on the
4 right, which I have colorized from MPEG-1 as a green frame.

5 Other frames can be coded predictively, and they
6 are called P-frames. And really what that means in this
7 figure is that a P-frame looks backwards to the previous
8 I-frame or P-frame. So this is indicated by the blue arrows
9 on the bottom that point from the I-frame to the first
10 P-frame and from the first P-frame to the second P-frame.

11 And, lastly, there are pictures that can be
12 predicted bidirectionally, in both directions. Those are
13 labeled with B. They are shown as having arrows pointing to
14 them from the I-frame and the P-frame that are surrounding
15 them, or in the case of the second half here, the two
16 P-frames that are surrounding them.

17 Q. And you've mentioned bitstream order and display
18 order previously. Did you prepare a demonstrative to
19 illustrate bitstream order and decoding order?

20 A. I did. And the first thing I'd like to do is
21 mention that Dr. Chrissan had a very nice graphic on this,
22 where he had a bunch of frames from a polo match and he had
23 them numbered in order, and then he rearranged them with
24 crossing arrows, right? So this is my significantly less
25 deluxe graphic that shows the same thing.

1 So up at the top, I'm showing four frames, an
2 I-frame, two B-frames, and a P-frame. And they are in
3 viewing order. The number corresponds to the order in time
4 at which that frame was originally taken.

5 Now, I've only shown two arrows just to remind us
6 that that B-frame requires information from both I0 and P3.
7 And as a result of the sentence that I just said, in order
8 for the decoder to be able to decode B1, well, not only I0
9 has to be there, but P3 also has to be there before the
10 decoder can decode B1.

11 So the order in which the frames are sent can be
12 out of order with display order, and I will say is out of
13 order with display order, when there are general B-frames
14 that are used such as they are on this slide.

15 Q. Did MPEG-1 disclose bitstream order and display
16 order?

17 A. It did. Now, these are exactly, I think, the two
18 figures that directly come out of MPEG that correspond to my
19 very simple example on the previous slide.

20 What I have done here is simply added the color
21 scheme that I have used so that we can see the match. And,
22 again, the relevant point is in Fig. D3 in display order,
23 those numbers associated with each picture are running from
24 left to right, right? The pictures are shown in increasing
25 order of display order.

1 But when those pictures or the frame data would
2 be put into a bitstream and, consequently, sent and decoded,
3 the P-frames always have to arrive before the B-frames on
4 which they depend.

5 So we see that out-of-order transmission in the
6 bottom, and the reordering of the numbers there helps us to
7 see that.

8 Q. And sticking with slide 117, the claims recite
9 decoding order. Is it correct that bitstream order is the
10 same as decoding order?

11 A. It is. And I think I've already used those
12 interchangeably without properly defining decoding order, so
13 thank you for that.

14 Q. Okay. Moving on to slide 118, you mentioned it a
15 few times. Can you explain what a group of pictures is in
16 MPEG-1?

17 A. Yes. So, again, I explained part of the
18 motivation for MPEG-1 was to provide the ability to do
19 random access, and that is provided through this structure
20 of frames in MPEG-1 that is referred to as a group of
21 pictures, and what I've done here is taken a figure from
22 MPEG-1 which provides examples of groups of pictures in
23 display order. So that means that the numbers are not here,
24 but they are implicit from it left to right.

25 Now, the way to read this figure is that there

1 are six example groups of pictures given. Each row should
2 be read as a group of pictures.

3 So the first row indicates that it is completely
4 permissible in MPEG to code every single frame as a still
5 image. You don't need to predict it all. So we would just
6 have I, I, I, I, I as the video was coded.

7 The second line indicates that it is also
8 permissible in MPEG to not use any bidirectionally coded
9 pictures and to only have a still frame followed by
10 predictively coded frames. And there could be 2 Ps, there
11 could be 14 Ps. MPEG is quite flexible, okay, so one can
12 have only Is and Ps.

13 And then the next one down is an example somewhat
14 like what I showed before with the Is -- I, P, and B.

15 And the last thing I'd like to point out here is
16 that the first three examples, they all start with an I.
17 Okay? So that I0 is going to be first. It is also possible
18 to have groups of pictures that start with a B-frame, as
19 some of the lower three examples show.

20 Q. And are there different types of GOPs in MPEG-1?

21 A. There are different types of groups of pictures,
22 and I will use GOP simply to shorten that a little bit.
23 MPEG uses two terms for groups of pictures. It refers to
24 closed groups of pictures and open groups of pictures.

25 And it gives us a definition here for a closed

1 group of pictures that says closed groups can be decoded
2 without using decoded pictures of the previous group for
3 motion compensation.

4 And another way to say that is that a closed
5 group can be independently decoded.

6 There are two examples of closed GOPs in MPEG-1.
7 The first one is -- as I have labeled, starts with that I0.
8 I've drawn the red box around a closed group of pictures
9 that starts with an I0. And MPEG calls this a typical
10 example of a closed group.

11 The second example MPEG has labeled as an open or
12 closed group, one can implement that as a closed group, and
13 that second example has some B-frames that show up before
14 the I-frame. And here I will simply point out that you
15 notice that in that type of closed group, the I-frame no
16 longer has the number 0. So I'm going to refer to that
17 later.

18 Q. Do your opinions only apply to closed groups of
19 pictures?

20 A. Yes, my opinions only apply to closed GOPs.

21 Q. Okay. Let's move on to RDX-120.

22 Did you prepare an illustration of a closed group
23 of pictures?

24 A. Yes. Now, this is the same group of pictures
25 structure that I used before, but I've added something to

1 it. And, in particular, I've drawn orange boxes around each
2 of these groups of pictures, and the reason I've drawn those
3 boxes is, I think the easiest way to understand a closed
4 group of pictures, we had a definition before that basically
5 said this is an independent sequence.

6 But when a group of pictures is closed, it means
7 that we can draw a box around that group, and notice that
8 there are no arrows leaving the box and there are no arrows
9 coming into the box.

10 So that's another way to interpret independently
11 coded sequence. Everything in that box only depends on
12 what's in the box.

13 Q. Before we move on, are you aware of any prior art
14 that disclosed GOPs with no B-frames or no leading B-frames?

15 A. Yes, I am.

16 Q. Let's move on to slide 121.

17 Can you describe, what is Morimatsu?

18 A. So Morimatsu is a U.S. Patent that addresses
19 transmission and reception of MPEG-1 coded video in an
20 error-resilient manner.

21 So thinking about the case, actually like what I
22 worked on for my Ph.D., what happens when some information
23 is lost and you still want to decode and show some video at
24 the decoder.

25 Now, MPEG-1 clearly calls out -- I'm sorry.

1 Morimatsu clearly calls out that this can used in MPEG-1.
2 Morimatsu refers to intra-frame coding process or
3 inter-frame coding process. And in the context of MPEG-1, a
4 person of ordinary skill understands that intra-frame is an
5 I-frame, those green frames, and then Morimatsu goes on to
6 refer to the fact that for the inter-frame coding, image
7 data in the previous frame is used.

8 So that is only using yellow frames. We are not
9 going to do bidirectional prediction. Morimatsu is limiting
10 these teachings to I-frames and P-frames only.

11 Q. And did you prepare an illustration of
12 Morimatsu's GOPs?

13 A. Yes.

14 Q. Is that what is shown here on slide 122?

15 A. Yes. So using, again, my simple example of a
16 four-frame group of pictures, this is what Morimatsu is
17 using for a group of pictures in the patents MPEG
18 error-resilient technique.

19 Q. Does Morimatsu's teaching of using no B-frames
20 confirm for you that it is possible and well-known to have
21 closed GOPs that always start with an I-picture?

22 A. So I think the answer to your question is yes,
23 but I knew that before I knew of Morimatsu. So, yes, the
24 GOP that Morimatsu uses is, by definition, a closed GOP with
25 only P-pictures. There are no arrows going in, there are no

1 arrows going out.

2 Q. What signals whether or not a GOP is closed?

3 A. So if you go to the next slide, please, the
4 MPEG-1 syntax includes what it calls a group of pictures
5 layer, and it starts with a group of pictures header. And
6 the group of pictures header is four variables which we see
7 at the top on the right-hand side. And within that four
8 syntax element header is one syntax element called a closed
9 GOP.

10 That is a 1-bit flag, we see that shown on the
11 right. When that flag is set to 1, the decoder knows that
12 the group of pictures that is arriving now with this header
13 has been encoded as an independent sequence, with no motion
14 vectors pointing to the previous group and, by definition,
15 no motion vectors pointing to the next one.

16 Q. You're referring to the group of pictures -- the
17 closed_gop_flag here on slide 123?

18 A. The closed_gop_flag, yes.

19 Q. Before we move on, did Morimatsu, the prior art
20 reference that the closed GOPs with no B-frames, also have a
21 signal for closed_gop?

22 A. Well, Morimatsu was MPEG-compliant. So it would
23 include the closed_gop_flag.

24 Q. And moving on to slide 124, can you explain, what
25 is the temporal reference value in MPEG-1?

1 A. So I'm going to start with the figure on the
2 bottom. This is a figure we've seen before. It's the
3 closed group of pictures that we saw as an example in
4 MPEG-1. Again, I've colored that with the colors that we've
5 been using for I, P, and B-frames. And all of those frames
6 are numbered with their display order, right?

7 This is an example group of pictures in display
8 order. There are 13 frames. It runs from 0 to 12. And
9 that number that corresponds to each frame is encoded in the
10 header for each frame.

11 Now, that's called a picture header. That's the
12 nomenclature for frame in MPEG-1. And what we see above is
13 the syntax in MPEG-1 for the picture header, where that
14 temporal reference value, which is the display order, is
15 actually transmitted.

16 Q. You've covered a lot of material in your
17 discussion of the overview of MPEG-1. Let's move to
18 slide 125 before beginning your limitation-by-limitation
19 analysis, and could you please provide for Her Honor a
20 summary of your invalidity opinions for MPEG-1?

21 A. Yes. So now I'm going to use the terminology
22 that I've just explained.

23 On the left-hand side is claim 8 of the '321
24 patent, and I have highlighted the specific terms that show
25 up on the right-hand side.

1 So, in '321, claim 8, there is reference to an
2 independent sequence. That is a closed GOP with no arrows
3 going out and no arrows coming in. The indication of the
4 first frame is the closed_gop_flag, when that comes in at 1.
5 The identifier values for the image frames are the
6 temporal_reference values, which are in the bitstream. And
7 the resetting the identifier value by the decoder would be
8 obvious to a person of ordinary skill in the art.

9 Q. Moving to slide 126, is it your understanding
10 that Nokia only contests the highlighted limitations?

11 A. Yes.

12 Q. Let's commence your limitation-by-limitation
13 analysis and start with the preamble here on slide 127.

14 Can you -- does MPEG-1 teach the preamble of
15 claim 8?

16 A. Yes. So claim 8 is a method claim. It's a
17 method for decoding a compressed video sequence. And we're
18 told that the MPEG-1 standard specifies a syntax for a coded
19 video bitstream, it defines a format for compressed digital
20 video, and that the standard document itself specifies the
21 decoding process.

22 Q. And moving on to slide 128, does MPEG-1 teach
23 decoding -- does it teach decoding an indication of at least
24 one image frame without reference to the previous GOP?

25 A. Yes. So I think claim 8[B] here, what I'm trying

1 to explain is that claim 8[B] requires that all
2 motion-compensated temporal prediction references are within
3 the GOP. So that's drawing the box around the GOP, and as
4 we've explained, any closed GOP in MPEG will meet that
5 limitation.

6 Q. And what about subsequent groups of pictures?

7 A. So there is no -- if a GOP is closed, by
8 definition, there will be no prediction from something that
9 occurs in the future back to it.

10 Q. And moving to slide 129, can you explain your
11 opinions as to how MPEG-1 discloses decoding an indication
12 of at least one image frame?

13 A. Yes. So I have indicated on the summary slide
14 that the indication is the closed_gop_flag. So there's a
15 lot going on here, so I'll try to walk us through it.

16 So in the middle I have plain text that is not a
17 callout from anything. So I will remind everybody that each
18 GOP in MPEG includes a flag that is a closed_gop_flag, and
19 that will indicate whether the GOP is open or closed. That
20 closed characteristic means that we meet the second part of
21 claim 8[B].

22 And I think that's all I need to say here.

23 Q. Moving on to slide 130, is it the case that a GOP
24 always begins with a GOP header in MPEG-1?

25 A. Yes. So these are simply MPEG-1 syntax rules,

1 right? A GOP always begins with a GOP header. So that
2 closed GOP flag will always be there.

3 MPEG-1 does not permit repeating a GOP header,
4 which means that when you receive a GOP header, you don't
5 need to wonder about what's coming next because it, by
6 definition, is going to be the first frame in the
7 independent sequence.

8 The GOP header is only allowed at the beginning
9 of a GOP, so, again, you know that what's coming next is the
10 first frame.

11 And the GOP header forces the end of the previous
12 GOP. So it is completely unequivocal that a closed_gop_flag
13 reception means that a GOP is starting.

14 Q. And moving on to slide 131, does the '321 patent
15 place any limitation on the position of the indication?

16 A. It does not. So the '321 patent calls out that
17 the identifier data transmitted together with the video
18 sequence, the first highlighting I have here, are preferably
19 included in the video sequence header fields. That's what
20 we saw for the closed_gop_flag that's in the GOP header.

21 And, in fact, claim 9 specifically refers to the
22 indication is in a separate flag included in the header of a
23 slice.

24 Q. And moving to slide 132, did ALJ Elliot agree
25 that this claim limitation is satisfied by MPEG-1?

1 A. Yes.

2 Q. Let's move on to slide 133 and the next claim
3 limitation. Does MPEG-1 teach starting decoding from the
4 first image frame?

5 A. It does. So we know that a GOP always starts
6 with an I-picture in decoding order. Okay? That is, no
7 matter what, the first frame that's going to come in after
8 you read the GOP header is going to be an I-frame that needs
9 to be decoded.

10 Q. Okay. And moving on to the next limitation, does
11 MPEG-1 teach decoding identifier values according to a
12 numbering scheme?

13 A. It does. As I have previously described, there
14 is the temporal reference syntax element. That syntax
15 element corresponds to pictures in display order, and it is
16 included in the picture header.

17 And temporal reference is reset to 0 at the start
18 of the GOP.

19 Q. And just so we're clear, is temporal reference
20 what you are identifying as the identifier value?

21 A. Yes.

22 Q. And with respect to slide 135, is the temporal
23 reference value decoded by the decoder?

24 A. It is decoded from the bitstream by the decoder.

25 Q. Let's move on to the next limitation starting

1 with slide 136.

2 Did you consider all parties' constructions in
3 your analysis?

4 A. Yes.

5 Q. And is it your opinion that MPEG-1 renders the
6 asserted claims obvious under all constructions?

7 A. Yes.

8 Q. Let's move to slide 137.

9 Can you explain why it would have been obvious
10 for the decoder to use a closed GOP to satisfy the resetting
11 limitation?

12 A. Yes. So, once again, I've shown the top part of
13 Fig. 18.d from the MPEG-1 standard, which is a typical
14 example of a closed group.

15 And what we can't see here is that the atypical
16 example of a closed group has got some extra frames there.

17 So when we have this typical example, the I-frame
18 is always not just the first frame in decoding order, but it
19 is also the first frame in display order. In other words,
20 every closed group of pictures will start with a green I0
21 frame. And that means that the temporal reference is going
22 to start at 0 for that I-frame.

23 Q. Okay. Moving to slide 138, how would a GOP need
24 to be constructed?

25 A. I'm sorry. Could you please repeat your

1 question?

2 Q. Sure. Moving to slide 138, how would a GOP need
3 to be construct -- how would a closed GOP need to be
4 constructed?

5 A. So, again, Fig. D.18 here provides two examples
6 of closed GOPs. The first one I've annotated, listed as
7 typical in the standard, is starting with an I-frame. So we
8 have an I0.

9 The second example of a closed GOP has what we
10 call two leading B-frames, meaning that there are two
11 B-frames before the first I-frame comes along.

12 Now, in order for this to be a closed GOP, recall
13 that we need to be able to put a rectangle around it and
14 have no arrows going in or out, okay?

15 That means that even though that frame 0 and 1 is
16 called a B-frame and under that frame type is permissible
17 that it can have arrows coming in from two directions, if we
18 might make the GOP closed, we will put that wall up before
19 the previous GOP, and the only arrows going into that
20 B-frame will be from the I-frame, okay?

21 Now, the MPEG calls this type of closed group
22 less typical. A less typical example of a closed group is
23 shown in Fig. D.18, and that's because guideline this type
24 of structure is less favored in MPEG-1.

25 Q. And you mentioned leading B-frames are less

1 favored. Moving to slide 139, can you explain why leading
2 B-pictures are disfavored?

3 A. Yes. So this is an II chart, and first I will
4 talk a little bit to explain what's going on.

5 So on that previous slide, I explained that if we
6 have a closed group, those first two B-frames only have
7 arrows pointing from one frame. They don't have two sets of
8 arrows pointing in.

9 Now, I believe that somebody mentioned this
10 earlier in this hearing, either Dr. Richardson or
11 Dr. Chrissan, that the B-frames are the smallest frames in
12 MPEG-1. We can do the best job of compressing them because
13 we have so many choices with those arrows coming in from two
14 directions.

15 The P-frames are less -- are larger than B-frames
16 when we compress them, because we only have a choice there
17 to look at one frame to predict them, not two, and the
18 I-frames are still images of the largest.

19 Now, when I have a closed GOP with two B-frames
20 at the beginning, they will only have arrows pointing to
21 them from one frame inside that group of pictures. They
22 don't get the benefit of the bidirectional arrows, and that
23 means that the efficiency of those leading B-frames is not
24 very good. They actually act like P-frames in terms of how
25 big they end up when they get compressed.

1 So having said all that, what I have illustrated
2 here is I've taken four examples of a length 13 closed GOP
3 just like what we saw in the standard. The first line
4 starts with an I-picture, and the other ones start with
5 those leading B-frames. And I've put an asterisk next to
6 them so that we understand that, even though they are called
7 B, they are actually sort of crippled by only being
8 predicted from the I-frame.

9 And looking at how many P-frames and how many
10 B-frames we have can give us an indication of how well we're
11 compressing.

12 In the first row where we start with an
13 I-picture, we have twice as many Bs as Ps. Those Bs are
14 super efficient. So for 8 out of 12 predicted frames we're
15 doing a great job.

16 On the other hand, with all the other
17 structures -- for example, I'll take the last line just to
18 pick on it -- I have an equal number of P and B-frames. So
19 I have not, you know, twice as many, but the same number.
20 My file is going to be bloated, for lack of a better word,
21 compared with what I would get by just starting off with an
22 I-picture.

23 Q. And moving on to slide 140, can you explain why
24 in your opinion it would have been obvious for -- a POSITA
25 would have understood that a decoder could reset the

1 temporal reference value in two ways?

2 A. Yes. So the first technique that I will describe
3 is using only the closed GOP value in the bitstream to set
4 the temporal reference of the first frame.

5 Q. Okay. And let's transition to slide 141.

6 Could you explain that first method?

7 A. Yes. So what would be done is the decoder would
8 decode the closed_gop_flag. It would then ignore or skip
9 the decoding process for temporal reference. Now, the
10 decoder knows exactly how many bits are in that syntax
11 element so it just hops directly over them.

12 And after decoding the closed GOP value, the
13 decoder would then set the temporal reference for the first
14 frame to 0. And it would then continue decoding temporal
15 reference minding its own business as it continues to
16 decode.

17 And this provides a measure of error resiliency.
18 It's essentially using the redundancy in the MPEG bitstream
19 to preemptively deal with potentially errors that happened
20 during transmission.

21 Q. Okay. You've covered method (i).

22 Transitioning to slide 142, could you explain how
23 a POSITA would understand that a decoder could reset the
24 temporal reference value under method 2?

25 A. Yes. So under method (ii), what could be done

1 is --

2 Sorry, if you could go back one, please, to the
3 summary. There we go.

4 In the second technique, rather than just using
5 the closed GOP value, the decoder could use both temporal
6 reference and the closed GOP value.

7 Now you can move on. Thank you.

8 Q. And moving to slide 143.

9 A. Right. So how would this work? In this case the
10 decoder would decode the closed_gop_flag. And then instead
11 of making a special case for, oh, I have a closed_gop_flag,
12 I'm going to count ten bits and not skip those, instead, it
13 simply decodes the temporal reference. It just continues
14 business as usual.

15 But then, based on the fact that it received a
16 closed_gop_flag, it will reset that temporal reference
17 value. So it reads it and then it resets it. Again, this
18 is a measure of robustness. And then this is business as
19 usual for the temporal reference values for the rest of the
20 frames.

21 Q. And moving on to slide 144, could you briefly
22 summarize your opinions for MPEG-1 rendering claim 8
23 obvious?

24 A. Yes. So, again, the independent sequence that's
25 identified in claim 8 is the closed GOP. The indication of

1 the first frame is the closed_gop_flag. The identifier
2 values are the temporal reference. That's the display
3 order. And the resetting by the decoder would be obvious.

4 I presented two ways to do that. One would use a
5 system where there are no leading B-frames, because they are
6 less efficient, and corresponding to using only closed GOPs
7 that start with I0.

8 Q. And let's briefly discuss claim 10 and transition
9 to slide 146.

10 Is it your understanding that claim 10 is an
11 apparatus claim that recites a video decoder that is
12 capable -- excuse me -- configured to perform certain
13 functions?

14 A. Yes.

15 Q. Okay. Let's briefly discuss your opinions as
16 they relate to the preamble of claim 10 and move to slide
17 147.

18 Is it your opinion that MPEG-1 discloses a video
19 decoder that is configured to perform certain steps in claim
20 elements?

21 A. Yes. What I've shown here is a decoder block
22 diagram from the MPEG-1 standard. Now, this is a flow
23 diagram for the decoding process, and a person of ordinary
24 skill would understand that this would be implemented on a
25 computer using software, using a processor, and that the

1 computer would be configured to do this. This is not
2 something that one would do by hand.

3 Q. Okay. And do your opinions regarding MPEG-1 for
4 claim 8 also equally apply to claim 10?

5 A. Yes.

6 Q. Is it your opinion that MPEG-1 also renders
7 claim 10 obvious?

8 A. Yes.

9 Q. Okay. Let's transition to your opinions
10 regarding MPEG-1 and Adolph, starting with slide 150.

11 Is Adolph prior art to the '321 patent?

12 A. Yes, it is.

13 Q. And moving to slide 151, does Adolph discuss
14 MPEG-1?

15 A. Adolph does discuss MPEG-1. It's very clearly
16 called out in the second paragraph.

17 Q. Why would a person of ordinary skill in the art
18 be motivated to combine MPEG-1 with Adolph?

19 A. Well, Adolph 1 teaches a technique that is
20 specifically directed to MPEG-1.

21 Q. And moving to slide 152, what does Adolph teach?

22 A. So Adolph is directed to, again, robustness.
23 When one is transmitting MPEG-1 data and there's the
24 opportunity for some bits to get messed up, how can one
25 still try to make sure that the video is decodable. And

1 Adolph suggests doing this by using something that is called
2 an IP counter, effectively counting when I-frames or
3 P-frames are received.

4 And Adolph gives us, as I've highlighted on the
5 second part here, that this method has the advantage that
6 even with the omission of a group of pictures or other
7 errors, for that matter, that the correct display order
8 could still be achieved. In other words, you still get
9 correct playback of video.

10 Q. Okay. And moving -- you mentioned IP counters.
11 Moving to slide 153, can you explain for Her Honor what
12 those IP counters in Adolph are in more detail?

13 A. I can. So there's a lot on this slide, but it's
14 actually fairly straightforward to understand.

15 So this is from Adolph. First, I will say let's
16 just ignore the first row labeled FM. That's not relevant.

17 So the second row we can see starts with the
18 letters DEO. And that is decoding order. And, in fact, if
19 we look at the frame types in the decoding order, we see
20 what we would expect for I-, P-, and B-frames in an MPEG
21 sequence.

22 IO is decoded first. The next frame that's
23 decoded is P3 because the B-frames will depend on it. And
24 then we go through several B-frames.

25 Now, the next row, DIO, is display order. And if

1 you look at simply the numbers on the frames in that row,
2 they count up.

3 Now, Adolph is also trying to point out what
4 happens when data is lost. I'm going to point with the
5 pointer to the little jaggy arrow smack in the middle.
6 Let's not worry about that. Let's just consider the
7 structure that's happening here.

8 Now, underneath the DIO row, there is a row that
9 is labeled GOP. And this is in this diagram an indicator
10 that, well, we're in the first GOP. And if you look at the
11 very end of the row, I've also highlighted a number 2, and
12 that's when Adolph's system says, oh, I've just received a
13 GOP header, now I know I'm GOP number 2.

14 The next highlighted row is the IP row, and this
15 is the IP counter. And this is a counter that Adolph
16 increments every time it decodes an I- or a P-frame.

17 So we can see that, if we line up the IP counter
18 with the DEO line, the decoding order line, in the very
19 first column, Adolph decodes I0, and, lo and behold, the IP
20 counter is 1. One I- or P-frame has been decoded.

21 Move one over. The next frame is P3. The IP
22 counter is incremented. The next frame is P1. It stays the
23 same because a B-frame is not a P-frame.

24 So this is simply incrementing every time an I or
25 a P is decoded.

1 Q. Okay. And moving on to slide 154, before we get
2 started with your walkthrough of the combination of MPEG-1
3 and Adolph, can you explain or summarize your opinion for
4 MPEG-1 and Adolph?

5 A. Yes. So in this combination, I'm still using
6 what I have pointed to for MPEG-1 for the independent
7 sequence, the closed GOP. The indication of the first frame
8 is still the closed_gop_flag being 1. And now the
9 identifier values can be either the temporal reference,
10 which I had previously mentioned, or these IP counter values
11 that Adolph is proposing.

12 And with regard to resetting by the decoder,
13 Adolph expressly resets those IP counters every time a new
14 GOP starts.

15 Q. And let's transition to slide 155.

16 Is Adolph's -- are Adolph's IP counter -- IP
17 counter, is it similar to a preferred embodiment of the '321
18 patent?

19 A. In fact, it is identical to a preferred
20 embodiment in the '321 patent.

21 In the upper part of this page I've highlighted
22 Adolph's description of how the IP counter operates. We see
23 that it is incremented whenever an I- or P-picture has been
24 identified in the bitstream. Now, those I- or P-pictures
25 are reference frames. They are both produced to encode

1 B-frames.

2 And the '321 patent has a very, very similar
3 sentence. It tells us that image frames are numbered in
4 which successive reference image frames in the coding order
5 are indicated with numbers incremented by 1.

6 So these are exactly the same kinds of frames.
7 That's a counter that's not going to tick up for a B-frame.
8 It is going to tick up for an I-frame and for a P-frame.

9 Q. Moving to slide 156, is an IP counter in Adolph
10 decoded by the decoder?

11 A. It is. According to Nokia's interpretation of
12 "decoded," yes.

13 Q. And can you explain how an IP counter in Adolph
14 is decoded?

15 A. Yes. So, again, Adolph counts the picture types
16 when they have been decoded. And I think I've previously
17 mentioned that the picture headers in the MPEG stream, which
18 I have excerpted on the bottom of this slide, include a
19 picture-coding type so before the pixels are decoded the
20 decoder knows exactly what type of frame that is. Is it an
21 I-frame, is it a P-frame, or is it a B-frame.

22 So that indicates to Adolph when the IP counter
23 should or should not be incremented.

24 Q. And moving along to slide 157, are the -- is the
25 IP counter in Adolph reset?

1 A. It is reset. Now, first off, Adolph -- to
2 explain this, Adolph resets that IP counter at each new
3 group of pictures. We saw that on the example figure from
4 Adolph, and this is clearly stated in the English here. So
5 that gets us to the start of the GOP.

6 Now, in order to get us to the indicated first
7 image frame, if you go on to the next frame, every group of
8 pictures in MPEG-1 starts with a GOP header, and then it
9 will always start with an I-picture in decoding order.

10 So when we have that closed GOP, the next picture
11 coming in, which is the first picture of the GOP, will be
12 that green I0 picture.

13 Q. Okay. And moving to slide 159, does this depict
14 the process of resetting the IP counter in Adolph?

15 A. Yes. So, again, I'll just follow the GOP and the
16 IP rows from the left-hand side where they both start off at
17 1 all the way to the right where the second frame from the
18 end is a new GOP that is received. We see that the GOP is
19 indicated by GOP 2. That's how we know that there's a new
20 GOP. And the IP counter goes from a previous value of 9 now
21 to a value of 1, because when that I0 is decoded, we go back
22 to one I- or P-frame has been decoded.

23 Q. Moving on to the next slide, 160, is it your
24 opinion that the combination of MPEG-1 and Adolph render
25 claim 8 obvious?

1 A. Yes.

2 Q. And does your opinion regarding the combination
3 of MPEG-1 and Adolph also apply to claim 10?

4 A. Yes.

5 Q. Okay. Moving on, I'd now like to discuss with
6 you priority date.

7 Did you evaluate a priority date issue for the
8 '321 patent?

9 A. Yes.

10 Q. And starting with slide 163, what is your opinion
11 on the proper priority date for the '321 patent?

12 A. It's my opinion that the proper priority date is
13 the date that it was filed in the U.S., which is January
14 25th, 2006.

15 Q. Did you review the foreign application that Nokia
16 cites in formulating your priority date opinions?

17 A. Yes.

18 Q. Moving to slide 164, in your opinion when was the
19 concept of resetting the identifier value disclosed?

20 A. In my opinion that resetting concept first
21 appeared in the U.S. application.

22 Q. Moving to slide 165, did the Finnish Application
23 disclose, reset, or set again?

24 A. It did not.

25 Q. And were you present for Dr. Richardson's

1 testimony on priority date during the first day of the
2 hearing?

3 A. Yes.

4 Q. Moving to slide 166, did Dr. Richardson only
5 apply Nokia and Staff's proposed construction for reset and
6 resetting?

7 A. Yes.

8 Q. Did Dr. Richardson identify any disclosures from
9 the Finnish Patent Application showing resetting or setting
10 again?

11 A. No.

12 Q. Moving to slide 167, is there any additional
13 prior art that invalidates the '321 patent under
14 Respondents' proposed construction and priority date?

15 A. Yes. There is public domain software available
16 called VLC. Version 0.7.2 was available at least as of May
17 21st, 2004, and I believe that this invalidates the '321
18 patent.

19 Q. And moving to slide 168, did VLC version 0.7.2
20 implement H.264 before the priority date of the '321 patent?

21 A. Yes.

22 Q. And transitioning to slide 169, is it your
23 opinion that if H.264 is found to infringe -- compliance
24 with H.264 by the accused products is found to infringe,
25 then VLC invalidates for the same reasons?

1 A. Yes.

2 Q. I would now like to transition to your secondary
3 considerations.

4 Did you also offer opinions on secondary
5 considerations?

6 A. Yes, I did.

7 Q. Starting with slide 170 -- actually, before we
8 start, did you review the testimony of Nokia's corporate
9 representatives on secondary considerations?

10 A. Yes.

11 Q. And did you see any connection between the
12 alleged success of H.264 and H.265 being due to the '321
13 patent?

14 A. I did not see any connection.

15 Q. Okay. Was Nokia's representative able to
16 identify any connection between the success of H.264 and
17 H.265 being due to the '321 patent?

18 A. No.

19 Q. Moving to slide 171, did you see any connection
20 between any praise by others of Nokia or any products being
21 due to the '321 patent?

22 A. No.

23 Q. And was Nokia's representative able to identify
24 any praise by others of Nokia or its products being due to
25 the '321 patent?

1 A. No.

2 Q. Okay. Transitioning to -- I'd now like to
3 transition to technical domestic industry and move to
4 slide 174.

5 Did you consider the materials related to the
6 alleged domestic industry products?

7 A. Yes.

8 Q. And transitioning to slide 175, does Nokia prove
9 technical domestic industry for the '321 patent or the '714
10 patent?

11 A. In my opinion, no.

12 Q. What does Nokia rely on to show satisfaction of
13 technical domestic industry?

14 A. So Nokia presented identical theories and
15 corresponding evidence to demonstrate both infringement and
16 technical domestic industry. So my opinions with respect to
17 infringement are equally applicable to this argument.

18 Q. And moving on to slide 176, you also offered
19 opinions on allegedly customized and off-the-shelf
20 components.

21 Did Nokia rely on the same evidence for the
22 allegedly customized and off-the-shelf components?

23 A. Yes. What's highlighted in yellow here are the
24 hardware and the operating system that Nokia asserted were
25 customized, yet the evidence that they provided was not for

1 any customization. It was for the same sections of the
2 standard, the same source code evidence, and they downloaded
3 an open source version of the software, which clearly is not
4 customized.

5 Q. Is it your opinion that the allegedly customized
6 chipsets and operating systems do not practice the asserted
7 claims for the same reasons?

8 A. Yes.

9 Q. I would now like to transition and discuss AV1
10 functionality for accused ASUS products out of the box.

11 Is it your -- excuse me. Allow me to restate.

12 Is AV1 functionality present on the accused ASUS
13 products out of the box?

14 A. It's my understanding that it is not.

15 Q. And what is your understanding based on?

16 A. It's based on the testimony that is shown here by
17 the ASUS corporate representative, David Chu.

18 Q. Okay. And moving to slide 179, does the lack of
19 AV1 functionality mean that the ASUS products out of the box
20 are not capable to play AV1 video?

21 A. They have neither software nor hardware and a
22 combination of hardware that provide AV1 functionality when
23 taken directly out of the box.

24 Q. And did you prepare this demonstrative to
25 illustrate the inability to play AV1 on an accused ASUS

1 product out of the box?

2 A. That is the intention of this demonstrative, yes.

3 Q. Were you present for both Dr. Chrissan's and
4 Dr. Moulin's direct testimony relating to AV1 functionality
5 on ASUS products out of the box?

6 A. Yes.

7 Q. Moving to slide 180, did both Dr. Chrissan and
8 Dr. Moulin testify that ASUS products were not capable of
9 playing AV1 video out of the box?

10 A. Yes.

11 Q. Did both Dr. Chrissan and Dr. Moulin testify that
12 ASUS accused products needed additional software to play AV1
13 videos?

14 A. Yes, they did.

15 Q. And moving to slide 181, in your deposition did
16 you observe the inability of an accused ASUS product to play
17 AV1 video on an out-of-the-box product -- allow me to
18 restate.

19 During your deposition did you observe that
20 the -- that an unboxed -- out-of-the-box ASUS product was
21 unable to play AV1 encoded video?

22 A. Yes. I opened a brand-new ASUS product and
23 attempted to play AV1, and it did not play.

24 Q. Can you describe your experience with attempting
25 to play AV1 on that ASUS product that you took out of the

1 box?

2 A. Yes. So -- and I will say that the deposition
3 transcript reflects all of this because I tried to be very
4 clear about exactly what was showing up on the screen at the
5 time.

6 I opened the box at the direction of
7 Mr. Verboncoeur. I, after it booted up and went through all
8 kinds of stuff, attempted to play AV1 video. AV1 video did
9 not play. I then at the direction of Mr. Verboncoeur
10 downloaded third-party software, specifically the AV1
11 extension from the Microsoft store, and installed that
12 third-party software on the brand-new ASUS computer. And
13 after the installation of that third-party software from
14 Microsoft, the AV1 video which previously did not play did
15 play.

16 Q. Okay. And what was required to make the AV1
17 video play on the accused ASUS product?

18 A. So generically what is required to play the video
19 is what we would call a codec. And, in fact, that is
20 exactly what the AV1 extension that I downloaded from the
21 Microsoft store was and is described by on the Microsoft
22 website, and I think also we saw exactly -- snippets from
23 this website when Mr. Zhang was cross-examining
24 Dr. Chrissan.

25 Q. And you mentioned the document Mr. Zhang

1 presented during his cross of Dr. Chrissan.

2 Does slide 182 show the same document and website
3 that you went to to download the AV1 codec?

4 A. So it doesn't have the URL, but I think that's in
5 the exhibit, and specifically I remember seeing the
6 additional codec packs available from the Microsoft Store,
7 the definition that codec packs add additional codec
8 support, the media player will then be able to play media
9 files encoded in these formats. And then underneath that
10 header we saw, as is represented here, the AV1 video
11 extension.

12 Q. And what is that AV1 video extension?

13 A. It is a codec.

14 Q. And can you explain for Her Honor, what is a
15 codec?

16 A. So codec used to be a solely technical term that
17 came from people like me who worked in the video field that
18 took the term "compression" and "decompression," and took
19 the first two letters from compression and the first three
20 letters from decompression, and it just became faster to say
21 codec.

22 And now that word is actually in common English
23 language use like we see on this page.

24 Q. Okay. And without a codec, could you play AV1
25 video on the ASUS product you tested during your deposition?

1 A. No.

2 Q. And where did you have to go to download the AV1
3 codec?

4 A. That was from the Microsoft Store.

5 Q. And that's a third-party website?

6 A. That was not an ASUS website, that's correct.

7 Q. And did the AV1 video only play after you
8 downloaded the codec from the Microsoft website?

9 A. That's correct. We tried to play it twice, first
10 before download and install and then after third-party
11 download and install.

12 Q. And did the AV1 codec you downloaded enable the
13 ASUS product you were using in your deposition to play AV1
14 video?

15 A. It did.

16 Q. And is it your understanding that out of the box
17 and untouched the accused ASUS products are not configured
18 to play AV1 video without downloading the AV1 codec?

19 A. Yes, that's my understanding.

20 Q. And can you just explain so the record is clear
21 why the AV1 video cannot play without the codec?

22 A. Well, the codec, fundamentally, is the software
23 that implements the algorithm. So if one does not have the
24 instructions to do the decoding, it is impossible to do the
25 decoding.

1 Q. I'd now like to transition to slide 184 and
2 discuss your redesign opinions.

3 But before we get started, can you briefly
4 explain how video encoding and decoding can occur on the
5 accused products in this investigation?

6 A. So on these accused products video encoding and
7 decoding, as I've mentioned -- they're instructions. Those
8 instructions can run in software only, so solely executing a
9 written program on the CPU, or they can run in a combination
10 of software and hardware, and that combination of software
11 and hardware is called hardware-accelerated decoding.

12 Q. And moving on to slide 185, what does Nokia
13 accuse of infringement in this investigation?

14 A. Nokia has only accused the hardware-accelerated
15 decoding. So if there is no hardware acceleration, my
16 understanding is there's no accusation of infringement.

17 Q. Moving to the next slide, is software-only
18 decoding or encoding accused of infringement?

19 A. No.

20 Q. And can you explain, what do the Acer and ASUS
21 redesign products do?

22 A. So they take a two-pronged approach to disabling
23 the hardware acceleration, two prongs.

24 The first prong is that software that comes
25 directly from Acer or ASUS, which is an updated BIOS, that

1 is installed on the machines. So that's from the Acer and
2 ASUS side.

3 The second prong is that updated drivers for the
4 third-party hardware that is doing the hardware
5 acceleration, updated drivers are also downloaded to the
6 machine.

7 And the drivers and the BIOS then work together
8 to prevent the hardware-accelerated encoding and decoding.
9 They effectively disable use -- like I've put the red X
10 here, they disable use of that specialized third-party
11 hardware.

12 Q. And what happens with software encoding and
13 decoding on the accused products even with the -- excuse
14 me -- on the redesign products?

15 A. Nothing. The redesign does not influence the
16 running of software that does not -- does not use that
17 hardware acceleration.

18 Q. Transitioning to slide 187, before we dive into
19 your opinions, can you describe the materials you reviewed
20 in formulating your redesign opinions?

21 A. Yes. So, first off, I examined the redesign
22 products themselves. Secondly, I looked at source code. I
23 looked at both source code from ASUS and Acer that were the
24 first prong, that updating the BIOS. And I also looked at
25 driver code from the third-party hardware manufacturers that

1 are the second prong, right? Those two work together and
2 you need to see that the pieces are going to come together.
3 And I also relied on litigation materials.

4 Now, I do want to say that the products that I
5 tested had been -- some of them/most of them had been
6 previously visited by Nokia's counsel and/or experts, which
7 I'm going to abbreviate as just Nokia for the rest of this
8 so I don't have to say all that, and they had modified some
9 of those machines.

10 So I actually did not have the opportunity to
11 examine, let's say, the redesign products out of the box.
12 Somebody had already modified them, and that somebody being
13 Nokia.

14 Q. Is it your understanding that Nokia does not
15 dispute that the redesign products have actually -- excuse
16 me. Let me just restate.

17 Is it your understanding that Nokia does not
18 dispute that the redesign actually disables the
19 hardware-accelerated encoding and decoding functionality
20 accused of infringement?

21 A. I do understand that.

22 Q. Let's move on to slide 188.

23 Is it your opinion -- strike that.

24 Are the redesign products reasonably capable of
25 infringement?

1 A. They are not reasonably capable of infringement.

2 Q. And could you explain your opinion for why the
3 redesign products are not reasonably capable of
4 infringement?

5 A. Yes. So I examined 14 products, 11 ASUS and 3
6 Acer products. As I mentioned, Nokia had already visited
7 these machines, and most of them had been modified relative
8 to what the redesign originally was.

9 Now, of those 14 machines, 10 of them were not
10 capable. I could not play H.264, H.265, and AV1 on them.
11 There were four machines which showed some degree of
12 playback. And I'll qualify what I mean by that. There's
13 some special cases, but four machines I was able to play
14 either all of the accused video coding standards or some
15 subset thereof.

16 And those machines that had undergone
17 modification -- so we heard from -- I heard
18 from Dr. Chrissan that it was a 15-minute job to do the
19 modification. Nokia actually visited those machines over
20 six days, so a combination of the machines over six days.
21 And I don't know how much time was spent on each day, but
22 visits over six days to result in somebody who can then go
23 in and spend 15 minutes, to me, is an indication that this
24 actually was not a trivial modification.

25 And that is the basis of my conclusion that they

1 are not reasonably capable of infringement.

2 Q. Okay. You mentioned being -- hearing
3 Dr. Chrissan's testimony on his redesign analysis.

4 Did Dr. Chrissan acknowledge that modifications
5 to the BIOS and drivers must be made to activate the
6 hardware-acceleration features accused of infringement?

7 A. Yes.

8 Q. And I believe you were covering this, but just so
9 the record is clear, is modifying the BIOS and drivers of a
10 laptop or computer trivial?

11 A. I certainly do not consider BIOS modification to
12 be trivial, because you can essentially demolish your
13 machine. You can put the machine in a state that it doesn't
14 boot, it doesn't turn on. You can end up with a real mess.

15 Q. Can you -- moving to slide 189, you mentioned
16 previously that Nokia failed to modify the redesign products
17 over several days.

18 Can you explain the demonstrative you've put
19 together here to illustrate Nokia's failed attempts?

20 A. Yes. So this is a screenshot of the screenshot
21 directory on the ASUS device that was numbered 3.

22 And in that screenshot directory, what one sees
23 is a lot of screenshots. Specifically we see screenshots
24 that are dated first from September 17th. Then we see
25 screenshots that are dated from September 24th. Then we see

1 screenshots that are dated from October 3rd. And, in fact,
2 this device, Nokia was not able to defeat the redesign.

3 And the devices that I have listed on the bottom
4 of this slide, those were all devices for which Nokia was
5 unable to perform modifications that caused the devices to
6 play the video.

7 Q. And you mentioned previously about the time
8 spent. Do you have any idea how long Dr. Chrissan or Nokia
9 spent investigating how to modify the redesign products?

10 A. I do not.

11 Q. Moving to slide 190 --

12 MR. JARVIS: Your Honor, we would like to go on
13 the confidential record just briefly.

14 JUDGE MCNAMARA: Sure.

15 (Whereupon, the hearing proceeded in confidential
16 session.)

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1 O P E N S E S S I O N

2 JUDGE MCNAMARA: Okay.

3 MR. VERBONCOEUR: I probably should have said
4 that a couple minutes earlier, Your Honor.

5 BY MR. VERBONCOEUR:

6 Q. Doctor, it's your testimony that, in order to
7 comply with the H.265 standard, a decoder must process each
8 of the spatial motion vector prediction candidates
9 sequentially beginning with the motion vector associated
10 with the location A1.

11 A. That is not accurate. My testimony is that the
12 standard as written has cascading information, which I
13 explained starting with this slide.

14 Q. Do you have a view one way or the other as to
15 whether an H.265 decoder can comply with the standard
16 without processing candidates sequentially as you've
17 described on your slide 46?

18 A. I have analyzed the standard as written. I have
19 not considered that question.

20 Q. I want to talk about the Rusert reference that
21 you described during your direct examination.

22 As written, Rusert identifies what you call the
23 first spatial motion vector prediction candidate after it
24 has processed the candidates you've identified as a subset
25 of spatial motion vector prediction candidates, correct?

1 A. Rusert uses the interim list that has been
2 constructed during the sequential processing of the
3 candidate being evaluated, and that interim list coincides
4 with the vectors that have already been put on the list.

5 Now, Rusert could just as easily have had an
6 additional array, labeled it vectors for comparison, and
7 copied those in. But a person of ordinary skill understands
8 that what Rusert wrote is a more efficient way to express
9 the same thing.

10 Q. And I have limited time so I would like to hone
11 in on this point. I'd appreciate a yes-or-no answer.

12 As written, Rusert identifies what you call the
13 first spatial motion vector prediction candidate after it
14 has processed the candidates you've identified as a subset
15 of spatial motion vector prediction candidates.

16 A. I don't agree with that characterization.

17 Q. Doctor, do you recall giving a deposition in this
18 case?

19 A. I do.

20 Q. And before that deposition began you raised your
21 right hand and you promised to tell the truth?

22 A. I did.

23 Q. It's the same oath that you gave when you walked
24 into this courtroom and offered your testimony here?

25 A. I did.

1 Q. I'd like to show you part of that deposition
2 transcript.

3 Let's have slide CDX-17C.71, please. .71,
4 please.

5 Doctor, you were asked the question:

6 Is it fair to say that, as written, Yeo,
7 Fujibayashi, Rusert, and Nakamura identify what you call the
8 first spatial motion vector prediction candidate after they
9 have processed the candidates that you've identified as a
10 subset of spatial motion vector prediction candidates?

11 And your answer was: So that is a true
12 statement. As the references are written, that is accurate.

13 Did I read that correctly?

14 A. You did.

15 MR. VERBONCOEUR: Your Honor, at this time I will
16 pass the witness to my colleague, Mr. Cameron.

17 JUDGE MCNAMARA: Thank you very much.

18 MR. CAMERON: Matthew Cameron for Nokia. May I
19 proceed, Your Honor?

20 JUDGE MCNAMARA: Yes.

21 BY MR. CAMERON:

22 Q. Good afternoon, Dr. Hemami. How are you?

23 A. I'm well. Thank you. How are you?

24 Q. My name is Matthew Cameron. I know we haven't
25 met before, but I would like to ask you a few questions, if

1 that's all right. Is that all right with you?

2 A. Sure.

3 Q. Do you understand that one of the disputed issues
4 in this case relates to the types of products that practice
5 the claims of the '321 patent?

6 A. I don't know what a type of product is. Could
7 you clarify?

8 Q. Do you understand that Respondents in this case
9 contend that the asserted claims are directed to a chipset,
10 while Nokia contends that the types of products that
11 practice the claims are entire products?

12 A. I do understand that, yes. Thank you for the
13 clarification.

14 Q. I'd like to ask you a few questions about one of
15 your slides.

16 Mr. Moreno, would you please pull up RDX-4.95?

17 Dr. Hemami, this is one of the slides you
18 presented during your direct testimony today, correct?

19 A. That's correct.

20 Q. The title of your slide is "The Asserted Claims
21 of the '321 Patent Are Only Directed to the Decoder." Do
22 you see that?

23 A. Yes.

24 Q. And then if we look on your slide, you're
25 describing the decoder and the decoding process on the right

1 side of the slide, correct?

2 A. I have provided a stylized representation,
3 correct.

4 Q. And right next to the word "decoder" you included
5 a picture of a laptop. Do you see that?

6 A. Yes.

7 Q. I'd like to ask you another question about
8 another slide.

9 Mr. Moreno, if we could please turn to RDX-4.184.

10 Dr. Hemami, this is another slide that you
11 presented during your direct testimony today, correct?

12 A. That's correct.

13 Q. And we can see here on the far left side there is
14 a laptop, correct?

15 A. Correct.

16 Q. And directly to the right of the laptop is a box
17 that you've labeled "software," correct?

18 A. That's correct.

19 Q. And to the right of that box there's a box
20 labeled "hardware," correct?

21 A. That is correct.

22 Q. So we have three items. We have a laptop, we
23 have software, we have hardware, correct?

24 A. That is correct.

25 Q. You chose to apply the labels "encoder" and

1 "decoder" to the laptop on your direct demonstrative,
2 correct?

3 A. Those labels are there.

4 Q. You understand that Nokia contends that H.264,
5 H.265, and AV1 decoders practice the asserted claims of the
6 '321 patent, correct?

7 A. Could you repeat the question, please?

8 Q. You understand that Nokia contends that H.264,
9 H.265, and AV1 decoders practice the asserted claims of the
10 '321 patent, right?

11 A. I understand that Nokia is accusing
12 hardware-accelerated decoding.

13 Q. Okay. You understand Nokia is accusing
14 hardware-accelerated decoding as it applies to those
15 standards and specifications, correct?

16 A. I'm sorry. Yes, correct.

17 Q. And I don't want to cover topics that my
18 colleague, Mr. Verboncoeur, has already gone over, but I
19 want to ask you some questions about your AV1 opinions, if
20 that's all right.

21 A. Please.

22 Q. Okay. You've given the opinion that the Acer
23 accused products -- strike that.

24 For ASUS, you have given the opinion that ASUS
25 accused products are not capable of playing AV1 out of the

1 box, correct?

2 A. That is correct.

3 Q. You have not given the same opinion for Acer
4 accused products, correct?

5 A. That is correct.

6 Q. Now, I want to make sure I understand your
7 opinions with respect to ASUS.

8 Is it your position that no ASUS accused products
9 can play AV1 out of the box?

10 A. It is my understanding that the accused ASUS
11 products are not able to play AV1 out of the box.

12 Q. And you relied on some testimony from an ASUS
13 corporate representative to support that opinion, correct?

14 A. That is correct.

15 Q. Did you look at ASUS's website to verify that
16 ASUS's representative was correct?

17 A. I did not.

18 Q. Are you aware that ASUS specifically advertises
19 that at least some of its products are configured to encode
20 and decode AV1 using hardware acceleration natively?

21 A. I'm not aware of that. I will say that -- I'll
22 just mention, and I'll try to be super quick, when this came
23 up in my deposition, I did make the comment that I don't
24 know how timing applies, I don't know if what's accused
25 is -- I don't understand in these cases if something that

1 was produced yesterday is going to fall into the accused
2 bucket because it has the same number.

3 So I just want to clarify that, that there is
4 some timing issues here that I just don't understand about
5 how these things work.

6 Q. Sure. Let's take a look at one of the pages of
7 ASUS's website.

8 Mr. Moreno, would you please pull up CX-7055?

9 Dr. Hemami, do you see that this is a blog post
10 from ASUS's website on the NUC mini PCs?

11 A. On January 5th, 2026, yes, I do.

12 Q. And do you happen to know how to pronounce the
13 name of that product, the NUC product?

14 A. I have absolutely no idea.

15 Q. I'm going to call it the NUC, if that's all right
16 with you.

17 A. That sounds great.

18 Q. All right. And you understand that the NUC
19 products, ASUS's NUC products, are among the accused
20 products in this case, correct?

21 A. I actually don't understand that, no.

22 Q. All right. Well, I'll represent to you that they
23 are.

24 Turning to page 4 of CX-7055, do you see the
25 section header, "Media Support: Either You Have It Or You

1 Don't"?

2 A. Yes, I do.

3 Q. All right. On the next page, CX-7055.5 -- and,
4 Mr. Moreno, if we could please zoom into the second
5 paragraph.

6 Do you see that ASUS states in this blog post
7 that its NUC products have dedicated processing for AV1
8 streams natively?

9 A. I do see that.

10 Q. And I misread. In fact, it says that the NUC 14
11 and NUC 15 Pro have dedicated hardware for processing AV1
12 streams natively, bypassing the CPU almost entirely,
13 correct?

14 A. Correct.

15 Q. And do you see that immediately below that
16 statement ASUS states, this has a massive impact on
17 performance?

18 Do you see that?

19 A. I do.

20 Q. Earlier I thought I heard you testify something
21 to the effect of disabling hardware acceleration has no
22 impact on performance. Did I hear that correctly?

23 A. I believe what you heard me read was my opinion
24 based upon the materials that the Acer and ASUS corporate
25 representative gave me.

1 Q. Okay. Yes or no, does disabling hardware
2 acceleration have an impact on performance of the device?

3 A. I think, posed as a general question as you have,
4 I can't answer that.

5 Q. Okay. Were you aware of this ASUS advertisement
6 when you rendered your opinions in this case?

7 A. I was not.

8 Q. I'm going to show you one more page from ASUS's
9 website.

10 Mr. Moreno, would you please pull up CX-7076?

11 Dr. Hemami, do you see that this is an
12 advertisement for ASUS's ProArt P16 product?

13 A. Well, it looks to be actually a page from ASUS's
14 website.

15 Q. Do I not say ASUS? I apologize.

16 A. You said it was an advertisement. This to me
17 looks like a store page.

18 Q. Okay. Do you see that this is a page from ASUS's
19 website?

20 A. I do.

21 Q. And it relates to a laptop called the ProArt P16?

22 A. Let me read this.

23 Q. It's at the very top.

24 A. Yes, it does appear to be a laptop.

25 Q. And do you see that this laptop happens to cost

1 over \$2,000?

2 A. That is the price that shows up in the upper
3 right.

4 Q. So this is a relatively high-end laptop, fair?

5 A. I buy MACs, so I miscalibrated.

6 Q. All right. Mr. Moreno, would you please zoom
7 into the paragraph captioned "Faster and Smoother Video
8 Editing"?

9 The first sentence states, for video editing, the
10 RTX 50 Series GPUs offer unmatched speed and stability with
11 10-bit 4:2:2 color and fast encoding/decoding for 4K/8K
12 content.

13 Do you see that?

14 A. I do.

15 Q. And then below that sentence, the same web page
16 from ASUS's website states that, AV1 Ultra High Quality Mode
17 boosts compression efficiency with excellent image quality.

18 Do you see that?

19 A. I do.

20 Q. And you would agree that the AV1 in "AV1 Ultra
21 High Quality Mode" refers to the AV1 specification?

22 A. Actually I don't know if the AV1 spec, off the
23 top of my head, has an Ultra High Quality Mode. It may
24 have, but, from going on memory from reading it, I would be
25 happy to look at it right now.

1 Q. I'm sure, if your counsel wants to follow up with
2 you on that, they can.

3 Were you aware of this ASUS web page before you
4 rendered your opinions in this case?

5 A. Well, if I was and I cited it, then the answer is
6 yes. I don't believe that I did.

7 Q. Mr. Moreno, would you please pull up CDX-4.98?

8 Dr. Hemami, do you recall showing this slide to
9 Her Honor?

10 A. Yes.

11 Q. And this is a slide that you copied and pasted
12 out of Dr. Chrissan's direct demonstratives, correct?

13 A. This is one of Dr. Chrissan's slides, yes.

14 Q. And I believe you testified that this slide
15 accurately depicts the technology for instantaneous decoder
16 refresh frames, correct?

17 A. I don't believe I used the word "accurately," but
18 I did state that he uses it to describe an IDR and that I
19 was going to use it to also describe the concept of the
20 decoder flush.

21 Q. You testified that this slide provides an
22 accurate description of IDR frames, correct?

23 A. I do not remember if I used that word.

24 Q. What would it surprise you if you used that
25 phrase?

1 A. I honestly don't remember.

2 Q. Let me ask you this, Dr. Hemami: Do you see that
3 the IDR frame is colored blue on this slide?

4 A. Yes, it is.

5 Q. And do you see that several frames over there's
6 an I6?

7 A. Yes.

8 Q. I6 is an intra-frame, correct?

9 A. That is correct.

10 Q. Do you agree that there's a difference between
11 IDR frames and intra-frames like I6?

12 A. So IDR frames are a special case of intra-frames.

13 Q. Your testimony or your understanding as an expert
14 is that IDR frames are a special case of I-frames, fair?

15 A. Well, we use the term "intra-frame" generically
16 for something that is coded as a still image, and in this
17 case I was discussing the frame at the beginning of the
18 group.

19 Q. Okay. Yes or no, are IDR frames a special case
20 of intra-frame, or I-frame?

21 A. When I question colloquially, the answer is yes.
22 Now, within these standards, if every single element as
23 available to the I-frames and the IDR frames is exactly the
24 same in terms of syntax and everything else, I would have to
25 refer to the standard, if I were to make that statement on a

1 bit-for-bit and syntax-element-by-syntax-element statement.

2 Q. It's fair to say that you've discussed a number
3 of prior art references later on in your presentation?

4 A. I did.

5 Q. Did you identify any IDR frames in any of those
6 references?

7 A. I would say that when I referred to the VLC
8 decoder or the VLC codec that included H.264 support, that,
9 by definition, would have IDR frames in it.

10 Q. Okay. Outside of H.264, did you identify any
11 alleged prior art that disclosed IDR frames?

12 A. Well, the Ruser reference is applicable in the
13 context of IDR -- forgive me -- in the context of H.264. So
14 in the context that IDRs exist in H.264, we have a mention
15 of a standard there that uses it.

16 And, additionally, that HEVC reference
17 references -- the Karczewicz reference for the emerging HEVC
18 standard would have IDR frames in that standard.

19 Now, yes, I see your face. These are references
20 from Karczewicz from '714.

21 It's late.

22 But you asked me what else I testified about that
23 would have IDRs in it, and those are accurate.

24 Q. Can we agree that IDR frames were new in the
25 H.264 standard?

1 A. We can agree that IDR frames were new in H.264.

2 Q. I'd like to move on to ask you a few questions
3 about the last limitation of the '321 patent's asserted
4 claims. Is that okay?

5 A. Sure.

6 Q. The final limitation of the '321 patent's
7 asserted claims requires resetting the identifier value for
8 the indicated first image frame of the independent sequence,
9 correct?

10 A. Correct.

11 Q. I didn't hear you present noninfringement
12 arguments relating to any other claim limitation in the
13 asserted claims. Is that accurate?

14 A. Noninfringement. So we shortened things quite
15 tremendously. I did actually refer to something that was
16 not a decoder value, so I think that your statement is not
17 quite accurate.

18 Q. Okay.

19 A. Sorry. Decoded value.

20 Q. Let me ask you this: You testified that the
21 H.264 standard includes a plain English phrase called
22 picture order count. Do you recall that?

23 A. I do.

24 Q. You weren't suggesting that picture order count
25 isn't part of the H.264 standard, were you?

1 A. No. I believe I stated very clearly what I
2 meant.

3 Q. Do you understand that picture order count is
4 decoded as set forth in the H.264 standard?

5 A. There is no variable that was pointed to by
6 Dr. Chrissan that computes picture order count in H.264.

7 Q. Yes or no, is picture order count decoded as part
8 of the H.264 standard?

9 A. The English phrase, no.

10 Q. Mr. Moreno, could I please have CDX-17.122?

11 Dr. Hemami, do you see that this is an excerpt of
12 the H.264 standard?

13 A. I can't see the standard number, but if you
14 represent to me that this is H.264, yes, I believe --

15 Q. I will represent it to you.

16 Do you see that heading 8.2.1.1 is titled
17 "Decoding Process for picture order count"?

18 A. Picture order count type 0, yes, it is.

19 Q. You would agree that this section of the standard
20 in fact describes the process for decoding picture order
21 count, wouldn't you?

22 A. This process uses the English phrase. There is
23 no variable that is equal to picture order count, the
24 English phrase. The variables that are in this section,
25 other than the ones that I have previously identified, if

1 they exist here, from Dr. Chrissan's testimony, I have
2 discussed.

3 Q. Do you agree that there are multiple parameters
4 or variables related to picture order count in the H.264
5 standard?

6 A. Well, in this decoding process, we see quite a
7 few variables, so, yes, I agree with that statement.

8 Q. One parameter relating to picture order count is
9 called pic_order_cnt_lsb, correct?

10 A. pic_order_cnt_lsb is a variable that is derived
11 in the standard.

12 Q. Dr. Hemami, pic_order_cnt_lsb is part of the
13 bitstream and is decoded by an H.264 decoder, correct?

14 A. I don't -- so we saw slice_pic_order_cnt_lsb. I
15 do not believe there is a syntax element called
16 pic_order_cnt_lsb. But we can look at the standard to
17 check. That's why we have the standards.

18 Q. I can actually do better than the standard.

19 Mr. Moreno, would you please pull up CDX-17.120?

20 Here I have an excerpt of a table from your
21 rebuttal expert report. Do you see that?

22 A. I do.

23 Q. And do you see that you've identified a variable
24 or parameter in the H.264 standard called
25 picture_order_count _lsb?

1 A. Yes, I do. And that is a syntax element. So
2 thank you for that reminder, yes.

3 Q. And you see that, according to you and your
4 table, it is present in the bitstream, right?

5 A. According to the table, it is, yes.

6 Q. And you did your best to ensure the information
7 in your table is accurate, right?

8 A. I did. Looking at it now, I suspect there may be
9 a typo, but we can worry about that later.

10 Q. The H.264 standard also specifies parameters
11 related to picture order count called
12 prev_picture_order_cnt_msb and prev_picture_order_cnt_lsb,
13 correct?

14 A. You call them parameters. I would call them
15 derived variables, which is the terminology in the standard.

16 Q. Okay. You would agree that those derived
17 variables, prev_picture_order_cnt_msb and
18 prev_picture_order_cnt_lsb are set to 0 by the decoder,
19 wouldn't you?

20 A. I believe I highlighted exactly the phrase where
21 that occurs following an IDR frame so that they can be used
22 in subsequent equations.

23 Q. So the answer to my question is yes?

24 A. Could you repeat the question?

25 Q. You would agree that prev_pic_order_cnt_msb and

1 prev_pic_order_cnt_lsb are set to 0 by the decoder in the
2 H.264 standard, correct?

3 A. So I'm going to be very careful about the wording
4 here because "set" is a word that shows up in claim
5 construction for both parties.

6 And I will say, I pointed to an equation where
7 those variables were going to be used later so that they
8 were given a value of 0 so that the equation would not be
9 garbage in/garbage out.

10 Q. Okay. Mr. Moreno, would you please pull up
11 CDX-17.123?

12 Dr. Hemami, I have another excerpt from your
13 rebuttal expert report, specifically paragraph 146.

14 Do you see that?

15 A. I do.

16 Q. And in this paragraph you state that, to the
17 extent the decoder simply sets an identifier value to 0 for
18 a first image frame without first decoding the identifier
19 value for the frame, the decoder has not reset the
20 identifier value, it has set it in the first instance.

21 Did I read that correctly?

22 A. You did.

23 Q. And then you state that, this is the case for
24 several variables or parameters in the H.264, H.265, and AV1
25 specification, correct?

1 A. Correct.

2 Q. Specifically with respect to H.264, you identify
3 prev_pic_order_cnt_msb and prev_pic_order_cnt_lsb as
4 identifier values that are set to 0 for a first image frame,
5 correct?

6 A. Well, they are in that sentence because that
7 was -- I had compiled the list of variables that
8 Dr. Chrissan had accused. So that is why they appear in
9 this paragraph referring to identifier value.

10 Q. Is the information in this paragraph inaccurate?

11 A. No. I think the information in this paragraph is
12 accurate. If one puts that paragraph in context, one can
13 see that it's discussing the alleged identifier values.

14 Q. Mr. Moreno, could I please have CDX-17.121?

15 Okay. I have another excerpt from your rebuttal
16 expert report. Again we have a table that you compiled. Do
17 you see that?

18 A. Yes.

19 Q. Do you see that you've identified
20 prev_pic_order_cnt_msb and prev_pic_order_cnt_lsb in your
21 table?

22 A. Yes, I have.

23 Q. And for both of those you state that they are set
24 by the decoder, not the encoder, correct?

25 A. The language that I used is that they are derived

1 or calculated.

2 Q. Dr. Hemami, your table says, set by
3 encoder/decoder in the heading. Do you see that?

4 A. Yes. I'm sorry. I was looking at the wrong
5 column. Yes.

6 Q. And you said that those two variables,
7 prev_pic_order_cnt_msb and prev_pic_order_cnt_lsb, are set
8 by the decoder, correct?

9 A. Yes. That column indicates at what -- which
10 widget the derivation occurs.

11 Q. Now, AV1 doesn't use picture order count, does
12 it?

13 A. I could not answer that question off the top of
14 my head. I focused on what Dr. Chrissan accused.

15 Q. Okay. You are aware that AV1 talks about
16 OrderHints, right?

17 A. I am.

18 Q. Can we agree that OrderHints is set to 0 by the
19 decoder?

20 A. The OrderHints array in positions 1 to 7, as
21 pointed to by Dr. Chrissan, does -- is zeroed out.

22 Q. And it's set to 0 by the decoder, correct?

23 A. That is in the decoder, yes, that is correct.

24 Q. Okay. Briefly, Dr. Hemami, I want to ask you
25 about your opinion that it would have been obvious to modify

1 the MPEG-1 standard to derive the invention of the '321
2 patent. Do you recall those opinions?

3 A. I do.

4 Q. And I recall you presented two methods for how
5 you would modify the MPEG-1 standard such that you would add
6 the reset limitation of the claims to the standard. Do you
7 recall that testimony?

8 A. The standard would do a reset as claimed.

9 Q. Okay. Mr. Moreno, would you please pull up
10 CDX-17.130?

11 Now, I have here an excerpt appendix to
12 Respondents' pre-hearing brief. Do you see that on your
13 slide?

14 A. I do.

15 Q. And you may not recall the headers to this
16 demonstrative, but I assume you recall the actual content,
17 the annotated versions of the MPEG-1 standard underneath
18 them; is that fair?

19 A. That's fair.

20 Q. And do you see that Respondents characterized
21 this analysis as Dr. Hemami's analysis as to obvious methods
22 for revising MPEG-1 where a decoder resets the temporal
23 reference? Do you see that?

24 A. I do.

25 Q. And first they present example 1, which

1 corresponds to your method 1 earlier today, fair?

2 A. Temporal reference is not decoded at all, yes,
3 that's correct.

4 Q. And just so we're on the same page, the black
5 text is from the MPEG-1 standard, right?

6 A. All the text -- oh, as opposed to -- okay, as
7 opposed to the red. So when we start with the super fuzzy
8 text, yes, what is not in red was from the standard.

9 Q. And just to make sure, the red text is what
10 you've added to revise MPEG-1 to get the claim language,
11 right?

12 A. So the red text provides a little bit more detail
13 in the context of exactly the decoding syntax. I've
14 presented these in a more colloquial manner today.

15 Q. And that's specifically what I want to ask you
16 about. The very first modification that you've made to the
17 MPEG-1 standard is to set pic_num equal to 0. Do you see
18 that?

19 A. I do.

20 Q. Pic_num is not in the MPEG-1 standard, is it?

21 A. That is something that I have defined as we can
22 see as an internal variable for the number of decoded
23 pictures. So that is a, shall we call it, an addition, yes.

24 Q. And you did not mention that your obviousness
25 theory depended on that addition earlier today, did you?

1 A. I did not explicitly call out the exact detailed
2 implementation. I chose to explain it in a English manner
3 rather than trying to put up what looks like computer code
4 on a fuzzy display. That is correct.

5 Q. Can we agree that there are several revisions
6 that you've made to the MPEG-1 standard as part of
7 example 1, method 1, of your theory?

8 A. Yeah, I think that that was captured in the four
9 steps. There would be -- there would be revisions.

10 Q. Dr. Hemami, you didn't mention any of the
11 revisions on this slide during your analysis or during your
12 presentation earlier today, did you?

13 A. No, actually I did.

14 Q. We can agree you didn't mention pic_num, correct?

15 A. That is an implementation specific issue, sort of
16 at a level below which I presented. It is correct that I
17 did not say I would do this step, this step, this step, this
18 step, inserting red arrows through this.

19 I felt that, given the time here, that would be
20 perhaps tedious, and I chose to go with an English
21 description of how one would do that. A person of ordinary
22 skill hearing or reading my English description would be
23 able to implement it.

24 Q. Okay.

25 Mr. Moreno, would you please turn to CDX-17.131?

1 Here we have another excerpt from Respondents'
2 pre-hearing brief, and, once again, we can see annotations
3 that you've made to the MPEG-1 standard, correct?

4 A. That is correct.

5 Q. And this particular example from Respondents'
6 pre-hearing brief corresponds to the method 2 that you
7 presented earlier today, correct?

8 A. This responds to method 2, yes.

9 Q. And, once again, we see that you are annotating
10 the MPEG-1 standard by adding pic_order_num?

11 A. Actually, pic_num.

12 Q. You're adding pic_num into the MPEG standard?

13 A. I'm not adding it into the MPEG-1 standard. I am
14 taking an implementation of the standard and modifying it in
15 a way that a person of ordinary skill would do in order to
16 provide the reset, and I will say this type of thing is
17 something that I did regularly with my students and in my
18 Ph.D. thesis for my research.

19 Q. Okay. When you presented your four-step method
20 to modify MPEG-1 according to the second embodiment or the
21 second method that you presented earlier today, once again,
22 you didn't mention pic_num in your analysis or in your
23 presentation, fair?

24 A. That is fair. I did not get into this level of
25 implementation detail.

1 Q. Thank you very much.

2 MR. CAMERON: I pass the witness.

3 JUDGE MCNAMARA: Well, we have a problem, folks.
4 We have a timing issue.

5 It is 5:30 and I cannot keep people late. And I
6 came in early. Dr. Hemami has been on for most of the day.
7 So what are we going to do here? Because Ms. Ducca still
8 has to be heard from, as do Respondents, if there is any
9 redirect.

10 What are we going to do? Do you want to take a
11 minute or so and confer?

12 MS. DUCCA: So I can tell you, Your Honor, I only
13 have about five or ten minutes. I know we have to leave now
14 though, but just if that helps the Respondents decide what
15 we're going to do.

16 JUDGE MCNAMARA: I think you better take a minute
17 or so and talk and agree, because, Dr. Hemami, if there are
18 additional questions, I am sorry to say, but you might have
19 to stay over.

20 A. I understand.

21 JUDGE MCNAMARA: Thank you. Okay, folks, figure
22 it out.

23 (Brief interruption.)

24 MS. DUCCA: Your Honor, it sounds like everybody
25 is in agreement that Dr. Hemami will stay over, and I'm so

1 sorry.

2 JUDGE MCNAMARA: Dr. Hemami, this is really good
3 of you, but typically when we hold these hearings and
4 subpoenas are issued for testimony, they typically include
5 boilerplate language that testimony will continue from day
6 to day.

7 So I am sorry about this, but you are still under
8 subpoena, and you are graciously agreeing to stay over, but
9 you really have to if they have questions.

10 A. Understood.

11 JUDGE MCNAMARA: Thank you very much for this.
12 That is very gracious, given the circumstances.

13 Okay. So that is what we are going to do. And,
14 folks, you really owe her a dinner.

15 All right. So is there anything else you would
16 like to discuss? How much time do you think tomorrow for
17 Dr. Hemami, just so she has an idea as well for planning
18 purposes?

19 MS. DUCCA: Again, I only have five or ten
20 minutes.

21 MR. JARVIS: Respondents will likely have 20
22 minutes of redirect.

23 MR. VERBONCOEUR: Your Honor, I don't anticipate
24 much, but I don't know exactly what will be asked at this
25 point.

1 JUDGE MCNAMARA: We are just trying to give you a
2 frame of reference here so that you have an idea, and I hate
3 to pun, but I do it all the time.

4 A. I already have to cancel one plane ticket, so
5 it's not a problem.

6 JUDGE MCNAMARA: Thank you very much.

7 Okay, everyone. Then I will see you tomorrow
8 morning at 9:00 a.m. Thank you very much.

9 //

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11 (Whereupon, at 5:31 p.m., the proceedings
12 adjourned, to reconvene the following day, March 10, 2026,
13 at 9:00 a.m.)

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1 C O N T E N T S

2 INDEX OF WITNESSES

3

	WITNESS	DIRECT	CROSS	RE- DIRECT	RE- CROSS	STAFF
5	MICHAEL PATRICK AKEMANN.....	893	925			958

6	KATE SHANG.....	985				
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7	SHEILA HEMAMI.....	998	1123			
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12	AFTERNOON SESSION.....	1060				
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19	CONFIDENTIAL SESSION.....	893-	916			
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20	CONFIDENTIAL SESSION.....	931-	964			
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21	CONFIDENTIAL SESSION.....	971-	982			
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22	CONFIDENTIAL SESSION.....	984-	995			
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23	CONFIDENTIAL SESSION.....	1117-	1164			
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1 EXHIBIT LISTS SUBMITTED FOR ADMISSION:
2 LIST OF EXHIBITS ADMITTED ON MARCH 6, 2026
3 CX-0300C
4 CX-0333C
5 CX-0339C
6 CX-0357C
7 CX-0358C
8 CX-0364C
9 CX-0462C
10 CX-0463C
11 CX-0464C
12 CX-0481C
13 CX-0483C
14 CX-0484
15 CX-0498C
16 CX-0926
17 CX-0927
18 CX-0928
19 CX-0929
20 CX-0930
21 CX-0931
22 CX-0934
23 CX-1845
24 CX-1944C
25 CX-2157

1	CX-2166
2	CX-2175
3	CX-2249C
4	CX-2251C
5	CX-2252C
6	CX-2253C
7	CX-2254C
8	CX-2276
9	CX-2295
10	CX-2312
11	CX-2314
12	CX-2316
13	CX-2320
14	CX-2322
15	CX-2352C
16	CX-2356C
17	CX-2357C
18	CX-2358C
19	CX-2359C
20	CX-2360C
21	CX-2389C
22	CX-2452C
23	CX-2591
24	CX-2592
25	CX-2641

1	CX-4808C
2	CX-6027
3	CX-6028
4	CX-6029
5	CX-6044
6	CX-6045
7	CX-6046
8	CX-6047
9	CX-6048
10	CX-6049
11	CX-6050
12	CX-6057C
13	CX-6059C
14	CX-6060C
15	CX-6061C
16	CX-6362
17	CX-6363
18	CX-6364
19	CX-6365
20	CX-6366
21	CX-6367
22	CX-6368
23	CX-6401
24	CX-6407C
25	CX-6408C

1	CX-6409C
2	CX-6410C
3	CX-6411C
4	CX-6412C
5	CX-6413C
6	CX-6414C
7	CX-6415C
8	CX-6416C
9	CX-6417C
10	CX-6418C
11	CX-6419C
12	CX-6420C
13	CX-6421C
14	CX-6422C
15	CX-6423C
16	CX-6424C
17	CX-6425C
18	CX-6426C
19	CX-6427C
20	CX-6428C
21	CX-6429C
22	CX-6430C
23	CX-6431C
24	CX-6432C
25	CX-6433C

1	CX-6434C
2	CX-6435C
3	CX-6436C
4	CX-6437C
5	CX-6438C
6	CX-6439C
7	CX-6440C
8	CX-6441C
9	CX-6442C
10	CX-6443C
11	CX-6444C
12	CX-6445C
13	CX-6446C
14	CX-6950
15	CX-6955
16	CX-6961
17	CX-6963
18	CX-6970
19	CX-6995
20	CX-7003
21	CX-7032C
22	CX-7049C
23	CX-7050C
24	CX-7068C
25	CX-7070C

1 CX-7137C
2 CX-7150
3 CX-7151
4 CX-7152
5 CX-7153
6 CX-7154
7 CX-7155
8 CX-7156
9 CX-7157
10 CX-7158
11 CX-7159
12 CX-7160
13 CX-7161
14 CX-7162
15 CX-7164
16 CX-7166
17 CX-7197
18 CX-7198C
19 JX-0062C
20 JX-0097C
21 JX-0124C
22 JX-0126C
23 JX-0127C
24 JX-0131C
25 JX-0132C

1	JX-0133C
2	JX-0141C
3	JX-0142C
4	JX-0243C
5	JX-0246C
6	JX-0251C
7	JX-0301C
8	JX-0303C
9	JX-0312C
10	JX-0314C
11	JX-0316C
12	JX-0325C
13	JX-0328C
14	JX-0329C
15	JX-0332C
16	JX-0342C
17	JX-0345C
18	JX-0349C
19	JX-0350C
20	JX-0352C
21	JX-0357C
22	JX-0359C
23	JX-0365C
24	JX-0373C
25	JX-0374C

1 JX-0379C
2 JX-0381C
3 JX-0386C
4 JX-0393C
5 JX-0401C
6 JX-0404C
7 JX-0408C
8 JX-0420C
9 JX-0421C
10 JX-0679C
11 JX-0680C
12 JX-0681C
13 JX-0682C
14 RX-0239C
15 RX-2416C
16 RX-2417C
17 RX-2418
18 RX-2730
19 RX-4014C
20 RX-4021C
21 RX-4045C
22 RX-4048C
23
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1 C E R T I F I C A T E

2 TITLE: CERTAIN VIDEO-CAPABLE LAPTOP, DESKTOP COMPUTERS,
3 HANDHELD COMPUTERS, TABLETS, TELEVISIONS, PROJECTORS, AND
4 COMPONENTS AND MODULES THEREOF

5 INVESTIGATION NO.: 337-TA-1448

6 HEARING DATE: March 9, 2026

7 LOCATION: Courtroom A

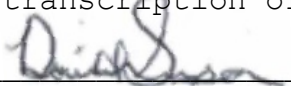
8 NATURE OF HEARING: Evidentiary Hearing

9 I hereby certify that the foregoing/attached
10 transcript is a true, correct and complete record of the
above-referenced proceedings of the U.S. International Trade
Commission. Date 3/9/26

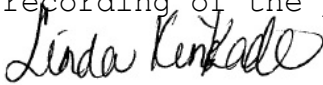
11 Signed: 
12 ss//
Heritage Reporting Corporation
13 1150 Connecticut Avenue, NW, Suite 305
Washington, D.C.

14 Signature of the Contractor or the Authorized Contractor's
15 Representative

16 I hereby certify that I am not the court reporter
and that I have proofread the above-referenced transcript of
17 the proceedings of the U.S. International Trade Commission
against the aforementioned court reporter's notes and
18 recordings for accuracy in transcription in the spelling,
hyphenation, punctuation and speaker identification and did
19 not make any changes of a substantive nature. The
foregoing/attached transcript is a true, correct and
complete transcription of the proceedings.

20 Signed: 
21 ss//

22 I hereby certify that I reported the
above-referenced proceedings of the U.S. International Trade
Commission and caused to be prepared from my record media
23 and notes of the proceedings a true, correct and complete
verbatim recording of the proceedings.

24 Signed: 
25 ss//

1 UNITED STATES INTERNATIONAL TRADE COMMISSION

2 Washington, D.C.

3 Before the Honorable MaryJoan McNamara

4 Administrative Law Judge

5 -----x

6 In the Matter of Investigation No.

7 337-TA-1448

8 CERTAIN VIDEO-CAPABLE LAPTOP, DESKTOP

9 COMPUTERS, HANDHELD COMPUTERS,

10 TABLETS, TELEVISIONS, PROJECTORS, AND

11 COMPONENTS AND MODULES THEREOF

12 -----x

13

14 International Trade Commission

15 500 E Street, SW

16 Washington, D.C.

17

18 Evidentiary Hearing

19 Tuesday, March 10, 2026

20 Volume V

21

22 The parties met pursuant to notice of the

23 Administrative Law Judge at 9:30 a.m. Eastern.

24

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13 *** Index appears at end of transcript ***

14

15 PLEASE NOTE: Quotations from documents are reflected in the
16 transcript as read and may not constitute a verbatim quote.

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1 P R O C E E D I N G S

2 (In session at 9:30 a.m.)

3 JUDGE MCNAMARA: Good morning, everyone. Please
4 be seated.

5 All right. Good morning. Before we get started,
6 I gather everyone has agreed upon the time that has been
7 spent and the time that remains. I am getting nods.

8 MR. NEWCOMER: Yes, Your Honor.

9 JUDGE MCNAMARA: All right. Good. Is there
10 anything you would like me to address before --

11 Mr. Newcomer? Yes, I can see.

12 MR. NEWCOMER: We have two housekeeping issues,
13 Your Honor, before we start with Dr. Hemami again.

14 JUDGE MCNAMARA: Sure.

15 MR. NEWCOMER: First, we have exhibits from
16 yesterday that need to be admitted, and, second, we wanted
17 to offer some clarification on these computer exhibits.

18 JUDGE MCNAMARA: Oh, I am so glad you are doing
19 that, because I was going to ask you to do that.

20 MR. NEWCOMER: Then perhaps I'll just start with
21 that one, if you want, Your Honor.

22 JUDGE MCNAMARA: Whichever is easiest, fastest.
23 I think the exhibits might be faster.

24 MR. NEWCOMER: Yes. Let's do exhibits first,
25 then.

1 JUDGE MCNAMARA: Okay.

2 MR. GRIGGS: Good morning, Your Honor. This is
3 Garrett Griggs on behalf of the Complainants.

4 JUDGE MCNAMARA: Good morning, Mr. Griggs.

5 MR. GRIGGS: Good morning. We would like to
6 admit the exhibits that were entered into the record with
7 Dr. Akemann yesterday and Ms. Shang.

8 JUDGE MCNAMARA: Okay.

9 MR. GRIGGS: And then I have a list of those, if
10 you would like. I also have the list from yesterday that
11 you requested.

12 JUDGE MCNAMARA: Thank you, I appreciate that.
13 And just be sure, please, that you have copies for
14 Ms. Kinkade as well.

15 Are there any objections?

16 MR. MILLER: No objections, Your Honor. Zach
17 Miller for Respondents.

18 JUDGE MCNAMARA: Good morning, Mr. Miller. All
19 right.

20 Ms. Ducca?

21 MS. DUCCA: No objections from Staff, Your Honor.

22 JUDGE MCNAMARA: All right. Then the exhibits
23 that have been identified by Mr. Griggs will be admitted
24 into evidence for the witnesses whom he identified and on
25 lists.

1 (Whereupon, the exhibits as recited by counsel
2 and reflected in the attached index were submitted and
3 received in evidence.)

4 MR. GRIGGS: Thank you, Your Honor. May I
5 approach with the list?

6 JUDGE MCNAMARA: Sure. And before we proceed on
7 that, looking at the lists, when you submit your final
8 exhibit lists, please be sure that even though you're
9 identifying each exhibit by a JX, a CX, an RX, that you also
10 use 25 characters to describe what the actual exhibit is,
11 whether it is a, you know, declaration of so and so,
12 whatever it is, so that when we are scrolling through on
13 EDIS, we can actually look at the item and the topic that is
14 addressed in that exhibit. Okay? I will talk more about
15 that at the end.

16 But thank you very much. They are admitted.

17 Okay. So now with respect to the next issue?

18 MR. NEWCOMER: With respect to the redesign
19 computers, Dr. Hemami is on the stand still, and this
20 involves her testimony. So, respectfully, I'm not sure she
21 should be in the courtroom for this part of the
22 conversation, just because it involves testimony that was
23 elicited yesterday.

24 I'm happy either way, but I just wanted to flag
25 that.

1 JUDGE MCNAMARA: So I thought, and perhaps I am
2 wrong, but I thought by clarifying you were just going to
3 identify the particular exhibit and then whether it
4 corresponded to the RDX, I think it is -- that had the list
5 of the various Acer and ASUS laptops that Dr. Hemami looked
6 at and those that Nokia inspected, that you would just go
7 through that C1, C2, C3 and identify, clarify.

8 MR. NEWCOMER: Sure, Your Honor. I'm happy to do
9 it that way. No problem. I just wanted to make sure --

10 JUDGE MCNAMARA: What were you going to do?

11 MR. NEWCOMER: I just wanted to make sure it was
12 okay to talk about Dr. Hemami's testimony while she is in
13 the courtroom and still on the stand as opposed to having
14 her out of the courtroom, but it's fine.

15 JUDGE MCNAMARA: I don't see any problem with
16 that. We are just clarifying exhibit numbers and those to
17 which she testified so that we are clear. I came away very
18 unclear.

19 MR. NEWCOMER: Absolutely.

20 MS. DUCCA: I think I know what they are going to
21 say, and if it's consistent with what I think they're going
22 to say, then I don't think there's any issue.

23 JUDGE MCNAMARA: Good.

24 Mr. Miller?

25 MR. MILLER: Yeah, I don't think there's an issue

1 either, Your Honor, but we can proceed.

2 JUDGE MCNAMARA: Well, we are being nice and
3 cautious, which is good.

4 MR. NEWCOMER: No problem, Your Honor. And I'm
5 going to try to do this so we don't have to go on the
6 confidential record.

7 JUDGE MCNAMARA: Good.

8 MR. NEWCOMER: But, just to be clear, there were
9 three laptops during discovery that were inspected -- or
10 offered to Nokia to be inspected. We went in September,
11 inspected them. Those three stayed in Acer's possession the
12 whole time.

13 In the pre-hearing brief, Acer said that they
14 were labeling as CPX-1 -- or CPX-ACER-1, CPX-ACER-2, and
15 CPX-ACER-3 the laptops --

16 MR. MILLER: Before you go on, just to make sure
17 there is no further confusion, RPX-ACER.

18 MR. NEWCOMER: Excuse me. RPX-ACER-1,
19 RPX-ACER-2, and RPX-ACER-3 as the laptops that had been
20 inspected.

21 JUDGE MCNAMARA: Yes.

22 MR. NEWCOMER: Then they, you know, elicited
23 testimony yesterday from Dr. Hemami on RPX-ACER-1,
24 RPX-ACER-2, and RPX-ACER-3.

25 Right before cross-examination yesterday, Nokia

1 learned that, in fact, those were not the laptops that had
2 been tendered during discovery or inspected by Nokia. So up
3 until the point of cross yesterday, the testimony elicited,
4 frankly, by Acer was about laptops that had never been
5 inspected.

6 We got those laptops that had been inspected from
7 Acer right before cross-examination, which is why
8 Mr. Verboncoeur was trying to do it on the fly. Those have
9 now been marked 4, 5, and 6.

10 JUDGE MCNAMARA: Okay.

11 MR. NEWCOMER: And --

12 JUDGE MCNAMARA: Pardon me. RPX.

13 MR. NEWCOMER: RPX-ACER-4, RPX-ACER-5,
14 RPX-ACER-6. Those are the ones that Nokia actually
15 inspected and that have the reversal of the design-around on
16 them. I think everybody is in agreement that RPX-ACER-4,
17 RPX-ACER-5, and RPX-ACER-6 are the actual ones that were
18 inspected and made available during discovery.

19 So the question is -- and I think that's right,
20 right?

21 JUDGE MCNAMARA: Yes. I was going to ask, do you
22 agree, Mr. Miller?

23 MR. MILLER: Well, I agree that those RPX-ACER-4,
24 RPX-ACER-5 and RPX-ACER-6 were the ones that Nokia inspected
25 and modified during discovery. I would just note that Acer

1 identified during discovery that it had imported two copies
2 of each of the three redesign products.

3 And Your Honor agreed that there is confusion as
4 to the exhibit numbers, and Respondents apologize for that,
5 for injecting whatever confusion there was as to the exhibit
6 numbers. We had originally identified RPX-1, RPX-2, and
7 RPX-3 on our exhibit numbers -- on our exhibit lists because
8 those were the products as unmodified by Nokia. Those were
9 the imported redesign products.

10 And I'll just note for the record, the documents
11 that I'm talking about as identifying that two of each of
12 the redesign products were imported are the importation
13 documents that list two of each redesign product as being
14 imported. I can give you the exhibit numbers for those,
15 Your Honor.

16 JUDGE MCNAMARA: That would be helpful. And also
17 do you have -- well, I will get the EDIS number later for
18 the stipulation.

19 MR. NEWCOMER: Thank you, Your Honor.

20 MR. MILLER: And the exhibit numbers for those
21 importation documents, Your Honor, are RX-204, RX-206,
22 RX-207, and RX-208.

23 JUDGE MCNAMARA: Thank you.

24 MR. NEWCOMER: It's news to me that they informed
25 us there were two. I've got an email here that says there's

1 one for each.

2 But setting aside that confusion, Your Honor, I
3 think we're all on the same page here that RPX-4, RPX-5, and
4 RPX-6 are the actual ones that were inspected. RPX-1,
5 RPX-2, and RPX-3 were never made available during discovery.
6 I think Respondents will agree to withdraw those because
7 they have never, ever been inspected by Nokia, at least
8 until we saw they weren't the right devices yesterday.

9 So the question is, how do we clean up the record
10 on direct and their pre-hearing brief and everything that
11 referred to 1, 2, and 3, now that we really need to refer to
12 4, 5, and 6. I don't know how to unwind -- I mean, I think
13 it would have to be line by line to unwind that. So I
14 appreciate your guidance on that.

15 JUDGE MCNAMARA: Ms. Ducca, do you have anything
16 to say?

17 MS. DUCCA: So let me -- can I ask the parties a
18 question?

19 JUDGE MCNAMARA: Sure.

20 MS. DUCCA: Okay. So does 1 align with 4?

21 MR. NEWCOMER: Yes.

22 MS. DUCCA: 2 aligns with 5, 3 aligns with 6?

23 MR. MILLER: Yes, that's correct.

24 MS. DUCCA: Can we just have a little key?

25 JUDGE MCNAMARA: Yes. Thank you very much. Yes,

1 exactly right. So in the post-hearing brief, just at the
2 start of the brief, just drop a footnote with a key that
3 says anytime -- you know, something to the effect of anytime
4 RPX-1, RPX-2, RPX-3 are identified or mentioned, they are
5 actually referring to RPX-4, 5, and 6 respectfully,
6 something, you know, just align them and keep reminding us,
7 because you know how repetition really helps.

8 So every now and then if you want to stick it in
9 or refer back to the footnote, that would be helpful. I
10 find sometimes repetition, you know -- people get it if you
11 keep repeating the same message. But I think that is a
12 really clean way of doing it.

13 MR. NEWCOMER: Thank you, Your Honor. I think
14 that makes sense.

15 MR. MILLER: That works for Respondents,
16 Your Honor. I'll also note that we'll include similar
17 descriptions for those on the exhibit list so that it's
18 clear that they correspond.

19 JUDGE MCNAMARA: Very good. That's exactly
20 right. Good solution all around.

21 MR. MILLER: Thank you, Your Honor.

22 JUDGE MCNAMARA: Anything else this morning?

23 MR. RIZZOLO: Your Honor?

24 JUDGE MCNAMARA: Mr. Rizzolo, yes.

25 MR. RIZZOLO: Thank you. Matt Rizzolo for

1 Respondents. There was the question of Mr. Robert Gray in
2 rebuttal --

3 JUDGE MCNAMARA: Yes.

4 MR. RIZZOLO: -- given the deadlines for
5 disclosure being two days in advance and him being
6 potentially slated to testify on Thursday if he is allowed
7 to be called back.

8 JUDGE MCNAMARA: Thank you for reminding me, and
9 I am addressing that. And so what I would say is that
10 neither the ground rules nor the Commission rules expressly
11 address the order of witnesses, whether a fact witness may
12 be called back on rebuttal despite not having been disclosed
13 as a rebuttal witness.

14 The most closely related provisions are Ground
15 Rule 9.1, Order of Examination, which does not contain any
16 prohibition on Complainants' fact witnesses being recalled
17 on rebuttal, and Commission Rule 210.36, which is a general
18 provision authorizing an ALJ to take evidence and hear
19 argument at the hearing.

20 In addition, Section 556 of the Administrative
21 Procedure Act, 5 U.S.C. ^a 556(c), authorizes an ALJ to
22 regulate the course of the hearing.

23 So, with all of that having been said, there is
24 authority to permit a fact witness who has been identified
25 in the case-in-chief to come back as a rebuttal witness.

1 Again, one of the things I would also mention is
2 that when I drafted my ground rules and as they have
3 evolved, I recognize -- I left enough flexibility also that
4 I recognize that there are unusual circumstances that allow
5 for a change in witness order. We certainly had it
6 throughout COVID. We certainly have had it at other times,
7 and I didn't go through and identify all the investigations
8 in which that has happened, but it certainly has.

9 And ultimately the whole point is to make sure
10 there is a thorough record and that we have all the evidence
11 that we really need to make a right decision or the best
12 decision that we can.

13 MR. NEWCOMER: Thank you, Your Honor.

14 JUDGE MCNAMARA: Okay.

15 Good morning, Dr. Hemami. How are you?

16 A. I'm well, and I'm not sure my microphone is on.

17 JUDGE MCNAMARA: If you hit the button -- this is
18 good too? Okay.

19 SHEILA HEMAMI,

20 having been previously duly sworn or affirmed
21 on their oath, was thereafter examined and testified further
22 as follows:

23 JUDGE MCNAMARA: And thank you for staying.

24 MS DUCCA: Your Honor, may I proceed?

25 JUDGE MCNAMARA: Yes, thank you, Ms. Ducca.

1 EXAMINATION BY COUNSEL FOR ITC STAFF

2 BY MS. DUCCA:

3 Q. Good morning, Dr. Hemami. I'm Marissa Ducca from
4 the Office of Unfair Import Investigations. It's good to
5 see you again.

6 MS. DUCCA: Your Honor, I think we should go on
7 the confidential record. I'm going to ask about the
8 redesigns, so I believe this is ASUS, Acer, and third-party
9 confidential.

10 (Whereupon, the hearing proceeded in confidential
11 session.)

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1 O P E N S E S S I O N

2 JUDGE MCNAMARA: Madam Translator, could you
3 identify yourself, please?

4 THE INTERPRETER: Amanda Lin, L-I-N.

5 JUDGE MCNAMARA: Now, before we start taking
6 Dr. Cheng's testimony, I'm going to administer an oath to
7 you.

8 AMANDA LIN,
9 having been duly sworn to translate the English
10 language into the Chinese language, and the Chinese language
11 into the English language, and render a true and correct
12 translation thereof, to the best of their ability,
13 interpreted the proceedings as follows:

14 JUDGE MCNAMARA: Please state your name.

15 THE INTERPRETER: Amanda Lin.

16 JUDGE MCNAMARA: I am going to administer an oath
17 to Dr. Cheng.

18 VICTOR CHENG,
19 having been first duly sworn or affirmed on
20 their oath, was thereafter examined and testified through
21 the interpreter as follows:

22 JUDGE MCNAMARA: Thank you very much. You may be
23 seated.

24 MR. ZHANG: Your Honor, before I start, may I
25 approach to make the mics --

1 JUDGE MCNAMARA: Yes, of course.

2 DIRECT EXAMINATION

3 BY MR. ZHANG:

4 Q. Good morning, Dr. Cheng. Could you please
5 introduce yourself?

6 A. My name is -- my last name is Cheng. My first
7 name is [English] Victor.

8 Q. And what is your title at ASUS?

9 A. General counsel.

10 Q. And before serving as general counsel at ASUS,
11 have you served as general counsel before?

12 A. I worked and served in TSMC in 1992.

13 Q. And what did you do after serving as general
14 counsel at TSMC?

15 A. I worked as the general counsel of Acer from 1982
16 to 1988.

17 Q. And after 1992 what did you do after serving as
18 general counsel at TSMC?

19 A. I taught patent laws in universities.

20 Q. When did you start your current role as general
21 counsel of ASUS?

22 A. I got on board on May 1st, 2025.

23 Q. And could you tell us what you did to prepare
24 yourself to testify about the negotiations between ASUS and
25 Nokia in this matter?

1 A. I reviewed all of the information including the
2 emails, the documents. I also spoke with the person or
3 people who worked on the case.

4 JUDGE MCNAMARA: Before we go any further, should
5 we go on the confidential record?

6 MR. ZHANG: Yes, that was my next request.

7 JUDGE MCNAMARA: Okay. Good.

8 (Whereupon, the hearing proceeded in confidential
9 session.)

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1 O P E N S E S S I O N

2 BY MR. FOUNTAIN:

3 Q. Dr. Cheng, it's your testimony you don't know who
4 GLS Capital is?

5 A. Correct.

6 Q. But it is your understanding that the patents
7 that Celerity controls are 4G and 5G patents that must be
8 licensed on FRAND terms?

9 A. Yes.

10 Q. And you're aware that Celerity filed lawsuits
11 against Nokia's U.S. customers, AT&T, T-Mobile, and Verizon,
12 in 2023?

13 A. I'm aware of that.

14 Q. And were you aware that Celerity reached out to
15 those carriers in 2022, just one year before filing those
16 lawsuits?

17 A. I'm not aware of that.

18 Q. Do you think it's reasonable for Celerity to file
19 a lawsuit with only one year of negotiation with the
20 carriers?

21 A. I do not agree.

22 Q. Is it reasonable or not? Is one year reasonable
23 or unreasonable for Celerity before waiting to file a
24 lawsuit?

25 A. I am not able to answer this question.

1 Q. In that lawsuit that Celerity filed against the
2 U.S. telecom companies, there are eight asserted 4G and
3 5G patents.

4 You're aware of that, right?

5 A. I'm not aware of that.

6 Q. Okay. You are aware, however, that your
7 licensing agent is seeking billions of dollars in damages
8 from the wireless carriers?

9 A. I'm not aware of that.

10 Q. You're the general -- by the way, ASUS
11 affiliates, including ATL, they are parties to those
12 lawsuits.

13 Do you understand that?

14 A. Yes.

15 (Whereupon, the hearing proceeded in confidential
16 session.)

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1 O P E N S E S S I O N

2 DAN SCHONFELD,

3 having been first duly sworn or affirmed on
4 their oath, was thereafter examined and testified as
5 follows:

6 JUDGE MCNAMARA: Please state your full name.

7 A. Dan Schonfeld.

8 JUDGE MCNAMARA: Thank you very much.

9 MR. THOMPSON: Good morning to you, Your Honor.
10 Again, Ben Thompson, with Fish & Richardson, representing
11 ASUS, and I will be questioning Dr. Schonfeld on behalf of
12 both Respondents.

13 JUDGE MCNAMARA: Great. Thank you.

14 DIRECT EXAMINATION

15 BY MR. THOMPSON:

16 Q. Good morning, Dr. Schonfeld. Can you please
17 start by introducing yourself?

18 A. Sure. Good morning. My name is Dan Schonfeld.
19 I live outside of Chicago with my wife, and I have two boys
20 in college.

21 JUDGE MCNAMARA: Yes, and we have spent some
22 hours together before.

23 A. Yes, we have.

24 Q. Dr. Schonfeld, have you created slides to aid
25 your testimony here today?

1 A. Yes, I have.

2 Q. And do you have a copy of those in front of you?

3 A. Yes, I do.

4 MR. THOMPSON: And just for the record,
5 Dr. Schonfeld's demonstratives are RDX-5.

6 Q. Dr. Schonfeld, can you start by telling us what
7 were your primary assignments in this investigation?

8 A. Sure. I was asked to analyze the issues of
9 infringement and technical domestic industry as it relates
10 to the '267 and '701 patents. I was also asked to look at
11 the issues of validity of the same patents, '267 and '701.

12 Q. Now, before we get into your conclusions, can you
13 start by describing some of your qualifications and
14 education?

15 A. Sure. My -- I got my undergraduate degree at UC
16 Berkeley in electrical engineering and computer science, and
17 my graduate degrees at Johns Hopkins in electrical and
18 computer engineering, and I've been at the University of
19 Illinois, Chicago, ever since.

20 Q. And have you received recognition and awards for
21 some of your work in engineering?

22 A. Yes, I have.

23 Q. Can you describe some of those examples?

24 A. Sure. The top row of this slide are fellowships
25 in the University of Illinois for research I've done.

1 Q. Have you published any academic or peer-reviewed
2 articles related to video coding or signal processing?

3 A. Yes, I have.

4 Q. Approximately how many?

5 A. Well, I've published overall about 300 papers,
6 but -- and a fraction of them relate to the issue of video
7 encoding and decoding.

8 Q. And do you have previous experience working as a
9 technical expert on matters involving video coding standards
10 such as H.265?

11 A. Yeah, I've done it several times.

12 Q. I believe Your Honor may have even been alluding
13 to one of those times a moment ago.

14 JUDGE MCNAMARA: Yes, I was.

15 Q. During the Complainants' case, there was a
16 discussion of an article pictured here on slide 5 that
17 concerns H.265.

18 Were you present for some of that discussion?

19 A. Yeah, I saw this article throughout the case and
20 at the hearing this past week.

21 Q. And do the authors of this particular article
22 include some of the drafters of the H.265 standard?

23 A. Yeah, they are -- I believe they are all the
24 editors of the standard, but not -- there's more, I believe.

25 Q. Fair to say this article in your field is kind of

1 a big deal?

2 A. Yeah, it's an important article, because it tells
3 the community before the standard was released, this is
4 2012, this standard was released in 2013, what to expect and
5 what's coming up next by the people who are working on it.

6 Q. What was the particular journal that published
7 this article, Dr. Schonfeld?

8 A. It's the IEEE Transactions on Circuits and
9 Systems for Video Technology.

10 Q. And can you describe for us what was your role or
11 what has been your role with respect to that specific
12 journal?

13 A. Sure. So I joined the university in 1990, and
14 this journal was first published in 1991, so it -- the
15 journal, myself, and the field of video compression, because
16 the first compression standard was around the same time, we
17 all grew up together. And so this journal and the video
18 compression community are strongly intertwined. A lot of
19 the major results are first published here and announced
20 here, like this particular article.

21 Q. And were you actually one of the editors of this
22 journal at the time that the H.265 authors submitted this
23 article?

24 A. Yeah, I was a Deputy Editor-in-Chief at the time
25 and later on I became the Editor-in-Chief.

1 Q. And while you were the Editor-in-Chief, did you
2 contact the authors of the H.265 standard and ask them to
3 submit many more articles for this journal?

4 A. Yeah. In particular, I contacted Tom Wiegand or
5 Thomas Wiegand, and I believe Ohm as well, and Detlev Marpe,
6 maybe a couple of other people, to provide a special section
7 on the developments of HEVC after this initial standard was
8 released, and that was done back in 2015 -- or '16, excuse
9 me.

10 Q. Have you also taught courses as a professor on
11 aspects of video coding and related technologies?

12 A. Yeah, many times, for many decades.

13 Q. Do you have any professional experience designing
14 or developing systems using video coding techniques?

15 A. I do. In the late '90s, I worked on doing
16 tracking of data inside the compressed domain. Back then it
17 was MPEG-2, and we could do it very, very fast, like 4,000
18 times faster than having to decompress it.

19 And as a result, a company by the name of
20 NeoMagic came and knocked on our door and invited me to work
21 with them on development of an MPEG-4 encoder, and we worked
22 on it for a few -- for a couple of years jointly between the
23 university and the company.

24 MR. THOMPSON: Your Honor, at this time I would
25 like to tender Dr. Schonfeld as an expert in the fields of

1 video compression, multimedia systems, and signal
2 processing.

3 JUDGE MCNAMARA: Mr. Cameron, does Nokia have any
4 objection?

5 MR. CAMERON: No objection, Your Honor.

6 JUDGE MCNAMARA: Ms. Ducca?

7 MS. DUCCA: No objection from Staff, Your Honor.

8 JUDGE MCNAMARA: Thank you very much.

9 Then Dr. Schonfeld is accepted as an expert
10 witness on the subject matter for which he has been called
11 to testify without objection.

12 Q. Dr. Schonfeld, can you tell us about some of the
13 materials you reviewed while conducting your analysis in
14 this case?

15 A. Sure. So I reviewed the patents, related
16 materials, like the file history, various technical
17 documents, a lot of source code, and prior art patents,
18 deposition testimony, and various other items that are
19 listed over here, like technical documentation.

20 Q. And based on all the materials you reviewed, what
21 are your primary conclusions?

22 A. So the conclusions that I have are that the '701
23 patent is not infringed by the accused products and does not
24 practice a domestic industry product, and the second
25 conclusion is that the '267 patent is invalid in light of

1 the prior art.

2 Q. We've got a number of patents at issue in this
3 investigation.

4 Can you give us a refresher on which are the '701
5 and '267 patents?

6 A. Sure. So at a very high level, the '701 patent
7 takes syntax elements and divides them into two categories,
8 a first category and a second category, where the first
9 category is context updated, the second category is
10 bypassed. The '267 patent is about the weighted combined
11 prediction and reducing its precision late by shifting.

12 Q. Do Complainants and Respondents propose
13 definitions for the level of a person of ordinary skill in
14 the art in this investigation?

15 A. Yes, they both propose.

16 Q. And do those definitions appear on slide 10?

17 A. They do.

18 Q. And do these proposed definitions apply across
19 the '701 and '267 patents?

20 A. They do.

21 Q. Now, Dr. Schonfeld, are there major differences
22 between these definitions that you needed to account for in
23 order to conduct your analysis?

24 A. No, they are almost identical.

25 Q. And do the conclusions that we'll discuss today

1 apply regardless of which of these levels of ordinary skill
2 is adopted?

3 A. They would apply regardless.

4 Q. Okay. Dr. Schonfeld, can we start off with
5 discussing aspects of the '701 patent?

6 A. Sure.

7 Q. And before we get to the patent in detail, can
8 you provide us with a background of the related technology
9 and the H.265 standard?

10 A. I would be happy to.

11 Q. What do we see here, Dr. Schonfeld, on slide 12?

12 A. So this is a sequence of video compression
13 standards. It looks like a lot, but it's not all of them.
14 These are just the ITU and the ISO. There are many other
15 organizations that have their own standards, but this shows
16 a sequence of the standards from its infancy back in 1990,
17 as I mentioned earlier, until today.

18 Q. And is it the HEVC or H.265 standard that's at
19 issue with respect to the '701 patent?

20 A. That's right. I refer to it interchangeably.
21 People refer to it in many names. It may refer to it
22 interchangeably as either H.265 or HEVC.

23 Q. Now, we're going to hear a lot about coding,
24 encoding and decoding here today. Can you start with an
25 overview of that process for us?

1 A. Sure. I think we have heard it several times
2 this week, but I'll do it once quickly.

3 The basic idea behind compression in general, not
4 just in video, is you try to predict, make a guess, and if
5 your guess is good, you only have to account for the
6 mistakes you made, and if they are small, you can compress
7 very well. That's sort of a basic philosophy behind
8 compression, in general, or coding.

9 And that's what happens here. We predict the
10 video frames. We transform them to make them uncorrelated
11 so we can make it tight, very few coefficients, if we can.

12 Then we provide syntax elements, that's the
13 mechanism by which we communicate, but we don't send the
14 syntaxes directly. We just have to interpolate them so we
15 can put them in 0's and 1's in a very efficient way.

16 And then on the decoder side, we do the exact
17 reverse. We decode the bitstream, look at the syntax
18 elements, inverse the transform, dequantize to the best
19 ability that we can. We cannot do it perfectly because it
20 is designed to throw away information. And then we
21 reconstruct the image.

22 Q. Dr. Schonfeld, does slide 14 show an aspect of
23 this prediction procedure you were just discussing?

24 A. It shows what I talked about earlier, that when
25 we make a prediction, here you can see the predicted block

1 on the right side, there are three blocks, it's the middle
2 one.

3 And then the original block, and we look at the
4 difference, which we usually call the residual, and if we
5 did a good job of predicting, the residual is small and the
6 compression is very high.

7 Q. And what happens to those residuals in the next
8 stage of the process?

9 A. In order to be able to code them efficiently, we
10 don't transmit the residuals as they are, because the
11 residuals just look like white noise. You know, if you
12 remember on the screen, when you don't have a connection on
13 the television, an old television, it looks like white
14 speckles, so it doesn't have any structure.

15 We transform it to a frequency domain, typically
16 the discrete cosign transform, so everything is condensed.
17 We get very few coefficients. You can see in the upper
18 left-hand corner, which are what is referred to as low
19 frequency, and as we move to the bottom right, that's the
20 high frequency. They will have very small values.

21 We then quantize it. And then the quantization
22 makes the numbers even smaller, and that's what we want to
23 code.

24 Q. On the far right of slide 15, are those the
25 transform coefficients we heard about a lot last week?

1 A. That's correct.

2 Q. Now, turning specifically to --

3 A. Yeah, and let me back up a little bit just to
4 correct what I said.

5 The transform coefficients are in the middle.
6 What's on the right are the quantized transform
7 coefficients, to be precise.

8 Q. Thank you. Now, shifting to H.265 specifically,
9 what happens to the transform coefficients after they are
10 quantized?

11 A. So it depends on the standard, but in the case of
12 H.265, what happens if you take the quantized transform
13 coefficients and then you break them up into little pieces,
14 various flags and remaining parameter, and you can see in
15 the case of H.265 you actually have five flags. One is the
16 significant coefficient flag, which just says is it a 0 or a
17 non-zero term. The other one, is it greater than 1 flag,
18 greater than 2 flag, the level remaining, and then the sign
19 flag, is it positive or negative.

20 Q. Why is it that the quantized transform
21 coefficients are translated into these structured syntax
22 elements before being sent over the bitstream?

23 A. Well, in the case of H.265, there are two things
24 going on there. You want the entropy coder to get small
25 items that are binary, because the entropy coder in this

1 case is called CABAC, context-adaptive binary arithmetic
2 coders, so it's looking for those flags because it can code
3 them efficiently.

4 In particular, what they are trying to do here
5 is -- remember I mentioned the fact that you're trying to
6 predict what you're going to get. So they are looking at
7 these DCT coefficients, and they are making a guess that on
8 the bottom right corner you will get very small values, so
9 there is no reason to send the actual value. They just make
10 a guess that it's 1, and they say, is it greater than 1,
11 hoping the answer is no. If the answer is no, you don't
12 need to send anything more other than the value of the flag
13 itself.

14 And then if they are wrong, once in a while they
15 will ask, is it bigger than 2, hoping the answer is no
16 again. And if the answer is still yes, then they have to
17 send the remainder. And it's not as efficient, but they are
18 hoping to make educated guesses. And that's some of the
19 philosophy behind this.

20 Q. Dr. Schonfeld, looking to these specific syntax
21 elements we see here on slide 16, did you pull those out of
22 thin air for purposes of this investigation?

23 A. No. I did not. They are part of the H.265
24 standard.

25 Q. And what do we see here on slide 17?

1 A. So you can see here on slide 17 there is a table.
2 It's labeled syntax elements and associated binarization.
3 And there is a column called syntax elements. And in H.265,
4 it spells out exactly what are syntax elements and what are
5 not by listing them so there is no issue, so when you design
6 a system, you know what the encoder should produce and you
7 know what the decoder should read.

8 And so the ones corresponding to the issue about
9 representing the residuals are all listed on the bottom
10 there, the bottom five, highlighted in yellow.

11 Q. And for the record, Dr. Schonfeld, are we looking
12 at Joint Exhibit 137 around page 241?

13 A. That's correct.

14 Q. Now, to be clear, are you saying that the H.265
15 standard includes complete lists and tables of all the
16 syntax elements?

17 A. Absolutely. Actually, not just H.265. Every
18 standard will list all the syntax elements, and they can
19 change from standard to standard. And if it's not in one of
20 those tables under the category of a syntax element, it is
21 simply not a syntax element.

22 Q. So, Dr. Schonfeld, if I want to know what are the
23 syntax elements specifically in the H.265 standard, can I
24 open up the standard, find the list, and they are right
25 there?

1 A. It will be right there. If you find it, it's
2 there. If you don't find it, it's not a syntax element.

3 Q. Can you walk us through an example of how a
4 syntax element is created from a specific transform
5 coefficient such as negative 2?

6 A. Sure. So this is a little bit of a fictitious
7 situation, but I'll show the value you would get for all the
8 flags and parameters corresponding to negative 2.

9 And so in the case of negative 2, it's non-zero,
10 so significant coefficient flag is 1, meaning it's not 0, 1
11 being true.

12 And then coefficient level greater than 1 flag,
13 you are looking not just at coefficient level greater than
14 1, you are looking for coefficient absolute value. So the
15 absolute value is 2. 2 is bigger than 1, so the answer is,
16 yes, it's true again, so the value is 1.

17 Then you ask, is it -- is the absolute value
18 greater than 2. 2 -- absolute value of 2 is not bigger than
19 2, so the answer is 0. And in this case you don't need to
20 send the remaining, but the remainder would have been 0.
21 And the reason it's 0 is because in this particular case, we
22 know that the value is bigger than 1, and it's not going to
23 be bigger than 2, so it must be 2, so there is no reason to
24 send anything other than 0.

25 If you had other situations, sometimes the

1 difference is 3 and sometimes the difference is 2, sometimes
2 the difference could be 1, depending on what information you
3 have.

4 And then finally, the coefficient sign flag just
5 tells it it's negative.

6 Q. So, Dr. Schonfeld, there's a number of transform
7 coefficients in this 4x4 block. How do we deal with the
8 multiple transform coefficients when it comes to creating
9 the syntax elements?

10 A. Yeah, we don't transmit them as a block. We
11 transmit everything, ultimately everything as a bitstream,
12 and we read them in what is known as a reverse scan order.
13 You can see on the left we go in this diagonal pattern. And
14 that same pattern is depicted in the middle, just to show
15 the pattern that we are taking.

16 This is a reverse order, because we want to begin
17 with the small values and then go to the larger values, and
18 the reason they are small is because we expect small values
19 for the high frequency in the bottom right, and we expect
20 large values for the top left portion.

21 And then -- but you can do this pattern in many
22 different ways. You can do it diagonally, like the middle,
23 or you can do it vertically like the one on the far right,
24 or you can do it horizontally, which I didn't show. It's up
25 to the encoder to tell the decoder which pattern it chose.

1 And the sequence of coefficients will change depending on
2 which one you selected.

3 Q. And so what's the result of that scanning
4 pattern, Dr. Schonfeld?

5 A. So when you go through and for each coefficient
6 you make decisions about what flags values you have and what
7 parameters they are, and then you do it throughout the
8 entire zigzag pattern. You generate a lot of these syntax
9 elements for the coefficients in the entire block.

10 Q. And what happens next to those syntax elements?

11 A. Well, the next thing that happens to these syntax
12 elements is they are sent in some type of a bitstream. I
13 just showed a random sequence of 0's and 1's corresponding
14 to these syntax elements, and they are simply input into an
15 entropy coder so we can put them directly into the bitstream
16 and transmit them.

17 Q. Okay. And what do we see here on slide 22,
18 Dr. Schonfeld?

19 A. So this actually shows the bin string coming into
20 the entropy coder. In this case you will see that what
21 happens, the entropy coder has two options, context update
22 or bypass. And context update does a better job. It looks
23 into the past and sees the pattern. It tries to come up
24 with statistics so it can do a really good job of encoding,
25 but it's slow and it's very, very resource heavy. It

1 requires a lot of work.

2 The bypass typically assumes that you are just
3 looking at something where the probability of a 0 or a 1 is
4 half, so it's a lot less work, but you pay a little price in
5 terms of how much it can compress, because the goal is what
6 comes on the right side is to have as few 0's and 1's as
7 possible.

8 Q. We'll certainly talk a lot about this going
9 forward, but can you tell us how is it decided which syntax
10 elements are coded using context update and which are
11 bypassed?

12 A. So the H.265 makes it very clear. The decision
13 about whether to context update or bypass is not something
14 that you have control over. It lists a syntax element and
15 it says this one would always be context updated, and
16 another one may -- is always bypassed. It never switches.
17 It must stay in that norm.

18 And anybody who wants to be compatible with the
19 standard cannot deviate from that.

20 Q. And do we find this assignment on page 250 of
21 JX-137?

22 A. That's correct.

23 Q. So, Dr. Schonfeld, for the syntax elements we've
24 been discussing, is it the case that the first three shown
25 here, the coefficient flag, greater1_flag, greater2_flag,

1 those will always be context updated?

2 A. That's right. It refers to clause 9.3.4.2.5.
3 The standards are a little tricky to read, but you have to
4 go to that clause, and you saw it in the hearing earlier
5 before, last week. It shows that this is indeed context
6 updated for the syntax elements listed in pink color up on
7 top.

8 Q. Okay. And the remaining two syntax elements, are
9 those always bypassed?

10 A. That's right. If you want to adhere to the
11 standard, anytime you see absolute level remaining or sign
12 flag, you must bypass them. There is no -- no option. It
13 stays this way for all five of these syntax elements.

14 Q. Okay. What happens after the coding process?

15 A. So after the coding process, then you transmit
16 it. You basically send it out.

17 Q. And what are the numbers on the far right side we
18 see here?

19 A. That's the actual coded bitstream. That's the
20 result of the entropy coder, and this is what you send out.
21 You either send it out for when you're video streaming over,
22 let's say, YouTube, or you put it in some kind of a storage
23 medium for storage, efficient storage, and this is what is
24 being sent out.

25 Q. And then what happens to this bitstream on the

1 other side of this process?

2 A. So when the other side receives it or decides to
3 take it out of storage, it has to go through the whole
4 process in reverse. It has to go through the entropy
5 decoder, retrieve the syntax elements from the entropy
6 decoder, then it has to begin to take the syntax elements
7 and establish other parameters during processing such as the
8 quantized transform coefficients, dequantize them, establish
9 the motion vectors, and recover the original reconstructed
10 image ultimately.

11 Q. So, Dr. Schonfeld, you talked a bit about how
12 these transform coefficients are translated into syntax
13 elements. Has the way in which that process occurs evolved
14 over time?

15 A. It has, yes.

16 Q. How so?

17 A. So if you're looking here at this sequence of
18 standards, the H.261 initially and MPEG-1, they usually use
19 things like the quantized coefficients as syntax elements,
20 and they put them into big tables called Huffman Tables,
21 Huffman Coding Tables, and they store them directly. And
22 this practice continued all the way until H.264, AVC, and
23 since then it went -- transitioned into a different style.
24 Instead of putting them together into these big tables, they
25 started breaking them up into pieces, into many small syntax

1 elements, exactly the reverse approach, into small little
2 binary flags and small numbers, and sent that to the entropy
3 coder.

4 And that has been the case since H.264, H.265,
5 which is the issue here, and the current standards, like
6 H.266.

7 Q. Dr. Schonfeld, is it the case that there may have
8 been standards more than 20 years ago, H.263, where we could
9 have considered a transform coefficient to be a form of
10 syntax element?

11 A. Yeah, even MPEG-4, we called it MPEG-4 part 2 or
12 visual, which is not AVC, even standards that are sometimes
13 used today may still have those DCT coefficients as syntax
14 elements, and it will list it in those standards. And it
15 was very commonly done, especially a while ago.

16 Q. But starting with AVC and forward, including
17 H.265, do any of those standards define transform
18 coefficients as syntax elements?

19 A. No, they go in the reverse direction. They break
20 up these coefficients into many small pieces and they do not
21 use DCT coefficients or quantized coefficients as syntax
22 elements in any of these standards.

23 Q. Okay. Can you tell us, starting with the '701
24 patent now, what was the '701 patent's proposal for how to
25 handle these syntax elements?

1 A. Sure. So the idea behind '701 is to take the
2 syntax elements, whatever they are, and break it up into two
3 categories, a first category and a second category.

4 Q. And then what does the patent tell us to do with
5 those two categories of syntax elements?

6 A. So the idea is very clear. First category, you
7 do context update. Context update is laborious work to make
8 the entropy coder work better.

9 The second category is the other approach, the
10 bypass. You do it a lot faster, but you pay a little price
11 in terms of the quality of entropy coding.

12 And so you can see on the bottom, for example, in
13 the bottom paragraph, it says context update operations are
14 not performed for syntax elements belonging to the second
15 category.

16 So it's a clear delineation. First category,
17 contacts update; second category, bypass.

18 Q. Before we turn to the claims of the '701 patent,
19 are the parties disputing any constructions for the '701
20 patent?

21 A. They are.

22 Q. And do we see those positions here on slide 30?

23 A. That's correct.

24 Q. To be clear, Dr. Schonfeld, though, does this
25 claim construction dispute impact any of the opinions you'll

1 be testifying on today?

2 A. No, I'm not addressing any issues related to this
3 construction.

4 Q. Dr. Schonfeld, does Nokia assert multiple '701
5 patent claims in this investigation?

6 A. They are.

7 Q. And can you describe for us how the language
8 varies and compares across the asserted claims?

9 A. So claim 1 and claim 8 are two independent method
10 and apparatus claims respectively. And they are virtually
11 identical except for the preamble of claim 8 has some of the
12 apparatus description. Claim 1, it just simply says method.
13 And then similar, claim 6 and claim 13 are the corresponding
14 dependent method and apparatus claims.

15 Q. And given the overlap in the claim language, can
16 we rely on claim 1 as representative to discuss your
17 noninfringement analysis?

18 A. Yeah, for all the issues that I -- that I have an
19 opinion on, claim 1 presents all of them.

20 Q. Dr. Schonfeld, I want to first address the
21 Certificate of Correction for the '701 patent claim.

22 Is that claim actually subject to a Certificate
23 of Correction?

24 A. Yeah, it is. You can see it talks about
25 column 14, lines 14 and 16, those are changes to claim 1.

1 Q. And on slide 34, does this depict claim 1 as it
2 was revised based on that Certificate of Correction?

3 A. It does. It switched the first and second
4 category on those two lines.

5 Q. And in this investigation, are all the experts
6 applying their analysis to this adjusted corrected claim 1?

7 A. That's my understanding, yes.

8 Q. And I raise that just for Your Honor and Staff
9 and anyone else. If you're looking later and you do find a
10 version that doesn't look like the one the parties have been
11 showing you, that may be the reason.

12 Can we walk now through the elements of claim 1,
13 Dr. Schonfeld?

14 A. Sure.

15 Q. Starting with the first limitation, what do we
16 see there?

17 A. So this is an explanation of what claim 1
18 requires. And it requires, as you can see in the first
19 limitation, an expected frequency of occurrence of syntax
20 elements in a bitstream. So you have to go through the
21 bitstream, look at the number of times different syntax
22 elements occur, and come up with some kind of a frequency of
23 occurrence, a histogram or some way of measuring it.

24 And then you can see this is depicted on the
25 bottom right where I've shown different syntax elements of

1 H.265, and a frequency of occurrence which shows the
2 frequency of occurrence of the first one being high, and the
3 fourth one being particularly low, as an example.

4 Q. And, Dr. Schonfeld, what does the claim tell us
5 to do once we have done that frequency occurrence analysis?

6 A. So based on the expected frequency of occurrence,
7 we determine the frequency of occurrence threshold. We
8 determine that line, which is labeled frequency of
9 occurrence threshold, so that it can be used later in the
10 categorization limitation.

11 So the first limitation is about determining that
12 line based on the frequency of occurrence.

13 Q. And what does the claim then tell us to do with
14 this threshold?

15 A. So once we know the threshold and determine the
16 threshold, now we apply it to the frequency of occurrence of
17 the syntax elements, and we look at them one by one.

18 The first one, we can see that the frequency of
19 occurrence is above the threshold, that's the coefficient
20 flag, and so it goes to category 2, according to the
21 limitation. The same thing is true for the greater than 1
22 flag. Greater than 2 flag is in red, because it's below the
23 threshold, so it goes to category 1.

24 The level remaining is below the threshold.
25 Again, that goes to category 1, and, finally, sign flag is

1 above the threshold, that will go to category 2.

2 So now we have categorized each and every syntax
3 element into one category or a different category.

4 Q. Now that we've categorized these syntax elements
5 into a first category and a second category, what does the
6 claim tell us to do with those categories?

7 A. So now that we have -- now that we have looked at
8 it, now we take those categories, and all the realizations
9 of the syntax elements, no matter what values we get for,
10 let's say, greater than 2 flag, or the level remaining, we
11 will always context update those.

12 And all the realizations in the second category,
13 like the coefficient flag, the greater than 1 flag, and the
14 signed flag in this example, we will not context update, we
15 will bypass for those.

16 Q. And is your description of the claim consistent
17 with what's in the specification of the '701 patent?

18 A. It is. These are portions of the abstract in
19 column 10 of the '701 patent on the left side of slide 39,
20 which shows the dichotomy between first category, second
21 category, where first category is context update, second
22 category is bypass, and you can see that reflected in Fig. 5
23 on the right side.

24 Q. Turning to slide 40, did Nokia's expert,
25 Dr. Richardson, also testify as to the effect that this

1 categorization in the '701 patent has on the syntax
2 elements?

3 A. Yeah, he talked about diverting the data elements
4 from context adaptive to bypass coding depending on the --
5 depending on the frequency and the threshold. And so he
6 discussed the diversion between context update to bypass
7 coding.

8 Q. Dr. Schonfeld, we've talked a little bit about
9 the '701 patent and a little bit about the 265 standard.
10 What differences jump out at you already before
11 we go forward?

12 A. So it's a marked difference. You can see what
13 the patent describes, which we just discussed, on the
14 right-hand side is syntax elements or it's context updated
15 or bypassed depending on frequency of occurrence. So we
16 actually look at the frequency of occurrence, we measure,
17 and we make a determination which bucket is it going to go
18 into, first category or second category, and that will
19 determine whether it will be context updated or bypassed.

20 And that could be fluid, for example, whereas the
21 H.265 takes a very different approach. It says this syntax
22 element is context updated, this example, and that's it.
23 That's the end of the discussion. There is no frequency of
24 occurrence. There is no transition. It must remain that
25 way if it's going to be H.265 compatible.

1 Q. Dr. Schonfeld, I want to zoom in a little bit on
2 the accused feature of the H.265 standard. The H.265
3 standard is a sizeable document; is that fair to say?

4 A. It is a pretty sizeable document, yes.

5 Q. And does Nokia accuse all aspects of the H.265
6 standard of infringing the '701 patent?

7 A. No. Nokia addresses a very specific part of the
8 transform coefficient and its representation.

9 Q. Turning to slide 44, what is the specific aspect
10 of the H.265 standard that is the subject of Nokia's
11 infringement allegations?

12 A. So Nokia is looking at the particular choice of
13 the reverse scan order, in this case diagonal, and the fact
14 that you go through and you look at the first eight
15 coefficients, and in those -- in that case you allow all
16 syntax elements, like the ones shown on the right, to be
17 used.

18 And then if you go past that point, then you drop
19 a couple of syntax elements, and you don't -- you don't
20 send -- you don't allow for those.

21 Q. And do we find on slide 45 a depiction of the
22 process you were just describing?

23 A. That's right. You can see on the left-hand side
24 I've shown an example where this is a result of the diagonal
25 reverse scan order. And we are -- I'm counting 1, 2, up to

1 8, and you can see all syntax elements are used for the
2 transform coefficients on the left, whereas when you go to
3 the right and you go past the 8 transform coefficient, you
4 expect the values to be smaller -- sorry -- you expect the
5 values to be larger. There is no reason to send those
6 greater than 1, greater than 2 flags. Those are guesses
7 that we were hoping to get a negative answer for.

8 We expect the answer to be positive now. They
9 are just wasting resources. So we just don't send them.
10 But, other than that, it's the same syntax elements before
11 and after. And they are used throughout the entire
12 sequence.

13 Q. What do we see here on slide 46, Dr. Schonfeld?

14 A. What we see over here is the -- this is
15 pseudocode from the center. This is pseudocode not
16 describing what to do, it's pseudocode describing how to
17 read the syntax. And so it goes through and it describes
18 what will you see in the bitstream, and it shows particular
19 coefficients -- coefficient absolute level greater than 1
20 flag, that's a particular syntax element that you will see
21 in particular situation, and the situation is highlighted in
22 yellow, where you have a significant coefficient, at a
23 particular location, and the number of greater than 1 flag
24 is less than 8, it's what I just described right now, where
25 you count backward and you look at the first 8 coefficients,

1 and it tells you, you should expect this coefficient for the
2 first 8 greater than 1 flag, which is right below the yellow
3 line.

4 Q. We heard during Complainants' case a discussion
5 of several patents where the accused feature for that patent
6 was something that Nokia itself proposed to the standard.
7 Is that the same case for the '701 patent?

8 A. No, it is not.

9 Q. And how did it end up that the accused feature in
10 the H.265 standard ended up in that standard if Nokia didn't
11 propose it?

12 A. It was proposed by, I think from Qualcomm. The
13 authors are listed up on the top right of slide 47, and
14 Qualcomm proposed it and this was accepted by the standard
15 committee.

16 Q. And do we find that proposal at RX-1998?

17 A. That's correct.

18 Q. Do all the relevant experts here agree that the
19 feature that's being accused under the '701 patent was a
20 Qualcomm contribution to the standard, not a Nokia
21 contribution?

22 A. That's my understanding. I haven't heard anybody
23 dissent from that view.

24 Q. And do we see traces of that, if we look on
25 slide 48, at the specific Qualcomm proposal?

1 A. Yeah, I would say more than traces. It
2 specifically proposes exactly the feature that's being
3 accused, where the greater than 1 flag appears in the first
4 8, 9, 0 coefficients, and then you have one greater than 2
5 flag beyond that.

6 Q. And then remind us of the effect that this
7 Qualcomm proposal had on how the standard operates.

8 A. So, in particular, it goes like this. You go
9 through and you send the first 5 syntax elements for the
10 first 8 coefficients or up to 5, and then you simply send 3
11 later on. And that's the only difference. It is just a
12 matter of which syntax elements you send and when.

13 Q. Dr. Schonfeld, during our discussion of the '701
14 patent moments ago, we discussed a lot about context
15 updating and bypassing. Do you recall that?

16 A. I do.

17 Q. Is there a reason why we were able to describe
18 the entire accused feature of the H.265 standard without
19 referencing context updating or bypassing?

20 A. Sure, because this is about what Nokia claims is
21 the categorization, but that categorization is completely
22 unrelated to the issue of context update and bypassing.

23 As I mentioned a couple of times already, and
24 might mention a few more times, context update or bypass is
25 specific to each syntax element. It can never change. It's

1 fixed. It is not related to its position in the
2 coefficients. And so this feature is completely unrelated
3 to whether it's context update or bypassed, and it's a
4 separate issue.

5 Q. Now, Dr. Schonfeld, were you here when
6 Dr. Chrissan opined on infringement?

7 A. I was here, yes.

8 Q. And is this one of the slides that Dr. Chrissan
9 presented?

10 A. I believe so, yes.

11 Q. And was he, in your opinion, able to show any
12 change in the coding process for any of the syntax elements?

13 A. No, he did not, actually. What he showed here is
14 exactly what I'm showing, which is the greater than 1 flag.
15 He puts a little dial that is all the way to the red, which
16 means it's a lot of work, I think is what he meant to
17 convey, and that means it's context updated. And in green
18 he puts the level remaining, and he put it as a moderate
19 level, and I think he meant to convey that it's bypassed.

20 JUDGE MCNAMARA: And you are on slide 52,
21 Dr. Schonfeld?

22 A. I am.

23 Q. Now, Dr. Schonfeld, if we look at the first 8
24 non-zero transform coefficients, and then we look at the
25 remaining non-zero transform coefficients, will we ever see

1 the coding procedure for either of those syntax elements
2 change?

3 A. No. The coding procedure, whether it's context
4 update or bypass, can never change. It's part -- it's built
5 into the standard for a fixed syntax element. It remains
6 fixed.

7 Q. And with that, can you just recap for us the
8 fundamental differences between the '701 patent and the
9 accused H.265 feature?

10 A. Yeah. In my view, it's a very dramatic
11 difference. It's completely different. The '701 is about
12 looking at frequency of occurrence threshold so you can
13 categorize into context update or bypass.

14 H.265, you're either context or bypass, whatever
15 the standard tells you to do for that syntax element, and
16 you never change.

17 JUDGE MCNAMARA: And you are on slide 53.

18 And, again, Mr. Thompson, if you can --

19 MR. THOMPSON: Yes, and I'll try and do better
20 about that. I appreciate that, Your Honor.

21 JUDGE MCNAMARA: Yes.

22 Q. I'm going to practice.

23 Turning to slide 54, can we start talking about
24 your specific noninfringement basis?

25 A. Sure.

1 Q. Okay. And looking at slide 55, how many reasons
2 do you plan to address here today as to your opinion that
3 the accused feature does not infringe?

4 A. I will focus on three reasons.

5 Q. Now, on slide 56, what is the first reason you
6 want to discuss for purposes of your noninfringement
7 analysis?

8 A. Yeah, the first reason is that the alleged syntax
9 elements, which are the non-zero transform coefficients, are
10 not syntax elements.

11 Q. And on slide 57, do we see where the syntax
12 element language appears in claim 1?

13 A. We do. It appears in every limitation of
14 claim 1.

15 Q. Now, on slide 58, what do we see here,
16 Dr. Schonfeld?

17 A. So this is part of the H.265 standard where it
18 lists the fact that it provides each syntax element, and it
19 has a table, in this case it's a syntax elements table, and
20 it has a column that says syntax element.

21 So when I'm asked what's a syntax element, I
22 don't look for a definition or a construction in the context
23 of H.265, I look for this list. And if it's there, I know
24 it is a syntax element. If it's not, it's not a syntax
25 element, at least from the H.265 perspective.

1 Q. So, Dr. Schonfeld, does Nokia assert in this case
2 the '701 patent, which includes many limitations including
3 the language syntax elements?

4 A. Every limitation includes syntax elements, yes.

5 Q. And in this case does Nokia contend that the
6 H.265 standard infringes the '701 patent?

7 A. It does.

8 Q. And did you testify that the H.265 standard
9 itself contains an entire list of all the syntax elements?

10 A. It does.

11 Q. So then when Nokia decides to assert this patent,
12 which of those syntax elements within this giant list does
13 it point to?

14 A. They do not point to any elements in this list.
15 They point to something else outside of the list.

16 JUDGE MCNAMARA: And you are on slide 58?

17 MR. THOMPSON: Yes, ma'am. Apologies again.
18 Thank you, Your Honor.

19 Q. Turning to slide 59, can you tell us,
20 Dr. Schonfeld, if Nokia is not pointing to anything on that
21 list, what is Nokia pointing to as the alleged syntax
22 elements?

23 A. So Nokia is pointing to the non-zero transform
24 coefficients as the syntax elements for the purpose of
25 claim -- the claims of the '701.

1 Q. Dr. Schonfeld, does the H.265 standard ever
2 identify a non-zero transform coefficient as one of its many
3 syntax elements?

4 A. No, it does not.

5 Q. Turning to slide 60, can you remind us of the
6 differences between the non-zero transform coefficients and
7 the real syntax elements?

8 A. So in the case of H.265, if you remember, we're
9 now using CABAC and we break up transform coefficients into
10 little small pieces, flags and remainders. Those are the
11 syntax elements on the right side.

12 The original value on the left side, that's the
13 non-zero transform coefficients. That's not a syntax
14 element in H.265.

15 Q. Turning to slide 61, during this process,
16 Dr. Schonfeld, what actually happens to the many non-zero
17 transform coefficients when it comes to syntax elements?

18 A. So each of the non-zero transform coefficient
19 gets broken up into multiple syntax elements, and all of
20 these syntax elements are sent immediately for entropy
21 coding.

22 Q. Dr. Schonfeld, does the H.265 standard have
23 separate definitions for transform coefficient and syntax
24 elements?

25 A. It does. You can see them on slide 62 on the

1 bottom. And you can see that the transform coefficient is
2 described, and it says, this is in the decoding process.
3 It's part of the preparation of the syntax elements. And
4 the syntax elements are described as an element of data
5 represented in the bitstream, which means that you take that
6 data element, you give it to the entropy coder, and you put
7 it into the bitstream.

8 Q. And we see those definitions here on slide 62?

9 A. We do.

10 Q. Other than the giant list of all the syntax
11 elements, does the standard provide any other way for us to
12 determine what are syntax elements and what are not syntax
13 elements as shown on slide 63?

14 A. It does. And we saw a glimpse of it when we
15 described -- when we saw what I described as a pseudocode
16 with a boldface underscore.

17 And here on slide 63 it states that syntax
18 elements are put in bold type and will all be lowercase
19 letters with underscore characters. And you can see the
20 syntax elements that we just described meeting that format.
21 They are all lowercase bold with underscore in between them.

22 Q. Dr. Schonfeld, will we find this identification
23 of syntax elements on -- within JX-137, pages 40 and 134?

24 A. That's correct.

25 Q. I see something fell. Would you like --

1 A. (Shaking head from side to side.)

2 Q. Okay. Now if you read through the H.265
3 standard, will we find any instance where the non-transform
4 coefficients that Nokia says are syntax elements appear with
5 this underscore and bold designation?

6 A. No, because the standard is careful to delineate
7 syntax elements and non-syntax elements. So you will never
8 find non-zero transform coefficients represented in this
9 format in the H.265 standard.

10 Q. Turning to slide 64, what did Dr. Chrissan have
11 to say about that?

12 A. Well, he agreed with what I just said, that the
13 claimed syntax elements are not what H.265 identifies in
14 bold type. He said there are differences.

15 Q. And do you understand Dr. Chrissan to be saying
16 claimed syntax elements, he's referring to the non-zero
17 transform coefficients?

18 A. Yes, I believe we established it in a previous
19 citation to his testimony.

20 Q. And so does Dr. Chrissan agree with you that his
21 syntax elements don't appear in the standard in bold type as
22 indicated by the standard?

23 A. Yeah. I think there is no dispute about it. The
24 H.265 does not view this as a syntax element.

25 Q. Dr. Schonfeld, what do we see here on slide 65?

1 A. This is part of the testing that was performed by
2 Nokia, and they used a particular software to look at
3 bitstreams, and it analyzes the bitstream and it puts it
4 into a format, into a table, and you can see in the middle
5 part it has SE Name, and a list of things. And then
6 Dr. Chrissan -- this is on slide 65 -- in his report, in
7 paragraph 309, talks about the fact that this represents 9
8 non-zero coefficients, and this is a portion of what he
9 provided.

10 And, in particular, the SE Name stands for Syntax
11 Element Name.

12 Q. And so, Dr. Schonfeld, if we look under the
13 column in Dr. Chrissan's testing software, where it says,
14 Syntax Element Name, are those the syntax elements that you
15 were pointing to?

16 A. They are. They are not the DCT coefficients.
17 They are the significant coefficient flag, then the greater
18 than 1 flag, and this list continues, and there would be
19 many of the other flags and remainder that I mentioned
20 before.

21 Q. Dr. Schonfeld, turning to slide 66, does the file
22 history for the '701 patent also help us address this syntax
23 elements issue?

24 A. It does.

25 Q. What do we see here on slide 66?

1 A. So this is a prior art reference used during the
2 prosecution history that the Examiner used for a rejection
3 of an earlier -- of an earlier claim.

4 Q. And, Dr. Schonfeld, what is the specific
5 reference that we see here on slide 66?

6 A. This particular reference is a publication, and
7 it's authored by Detlev Marpe, Heiko Schwarz, and Thomas
8 Wiegand, that we heard about several times, the editor of
9 the H.265 standard, and that was their paper that was used
10 for the rejection.

11 Q. And is this Marpe reference RX-2268?

12 A. It is.

13 Q. Turning to slide 67, Dr. Schonfeld, can you tell
14 us what did the Nokia applicant say in response to the
15 Patent Office's rejection?

16 A. Yeah. They said -- this is -- I'm paraphrasing.
17 I'm not going to quote it. I'll just explain it in my own
18 words.

19 They said that this is an improper rejection
20 because these are not syntax elements that are categorized
21 in that particular reference. It's the binarization of
22 those syntax elements that are categorized, and, therefore,
23 it should not be used as a form of rejection by the
24 Examiner.

25 Q. And is the file history of the '701 patent JX-3?

1 A. That's correct.

2 Q. Turning to slide 68, how did the Marpe inventors,
3 including one of the authors of the H.265 standard, describe
4 a syntax element in their patent publication?

5 A. So in slide 68, in paragraph 45 of the Marpe
6 reference, they describe a syntax element is a data value
7 having a certain meaning in the video signal bitstream that
8 is passed to the entropy coder. And then you can see on the
9 left-hand side the figure shows syntax elements coming into
10 the entropy coder.

11 Q. And is this description of one of the authors of
12 the H.265 standard consistent with your understanding of
13 syntax elements?

14 A. It's exactly identical.

15 Q. Is this description from one of the authors of
16 the H.265 standard consistent with Nokia's proposal for how
17 we should view syntax elements in this case?

18 A. Not in the context of the H.265 standard, no.

19 Q. Now, does Dr. Chrissan acknowledge that syntax
20 elements and transform coefficients, they are separately
21 defined in the standard?

22 A. Yeah. He specifically says that the H.265
23 defines syntax elements differently from the transform
24 coefficients.

25 Q. So then how does Dr. Chrissan and Nokia justify

1 pointing to a syntax element that's not identified as a
2 syntax element in the standard?

3 A. So they rely on the H.265 standard, but not on
4 the list of syntax elements. They rely on the definition
5 3.168, up on the top of slide 69, which states that syntax
6 elements is an element of data represented in the bitstream.
7 And they take a very broad view of what represented means in
8 order to account for that.

9 Q. Turning to slide 70, is Nokia's view here today
10 consistent with Nokia's view during prosecution of the
11 patent?

12 A. No. It's exactly opposite. Back during
13 prosecution, they had a very, very narrow view. They didn't
14 even allow for it to be binarized, which is coming closer to
15 the data -- to the bitstream, whereas today they allow for
16 it to be anything that's represented, which encompasses
17 almost everything in the video coder.

18 Q. So, Dr. Schonfeld, during prosecution, if we look
19 at part 110 and 108 in this figure on the left, was that
20 part of the discussion between Nokia and the Patent Office?

21 A. Yeah, that's exactly right. So if you look at
22 the output of 110 and 108, they said that's binarized. The
23 syntax elements are 104, just to the left of it.

24 JUDGE MCNAMARA: And you're on slide -- I
25 apologize -- you're on slide 70. Please keep referencing

1 the slides.

2 MR. THOMPSON: Yes, Your Honor.

3 JUDGE MCNAMARA: Thank you.

4 A. And so you can see that that's what they
5 distinguish. They said it's too close to the bitstream.
6 It's represented too closely. It's one step too close to
7 the bitstream. And, therefore, it's not a syntax element,
8 so the rejection should not be accepted.

9 And so they took a very rigid view of what -- of
10 what a syntax element is. They didn't even allow it to be
11 binarized.

12 Q. Now, Dr. Schonfeld, if we were to apply Nokia's
13 view it takes today that a syntax element can be any data
14 represented in the bitstream, would that then include the
15 binarized syntax elements Nokia told the Patent Office were
16 not syntax elements?

17 A. Absolutely. There is no question that the
18 binarized syntax elements are certainly represented in the
19 bitstream. That's -- it goes directly to the context -- to
20 the arithmetic coder. You can see it, it's box 100, and
21 binary arithmetic coder is listed below. It's in Fig. 2 of
22 Marpe on slide 70.

23 Q. And, Dr. Schonfeld, under Nokia's view of the
24 syntax elements definition, I think we would still agree
25 that the syntax elements themselves on the far left-hand

1 side of the Marpe figure, those would still be syntax
2 elements; is that correct?

3 A. Yeah, I think that's correct. Syntax elements --
4 everybody agrees that these syntax elements would be syntax
5 elements.

6 Q. Now, can you explain, Dr. Schonfeld, how Nokia
7 takes that one step further and reaches out to call the
8 transform coefficients syntax elements?

9 A. Sure. So if you recall, the non-zero transform
10 coefficients are made up of multiple syntax elements, five
11 of them, in particular, the greater than 1 flag, greater
12 than 2 flag. And you can use them to reconstruct and
13 transform back to the non-zero transform coefficients.

14 So those non-zero transform coefficients would be
15 somewhere to the left of Fig. 2 outside of the screen. It's
16 not depicted here. And that's what they are pointing to as
17 being the syntax elements. It's not represented on the
18 screen itself.

19 Q. Now, Dr. Schonfeld, if we were to adopt Nokia's
20 view that a syntax element could be any element of data, any
21 element of data at all represented in the bitstream, could
22 that lead us to some pretty absurd results?

23 A. Yeah, because they take the word "represented" to
24 mean anything that can be recovered. And that -- it takes
25 the meaning out of the definition in the H.265 out of it,

1 and it would lead to absurd results, yes.

2 Q. So just to take one of these examples, my
3 children, they like to take videos of me when I'm angry at
4 them. They think that's really funny. And then they text
5 it to their mom.

6 Does that video go across the bitstream?

7 A. The video itself is certainly represented in the
8 bitstream. That's the entire purpose of video coding, so
9 that would be -- that would meet Nokia's interpretation of
10 syntax element as they read the word "represented," yes.

11 Q. So because that video is a data element in the
12 bitstream, the whole video becomes a syntax element under
13 Nokia's view?

14 A. In my understanding of their view, yes.

15 Q. And not only that, Dr. Schonfeld, because I
16 appear as an angry person in that video, I'm also myself
17 represented in that bitstream; is that fair?

18 A. If you take the meaning of the word "represented"
19 in that -- to that level, yes, absolutely.

20 Q. So under Nokia's view, I might even be a syntax
21 element.

22 A. If you take the interpretation they have of the
23 word "represented" to its logical conclusion, that's the
24 case.

25 Q. Dr. Schonfeld, can you tell us what was actually

1 meant by the H.265 definition where syntax element is an
2 element of data represented in the bitstream?

3 A. Yeah. What is meant is we take the syntax
4 element and we provide it to the entropy coder. And the
5 entropy coder converts it into 0's and 1's.

6 What we are talking about, the syntax elements is
7 what is in the bitstream, but we don't put it directly. We
8 put it through an entropy coder. And so we represent it in
9 the bitstream, but they are only talking about the very last
10 stage.

11 What is shown over here in box 100C, in Fig. 2,
12 and you can see it says binary encoder, that's the entropy
13 coder. Maybe if we go back one slide, it might be -- or two
14 slides -- excuse me -- it might be even a little cleaner and
15 clearer.

16 Both from their definition, it's passed through
17 the entropy coder. And this is slide 68. Excuse me. And
18 you can see in Fig. 1 of that slide, from the Marpe
19 reference, the syntax elements come to the entropy coder.

20 So we are talking about putting the syntax
21 element into the bitstream, but we don't do it directly. We
22 need one little step, entropy coding, and that's why it says
23 represented.

24 They do not mean that anything that could be
25 recovered, going all the way back to the left in the

1 picture, which is 10, showing the raw video, which accounts
2 for some of the questions that Mr. Thompson asked me about,
3 that's not what the intention of the syntax elements is.

4 Q. Dr. Schonfeld, turning to slide 71, setting aside
5 the fact that I'm pretty sure I'm not a syntax element, what
6 else do we have to ignore in order to adopt Nokia's view of
7 the scope of a syntax element?

8 A. Well, we have to adopt a view that's inconsistent
9 with the standard, which specifies and lists the syntax
10 elements. We have to ignore the requirement of the standard
11 that says how they will be represented in bold type. This
12 is on slide 71.

13 And then we have to ignore the testing provided
14 by Nokia, which lists the syntax elements as SE Name, when
15 it analyzes it. And we also have to ignore Nokia's own
16 reaction to the Examiner's rejection of the Marpe reference,
17 and what the Marpe reference teaches, who is the editor of
18 the H.265 in terms of the third author, Thomas Wiegand, and
19 actually all three of these people, both Detlev Marpe and
20 Heiko Schwarz, were all part of the H.265, specifically
21 teach about what a syntax element is.

22 Q. Turning to slide 72, Dr. Schonfeld, can we now
23 turn to the next reason you provide as a basis for your
24 noninfringement opinion?

25 A. Sure.

1 Q. And what is this second argument all about?

2 A. So for the purpose of the second argument, I'm
3 going to ignore my issue with the syntax elements. I'm
4 going to accept Nokia's view and I'm going to assume that
5 the non-zero transform coefficient is in fact a syntax
6 element, and all I want is to see whether it's actually used
7 consistently in the claim language, if I do accept it.

8 Q. And so, Dr. Schonfeld, if we were to accept
9 Nokia's view of a syntax element, what do we see here on
10 slide 73?

11 A. So on slide 73, you see on the left, claim 1, and
12 then I have highlighted all the syntax elements references,
13 and then on the right I've replaced them all with non-zero
14 transform coefficients to see if that's how, in fact, the
15 H.265 standard actually works.

16 Q. So, Dr. Schonfeld, on slide 74, can you tell us
17 what do we still have to see even under Nokia's view with
18 respect to the syntax elements in the claim?

19 A. So the categorizing limitation still requires you
20 to categorize into a first category and a second category,
21 and now we have to categorize those non-zero transform
22 coefficients.

23 Q. Turning to slide 75, for the categorization
24 limitation, what does Dr. Chrissan identify as the first and
25 second categories of syntax elements?

1 A. So, Nokia represents the first category to be the
2 first 8 non-zero transform coefficients, and the second
3 category are the remaining or other non-zero transform
4 coefficients.

5 Q. And do we see that here on -- graphically
6 depicted on slide 76?

7 A. That's correct. You can see on the right I've
8 listed, according to one particular scan, the diagonal scan,
9 in this particular example the first 8 non-zero transfer
10 coefficients on the left, and the other or remaining
11 transform coefficients on the right. And they are
12 highlighted in yellow on slide 76 and numbered for the first
13 category and not numbered for the second category.

14 Q. So for the categorization, categorizing
15 limitation, does Nokia point to the first 8 non-zero
16 transform coefficients as the first category of syntax
17 elements?

18 A. It does.

19 Q. And for the categorization, categorizing
20 limitation, does Nokia point to the remaining transform
21 coefficients as the second category of syntax elements?

22 A. It does.

23 Q. Are they able to maintain that same mapping
24 through the rest of the claim elements even assuming that
25 transform coefficients would be syntax elements?

1 A. No. They actually change the mapping of what the
2 syntax elements is later on.

3 Q. Turning to slide 77, can you please explain that
4 for us, Dr. Schonfeld?

5 A. Sure. So once we have categorized it on the
6 upper left-hand corner of slide 77, we have the categorizing
7 limitation that decides what the first and second categories
8 are. And for the first category, those are the 8 non-zero
9 transform coefficients as represented by Nokia in the top
10 right of this slide.

11 And then on the bottom left we have the
12 limitation, the entropy coding symbols limitation, where we
13 have to actually take the symbols that correspond to the
14 first category of syntax elements and to context update
15 those.

16 And they don't apply it to the first 8 non-zero
17 transform coefficients. Instead, Nokia applies it to
18 symbols corresponding to one flag, the coefficient absolute
19 level greater than 1 flag, which is not the 8 non-zero
20 coefficients. It's just one flag. And that's on slide 77.

21 Q. Turning to slide 78, what did Dr. Chrissan say
22 during his testimony about this particular inconsistency?

23 A. Well, he agreed that he is not using the
24 categorization of that particular value that's getting
25 context updated. He said it is not the syntax elements

1 getting categorized, referring to his syntax elements.

2 Q. So in limitation -- the second limitation, we
3 have to categorize a first category of syntax elements. So
4 we have to categorize syntax elements into a first category.

5 Am I right about that?

6 A. That's correct.

7 Q. And for that portion of the claim, Dr. Chrissan
8 pointed to what, Dr. Schonfeld?

9 A. To the first 8 non-zero coefficients.

10 Q. And when we reach later in the claim, we've got
11 to encode symbols corresponding to the first category of
12 syntax elements.

13 Is that what the claim tells us?

14 A. It does.

15 Q. And what does Dr. Chrissan point us to when it
16 comes to the first category of syntax elements in the very
17 next claim limitation?

18 A. He is using a different variable, the coefficient
19 greater than 1 flag, and he agrees that's not what I
20 categorized. By -- when I say "I," I'm referring to quoting
21 Dr. Chrissan or referring to Dr. Chrissan.

22 Q. And have you depicted graphically this
23 inconsistency on your slide 79?

24 A. Yeah. I've shown what the theory is, as I
25 understand it, which is the categorization is applied to the

1 non-zero transform coefficient, which are the alleged syntax
2 elements. The entropy coding and context update is not
3 applied to those. Instead, it's applied to one flag, the
4 coefficient absolute level greater than 1 flag instead,
5 which is not the alleged syntax element even if we were to
6 accept the view that non-zero transform coefficients were
7 syntax elements. And that's on slide 79.

8 Q. Turning to slide 80, do we see a similar
9 inconsistency with Dr. Chrissan's discussion and mapping of
10 the second category of syntax elements?

11 A. Yeah. The whole story repeats for the other
12 category, because now, for the second category, Nokia maps
13 it to the remaining non-zero transform coefficients, and for
14 the purpose of meeting the entropy coding symbols that have
15 been bypassed, which is on the bottom left limitation of
16 slide 80, they point to a different variable, coefficient
17 absolute level remaining, which is, once again, not the
18 alleged syntax element. It's not the non-zero transform
19 coefficient. And this is, again, on slide 80.

20 Q. And on slide 81, do we see similar testimony from
21 Dr. Chrissan that is from his testimony last week?

22 A. Yeah. He, again, confirms the fact that, for the
23 purpose of the last limitation, he is not using the same
24 syntax elements. He is using the coefficient absolute level
25 remaining, which is not what was categorized.

1 Q. Now, Dr. Schonfeld, what does the patent say
2 about categorizing and entropy coding with respect to syntax
3 elements?

4 A. So, again, the entire invention is about
5 categorizing syntax elements into a first category that's
6 context updated and categorizing syntax elements into a
7 second category that's bypassed. And that's clear in slide
8 83, from Fig. 5 and the citations that I've shown over here
9 from column 10 in the abstract.

10 Q. Dr. Schonfeld, Nokia presented a way to
11 categorize these non-zero transform coefficients into the
12 first 8 and the remaining coefficients.

13 Why were they unable to use that categorization
14 to show that the syntax elements, the way they were coded,
15 changed?

16 A. Because Nokia's theory requires them to find a
17 switch in the syntax elements going from context updated to
18 bypass or vice versa, and in the H.265 standard. But the
19 H.265 standard is designed to avoid it, to fix it. And so
20 no matter what mapping they have tried to come up with, they
21 will always run into a contradiction, and that's the
22 contradiction that they chose.

23 Q. If we look at how the coding actually occurs with
24 respect to the first 8 non-zero coefficients, Nokia's first
25 category, and a second 8, the remaining non-zero

1 coefficients, the second category, what do we actually see
2 with the coding?

3 A. The context update and bypass syntax elements
4 never changes. It's not allowed to change. And that's the
5 problem I just spoke about. It remains constant. You can
6 see the context updates, when sent for the first three, is
7 always context updated for the first three when sent. And
8 the other two is bypassed when sent. It's always bypassed
9 regardless of the position of the coefficients or anything
10 else.

11 Q. And that's depicted here on slide 84?

12 A. That's correct.

13 Q. Turning to slide 85, what is your third reason
14 for your opinion that H.265 does not infringe the '701
15 patent?

16 A. Okay. So for the previous two reasons, the first
17 one I talked about the syntax elements, and whether non-zero
18 transform coefficients are syntax elements. Then for the
19 second one I accepted the view that, Nokia's view, that
20 non-zero transform coefficients could be syntax elements.

21 For they're analysis, for the third one, I'm
22 accepting every single issue that they have raised, whether
23 it's frequencies of occurrence or categorization, I'm
24 accepting everything, and I just want to see whether or not
25 it satisfies the limitations with that particular view.

1 Q. And, Dr. Schonfeld, accepting all of those
2 assumptions, at that point do Nokia's infringement
3 allegations work out?

4 A. Not in my view, no.

5 Q. For purposes of examining this opinion, can you
6 remind us, again, what is the first category and what is the
7 second category?

8 A. So according to Nokia, the first category are the
9 first 8 non-zero coefficients shown on the left in slide 86,
10 and then the remaining non-zero transform coefficients are
11 shown on the right in the same slide.

12 Q. And if we carry that through the rest of the
13 claim, Dr. Schonfeld, what do we need to see to find
14 infringement?

15 A. So if we accept the entirety of Nokia's theory,
16 it requires, very simply, when we are in the first category,
17 we context update everything, but when we are in the second
18 category, we bypass. That's what's required according to
19 their mapping.

20 Q. And what do we see depicted here on slide 88?

21 A. So if we were to practice this in the H.265
22 standard, and I'm now assuming that the non-zero transform
23 coefficients are the syntax elements, and I'm ignoring the
24 issue of the syntax elements being different, this is in
25 slide 88, but I'm -- but what is required is that the

1 non-zero transform coefficients have to be context updated,
2 which means all of these would need to be context updated.

3 And then when we transition to the second
4 category, to the other or remaining non-zero coefficients,
5 then what is required is that all of these be bypassed. So
6 it's a very clear delineation. You would have to context
7 update for the first 8 non-zero coefficients, and bypass for
8 the rest, if you were to accept all of Nokia's assertions
9 about the mapping.

10 Q. So, Dr. Schonfeld, this is what Nokia needed to
11 show.

12 How does the standard actually work?

13 A. So the way it actually works, as we have said all
14 along, it doesn't do it. The first -- the particular syntax
15 elements are either context updated or bypassed, and that
16 never changes. It's the position of the coefficient is
17 irrelevant for the purpose of deciding whether to context
18 update or bypass.

19 Q. And this is shown on slide 89, Dr. Schonfeld?

20 A. It is, yes.

21 Q. And turning to slide 90, can you explain to us
22 again why the coding doesn't change?

23 A. So I said it several times that in H.265, context
24 update remains fixed for a given syntax elements and never
25 changes, or bypass never changes. And this is a portion in

1 slide 90 from Table 9-48, which specifically states this.
2 It shows which syntax elements would be context updated, the
3 top three, and which ones will be bypassed, the bottom two.

4 Q. Dr. Schonfeld, were you present when Dr. Chrissan
5 presented this chart during his testimony last week?

6 A. I was here, yes.

7 Q. And if we can first follow the line where we have
8 this greater 1 flag, do you see that, Dr. Schonfeld?

9 A. I do.

10 Q. And is this meant to represent the first 8
11 non-zero coefficients?

12 A. That's correct.

13 Q. And then after that we've got this threshold and
14 we see the remaining coefficients.

15 Is that what's being represented on
16 Dr. Chrissan's demonstrative here?

17 A. That's correct.

18 Q. Now, Dr. Schonfeld, for this greater 1 flag, what
19 is the coding method per the standard at this column here
20 beneath the 3 on slide 91?

21 A. So this will be -- this will be context updated.

22 Q. And if we look at the entry right before the
23 threshold for the greater1_flag, what would be the assigned
24 coding method for that flag at that point in the process?

25 A. It will be context updated.

1 Q. Now, if we go just past the threshold,
2 Dr. Schonfeld, we see this X.

3 Do you see the X?

4 A. I do.

5 Q. Does that indicate that the coding assignment for
6 the greater1_flag has now changed?

7 A. No, it does not. It does not stop being context
8 updated. It simply -- it indicates that it's not used. But
9 if it were used, it could only be context updated.

10 Q. So, Dr. Schonfeld, is it correct that the '701
11 patent says, we change the context, we change the updating
12 process once we get past this threshold?

13 A. We do not change the updating process at all. We
14 are not allowed to change the update process, not for this
15 syntax element, but for any syntax element.

16 Q. I may have misspoke. I'm asking, in accordance
17 with the '701 patent, would that tell us, when we cross this
18 threshold, we need to change the updating process for this
19 particular syntax element?

20 A. That's right. When we -- if you were to apply
21 the '701 patent, then you would need to go from one category
22 where you context update to a second category, which is past
23 the threshold line, and bypass past that line.

24 Q. And in the standard was it Qualcomm's idea to
25 instead just drop the syntax elements altogether?

1 A. For the greater than 1 flag, that's correct.

2 Q. Now, if we go down to the same two columns for
3 the last flag here, the level remaining, we see a 1 here on
4 slide 91 below the column that has a 3, or two away from the
5 threshold, what's the coding process for this remaining flag
6 at this point in time?

7 A. It will be bypassed.

8 Q. And what is it if we move one cell to the right?
9 What's the coding process for this particular syntax
10 element?

11 A. So you are pointing to the 3 below the
12 coefficient 5 in slide 91, and that will be bypassed.

13 Q. Okay. Now let's jump over the threshold.
14 What is going to be the coding process now for
15 this particular syntax elements, since we passed the
16 threshold?

17 A. It's going to be bypassed.

18 Q. If I were to extend this particular row out to
19 infinity --

20 JUDGE MCNAMARA: Which particular row,
21 Mr. Thompson?

22 MR. THOMPSON: Yes, ma'am. Thank you, Your
23 Honor.

24 Q. If I were to extend this particular row
25 corresponding to the coefficient absolute level remaining,

1 I'll say out to a thousand, because I can't actually extend
2 it to infinity, is the coding assigned to this particular
3 syntax element ever going to change?

4 A. No. It will remain either bypassed or context
5 update. Actually, Dr. Chrissan's slides on the left
6 indicate that with those little circles. The ones that are
7 light green, neon green, heavier, are context updated
8 always. The ones below are bypassed always.

9 Q. And, Dr. Schonfeld, turning to slide 94, can you
10 just explain to us why there is a difficulty to have Nokia
11 map these transform coefficients to the syntax elements in
12 the claims?

13 A. So, as I mentioned earlier, when you are looking
14 in the H.265 for a transition of context update to bypass,
15 it's not possible to find it when the standard is designed
16 to avoid it. And that's exactly what's happening here. It
17 is fixed, and, therefore, can never be done. And that's on
18 slide 94.

19 Q. So, Dr. Schonfeld, we're going to transition away
20 from the '701 patent in a moment, but I'd like to first kind
21 of have you walk me through a story that I find especially
22 interesting.

23 Can you first remind us, looking at slide 96, how
24 did this accused feature end up in the standard?

25 A. So this accused feature is a proposal by

1 Qualcomm. It's on slide 96. And it's from Exhibit RX-1998.

2 Q. And where was this proposal, where and when was
3 this proposal submitted to the standards body?

4 A. This was submitted in the HEVC meeting in
5 San Jose back in February of 2012.

6 Q. Turning to slide 97, did Qualcomm also have a
7 presentation they gave to the attendees proposing this
8 particular solution?

9 A. They did. This is part of the presentation.
10 It's on slide 97. And it describes exactly how this accused
11 feature works with a greater than 1 flag for the first 8
12 coefficient.

13 Q. Is that presentation RX-1996?

14 A. It is.

15 Q. Now, you've participated in some of these
16 efforts.

17 Do the standards committees oftentimes, or maybe
18 always, record committee notes to reflect the ongoings of
19 these various meetings?

20 A. Yeah. I've read such minutes, and I've seen them
21 list various documents about what happened in those
22 meetings.

23 Q. And does this -- does document RX-2261 on slide
24 98 correspond to notes presented at a particular meeting of
25 the H.265 standards committee?

1 A. Yeah. These are quarterly meetings that the
2 standard body runs and where they discuss all the proposals.
3 And these are the editors and the people running the
4 meeting. And this is, in slide 98, a summary from that
5 particular meeting report.

6 Q. Is this a summary of the meeting where Qualcomm
7 proposed this particular idea to the standard that is now
8 being accused of infringement?

9 A. Yeah. It's the same meeting from February of
10 2012 in San Jose, California.

11 Q. And it looks like from the notes here, it was in
12 February at the DoubleTree Inn in San Jose; is that right?

13 A. They were in the DoubleTree Inn, yes.

14 Q. Now, do these committee notes acknowledge the
15 Qualcomm proposal to the standard that is now the subject of
16 Nokia's infringement allegations?

17 A. They do. They refer to it here in slide 99 from
18 RX-2261.

19 Q. And do we see reference to these up to 8 -- we
20 see 8 greater than 1 there at the bottom of Scheme 2.

21 Can you describe that for us?

22 A. Yeah. This is exactly the proposal that Qualcomm
23 provided, and this is about using the Scheme 2 from that,
24 where up to 8 greater than 1 flag are used, otherwise same
25 as Scheme 1.

1 Q. Now, there's -- there are generally a lot of
2 folks attending these standards meetings.

3 Is that fair to say, Dr. Schonfeld?

4 A. It's a large numbering, yes.

5 Q. And, in fact, were inventors from the Nokia '701
6 patent also present at that meeting?

7 A. Yeah, they were. The same inventors from the
8 '701 patent were part of that same meeting in February of
9 2012 in San Jose.

10 Q. And did the Nokia inventors submit their own
11 proposal during that meeting?

12 A. They did. They provided their own competing
13 proposal to the same subcommittee and to the same meeting.

14 Q. And did the Nokia inventors' proposal reference
15 syntax elements?

16 A. They did.

17 Q. And when the Nokia inventors of the '701 patent
18 referenced syntax elements, what source of syntax elements
19 were they pointing to?

20 A. They were pointing to syntax elements that were
21 consistent with the standard at the time of its development
22 and consistent with the style of using lowercase with
23 underscores in between.

24 Q. Did the Nokia inventors at that time point to
25 non-zero transform coefficients as being syntax elements?

1 A. Not in this proposal, no.

2 Q. Okay. I want to just put us in the scene here at
3 the DoubleTree, and we have the '701 patent inventors, they
4 are at this standards committee meeting.

5 Is that your understanding?

6 A. They are.

7 Q. And we have the '701 patent inventors at the
8 meeting, and is Qualcomm presenting this currently accused
9 feature for adoption?

10 JUDGE MCNAMARA: Pardon me.

11 MR. CAMERON: Matthew Cameron.

12 Your Honor, we have an objection. Counsel is
13 asking the witness to describe personal knowledge of what
14 purportedly happened at this meeting, and I don't believe
15 any foundation has been laid that this witness was at the
16 meeting or has any personal insight as to what was happening
17 there.

18 JUDGE MCNAMARA: Any response?

19 MR. THOMPSON: I'll adjust the way I ask the
20 question.

21 JUDGE MCNAMARA: I think that makes sense. And
22 it was Mr. Cameron who was speaking.

23 MR. CAMERON: My apologies, Your Honor. Yes.

24 Q. So basically your review of the documents
25 surrounding this particular meeting, do the documents

1 reflect that Qualcomm was present at this meeting making a
2 proposal to the standards body?

3 A. It does.

4 Q. And if we believe Nokia's position in this case,
5 do the notes reflect that Qualcomm was proposing to the
6 standards body that the standard adopt a feature that would
7 infringe the Nokia patent?

8 A. Say it again?

9 Q. Sure. If we take Nokia's position, would it be
10 the case that the Qualcomm attendees were proposing to the
11 standard that it adopt technology that would infringe
12 Nokia's '701 patent?

13 A. That's correct. That's what today is being
14 alleged. That's right.

15 Q. And do the documents reflect that the Nokia
16 inventors were present at this meeting?

17 A. Yeah. It shows the minutes, and it shows two out
18 of the three inventors being present at that meeting.

19 Q. And do the documents reflect via the summary of
20 the meeting that, after Qualcomm makes its presentation, the
21 Nokia inventors, they stand up and they cheer and they
22 support the idea?

23 A. I haven't seen any such evidence.

24 JUDGE MCNAMARA: Again, I think that's -- you can
25 rephrase.

1 Mr. Cameron, go ahead and lodge your objection.

2 MR. CAMERON: My objection is that counsel is
3 asking the witness for information that he does not have any
4 foundation to have. And, moreover, I'll object because this
5 line of questioning certainly is not supported in the
6 witness expert report, about whether folks are standing up
7 and cheering or objecting or anything like that.

8 JUDGE MCNAMARA: Okay. It's a little beyond the
9 scope here. I agree.

10 So, Mr. Thompson, would you please just get to
11 the question and the information.

12 MR. THOMPSON: Yes, Your Honor.

13 Q. What does the summary of this particular meeting
14 indicate that the Nokia inventors were doing when Qualcomm
15 was proposing this particular feature to the entire
16 standard?

17 A. It shows that they provided an alternative, a
18 different approach to the same problem or to a similar
19 problem.

20 Q. Dr. Schonfeld, have you seen any evidence in the
21 record in this case to indicate why Nokia would present an
22 alternative to a standard if Qualcomm was there presenting
23 that the '701 patent invention be adopted as part of the
24 standard?

25 A. I've seen no evidence to that effect.

1 Q. With that, Dr. Schonfeld, can you remind us of
2 the reasons you believe that the H.265 standard does not
3 meet the elements of the '701 patent?

4 A. Sure. So there are three reasons. One is what
5 they point to as the alleged syntax elements for their
6 mapping are not syntax elements in accordance with the H.265
7 standard.

8 Secondly, when they -- if you do accept that
9 view, that they are syntax elements, they are not used
10 consistently. Sometimes either they refer to non-zero
11 transform coefficients for categorization, later on they
12 refer to those flags as being the alleged syntax elements
13 that have to be context updated or bypassed.

14 And, then, finally, if you accept the entire
15 theory, it is still not used consistently where you go from
16 context update to non-zero transform coefficients,
17 regardless of what they are, to bypass.

18 And the reason for it is the same fundamental
19 reason. They are looking for a transition from context
20 update to bypass associated with a syntax element in a
21 standard that is designed to avoid it. And the same thing
22 applies to both the accused product and the domestic
23 industry products.

24 Q. Dr. Schonfeld, we're here on slide 102, and I
25 believe you just confirmed this, but do the parties agree

1 based on the experts' opinions that technical domestic
2 industry for the '701 patent rises and falls with
3 infringement?

4 A. I believe so. This is at least my opinion.

5 MR. THOMPSON: Your Honor, I'm at a point where
6 I'm about to transition into the '267 patent. I don't know
7 if you want me to take a pause or plow forward.

8 JUDGE MCNAMARA: What time is it? 12:54. Let's
9 break for lunch. I'll see you back here in an hour.

10 (Whereupon, the proceedings recessed at 12:53
11 p.m.)

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1 AFTERNOON SESSION

2 (In session at 2:00 p.m.)

3 JUDGE MCNAMARA: Good afternoon, everyone.

4 Please be seated.

5 I hope everyone had a chance to eat something,
6 some refreshment.

7 All right. Are we ready to go back on the
8 record, Mr. Thompson?

9 MR. THOMPSON: Yes, ma'am, Your Honor.

10 JUDGE MCNAMARA: Okay.

11 MR. THOMPSON: May I proceed?

12 JUDGE MCNAMARA: Yes. Thank you very much.

13 BY MR. THOMPSON:

14 Q. Dr. Schonfeld, can we now proceed to discuss your
15 opinions with respect to the asserted '267 patent?

16 A. Sure.

17 Q. And before we dive into that patent, can you
18 provide us with a brief overview of some of the relevant
19 video coding concepts, starting around slide 104?

20 A. Sure. So before, in the previous patent, I
21 talked in the beginning about the prediction part, and now
22 we are just diving into this part. And, in particular, we
23 are talking about a particular kind of prediction called
24 bidirectional prediction, where we predict from the past and
25 the future and combine it in a weighted way, and this is

1 shown on slide 104.

2 And you can see we're trying to predict the
3 particular block in red. And if you were to do the
4 prediction and combine it, then when you click on this
5 slide, you get the recovered, reconstructed prediction,
6 based on what you obtained from the previous and the future
7 reference frame.

8 Q. Turning to slide 106, can you help us understand
9 how these predictions are generated?

10 A. Sure. So when you look at the block, the red
11 block I had in the previous frame, in slide 104 and 105, we
12 look at the best match, and sometimes the best match in the
13 previous frame or the future frame is on the pixels that
14 exist. And those are depicted as integer pixel locations in
15 big squares with capital letters, but sometimes one of them
16 may be too far to the left and the other one too far to the
17 right, so we want to find a point in between them and get an
18 even better prediction.

19 And so we do all sorts of what we call
20 interpolation, various schemes that allow us to estimate
21 pixels in between. We effectively create sort of a
22 reference frame, which is much larger than it truly is, and
23 we can point in between the pixels.

24 And so we have these vectors, we call them motion
25 vectors, and sometimes we point to the original pixels,

1 sometimes we point in between the pixels. We call it either
2 fractional pixels, half pixels, sometimes quarter pixels,
3 even more refined than that.

4 Q. Turning to slide 107, how is the interpolation
5 handled across the encoder side and decoder side?

6 A. It's handled in exactly the same way. It must be
7 handled in this way. You need to make sure that whatever
8 you do on the encoder, you do exactly the same thing on the
9 decoder, or else they will be pointing at different points,
10 and the recovery will be incorrect and you'll see it.

11 And then, for example, on the left we see the
12 reference frame. This is in slide 107. Reference frame on
13 the left. We go through this interpolation filter, it
14 generates the interpolated image, which is much -- so if the
15 original was let's say 10x10 pixels, this might be a hundred
16 by a hundred. The way you generate the pixels in between is
17 with that complicated equation down below.

18 And on the decoder side, we go through the exact
19 same process. We use the same equation. We generate the
20 same image. So when the motion vector is available, it
21 points to exactly the same pixel values.

22 Q. Turning to the asserted patent itself, can you
23 provide us with some of the high-level details?

24 A. Sure. So this is the '267 patent. Its authors
25 are Ugur, Lainema, and Hallapuro, and the priority date is

1 January 7th, 2011.

2 Q. And what do we see here on slide 109?

3 A. So this depicts the problem. The problem was
4 that when you have these combinations, if you were to refine
5 the values -- if you were to lower the precision too early,
6 the errors would accumulate.

7 So the principle was a very simple principle,
8 delay the reduction in precision as late as possible and
9 then you'll get a better, more precise number. That was the
10 problem. And the solution is exactly that. Precision is
11 reduced after combination rather than before combination.

12 Q. Dr. Schonfeld, do we see a depiction from the
13 patent of the prior art?

14 A. So this is the patent's -- the '267 patent's
15 depiction of the prior art. And you can see here the
16 weighted combination, and the weighted combination is
17 depicted on the left. We see the input coming in. And then
18 we have a first prediction. It goes through some filter and
19 it generates a first prediction.

20 Then the rounding offset, it's just a way of
21 doing the precision reduction in some more precise way.

22 And then we do reduce it all the way back to what
23 it was at the input. It's reduced. It's shifted to the
24 input bit-depth. So it goes back to what it started with at
25 the input, the input bit-depth.

1 Then we add them together, and then we add the
2 round offset that's, again, not relevant to the weighted
3 combination, and then, finally, we shifted back down to the
4 original bit-depth again. That's the prior art. And the
5 problem is that those intermediate shifts that are depicted
6 in green that reduce the precision, they might reduce it too
7 much, and, therefore, that error would accumulate at the
8 very output.

9 Q. Now, using figure 11 from the '267 patent, can
10 you describe what was the suggested change to this process
11 from that patent?

12 A. Yeah, there are a couple of stylistic
13 distinctions between them, but they have really no relevance
14 to the operation, like changing the N-tap to P-tap on the
15 far left side of slide 111.

16 And then removing some parentheses in 110. The
17 main difference is the middle part in purple, and that is --
18 it says right shift to intermediate bit-depth. Before it
19 said to right shift to the original input bit-depth, and now
20 you don't go all the way down. You make sure that it
21 remains high. And you only reduce to the input bit-depth at
22 the very end like you did before, all the way on the right
23 at box number 1111.

24 Q. Dr. Schonfeld, unlike our discussion of the '701
25 patent, was the feature that's being accused under the '267

1 patent something that Nokia actually did propose to the
2 standard?

3 A. Yeah, Nokia did propose this particular patent to
4 the standard.

5 Q. And when Nokia proposed this particular idea to
6 the standard, how did Nokia characterize their proposal?

7 A. They characterized it as an idea that's similar
8 to the rounding performed by Qualcomm earlier, and they
9 described it as a minor fix to the problem.

10 Q. And do we see that here on slide 113?

11 A. We do.

12 Q. And was the Nokia proposal captured in JX-187?

13 A. It was, yes.

14 Q. Now, when one of the inventors of the '267 patent
15 was deposed many years later, looking back at his
16 contribution, did he view it as a significant improvement?

17 A. He characterized it as a small software change,
18 and he stood by that characterization of a minor fix.

19 Q. And do we see that in JX-181?

20 A. That's correct.

21 Q. There's a number of claims asserted here, and I
22 want to try to help us to group them into various categories
23 so that maybe we can move through this laconically.

24 Can you help us to describe the relationship
25 between the claims?

1 A. Sure. So there are four asserted claims. Each
2 of the asserted claims is a dependent claim from an
3 independent claim that's no longer asserted.

4 And they are broken up into encoding and decoding
5 claims. And here we see the encoding claims, and they
6 contain a method claim, an apparatus claim, and as you can
7 see, they are virtually identical. The only difference is
8 the apparatus and method and some of the depiction of the
9 apparatus in the first limitation.

10 So if you look at the apparatus claim, and you
11 meet everything that the apparatus claim requires, that
12 means that you meet everything the method claim requires at
13 the same time.

14 Q. And turning to slide 116, do we see a similar
15 relationship between the apparatus and method claims of the
16 decoding claims?

17 A. That's right. The decoding claims are, again,
18 the method claims are -- the asserted claims are the
19 dependent claims, 20 and 26, and the method claim is
20 essentially a subset of the requirements of the apparatus
21 claim. So if you meet everything the apparatus claim
22 requires, you have met everything the method claim requires.

23 Q. Now, Dr. Schonfeld, is this the first time that
24 Nokia has asserted the '267 patent at the ITC?

25 A. No.

1 Q. Is this the first time that you are offering
2 expert testimony on the '267 patent at the ITC?

3 A. No, I've done it before.

4 Q. Can you tell us, when previously was the '267
5 patent asserted?

6 A. It was asserted in the 1380 investigation.

7 Q. Okay. For starters, were there apparatus and
8 method claims asserted in that investigation?

9 A. No. In that investigation it was completely
10 focused only on apparatus claims at the time of the hearing.

11 Q. And can you tell us, Dr. Schonfeld, what were
12 Judge Elliot's findings for the '267 patent claims in that
13 investigation?

14 A. So as it relates to the claims in this case,
15 Judge Elliot found claims 7, 25, and 26 to be invalid based
16 on what was presented in front of him in that investigation.

17 Q. And did Judge Elliot also make additional
18 findings with respect to other claims?

19 A. He did.

20 Q. And what were those?

21 A. So, in particular, as it relates to the issues
22 here, Judge Elliot found that claim 8 has almost negligible
23 differences between itself -- between the issues that were
24 presented in the prior art and the patent -- and the claim,
25 excuse me, and that the motivation was present, but he did

1 not find invalidity.

2 Q. And do we see an excerpt from the ID from that
3 investigation at RX-1945?

4 A. That's correct.

5 Q. So then did Judge Elliot also ultimately find
6 claim 8 invalid?

7 A. He did not.

8 Q. And why not?

9 A. Well, he said that the opinions were
10 well-supported, but there was lack of evidence of the level
11 of ordinary skill and, as a result, the expectation of
12 success was not clear, and, therefore, he ruled that
13 claim 8 isn't -- he did not find it invalid for those
14 reasons.

15 Q. And what particular concept was Judge Elliot
16 looking for to assess the expectation of success?

17 A. He was looking for the level of ordinary skill in
18 order to determine whether there was a reasonable
19 expectation of success.

20 Q. So following the outcome of the 1380
21 investigation, where does that leave the apparatus claims?

22 A. So in terms of the apparatus claims in this
23 issue -- in this case, in this investigation, if one were to
24 accept Judge Elliot's rulings, based on what he ruled, he
25 ruled that claim 7 is invalid, which is a non-asserted

1 claim, and claim 25, which is also non-asserted as invalid,
2 and the dependent claim 26 is -- is invalid, but dependent
3 claim 8 is not invalid for the reasons I mentioned about the
4 lack of evidence of a person of ordinary skill and the
5 expectation of success.

6 Q. And given the overlap between the apparatus
7 claims at issue and the method claims at issue, what impact
8 would Judge Elliot's findings have on the asserted method
9 claims?

10 A. So, in my opinion, because the method claims are
11 a subset of the apparatus claims, and we saw the limitations
12 earlier, they contain all the same limitations, the
13 apparatus contain a few more. By the same reasoning, the
14 method claims, in my view, at least would have been invalid,
15 when he found them invalid for the apparatus claims, and so
16 it just leaves at issue claim 2 and claim 8 for the encoding
17 side claims.

18 Q. Dr. Schonfeld, what was the piece of prior art
19 that was at issue in the 1380 investigation?

20 A. It was a publication by Walker that was from
21 Qualcomm, published on December 22, 2005.

22 Q. Do we see the cover page from Walker on slide 123
23 and the Walker reference is JX-683; is that correct?

24 A. That's correct.

25 Q. At a high level, what was the Walker reference

1 directed to?

2 A. So it was directed to doing both encoding and
3 decoding of video, and, in particular, using weighted
4 bidirectional encoding schemes for multiple type of encoders
5 with a single decoder.

6 Q. And what do we see here, Dr. Schonfeld, from the
7 Walker reference on slide 125?

8 A. So this is Fig. 1 of the Walker reference, and it
9 shows various encoding devices on the left. And so you have
10 different type of encoders all with their own schemes, all
11 performing different type of weighted bidirectional
12 prediction on the encoder side.

13 And on the decoding side on the right, you have
14 this what is sometimes referred to, I believe, as universal
15 decoder. So it's a decoder that can decode any of these
16 different encoders.

17 Q. On slide 126, what does Walker tell us about its
18 bidirectional prediction process on the encoder side?

19 A. Okay. So the encoder side that's represented in
20 terms of the text on the upper right-hand side of slide 126,
21 and as you can see, it refers in red to the previous
22 reference picture 510, you can see that depicted in Fig. 5
23 on the left, on the upper left-hand corner, and then you can
24 see the best matching macroblock 520 that is shown -- that
25 is obtained from it.

1 And then below it we see subsequent reference
2 picture 575 in the upper right side of Fig. 5, and it has
3 its best matching macroblock 580. And that is all on the
4 encoding side, which is the upper half of Fig. 5 on the
5 left.

6 And then the decoder side has the same thing on
7 the bottom portion.

8 Q. Turning to slide 127, what is the next step in
9 the prediction process according to Walker?

10 A. So the next step is what he refers to as the
11 weighted best matching previous macroblock. You can see it
12 in red and green for the encoder side, corresponding to what
13 is shown in Fig. 5 and highlighted in slide 127 in red,
14 weight times the best match 520, that would be the weighted
15 best matching previous block, and the corresponding weighted
16 best matching subsequent block is shown next to it. And
17 that's on the encoder side.

18 And, once again, below on the bottom half of
19 Fig. 5, the same thing for the decoder.

20 Q. What does the Walker reference say should be done
21 with these weighted matching blocks?

22 A. So once you compute those weighted matching
23 blocks, you add them together, and you can see that, again,
24 on the upper right-hand side on slide 128, referring to the
25 weighted combined bidirectional macroblock, and that's shown

1 in the figure in this big red -- in the upper red of Fig. 5
2 of Walker. And the same thing on the bottom. The big
3 square below, that would be the combined weighted prediction
4 on the decoder side.

5 Q. Dr. Schonfeld, does the Walker prior art provide
6 equations for its bidirectional prediction process?

7 A. It does. You can see here in slide 129 it shows
8 the encoder equation on the top left, and the pred0 would be
9 the best match. w0 was the weight we saw previously. Pred1
10 would be the best match. w1 would be the weight we saw
11 previously, and correspondingly on the decoder side, it's a
12 similar equation. And then it has tables underneath that
13 goes through, and step by step through the equation, they
14 indicate how many bits are needed at each step of the
15 process.

16 And so those tables provide the information about
17 the number of bits needed, and I will need to refer to them
18 as I go through the equation.

19 Q. During your technology background, Dr. Schonfeld,
20 you talked a little bit about interpolation. What does
21 Walker disclose regarding interpolation?

22 A. So when we -- when Walker finds the best match,
23 it provides it in one of two ways: Either you can see up
24 here in slide 130, in paragraph 111 of Walker, it talks
25 about the fact that you can either go to the pixel or the

1 interpolated pixel.

2 You can see in paragraph 114 below, it sometimes
3 refers to the original pixel as original integer pixel. And
4 the half pixel are the interpolated pixels.

5 And on Fig. 9 of Walker on the right of slide
6 130, you can see the original integer pixels are shown in
7 capital letters and big circles, and the interpolated points
8 in between are shown in blue squares with lowercase letters.

9 And every time you see a motion vector, it's
10 either pointing to one or the other. Walker teaches you can
11 use either one. And you can use -- you can use them anytime
12 you want, either pointing to the original integer or to the
13 interpolated pixel in between.

14 Q. Dr. Schonfeld, given the '267 patent was also the
15 subject of the 1380 investigation, for purposes of our
16 walkthrough, are we starting completely from scratch today?

17 A. No. We have what I presented essentially in the
18 1380 investigation -- in the prior investigation.

19 Q. So can we first walk through essentially your
20 presentation from the 1380 investigation applying Walker to
21 the asserted claims?

22 A. Sure.

23 Q. Okay. Can you please start on slide 132 with the
24 preambles of claims 7 and 25?

25 A. Okay. So claim 7 and 25 are the encoding and

1 decoding claims. They are quite different claims, but
2 because we are beginning with the apparatus, the preamble
3 and the first limitation will be the same, so I'll do it
4 together, and then it will split off.

5 And in terms of the preamble, what is required is
6 an apparatus for encoding and decoding respectively, and as
7 you can see in Walker, paragraph 25, in slide 132, it talks
8 about the encoder and decoder devices. And in paragraph 3
9 it talks about an apparatus for decoding compressed video
10 data.

11 Q. Turning to slide 133, does Walker disclose claim
12 limitation 7[A] and 25[A]?

13 A. It does.

14 Q. How so?

15 A. So claims 7[A] and 25[A] both require a
16 processor, memory, and computer program code. And as you
17 can see, in paragraph 122, Walker describes various
18 processors, including a general purpose processor.

19 And in paragraph 123 he talks about the software
20 module executed by a processor, which is a computer program
21 code. And this is available, the software module may reside
22 in memory, and it gives a whole list of memory.

23 Q. Now, for the remainder of the limitations for
24 claims 7 and 25, do we need to address those separately?

25 A. Yeah, they are quite -- they are very similar.

1 They mirror each other. But they are distinct, and so we
2 have to address them separately.

3 Q. Okay. So, Dr. Schonfeld, what is your opinion
4 with respect to the Walker reference and limitation 7[B]?

5 A. So with respect to 7[B], the first half requires
6 a first reference block based on the first motion vector,
7 and a second reference block based on the second motion
8 vector.

9 And as you can see in slide 134, in paragraph 34
10 of Walker, it talks about the previous reference picture
11 510, which you can see in Fig. 5 of Walker on the right, and
12 you can see the subsequent reference picture 575, which you
13 can see in the same figure, and then it shows the particular
14 motion vectors are 525 and 585, and these motion vectors are
15 pointing in the original reference pixels.

16 And these motion vectors are either pointing to
17 integer pixels or to subpixels, depending on whether you
18 apply the interpolation filter or not.

19 Q. Dr. Schonfeld, I believe you discussed now the
20 first portion of claim 7[B] on slide 134. Can we turn to
21 the second portion of claim [B]?

22 A. Sure.

23 Q. Please proceed.

24 A. So the second portion states, wherein the pixels
25 of the current block, the first reference block and the

1 second reference block, have values of first precision, and
2 the first reference block -- all of the blocks in the
3 reference, the previous and subsequent blocks, are described
4 in Walker in slide 135 in paragraph 60 as -- in paragraph 30
5 and 60 as having 8-bit luminance Y and 8-bit chrominance
6 values. Those are the representation of the color. We
7 usually transform red, green, and blue to luminance Y and
8 two different kinds of color information, which we call CR
9 and CB.

10 And this is also depicted in the table I spoke
11 about earlier, and, in particular, pred0, pred1, which are,
12 again, either the original pixels or the half pixels,
13 depending on what the motion vector pointed to, are 8-bit
14 representation -- sorry -- yeah, they are 8-bit
15 representation, and in particular -- let me back up a little
16 bit.

17 The 8-bit representation is when it points to the
18 integer pixels, those are in the original reference pixels,
19 and that's the same 8-bit for luminance, chrominance R and
20 chrominance B.

21 Q. Dr. Schonfeld, can you now tell us your opinion
22 on how the Walker reference discloses limitation 7[C] and
23 [D]?

24 A. Sure. So these limitations require a first and
25 second prediction. And you can see on slide 136 I

1 highlighted in the claim language the first and second
2 prediction. And, in particular, that prediction has to be
3 in a second precision that's higher.

4 And in the case of Walker in the equation, in
5 paragraph 68, it shows $\text{pred0 times } w0$. That would be the
6 first prediction. $\text{pred1 times } w1$, that would be the second
7 prediction. And specifically teaches that $\text{pred0 times } w0$ in
8 Table 2 below would be 16 bits and the same thing for pred1,
9 $w1$.

10 And so we have now increased the precision to 16
11 bits.

12 Q. And, Dr. Schonfeld, just so I'm following along,
13 the increase in precision is from 8 bits to 16 bits, am I
14 correct?

15 A. That's correct. We have gone from 8 bits for the
16 first precision to 16 bits for the second precision.

17 Q. In the 1380 investigation, what understanding of
18 the term "precision" did you apply for purposes of your
19 analysis?

20 A. So as I stated in that investigation, and I'll
21 just quote the first sentence, so the '267 patent uses the
22 term "precision" pretty broadly, but it at least includes a
23 number of bits needed to represent possible values.

24 Q. And is that an excerpt from RX-4058?

25 A. It is.

1 Q. What was the basis for your understanding of
2 precision as you applied it in the 1380 investigation?

3 A. Well, the first one is just knowledge from a
4 person of ordinary skill's perspective, and it is consistent
5 with the claims. The dependent claims are -- require things
6 like wherein the first precision indicates a number of bits
7 needed, and the same thing appears for the second precision,
8 and it appears throughout.

9 And the specification makes clear that precision
10 becomes so many bits. It mentions it several times in
11 column 13 and column 18. It specifically describes
12 precision in terms of the number of bits, and the patent is
13 replete with other references that are similar.

14 And one of the inventors, Mr. Jani Lainema, said
15 something to that effect. He said that precision to the
16 number of bits that are needed is an example of precision.
17 It's consistent with that definition.

18 Q. And is the inventor's testimony captured from
19 JX-181?

20 A. That's correct.

21 Q. Dr. Schonfeld, during the 1380 investigation, did
22 any of Nokia's experts or Nokia itself dispute the meaning
23 of precision that you applied?

24 A. No, there was no dispute that I was aware of as
25 to the meaning of precision. Everybody applied it in the

1 same manner in that investigation.

2 Q. And, Dr. Schonfeld, as far as you're aware, did
3 Judge Elliot apply a different understanding of precision
4 compared to what you were applying?

5 A. I believe he pointed to the same -- to the same
6 type of precision. Specifically, he referred to the number
7 of bits several times as being the precision. I don't think
8 he defined it, but he implied it several times.

9 Q. Even though there was no dispute about the
10 precision issue in the 1380 investigation, did Nokia dispute
11 your identification in Walker of the prediction?

12 A. They did.

13 Q. And can you describe the nature of that dispute,
14 please?

15 A. Yeah. They said essentially that the pred is the
16 prediction itself. When you multiply it by a weight, that's
17 not a prediction anymore. So they argued that pred0 times
18 w0 is no longer a prediction, and the same thing for pred1,
19 w1.

20 Q. And has Nokia and its expert made the same
21 argument in this investigation?

22 A. They have, yes.

23 Q. Can you explain what was your response to this
24 argument about the prediction in the 1380 investigation?

25 A. So in the 1380 investigation, I pointed to a

1 whole array of things, but the main ones I would say are the
2 dependent claim 10 specifically teaches that the second
3 prediction is obtained by shifting values of said second
4 reference block to the left.

5 And the effect of shifting to the left, as
6 described below from Walker, is a scaling factor through
7 multiplication or division. In fact, the '267 patent says
8 the same thing exactly, that you can shift to the right and
9 you can do it through division.

10 And, in particular -- or that it has the effect
11 of division.

12 And so what this dependent claim makes clear is
13 one form of prediction is obtained by multiplying something
14 by a coefficient or dividing it by a coefficient or shifting
15 it to the right or left.

16 Q. And, Dr. Schonfeld, after hearing your opinions
17 and the position Nokia took in the 1380 investigation, did
18 Judge Elliot offer a finding on this issue?

19 A. He did. In slide 141, from the RX-1945, he
20 stated that prediction is broad enough in a plain and
21 ordinary sense to cover weighted values.

22 Q. Shifting back to the limitations, can you
23 describe your opinion with respect to Walker's disclosure of
24 the claim 7[E] and [F] requirements?

25 A. Sure. So claim 7[E] is about the combined

1 prediction, combining the first and second prediction. And
2 that's depicted in yellow both in the equation on slide 142
3 up on top, you can see pred0 , $w0$, plus pred1 , $w1$, plus an
4 offset.

5 And then, finally, in claim limitation 7[F], it
6 says decrease the precision by shifting bits of the combined
7 prediction to the right. And that's shown in the same
8 equation on the same slide. And you can see the double
9 carets or the 2 greater than signs. You shift to the right
10 by some amount called $\log wD$ plus 1.

11 And Walker specifically teaches that $\log wD$ plus
12 1 corresponds to LWD -- or LWD plus 1, and, in particular,
13 on the table below, you can see that the original combined
14 prediction had 18 bits, and now after shifting we're down to
15 10 bits, and, therefore, the shifting of Walker teaches
16 decreasing the precision by shifting bits to the right.

17 Q. Wrapping up with limitation 7[G], can you
18 describe your opinion with respect to this limitation in the
19 Walker reference?

20 A. So in the case of limitation 7[G], it requires
21 encoding the residual data, which is obtained by the
22 difference between the combined prediction, we just referred
23 to, and the block of pixels.

24 And Walker in paragraph 34 highlighted in
25 slide 143 talks about the weighted combined prediction, a

1 weighted combined bidirectional macroblock subtracted from
2 the current macroblock, and it described it as a residual
3 error, and, in particular, it states that the residual error
4 is encoded.

5 And, finally, in paragraph 28, it talks about the
6 fact that it is encoded -- it's an encoded data stream, and
7 so, therefore, we have the final data stream and the
8 encoding of the residual data.

9 Q. Earlier I know we had a fork in the road where we
10 split off claims 7 and 25. Can we now return to element
11 25[B] of the '267 patent, and can you provide your opinion
12 on Walker with respect to this limitation?

13 A. Okay. So these are going to be the dual versions
14 of the limitations on the decoder side. So they will be
15 quite similar to what we just went through.

16 And so I'll try to do it a little bit faster.

17 The claim limitation 25[B] requires the first
18 reference block on a first motion vector and a second
19 reference block on a second motion vector. Those are
20 described in Walker on the slide in paragraph 35, on
21 slide 144.

22 And you can see the result that is obtained from
23 the reference block. These are the same reference blocks
24 510 and 575, but on the decoder side, the reconstructed
25 versions of those.

1 And then the motion vectors, again, pointing
2 either to the original integer pixels or to the subpixels in
3 between, Walker allows you to have both choices.

4 Q. And, Dr. Schonfeld, can you please provide your
5 opinion on the second portion of claim 25[B] in Walker?

6 A. So, again, this is the precision required by the
7 previous frame -- the previous block, the future block, and
8 the current block, and it's the same evidence from
9 paragraph 30 of Walker and 60 of Walker on slide 145 talking
10 about the 8-bit luminance and the 8-bit chrominance R and
11 chrominance B, and this is shown in table 4. The equation
12 above, pred0, pred1, referring back to the original integers
13 that it emanates from, that's to the result of the
14 interpolated pixel.

15 And then those were at 8 bits resolution. And
16 that is the first precision, just like it was on the encoder
17 side.

18 Q. Okay. Dr. Schonfeld, marching forward, can you
19 please provide your opinion on limitations 25[C] and [D]
20 compared to Walker?

21 A. Sure. So, again, this requires a first and
22 second prediction at the higher precision, a second
23 precision. The prediction in the case of Walker is pred0,
24 wA shifted to the right by 6, and pred1, wB shifted to the
25 right by 6. And those have a value corresponding to 17 bits

1 for each of them.

2 And so now we get 17 bits, which is obviously
3 higher than the 8 bits we had earlier, and so that's a
4 second precision higher than the original 8 bits.

5 Q. And, Dr. Schonfeld, can you take us through your
6 opinions on limitations 25[E] and [F] compared to Walker?

7 A. Sure. So, again, 25[E] is the combined
8 prediction. We see it up on top in yellow, combining the
9 two predictions that we spoke about.

10 And then 25[F] is a decrease of precision by
11 shifting of the combined prediction to the right. And
12 that's highlighted in red, both in the equation by shifting
13 to the right by 8, again, the shift to the right by 8 is
14 with these two caret signs, which are 2 greater than signs.
15 People refer to it in different ways in different
16 environments, so I just say both to make sure it's not
17 confusing.

18 And you can see it's shifted to the right by 8.
19 And as a result, we went down in precision from 19 bits all
20 the way down to 11 bits.

21 Q. And, finally, Dr. Schonfeld, can you compare --
22 provide your opinion on Walker and limitation 25[G]?

23 A. So limitation 25[G] simply requires
24 reconstructing a block of pixels based on the combined
25 prediction. And you can see in Walker, in paragraph 111, it

1 describes -- sorry, paragraph 35 -- it describes a combined
2 weighted prediction leading to a reconstructed macroblock.
3 And the same thing is described in paragraph 111, talking
4 about the output picture.

5 And you can see it clearly in Fig. 8. Figure 8
6 is a schematic diagram of Walker on the decoder side, and it
7 shows the combined prediction that these are the left
8 portion, the red lines merging together at the plus sign,
9 865 in Fig. 8 on slide 148, and it is shifted to the right
10 at 870. And then this is combined at 885 with the
11 reconstruction of the residual block to provide the output
12 on the right-hand side at 825.

13 Q. With that, Dr. Schonfeld, have we walked through
14 effectively your opinions from the 1380 investigation with
15 respect to these claims?

16 A. With respect to these two independent claims,
17 that's correct.

18 Q. And based on that evidence and opinions in the
19 1380 investigation, what was the outcome?

20 A. In the previous investigation, Judge Elliot found
21 both of them to be invalid.

22 Q. Dr. Schonfeld, can we now move on to apparatus
23 claims 8 and 26, the dependent claims?

24 A. Sure.

25 Q. And can you provide your opinion as it was in the

1 1380 investigation regarding how Walker disclosed the first
2 portion of claim 8 and 26?

3 A. So the first portion of claim 8 and 26 both
4 require that in an instance in which the first motion vector
5 points to a subpixel, and as I mentioned earlier, you can
6 either point to an integer or to a subpixel, and so in the
7 case of Walker, once again, paragraph 111 talks about the
8 fact that you can point to a pixel or an interpolated pixel,
9 and I said you have a choice.

10 For claim, 8 you no longer have the choice. You
11 had the choice for the independent claim, which is no longer
12 asserted, but now for claim 8 you no longer have the choice.
13 You still have the choice for the second prediction, but not
14 for the first one.

15 And this is also described in paragraph 114, and
16 it is depicted in Fig. 9 on the right, and you can see the
17 half pixel resolution in blue with small -- in small blue
18 squares with lowercase letters. Those would be the half
19 pixel that are obtained and are used for the purpose of the
20 first prediction in claim 8.

21 Q. Turning from slide 150 to 151, what's your
22 opinion with regards to Walker and disclosing the second
23 portion of claims 8 and 26?

24 A. So the second portion requires that the said
25 first prediction is obtained by interpolation using pixel

1 values of the first reference block.

2 And this is exactly what Walker describes. It
3 describes a traditional interpolation filter, where you do
4 pixel interpolation as described in paragraph 111 on
5 slide 151.

6 And he describes in particular half pixel
7 interpolation. And you can see in Fig. 8 -- we saw it in
8 Fig. 9 before with the small squares, and Fig. 8
9 specifically shows where the pixel interpolation is
10 performed. It's box 835 in Fig. 8. That's where the pixel
11 interpolation is performed on the decoder side.

12 Q. Dr. Schonfeld, what are the differences, if any,
13 between the language in claim 8 and the language in
14 claim 26?

15 A. The only difference is the fact that one is a
16 dependent claim of an encoding claim and one is a dependent
17 claim of a decoding claim.

18 Q. And is claim 8 the encoding claim and claim 26
19 the decoding claim?

20 A. That's correct.

21 Q. And can you remind us, what was the outcome in
22 the 1380 investigation with respect to the decoding claim?

23 A. So with the decoding claim, with the Fig. 8 I
24 just described, Judge Elliot found that the decoding
25 dependent claim was invalid. That's claim 26 as shown over

1 here on slide 152 from RX-1945.

2 Q. And I think we covered this earlier, but did
3 Judge Elliot make the same finding with respect to the
4 encoding claim given the overlap in language?

5 A. No, he did not. He ruled that claim 8 was not
6 found to be invalid.

7 Q. Okay. And can you just remind us exactly how
8 that happened?

9 A. So, as described over here in slide 153, he
10 stated that Dr. Schonfeld has shown it would have been
11 entirely reasonable and the difference between the claim and
12 the prior art is almost negligible, and the motivation is
13 present, but Schonfeld did not opine regarding any
14 expectation of success, and his otherwise well-supported
15 opinion is undermined by the lack of evidence on the level
16 of ordinary skill.

17 Q. Was he looking to see more evidence of the
18 encoder operations on the -- sorry -- the interpolation
19 operations on the encoder side?

20 A. Yeah. He was looking for evidence that the
21 person of ordinary skill would have found it -- would have
22 had a reasonable expectation of success to bring in the same
23 interpolation filter from the decoder and apply it on the
24 encoder.

25 Q. Okay. If we look at where we stand at the

1 moment, and based on the analysis you offered in the 1380
2 investigation, where does that leave us with respect to the
3 claims that are asserted in this case?

4 A. So, in my view, I've just shown the same evidence
5 I presented in the 1380 investigation, which in my view is
6 sufficient to find claim 1, claim 7, claims 19 and 20,
7 claims 25 and 26 have all -- are all invalid based on the
8 information I showed in the previous investigation, but
9 claim 2 and claim 8 would be insufficient under Judge
10 Elliot's ruling based on the reasonable expectation of
11 success based on the evidence I've shown so far.

12 Q. Probably we're not surprised that here today you
13 may have some evidence that will address those gaps that
14 were left from the 1380 investigation; is that fair?

15 A. That is my intention.

16 Q. Looking back at the 1380 investigation, was there
17 more you could have done to have filled those gaps and
18 perhaps we might not be here today?

19 A. Yeah, there are quite a few more things I could
20 have done. In retrospect, I regret not doing it, but I hope
21 to address them today.

22 Q. So are you going to offer just enough additional
23 evidence required to prove the encoding claims invalid?

24 A. No. My plan is to offer a little bit more than
25 necessary or a lot more than necessary to make sure I don't

1 make the same mistake twice.

2 Q. Okay. Let's turn now to slide 156.

3 And can you remind us of what were the
4 shortcomings that Judge Elliot identified in his 1380 ID?

5 A. Well, the first one was that I didn't present a
6 level of ordinary skill in the art sufficiently well and, in
7 particular, to address how it would affect the reasonable
8 expectation of success.

9 Q. And can you remind us -- I believe we visited
10 this earlier -- what is the level of skill in the art that's
11 being applied in this case?

12 A. So it's an undergraduate degree in a technical
13 field, like electrical engineering or computer science, and
14 then at least two years under both proposed constructions of
15 practical experience in either video and/or image processing
16 or coding or just video decoding or encoding technologies,
17 and additional education could substitute for work
18 experience and vice versa.

19 Q. In the previous case, Dr. Schonfeld, did Judge
20 Elliot find there was sufficient evidence of the claimed
21 interpolation aspects on the decoder side?

22 A. That's correct. He found that it was invalid in
23 the decoder, that there was sufficient evidence on the
24 decoder side, but it was absent on the encoder side.

25 Q. Can you explain to us why is it that a person of

1 skill in the art would have had a reasonable expectation of
2 success with respect to using Walker's disclosed methods of
3 interpolation also on the encoding side?

4 A. As I presented earlier, when it comes to getting
5 the motion vector, you need to make sure you have the same
6 motion vector on both sides. If you have an interpolation
7 filter on the decoder side, you better have the same exact
8 interpolation filter on the encoder side or else it's not
9 going to work.

10 So from the perspective of a person of ordinary
11 skill in the art, if they hear that there is an
12 interpolation filter in either encoder or the decoder, we
13 usually don't even have the conversation about what happens
14 on the other side outside of a court, but we usually
15 assume -- not assume -- we know it's on the other side.

16 Q. Turning to slide 158, Dr. Schonfeld, can you
17 remind us what was the evidence that you did point to in the
18 1380 investigation with respect to claim 8 and the
19 interpolation?

20 A. So I pointed to Fig. 8, which is on the decoder
21 side, and the pixel interpolation 835, and then in
22 paragraphs 114 -- 111 and 114, I talked about the fact that
23 there is an interpolated pixel or interpolated or half pixel
24 description. And then to the extent it's only available and
25 only shown schematically on the decoder side in Fig. 8, I

1 said that the person of ordinary skill would have known that
2 it must be on the encoder side, and I left it pretty much at
3 that level.

4 Q. Was there something else that you could have
5 pointed to in Walker to show the same interpolation process
6 was happening on the encoder side?

7 A. Yeah. And this is a -- this is a mistake of mine
8 that I particularly regret, because the exact same evidence
9 in paragraph 111, where it says, underlined in red,
10 interpolated pixel, up above it specifically says an encoder
11 can perform pixel interpolation. And I simply did not
12 underline it, and I did not talk about it during the
13 proceeding.

14 Q. With that, have you fully addressed at least the
15 concerns or issues that Judge Elliot raised in his ID from
16 the 1380 investigation?

17 A. I believe that that should be sufficient to
18 address it and it goes beyond what I provided in the
19 previous investigation.

20 Q. And assuming that you've adequately addressed
21 those shortcomings here today, where does that leave us with
22 respect to the claims asserted in this case should we agree
23 with Judge Elliot findings?

24 A. If we agree with Judge Elliot's findings and if
25 we agree with my additional evidence that I just provided

1 now, as it relates to the encoding side of the interpolation
2 filter, that should be sufficient to invalidate all of the
3 asserted claims in this case.

4 Q. Now that you have addressed the 1380
5 investigation gaps, I'll call them, do you plan to stop
6 there?

7 A. No. I feel like I need to do a little bit extra
8 to make sure I don't get on the wrong side of the law again.
9 And so I'm going to take another reference and look at this
10 issue from scratch.

11 Q. Turning to slide 162, what do we see here,
12 Dr. Schonfeld?

13 A. This is the Srinivasan reference. It's a
14 publication, a patent publication, a patent from 2009.

15 Q. And is the Srinivasan reference RX-2024?

16 A. That's correct.

17 Q. Can you tell us what is Srinivasan directed to at
18 a high level?

19 A. So, again, it's about encoders and decoders.
20 It's the same field. It talks about having rounding errors
21 and how to deal with them in the context of interpolation
22 filters and, in particular, the approach is to do shifting
23 at a later stage.

24 And so it provides right shifting is deferred to
25 a later stage, as described in slide 163 in column 6, column

1 16, and column 14.

2 Q. Now, Dr. Schonfeld, can you just walk us through
3 the relevant Srinivasan disclosures?

4 A. Sure. So here we see on slide 164, Fig. 14 on
5 the left is a multistage interpolation filter. Instead of
6 going through it once, it goes through multiple times. As
7 you can see on the top left, it has X bit range. That's the
8 precision of the input. And it keeps on going where the
9 precision keeps staying high all the way through even until
10 the very end.

11 And it talks about in the right-hand side, in
12 columns 9 and 19, about the fact that this is applied for
13 bidirectional prediction, and the idea is to use the highest
14 possible accuracy for as long as possible.

15 If you go on to the next slide, slide 165, it
16 actually provides the interpolation filter equation up on
17 the top left, from column 19, line 7. This is how the
18 interpolation between the pixels is performed.

19 And this is described in the abstract where he
20 talks about subpixel samples in the context of multistage
21 interpolation.

22 And then Fig. 9, once again, on the right-hand
23 side from Srinivasan, it shows the original integer pixels
24 that are shown in circles that are filled, and all of the
25 empty circles are the fractional pixels in between them. It

1 actually goes through, in this case, half pixel as well as
2 quarter pixel representation.

3 And if you go to the next slide, slide 166, it
4 talks about the fact that the output can either be the
5 original input precision of X bits or higher, X plus 1, and
6 that this is just one example.

7 And in particular it talks about the fact that
8 the output values of the last stage can have a bit-depth
9 that can be extended arbitrarily. This is from column 20 on
10 slide 166 of Srinivasan. And then at the very end it also
11 says that the dynamic range can have different bit-depth.

12 So it allows for a lot of flexibility in terms of
13 how high the precision should be at the very end of the
14 interpolation filter.

15 Q. Dr. Schonfeld, if we go back to slide 165
16 briefly, is this an example of the type of encoder side
17 interpolation that Judge Elliot was looking for more of in
18 the 1380 investigation?

19 A. Yes. As it says here, it's both a video encoder
20 or decoder. So this is used in both and this is expressly
21 disclosed in Srinivasan.

22 Q. Dr. Schonfeld, is it your opinion that a person
23 of skill in the art would have been motivated to combine the
24 Walker and Srinivasan references?

25 A. In my opinion they would have, yes.

1 Q. Can you walk us through each of your reasons for
2 that opinion?

3 A. So initially they are both in the same field,
4 both relating to video data encoding and decoding.

5 And if you go -- this is on slide 167. If you go
6 on to slide 168, they both address the issues of
7 bidirectional prediction and high precision. And this is --
8 you can see both Walker Fig. 9 and Srinivasan Fig. 9.
9 Fig. 9 is just a coincidence obviously.

10 And then in the next slide, slide 169, you can
11 see both Walker and Srinivasan want to be able to apply
12 their ideas to multiple different types of video decoding
13 standards, such as -- that are quite similar, WMV9 and 8
14 respectively, MPEG-4 in both cases and H.263 and H.264.

15 And then on the next slide, 170, you can see that
16 they both want to improve the coding efficiency by both
17 using combined interpolation and doing it at high precision.
18 And so Walker describes the fact that in paragraph 111 it
19 can perform pixel interpolation and the -- do pixel or
20 interpolated pixel.

21 And the same thing in Srinivasan, talking about
22 encoder and decoder can perform interpolation with a
23 rounding error is dealt with by right shifting deferred
24 until the very -- until much later stages.

25 And then, finally, in slide 171, in my opinion a

1 person of ordinary skill in the art would have had a
2 reasonable expectation of success in combining the two,
3 because they both address interpolation, which was
4 well-known. It was part of the video compression standards
5 since MPEG-2 at least -- MPEG-1 actually.

6 And in the case of Walker and Srinivasan, they
7 both -- they both teach interpolation, which was used in the
8 prior art methods.

9 Their techniques involve very similar type
10 filters. Walker specifically says you can use many other
11 filters.

12 And, finally, they both implement teachings of
13 bidirectional prediction in this context.

14 Q. And with that, Dr. Schonfeld, turning to slide
15 172, what does the combination of Walker and Srinivasan
16 cover with respect to claim 8?

17 A. So in my opinion, if you recall claim 8 was the
18 encoding side pixel interpolation for a subpixel resolution
19 of the motion vector, and Walker actually does expressly
20 disclose it in the line that I did not opine on in the 1380
21 investigation, but Srinivasan, just to make sure, really
22 discloses it over -- in a lot of detail in the same context
23 of keeping the resolution high on both the encoder and
24 decoder and deferring shifting until later, as described in
25 slide 172.

1 Q. Now, Dr. Schonfeld, you now believe you've
2 provided multiple theories to account for the gap that Judge
3 Elliot identified in the evidence from the 1380
4 investigation?

5 A. I provided -- that's correct. I provided several
6 different explanations and hopefully addressed the issue
7 properly this time.

8 Q. Okay. Can you actually just summarize the
9 various theories that you've presented now to try to account
10 for the shortcoming from 1380?

11 A. Yeah. So one theory is I provided the better
12 motivation to bring in the information from Walker from the
13 decoder side to the encoder and explaining why a person of
14 skill would have found it -- would have had a reasonable
15 expectation of success.

16 I secondly combined Walker and Srinivasan to do
17 just that.

18 And, finally, I pointed to the fact that in
19 Walker, in the same paragraph I displayed but didn't talk
20 about, the right portion of that paragraph, Walker expressly
21 discloses the fact that the interpolation is also done on
22 the encoder.

23 Q. Now, does Nokia offer a new construction here in
24 this case that they have offered only after the outcome of
25 the 1380 investigation?

1 A. Yeah, Nokia did propose a new construction for
2 precision in this case.

3 Q. And can you summarize the various constructions
4 that are at issue here?

5 A. Yeah. So there are three different
6 constructions. They are all quite similar, especially the
7 bottom part of Nokia, the "for example" part. Respondents'
8 construction and Staff's are quite similar. There are
9 little differences between them. And then the first part of
10 Nokia is quite a bit different.

11 Respondents' construction is the closest to the
12 language used in the 1380 investigation, but it's very
13 similar to Staff's and Nokia's bottom part. And then the
14 major difference is in the first part of Nokia's proposed
15 construction.

16 Q. Dr. Schonfeld, in your opinion is the '267 patent
17 invalid regardless of which construction is ultimately
18 adopted?

19 A. In my opinion, it is, yes.

20 Q. And did your analysis that you've presented so
21 far account for the Respondents' proposed construction?

22 A. It did.

23 Q. Do you plan to provide some additional testimony
24 to account for the other proposed constructions?

25 A. Yes, I do. I plan to particularly address

1 Nokia's proposed construction, because that's the biggest
2 difference, and in the process of addressing Nokia's
3 proposed construction, it will address any differences
4 between Nokia, Respondents, and Staff in the process of
5 doing so.

6 Q. Dr. Schonfeld, what is the sort of key
7 distinction between the various constructions that we see
8 here on slide 175?

9 A. So the bottom portion of Nokia, Respondents, and
10 Staff all deal with the number of bits needed, either to
11 represent possible values or to represent each possible
12 distinct alternative.

13 The major different with Nokia is the first part
14 states that it's a measure of the number of distinct
15 alternatives from which a value can be determined.

16 Q. Now, turning to slide 176, does Nokia agree that
17 the excerpts that you've identified from Walker satisfy
18 Nokia's construction of precision for claim 7[C] and [D]?

19 A. They do not.

20 Q. And what is their position?

21 A. Their position is that when you apply a weight to
22 a value like pred_0 , w_0 is fixed, and, therefore, it doesn't
23 change the number of possible values it can get after you
24 multiply it. It only scales them so they may be further
25 apart, but the number of alternatives remains unchanged.

1 Q. And do you have a response to Nokia's argument?

2 A. I do.

3 Q. What is that?

4 A. So even accepting Nokia's proposed construction
5 or accepting Nokia's proposed construction, I disagree
6 because, as Walker itself shows in slide 176, in the Table 1
7 from paragraph 68, the weights have a wide variance. They
8 can take on values of minus 128 to plus 127. So each block
9 is very likely to have very different values of weights.
10 And so you are going to get many different type of
11 alternatives as a result of multiplying by this particular
12 weight.

13 And so as a result, in my opinion, it meets their
14 construction in the sense that it provides for more
15 alternatives than you had prior to the multiplication by the
16 different weights.

17 Q. And we're looking at information concerning the
18 encoding side.

19 Turning to slide 177, can you discuss your
20 opinions with respect to the decoding side?

21 A. So, once again, on the decoding side, you have
22 slide 177, and it shows the equations with w_A , w_B . And
23 Nokia, as I understand it, asserts the same thing for the
24 encoding and decoding.

25 Here on the decoding side we saw earlier Fig. 8

1 from Walker on slide 177. And it specifically says in the
2 highlighted yellow box on the bottom left of Fig. 8, 852, it
3 says modify weights.

4 And so, as you modify the weights, you change the
5 different weights, it increases the number of alternative
6 possible values that can be realized and, therefore, it
7 meets Nokia's proposed construction.

8 Q. Dr. Schonfeld, even if we were to assume that
9 multiplying weights would not satisfy Nokia's construction,
10 is there anything else in Walker you can point us to?

11 A. Yeah. We spoke about Walker teaching the
12 interpolation filter. And I pointed to the prediction, the
13 value pred0 times w_A .

14 But in the case where Walker teaches an
15 interpolation filter, which would increase the precision,
16 because, for example, Walker teaches in paragraph 114 that
17 other pixel interpolation methods could be used, in that
18 case, you could have pointed to the pred0 without reference
19 to the weight, and you would have had something that would
20 have met, according to Nokia itself, their own construction,
21 because this is exactly what they applied for infringement
22 purposes. They said the output of the interpolation filter
23 meets Nokia's proposed construction, and, therefore, that
24 would apply as well.

25 So in that case it would be a situation where you

1 would take the teachings of Walker, apply an interpolation,
2 which would increase the precision at the output of the
3 interpolation filter, and you would use that as your
4 prediction, and ignore the further multiplication by an
5 additional weight.

6 Q. Dr. Schonfeld, if I understand you correctly, if
7 Nokia is going to dispute that the first prediction and
8 second predictions that are the interpolated pixels, if
9 those are not predictions, does Nokia's infringement case
10 fall apart?

11 A. If they apply the same theory for infringement
12 and invalidity, either they are both -- either both are met
13 for this limitation or both fail. They cannot -- it cannot
14 be different because it's exactly the same mapping.

15 Q. And, Dr. Schonfeld, what if we look to the Walker
16 plus Srinivasan combination, does that also account for
17 Nokia's proposed construction?

18 A. It does and in exactly the same way. Here I'm
19 doing the same mapping again, but instead of relying on
20 Walker alone, I'm relying on the teaching of Srinivasan.
21 And this is on slide 179.

22 And if you recall, in my background of
23 Srinivasan, I showed the actual filter equation. That
24 filter equation would result in a higher precision,
25 according to Nokia, under their own construction. And it

1 says so right here in Srinivasan, that you increase the
2 precision at the output of the interpolation filter either
3 by, one, as an example, or much more, because it can be
4 extended arbitrarily as shown in Srinivasan in column 20 on
5 slide 179.

6 Q. So, Dr. Schonfeld, like the 1380 investigation,
7 we have to assume that Nokia does not agree its patent is
8 invalid.

9 Is that fair?

10 A. That's fair.

11 Q. And can you walk us through Nokia's disputes with
12 your invalidity opinion?

13 A. Sure. So the first one is Nokia argues that
14 Walker's weighted predictions are not predictions. In
15 particular, this is a citation to RX-2667, which is the
16 product of prediction and the weight in this context as a
17 value without any direct physical significance.

18 This is essentially the same argument that they
19 made in the 1380 investigation, that is, the weighted
20 prediction is no longer a prediction. That's how I
21 interpret this argument.

22 And I disagree with it, because this was
23 addressed previously in the previous 1380 investigation.

24 Q. In the 1380 investigation, did Judge Elliot
25 specifically reject that particular argument?

1 A. He did, based on the evidence, part of which I
2 showed over here, the fact that the dependent claims do
3 exactly the same thing, they multiply by a weight through a
4 right shift. And Judge Elliot did reject this argument.

5 Q. What is Nokia's second argument?

6 A. The second argument is that the best matching
7 macro blocks do not consist of pixels from the reference
8 picture and, in particular, that they are determined
9 according to a fractional motion vector and not to the
10 original reference pixel.

11 Q. And, in your opinion, Dr. Schonfeld, is that a
12 valid argument that should preserve the '267 patent's
13 validity?

14 A. Not in my view, because when I pointed to the
15 motion vectors, I was pointing to the motion vectors, but
16 the underlying reference block remains the same, original
17 reference block at the original resolution, and therefore I
18 disagree with that conclusion. And I think -- so I disagree
19 for that particular reason.

20 Q. And, Dr. Schonfeld, what is Nokia's third
21 validity argument?

22 A. The third argument is that the pred0 w0 and pred1
23 w1 do not -- they do not change the precision under any of
24 the proposed constructions, Respondents', Staff's, or
25 Complainants'.

1 Q. Dr. Schonfeld, for starters, does that gripe make
2 any sense to you if we're applying Respondents'
3 construction?

4 A. No. That issue was addressed directly in Walker.
5 It specifically provides a number in the table that we
6 talked about earlier, and you can see it in Table 2 from
7 Walker.

8 And then, in particular, that is a ruling that
9 Judge Elliot already provided on this issue, and he
10 disagreed as it relates to Respondents' construction.

11 Q. And are there any other reasons you believe that
12 Nokia's third argument is not valid?

13 A. Yeah. Essentially this is the same issue I just
14 addressed when I talked about the new proposed construction,
15 and I gave my reasons, and they were three separate reasons.

16 One is it does meet it under the new construction
17 because the weights can change, as Walker makes clear.

18 Secondly, in the alternative, Walker can -- I can
19 point to Walker with a prediction interpolation filter that
20 does increase the precision and I could have pointed to that
21 as a prediction, which would have been identical to their
22 infringement theory.

23 And, thirdly, could I have done exactly the same
24 thing in the combination with Srinivasan.

25 Q. Speaking of the Srinivasan combination, what is

1 Nokia's fourth validity theory?

2 A. In this case Nokia argues that the extra bit
3 example that I said, extra X plus 1, is not an additional
4 precision bit. It's a sign bit that's used for underflow or
5 overflow. And that there is clamping at the end where the
6 final 8-bit values are back at the end of Srinivasan.

7 Q. And what is your response to this particular
8 argument?

9 A. So in response to this particular argument, I
10 have a couple of different responses.

11 One is this is pointing to a different embodiment
12 from the embodiment I'm relying on for the purpose of my
13 combination.

14 Secondly, I'm relying on a specific teaching in
15 Srinivasan for just doing the bidirectional prediction and
16 providing a higher precision at the end, and I'm not relying
17 on the entirety of Srinivasan.

18 Q. So effectively is this counterargument saying
19 that you needed to take everything from every embodiment in
20 Srinivasan to make your combination and you were not
21 permitted to grab certain concepts from particular
22 embodiments for that combination?

23 A. That's my understanding of the criticism in this
24 case.

25 Q. What is your -- what is Nokia's final rebuttal to

1 your invalidity theories?

2 A. That my motivation to combine was generic.

3 Q. And did you already explain to us previously in
4 detail the basis for your motivation to combine Walker and
5 Srinivasan?

6 A. I did. And I think it's as thorough as I know
7 how to do it, which is -- it's in the same field. It's
8 addressing the same problem in the same way. They are
9 designed to work with the same standards. And a POSITA
10 would have had a reasonable expectation of success because
11 of all of these -- because of the teachings of both which
12 align themselves with each other.

13 Q. Okay. Dr. Schonfeld, I want to have a brief
14 discussion now about noninfringement with respect to the
15 '267 patent.

16 And turning to slide 192, can you describe for me
17 what is the particular claim limitation that we're going to
18 discuss for this portion?

19 A. Sure. So this applies to all of the asserted
20 claims, because it applies to all of the independent claims,
21 which require decreasing the precision of the combined
22 prediction through a right-shifting operation.

23 Q. To be clear, Dr. Schonfeld, were the specific
24 noninfringement opinions we're about to discuss at issue in
25 the 1380 investigation?

1 A. They were not.

2 Q. So when we're looking to the accused products,
3 what literally are we trying to find in order to assess
4 infringement of these limitations?

5 A. We are looking for a shifting operation, for
6 example, those double or triple carets or double or triple
7 greater than signs. We're just looking for a shifting
8 operation.

9 MR. THOMPSON: At this point, Your Honor, I'm
10 about to get into some source code, and so I believe we need
11 to go on the third-party confidential record.

12 (Whereupon, the hearing proceeded in confidential
13 session.)

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1 O P E N S E S S I O N

2 BY MR. THOMPSON:

3 Q. Dr. Schonfeld, can you remind us of your primary
4 conclusions on the '207 -- sorry -- the '267 and '701
5 patents?

6 A. Sure. So with regard to the '701 patent, it's my
7 opinion that the '701 patent does not infringe the asserted
8 claims in terms of -- the accused products do not infringe
9 the asserted claims of the '701 patent and it does not
10 satisfy the technical domestic industry for the same
11 reasons.

12 And with respect to the '267 patent, in my
13 opinion the asserted claims are invalid, both based on what
14 I presented previously and the additional information I
15 presented and the additional evidence I presented today.

16 Q. Dr. Schonfeld, Complainants' counsel are highly
17 skilled attorneys and I expect they are going to get up here
18 and they are going to ask you whether you previously had
19 invalidity opinions for the '701 patent and more
20 noninfringement arguments for the '267 patent that were not
21 presented today.

22 Can you explain that?

23 A. I did have other opinions, but I decided not to
24 present them today.

25 Q. Why is that?

1 A. For two reasons. One is I wanted to be
2 deferential and respectful to the decision of Judge Elliot
3 in the previous investigation and not rehash issues he has
4 already ruled on.

5 And, secondly, in every dispute there are some
6 arguments that are -- where reasonable people can disagree
7 on where the line is a fine line, and I didn't think it's
8 needed. I felt that I could discard those, not present
9 them, and only present issues that, in my view, should be
10 without dispute.

11 MR. THOMPSON: No further questions, Your Honor,
12 right now. I'll pass the witness.

13 JUDGE MCNAMARA: Thank you, Mr. Thompson.

14 Mr. Cameron?

15 MR. CAMERON: Your Honor, Matthew Cameron. Would
16 now be a good time for the afternoon break?

17 JUDGE MCNAMARA: Sure. I'll see you back here --
18 and I'm sure Dr. Schonfeld could use it as well. I'll see
19 you back here in 15 minutes.

20 (Whereupon, the proceedings recessed at 3:25
21 p.m.)

22 (In session at 3:40 p.m.)

23 JUDGE MCNAMARA: Thank you, everyone. Please be
24 seated. Thank you.

25 MR. CAMERON: Your Honor, before I begin, just a

1 housekeeping matter. I'm going to be splitting this cross
2 with my colleague, Mitch Verboncoeur.

3 JUDGE MCNAMARA: Very good.

4 MR. CAMERON: Verboncoeur. My apologies.

5 JUDGE MCNAMARA: It is a question of a syllable.

6 MR. CAMERON: I have mispronounced his name for
7 years. I discovered just recently how to do it correctly.

8 JUDGE MCNAMARA: I am afraid we all do it
9 occasionally with one another.

10 MR. CAMERON: May I proceed, Your Honor?

11 JUDGE MCNAMARA: Yes, please.

12 CROSS-EXAMINATION

13 BY MR. CAMERON:

14 Q. Good afternoon. I don't believe we've been
15 formally introduced, but my name is Matthew Cameron, and I
16 represent Nokia in this matter.

17 A. Very nice to meet you.

18 Q. I'm going to ask you a few questions about the
19 '701 patent, if that's all right with you?

20 A. Of course.

21 Q. Before I start, I wanted to ask you about
22 something I heard you say on direct.

23 During your direct testimony, you indicated that
24 the transform coefficient coding technology that Nokia has
25 accused of infringement has nothing to do with switching

1 between context updating and bypass mode; is that correct?

2 A. I don't recall exactly how I said it, but what I
3 was pointing to is the fact that the first 8 coefficient
4 division and the second 8 coefficient division has nothing
5 to do with whether you context update or bypass.

6 Q. So before the threshold, after the threshold,
7 that has nothing to do with whether you're going to use
8 context updating or bypass, fair?

9 A. That's correct.

10 Q. Okay. I want to ask you about one of your
11 slides.

12 Mr. Moreno, would you please pull up RDX-5.97?

13 Dr. Schonfeld, this is one of the slides you
14 presented during the hearing, correct?

15 A. It's the Qualcomm's -- Qualcomm's proposal at the
16 meeting. I did present it, yes.

17 Q. And this proposal during the meeting relates to
18 the technology that was adopted into the standard that Nokia
19 has accused of infringement, correct?

20 A. Well, this proposal eventually led to something
21 that was adopted. I'm not sure at what stage the proposal
22 was in, but the proposal that Nokia ultimately provided in
23 terms of separating the greater than 1 coefficient for the
24 first 8, that part was adopted. Other things within the
25 proposals were not adopted.

1 Q. Okay. Dr. Schonfeld, you highlighted in yellow
2 the first two bullet points. Do you see that?

3 A. I do.

4 Q. You did not highlight the third bullet point,
5 correct?

6 A. I did not highlight the third bullet point, no.

7 Q. And do you see that, as part of this proposal,
8 the contribution is stating early switch. And then what is
9 that term right there? How do you pronounce it?

10 A. It's the Golomb-Rice coding. It has to do with
11 the way in which you binarize.

12 Q. Okay. Early switch to Golomb-Rice bypass code.
13 Do you see that?

14 A. I do.

15 Q. And if we could please turn to slide 96, RDX
16 slide 96.

17 Here we have the Qualcomm proposal that you
18 pointed to again, correct?

19 A. I pointed to this slide, yes.

20 Q. And, once again, you didn't highlight anything
21 dealing with that Golomb-Rice bypass mode, right?

22 A. I did not.

23 Q. And if you look at it, do you see where it states
24 in the sentence directly above the one you've highlighted
25 that you're switching to Golomb-Rice bypass mode coding for

1 the remaining level?

2 A. I do see that, yes.

3 Q. Okay. And do you agree that the threshold of 8
4 is related to that switch?

5 A. I don't remember the relationship of 8 to that
6 switch, but there might be a relation, but the Golomb-Rice
7 coding is about binarization, nothing to do with context
8 update.

9 Q. Sir, your testimony is that statement in
10 Qualcomm's proposal is only about binarization, it has
11 nothing to do with bypass mode?

12 A. Well, I don't -- I didn't look at this particular
13 aspect of it, but I can -- what I'm saying is that
14 Golomb-Rice coding is the method by which the standard takes
15 something like the remainder level and parses it into binary
16 bins, and then it decides to bypass each of the binary bins.

17 So I don't know if this is exactly talking about
18 the same thing or not, but to the extent it is, that's not
19 context update.

20 Q. You're speculating as to what it's talking about,
21 fair?

22 A. Yes, because you're asking me to speculate about
23 what it's talking about, so I am.

24 Q. And you can agree that it states "bypass mode."
25 Do you see that?

1 A. I do see that, yes.

2 Q. Okay. I want to ask you a little bit how this
3 switching process works in the transform coefficient coding
4 process, and to do that I'm going to switch over to the
5 document camera and ask you a few questions about one of
6 your slides.

7 So do you see that I've put on the ELMO one of
8 your slides, RDX-5.89?

9 A. I do see that, yes.

10 Q. And do you see that you've separated it between
11 non-zero transform coefficients before the threshold of 8
12 and non-zero transform coefficients after the threshold of
13 8?

14 A. Correct.

15 Q. And I apologize for this, but I'm going to ask
16 you to do a little bit of math. Is that all right?

17 A. We'll see.

18 Q. All right. What I want you to do is, I want you
19 to assume that we are going to code a transform level of 2
20 and we're going to assume that we're coding the transform
21 level of 2 both before the threshold and after. Okay?

22 A. Sure.

23 Q. How would you code the transform level of 2
24 before the threshold?

25 A. It would depend on whether there was a greater

1 than 1 before that or not.

2 Q. I'm saying before the threshold of 8.

3 A. I know. It still depends on whether there was a
4 previous greater than 1 true value or not.

5 Q. Okay.

6 A. In other words, the greater than 2 flag would or
7 would not come into play depending on whether this was the
8 first time it's a greater than 1 value or not.

9 Q. Okay. In your slide, you've depicted that the
10 greater than 2 flag is still being used. Do you see that?

11 A. It's available before 8 and it is not available
12 after 8, but it may not be available even before 8.

13 Q. I want you to assume for purposes of our
14 discussion that it's available before 8, okay?

15 A. For this particular coefficient, whatever it is.

16 Q. Yes, sir.

17 A. I understand.

18 Q. And just so we're clear, you understand that this
19 greater than 2 flag is not what we are accusing in this
20 case, right?

21 A. I'm not so sure I agree with that, because you
22 are accusing the non-zero coefficients and the symbols
23 corresponding to them, which include the greater than 2
24 flag. So I know that you are ignoring it for the purpose of
25 certain limitations, but I don't see how it's consistent

1 with your theory. So I don't agree with your statement.

2 Q. Okay. Let's code this coefficient level of 2,
3 okay? Walk me through it. What value should I put for each
4 of these five syntax elements?

5 A. So, again, if we are assuming that it's the first
6 time that there was a coefficient greater than 1, then you
7 would put significant coefficient flag, you would say 1, and
8 then greater than 1 you would say 1, greater than 2 you
9 would say 0, remaining would be 0.

10 Q. That's because it's positive, right?

11 A. No, that's because we know that it was greater
12 than 1, so it has to be at least 2.

13 Q. My apologies. The coefficient sign flag would be
14 0, right?

15 A. I'm sorry?

16 Q. The coefficient sign flag would be 0, correct?

17 A. The sign flag would be -- yeah, the sign flag
18 would be 0 because it's positive.

19 And I should say one more thing. We are assuming
20 that greater than 1 flag was not ever greater than 1 before,
21 so the greater than 2 flag is used. We also have to assume
22 that this is not the first significant coefficient, which is
23 1, or else you don't send the 1 on top, because you get the
24 coordinates for the first one and so you don't send the
25 first one.

1 So there are a couple of different things that
2 HEVC does or H.265 does that may change what happens here in
3 different -- for different coefficients.

4 Q. Okay.

5 A. So we have to assume that it's not the first
6 non-zero coefficient and it's a first non-zero coefficient
7 that is bigger than 1.

8 Q. Okay. Now I'd like to move on to what happens
9 when you have greater than 8 non-zero coefficients, and,
10 again, we're going to code the same value of 2. Walk me
11 through the process.

12 A. So in this particular case, it will be 1 for the
13 significant coefficient, and then it will be 1 for the
14 remaining, and then it will be -- coefficient sign flag
15 would be 0 again.

16 Q. And we don't use the greater than 1 flag or the
17 greater than 2 flag at all, right?

18 A. Right. And we also have to make additional
19 assumptions here, such as we have to make sure that this
20 coefficient is not the last coefficient, the 00 or DC
21 coefficient, or else we don't send the sign flag either,
22 because we know it's going to be positive. So you have to
23 almost treat every coefficient separately because different
24 things get sent or not sent depending on which coefficient
25 it is.

1 Q. Okay. Well, I just had you walk me through it,
2 and this is the result of our discussion with all the
3 assumptions you've made, right?

4 A. This is a particular case where this happens. In
5 other cases it will happen differently for the same numbers.

6 Q. And I wanted to ask you about this 1. So before
7 we have -- before the threshold, we're coding a value of 1
8 in the greater than 1 flag, right?

9 A. That's right.

10 Q. And then after the threshold, the value that
11 would have been coded as greater than 1 ends up in the level
12 remaining flag, correct?

13 A. That's not how it works, but -- you can say it,
14 but it's not the mechanism. They are treated completely
15 differently. They are different syntax elements, different
16 algorithms. You can do this if you want to, but it has no
17 relevance to what happens.

18 Q. Well, sir, you just said they are coded
19 differently, and that's what I want to ask you about.

20 This 1, when its coded in the greater than 1
21 flag -- Dr. Chrissan referred to it as a bucket. Would you
22 characterize it as a bucket? Would that be fair?

23 A. Where is the bucket?

24 Q. That the greater than 1 flag is akin to a bucket,
25 that we have these five buckets that you use to calculate

1 the coefficient level.

2 A. It's a flag. It's a flag. The common term in
3 the field is "a flag."

4 Q. Okay. You code it as a 1, right?

5 A. Yeah.

6 Q. After the threshold, you take that 1 and you put
7 it into the level remaining bucket, fair?

8 A. Absolutely not.

9 Q. Look at the math.

10 A. You can put it anywhere you like, but they are
11 two different syntax elements, two different meanings. They
12 express different issues. So just because the math works
13 out like this doesn't mean -- doesn't mean it's sensible
14 from the point of view of the syntax and the standard.

15 Q. Okay. This greater than 1 flag is context
16 updated, right?

17 A. That's right.

18 Q. And so this 1 before the threshold is context
19 updated, right?

20 A. The 1 is context updated.

21 Q. Okay. After the threshold, it's now in this
22 level remaining bucket, right?

23 A. No.

24 Q. There is a 1 in the level remaining bucket that
25 wasn't there before the threshold. Do you see that?

1 A. It was not there for a different coefficient that
2 appeared before the threshold.

3 Q. With the same value, though, sir. They have the
4 same value.

5 A. Okay, that's fine.

6 Q. The 1 in the level remaining is bypass mode code,
7 correct?

8 A. The level remaining is always bypass mode, so the
9 1 is bypass.

10 Q. Okay. So on the left we have a 1 that's context
11 updated, on the right we have a 1 that's bypass coded,
12 correct?

13 A. We have a -- on the left we have a 1, 1 and a 0
14 that's context updated. On the right we have a 1 that is
15 context updated. On the left we have a 0,0 that's bypassed.
16 On the right we have a 1,0 that's bypassed. I don't quite
17 understand the question.

18 Q. Sir, you just said that this math is right. I
19 know you're quibbling with me about whether it satisfies the
20 claim language, but this is an accurate representation of
21 how a transform coefficient level of 2 would be coded before
22 the threshold and after, fair?

23 A. In my opinion, there is nothing fair about this
24 presentation because it's just representing as if the value
25 1 in one syntax element has something to do with the other

1 syntax elements. The way that they are coded is depending
2 on the syntax element. It was -- the bypass was bypass
3 before and it's bypass now.

4 So in answer to your question, is it fair? The
5 answer is no, I'm sorry.

6 Q. Do you remember in the Qualcomm presentation when
7 it discussed the early switch to bypass mode?

8 A. That's talking about something different, I
9 believe. We were talking about the Golomb-Rice code.
10 That's a different issue.

11 Q. My question was, simply, do you remember seeing
12 it in the presentation, yes or no?

13 A. I remember seeing the words "early bypass."

14 Q. And your testimony under oath is that the switch
15 we see here on the page has nothing to do with that.

16 A. My testimony is that the context update remains
17 context update despite -- regardless of whether it's in the
18 first coefficient, the 8th coefficient, or the 15th
19 coefficient, it's going to always be context updated.

20 And just like we see over here, the bypass of the
21 remaining remains bypass throughout. The fact that it has
22 different values in different -- it takes on different
23 values, that's not what the standard is about. The standard
24 is about how to code context update or bypass a particular
25 syntax element, and, as you can see, it never changes.

1 Q. Sir, you would agree there's a difference between
2 how transform coefficients are coded before the threshold of
3 8 and how they are coded after the threshold of 8, wouldn't
4 you?

5 A. Not in terms of context update. In terms of
6 which syntax elements are used, I would agree with that, but
7 not in terms of context update.

8 Q. And different syntax elements use different modes
9 of coding. Some use context updating, some use bypass,
10 correct?

11 A. And that's fixed, I agree.

12 Q. Okay. Now, I have several more sheets so we
13 could do more examples, but it would be fair to say that we
14 could pick other values and, again, we would see differences
15 between what you would put in the level remaining bucket
16 before the threshold and what you would put in the level
17 remaining bucket after the threshold.

18 A. And I'm sure we can do examples where it doesn't
19 match --

20 Q. Sure.

21 A. -- but I agree with you.

22 Q. Sure. For example, if we pick the value of 15 --
23 do you remember Dr. Chrissan showing an example of 15?

24 A. I don't remember, but I'll take your word for it.

25 Q. If we were to do that math again for 15, there

1 would be a difference between how it was coded before the
2 threshold and after, fair?

3 A. I don't know exactly what you mean, but -- I'm
4 not sure exactly what you are referring to.

5 Q. The level remaining bucket would have a different
6 value in it before the threshold than after, fair?

7 A. The level remaining bucket can take on the value
8 of the actual value either not being sent if the greater
9 than flags are 1 or being minus 1, minus 2, or minus 3,
10 depending on the circumstances.

11 Q. Sir, I just asked if the value of the level
12 remaining bucket would be different before the threshold
13 compared to after the threshold for a value of 15. You
14 would agree that it would be different, right?

15 A. No, I agree that we have to go through a series
16 of assumptions like the ones we did. You don't code it
17 based on -- either before or after. You decide the value --
18 the symbol values of the syntax elements only when you look
19 at the entire scan order. You cannot decide it based on the
20 number.

21 Q. Okay. Those assumptions you just discussed, you
22 didn't mention any of those on your direct, did you?

23 A. No, but I -- no, I did not mention those in my
24 direct.

25 Q. Okay. I'd like to ask you about another one of

1 your slides.

2 Mr. Moreno, would you please turn to RDX-5.17?

3 Dr. Schonfeld, you discussed this slide during
4 your direct, right?

5 A. Yes, I did.

6 Q. And the point you were making is that the five
7 syntax elements you've highlighted yellow are the only ones
8 that are relevant, right?

9 A. Well, they are the ones relevant to the non-zero
10 transform coefficient that Nokia alleges is the syntax
11 elements.

12 Q. And can we agree that a non-zero transform
13 coefficient is essentially separated into two or more of
14 these syntax elements and that's what's inserted into the
15 bitstream?

16 A. I wouldn't characterize it quite that way. I
17 would say it's transformed and it's generating all of the
18 syntax elements so that you can go back and recover the
19 original non-zero coefficients. If that's what you meant, I
20 would agree with that.

21 Q. Essentially that you have a non-zero coefficient,
22 and you use these five syntax elements together to recreate
23 whatever that transform coefficient level was?

24 A. Quite frankly, that's not sufficient. You need
25 other things. You need the coordinates of the first

1 non-zero coefficient, you need a few other things to really
2 get there, but this is part of it.

3 Q. Okay. And you highlighted the five at the
4 bottom, but you didn't say anything about residual coding
5 under the syntax structure. Do you see that?

6 A. Where are you looking at? I'm sorry.

7 Q. Towards the top of your chart, do you see
8 "residual coding" and then open parentheses?

9 A. Yeah.

10 Q. What's the relationship between residual coding
11 and transform coefficients?

12 A. Residual coding is the syntax structure related
13 to the syntax elements needed to code the residual.

14 Q. That's related to transform coefficients, right?

15 A. That is part of what residual provides, yes.

16 Q. I mean, during your direct you discussed residual
17 in connection with transform coefficients, fair?

18 A. There is a relationship between them. I don't
19 disagree with that.

20 Q. Okay. It's your position that residual coding or
21 transform coefficients aren't syntax elements. The only
22 things that are syntax elements are things to the right of
23 the syntax structure, so the specific values that have
24 underscores in them. Is that fair?

25 A. I would put it in my own words. The residual

1 coding is used to code things including the non-zero
2 transform coefficients, and in the process they generate
3 many syntax elements, including the ones listed here.

4 Q. Now, you understand Dr. Chrissan mapped the
5 claimed syntax elements to non-zero transform coefficients,
6 right?

7 A. Absolutely.

8 Q. You understand that's Nokia's position, right?

9 A. I do.

10 Q. Okay. You disagree with Dr. Chrissan on that
11 point, fair?

12 A. As it relates to the '701 mapping, that's one of
13 our disagreements, yes.

14 Q. So I just want to focus on whether non-zero
15 transform coefficients are syntax elements for the time
16 being. Can we do that?

17 A. Absolutely.

18 Q. Okay. Your testimony is that non-zero transform
19 coefficients are not syntax elements, right?

20 A. In the context of the H.265 standard, I made it
21 clear that in other contexts they would be.

22 Q. Okay. In the context of the H.265 standard, not
23 transform coefficients.

24 A. Correct.

25 Q. In the context of the '701 patent, not transform

1 coefficients, that's your opinion, right?

2 A. I never said that.

3 Q. Are non-zero transform coefficients sufficient to
4 satisfy the syntax elements limitation in the '701 patent?

5 A. Why not? If you apply the syntax elements to a
6 standard where the transform coefficients happen to be
7 syntax elements, then there is no problem with that.

8 Q. You understand that neither party has asked Her
9 Honor to construe the term "syntax elements"?

10 A. That's my understanding, yes.

11 Q. And that means your job, as an expert witness, is
12 to analyze the term "syntax elements" under its plain and
13 ordinary meaning, right?

14 A. Yes.

15 Q. The plain and ordinary meaning of syntax
16 elements, in your view, is reflected in the H.265 standard,
17 correct?

18 A. I think it's consistent with it, not in the way
19 interpreted by Nokia, but it's consistent with that
20 definition.

21 Q. Sir, is the plain and ordinary meaning of the
22 claim syntax elements reflected in the H.265 standard?

23 A. As understood by a person of ordinary skill in
24 the art, where the word represented is not taken out of
25 context, yes.

1 MR. CAMERON: Your Honor, I move to strike as
2 nonresponsive. It's a yes or no question.

3 JUDGE MCNAMARA: I am going to let it stand, and
4 you can come back around on that and ask about the
5 qualifying -- why he is qualifying it.

6 MR. CAMERON: Okay.

7 Q. Sir, you qualified your answer just then.

8 A. I'm sorry?

9 Q. You qualified your answer just then, fair?

10 A. I gave an explanation. I didn't realize it was a
11 yes or no question. I'm sorry.

12 Q. Okay. Yes or no, is the plain and ordinary
13 meaning of the claim syntax elements reflected in the H.265
14 standard?

15 A. Yes.

16 Q. Okay. Let's take a look at the definition of
17 syntax element in the standard.

18 Mr. Moreno, could you please pull up CDX-23.11?

19 You would agree that the definition on this
20 screen corresponds to the plain and ordinary meaning of
21 syntax element as it is used in the '701 patent, fair?

22 A. I think it is consistent with how it's used.
23 This is the definition from the 265 standard.

24 Q. Okay. Could you please read that definition into
25 the record?

1 A. Sure. Syntax element: An element of data
2 represented in the bitstream.

3 Q. Can we agree that transform coefficients are an
4 element of data?

5 A. Yes.

6 Q. Can we agree that transform coefficients are
7 represented in the bitstream?

8 A. Not in the context of the H.265, because they are
9 not syntax elements.

10 Q. Let's take a look at what you said in your expert
11 report.

12 Mr. Moreno, could we please pull up CDX-23.13?

13 All right, sir, I have a paragraph of your expert
14 report copied on the right, and then I have an annotated
15 figure on the left that appears just above this paragraph in
16 your report, but I put them side to side so they are easier
17 to read.

18 Do you see that on the screen?

19 A. I do.

20 Q. And do you recall this part of your expert
21 report?

22 A. To a degree, yes.

23 Q. Okay. If we look at paragraph 277, you are
24 discussing three non-zero transform coefficients, correct?

25 A. I think so.

1 Q. You've put a red box around the transform
2 coefficient with a value of 1, a green box around the
3 transform coefficient with a value of 5, and a blue box
4 around the transform coefficient with a value of negative 5.
5 Do you see that?

6 A. I do.

7 Q. And then specifically, you're talking about the
8 transform coefficients that you've encircled with blue and
9 green boxes, where you state that the two coefficients have
10 the same absolute value.

11 Do you see that?

12 A. I do.

13 Q. Then you state, but they are represented
14 differently in the coded bitstream.

15 Do you see that?

16 A. I do.

17 Q. And when you're referring to the fact that those
18 two transform coefficients are represented differently in
19 the bitstream, you're talking about the ones that you've put
20 a blue box around, the value of negative 5, and a green box
21 around, the value of 5, correct?

22 A. That's correct.

23 Q. And would you agree that in the accused products,
24 the accused products count the number of times a non-zero
25 coefficient is decoded correctly?

1 A. Is decoded correctly?

2 Q. Yes, sir. Let me restate my question.

3 Would you agree that the accused products count
4 the number of times a non-zero coefficient is coded?

5 A. Up to a point, not -- not for all coefficients.

6 Q. Before the threshold, they count the number of
7 times a non-zero transform coefficient is decoded and after
8 the threshold they don't?

9 A. They might, but they don't need to.

10 Q. Let's go back to the definition of syntax
11 elements. There's no dispute that non-zero transform
12 coefficients are elements of data, right?

13 A. Not in my mind, no.

14 Q. And we just saw a section of your own expert
15 report where you stated that non-zero coefficients are
16 represented differently in the coded bitstream, right?

17 A. Because they use different syntax elements and
18 different syntax elements values, but not -- not because it
19 meets the definition.

20 Q. Sir, you said that the non-zero transform
21 coefficients in your report are represented differently in
22 the coded bitstream, yes or no?

23 A. That's correct.

24 Q. Okay. Now, counsel asked you a few examples of
25 alleged absurdities in our read of the term "syntax

1 elements." Do you recall that?

2 A. That's right.

3 Q. And one of them was that counsel mentioned a
4 video of him yelling at his kids, and he asked you whether
5 under our interpretation that would satisfy the claimed
6 syntax elements, do you recall that?

7 A. I do.

8 Q. Has Nokia ever accused anything of that sort in
9 this case?

10 A. No. They stopped at the non-zero coefficient.
11 My point -- I think Mr. Thompson's point was that you could
12 have taken that one step further, because represented would
13 have had the same meaning had you taken it further all the
14 way to the raw video.

15 Q. Has Nokia ever taken it to that level of
16 absurdity, to the best of your knowledge?

17 A. I didn't see it. I haven't seen anything like
18 that or a reason for it.

19 Q. Were you here during Dr. Iain Richardson's
20 testimony? I believe you were, judging from your slides.

21 A. I was here.

22 Q. You would agree that Dr. Richardson is an expert
23 in the field of video coding and decoding, wouldn't you?

24 A. I would.

25 Q. And Dr. Richardson has written several prominent

1 reference books relating to video coding standards, correct?

2 A. Correct.

3 Q. You've reviewed Dr. Richardson's reference books,
4 correct?

5 A. Not in their entirety, but sections definitely.

6 Q. In fact, you've relied on Dr. Richardson's books
7 to support your positions in other matters, correct?

8 A. In other litigation matters, that's correct.

9 Q. Let's take a look at one of Dr. Richardson's
10 books.

11 Mr. Moreno, could we please pull up CDX-23.19?

12 Do you see Dr. Richardson's textbook titled
13 "Coding Video, a Practical Guide to HEVC and Beyond" on the
14 screen?

15 A. I do see that.

16 Q. HEVC is another term for the H.265 standard,
17 correct?

18 A. Correct.

19 Q. And do you see that in Dr. Richardson's chapter
20 titled Entropy Coding, Dr. Richardson states, a video
21 encoder produces many different symbols or syntax elements
22 containing information such as transform coefficients,
23 prediction choices, block sizes, and many other parameters.

24 Did I read that correctly?

25 A. Correct.

1 Q. And then the third sentence states, certain
2 syntax elements such as transform coefficients can have a
3 range of values, while others are binary.

4 Do you see that?

5 A. I do.

6 Q. Now, you understand that Dr. Richardson's book
7 was published in 2024, correct?

8 A. I'll take your word for it.

9 Q. Okay. Do you understand that Dr. Richardson's
10 book was not published for purposes of this litigation?

11 A. I assume that.

12 Q. It was published before any litigation existed
13 between Respondents and Complainants, fair?

14 A. I'll take your word for it. I'm not involved
15 with litigation matters to that level.

16 Q. Let's take another -- a look at another one of
17 Dr. Richardson's textbooks.

18 Mr. Moreno, would you please pull up CDX-23.21?

19 Here we have an excerpt from another textbook
20 written by Dr. Richardson. Do you see that?

21 A. I do.

22 Q. Have you read this one?

23 A. I don't remember.

24 Q. Okay. I've pulled out a section, 13.2.2, titled
25 "Coded Data In/Out." Do you see that?

1 A. Yes.

2 Q. And the first sentence states, coded video data
3 is a continuous sequence of bits describing the syntax
4 elements of coded video, such as headers, transform
5 coefficients, and motion vectors.

6 Do you see that?

7 A. I do.

8 Q. Would you agree that Dr. Richardson's textbooks
9 are consistent with the understanding of a person of
10 ordinary skill in the art to the '701 patent?

11 A. If I have to comment on this, I'm happy to, I'll
12 be happy to explain, but I wouldn't agree with the statement
13 as you phrased it. These are general statements that are
14 true of some encoders, in some coding standards, not true
15 for other coding standards.

16 I don't believe that these are meant specifically
17 only for the HEVC. In fact, in the previous spec that you
18 showed, underneath it talks about multiple different coding
19 standards. So I don't have that perspective of the sentence
20 that you just asked me to agree to.

21 Q. All right. So you won't agree with
22 Dr. Richardson's textbooks, fair?

23 A. I'm sorry?

24 Q. You don't agree with Dr. Richardson's textbooks?

25 A. I'm not sure that he meant it to be a statement

1 that's true for HEVC. This was the beginning of a chapter.
2 He talked about multiple coding standards. He can talk for
3 himself if he chooses to, but I don't take it as a
4 representation of something that's necessarily limited to
5 HEVC.

6 Q. Were you here during the first day of this trial?

7 A. I was.

8 Q. Did you hear my colleague, Mitch Verboncoeur, ask
9 him, Dr. Richardson, if non-zero transform coefficients are
10 syntax elements?

11 A. In the context of H.265?

12 Q. Did you hear him ask that question?

13 A. I don't remember.

14 Q. Okay. You would agree that Gary Sullivan is a
15 top figure in the field of video coding, wouldn't you?

16 A. Yes.

17 Q. Who is Mr. Sullivan?

18 A. He was at Microsoft. He is one of the editors of
19 264 and 265.

20 Q. And I believe you highlighted one of his papers
21 during your direct examination; is that fair?

22 A. I did.

23 Q. Mr. Moreno, could you please pull up CDX-23.23?

24 Here I have an excerpt of one of Mr. Sullivan's
25 papers relating to the H.264/AVC standard. Do you see that?

1 A. Yes, I do.

2 Q. And you would agree that H.264 is when the
3 standard started to divide the syntax elements into various
4 subcomponents and send those in the bitstream, fair?

5 A. That's my recollection.

6 Q. Okay. Do you see -- Mr. Moreno, if you could
7 please highlight the last sentence in the paragraph up at
8 the top.

9 As in previous standards, the macroblock is the
10 fundamental unit of the syntax and decoding process. Syntax
11 elements include.

12 And then if we go down to item G, it says, motion
13 vectors sent as a delta from the prediction of the motion
14 vector formed from neighboring data. And, H, the quantized
15 transform coefficients (from 8x8 or 4x4 transforms.)

16 Did I read that correctly?

17 A. I think so.

18 Q. So we've seen published scholarly work from
19 Dr. Sullivan; is that correct? Is it mister or doctor?

20 A. Dr. Sullivan.

21 Q. We've seen published work from Dr. Sullivan,
22 correct?

23 A. That's correct, talking about general previous
24 standards, but we have -- this is a scholarly work, yes.

25 Q. And we've seen two textbooks from Dr. Richardson,

1 one of which was published in 2024, correct?

2 A. I took your word for it. I'm going to still take
3 your word for it.

4 Q. Okay. Can you point me to a textbook or a
5 published paper that expressly states that non-zero
6 transform coefficients are not syntax elements?

7 A. The 265 standard.

8 Q. Do you have anything besides the 265 standard you
9 could point me to to confirm your understanding?

10 A. 264 standards, 266 standards, AV1, all of the
11 standards that appear after arithmetic coding started being
12 used in the video compression community.

13 Q. Is there anything in that standard that says they
14 are not using that language, that syntax elements -- that
15 transform coefficients are not syntax elements?

16 A. I don't -- I've never seen a standard saying what
17 they are not. They usually say what they are, so I don't
18 think so.

19 Q. And we saw the definition of syntax elements from
20 the H.265 standard earlier, didn't we?

21 A. In the 265 standard, yes.

22 Q. And that's the definition that Dr. Chrissan
23 applied in his analysis, correct?

24 A. He applied an interpretation of it, but, yes.

25 Q. All right. Thank you.

1 A. Thank you.

2 BY MR. VERBONCOEUR:

3 Q. Good afternoon, Dr. Schonfeld.

4 A. Good afternoon.

5 Q. Good to see you again.

6 A. Very good to see you again too.

7 Q. My first question to you is, do you agree with
8 the following statement:

9 The H.265 standard is a decoding standard and
10 does not set forth a standard for the encoding of video?

11 A. If I may answer it more than yes or no, with a
12 little subtlety, compression standards are decoding
13 standards. They don't -- they don't tell you how to decode.
14 They tell you what the syntax coming into the decoder is and
15 what to produce as an output. But a decoding standard can
16 limit what the encoder can do if it's compatible with it.

17 I don't know if it addresses your question as you
18 meant for it to be asked. If not, I'll try again.

19 Q. I'm looking for a yes or no here, whether you
20 agree with the statement or not.

21 A. Okay.

22 Q. If it's your testimony that you disagree, very
23 well.

24 A. Sure.

25 Q. The H.265 standard is a decoding standard and

1 does not set forth a standard for the encoding of video.

2 A. It specifies it -- I would say, yes, but it's a
3 qualified yes because it's not exactly accurate.

4 It can impose essentiality, for example, on some
5 aspects of encoders, but it does not -- it is not -- it only
6 specifies the standard. It doesn't tell you what to do on
7 the decoder or the encoder.

8 Q. Doctor, you recall giving opinions in the 1380
9 matter, correct?

10 A. Correct.

11 Q. And, in fact, you spent a large portion of your
12 direct examination discussing those opinions you provided in
13 the 1380 matter?

14 A. Today I did, yes, that's right.

15 Q. And when you provided those opinions in the 1380
16 matter, I'm sure you endeavored your best to provide
17 accurate factual statements; is that fair?

18 A. Definitely, of course.

19 Q. And as part of that 1380 matter, you drafted a
20 report on various -- you actually drafted two reports on
21 various matters pertaining to two of those asserted patents?

22 A. Correct.

23 Q. Mr. Moreno, can we please have slide CDX-23C.101.

24 Doctor, what I've done here on slide 101 is I've
25 excerpted a portion of one of the two reports that you

1 provided in the 1380 matter. This is your rebuttal report
2 from that matter, and I'm going to read from that report.

3 I agree that it would be improper for Dr. Moulin
4 to attempt to do so because the H.265 standard is a decoding
5 standard and does not set forth a standard for the encoding
6 of video.

7 And then you continued, as evidenced by at least
8 sections 3.50 and 3.51 set forth below.

9 And you provide two definitions.

10 Do you see that?

11 A. Absolutely.

12 Q. And those definitions are of encoder and encoding
13 process.

14 A. Correct.

15 Q. And the definition of encoding process in the
16 H.265 standard is a process not specified in this
17 Specification that produces a bitstream conforming to this
18 Specification.

19 A. This language appears in every standard,
20 including 265.

21 Q. Now I want to talk about the topic of truncation,
22 and I want to stay on the public record and not discuss any
23 third-party confidential information at this point.

24 So let's keep in mind as we have this discussion.

25 A. I'll do my best.

1 Q. You told us earlier that truncation is not
2 shifting bits to the right. Did I hear that correctly?

3 A. It's not using an arithmetic right-shift
4 operation. It does produce the same result of numbers, but
5 it's not using a shift term.

6 Q. And you understand that the claims of the '267
7 patent use the phrase shifting bits to the right?

8 A. My recollection is that it says reduce precision
9 by shifting bits to the right.

10 Q. And, Doctor, just to make sure I've captured your
11 opinion correctly, your opinion is that truncation is not
12 shifting bits to the right.

13 A. It's not using a shifter, and, therefore, in my
14 view, it's not performing what the claim requires, which is
15 reduction of precision by shifting.

16 Q. But at the time of the '267 patent, a person of
17 ordinary skill in the art understood that truncating the
18 binary number through right shifting was sometimes referred
19 to as rounding the binary number.

20 A. That may be reasonable.

21 Q. And they understood that truncating a number by
22 right shifting and logical right shifts are both forms of
23 shifting bits to the right.

24 A. I'm not sure that I would characterize it that
25 way, I don't think. The language that -- I wouldn't

1 characterize it that way. They both result in shifting bits
2 to the right. They don't use shifters in one case.

3 Q. I would like to have slide CDX-23C.105.

4 Doctor, we're going to go back to one of those
5 1380 reports that you provided. So what I've done here on
6 slide 105 is I've placed your opening report from the 1380
7 matter, paragraph 127 on the left side, and then your
8 opening report in this matter, paragraph 126, on the right
9 side.

10 A. Okay.

11 Q. Doctor, you see that you start the first sentence
12 of each of those paragraphs in exactly the same way. Do you
13 see that?

14 A. I do.

15 Q. And what you've done, though, is in the prior
16 case what you said is that a person of ordinary skill in the
17 art understood that truncating a binary number through right
18 shifting was sometimes referred to as rounding the binary
19 number.

20 But when you prepared your report in this case,
21 you took that language out, and you substituted in a logical
22 right shift.

23 A. Yeah, I see that.

24 Q. And you give an example of -- now, I'm looking
25 again now at the left of slide 105 with the 1380 opening

1 report -- you illustrate this concept with a simple example
2 where you truncate the binary number 101, which is the
3 number 5 in decimal form. Do you see that?

4 A. Yes.

5 Q. And when you prepared your report in this matter,
6 what you did is you removed the verb "truncating" and you
7 substituted in the same example, performing a logical right
8 shift. Do you see that?

9 A. I do.

10 Q. The math is the same. The only difference
11 between these two paragraphs across matters is that we
12 remove the verb "truncating" in the early matter and we
13 substitute in "performing a logical right shift."

14 A. Absolutely. I completely agree, because the
15 issue is how it's done, not what the result would be.

16 Q. And, Doctor, you agree that a person of ordinary
17 skill in the art would understand that this shifting
18 operations could be accomplished by methods such as applying
19 a scaling factor through multiplication or division?

20 A. That's right. You get the same result, exactly.

21 Q. And, in fact, Walker tells us that.

22 A. That's correct. '267 tells us that.

23 MR. VERBONCOEUR: Your Honor, we briefly need to
24 go on the third-party confidential record.

25 (Whereupon, the hearing proceeded in confidential

1 session.)
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1 O P E N S E S S I O N

2 BY MR. VERBONCOEUR:

3 Q. What I'd like to talk about now, Doctor, is the
4 concept of predictions. And first I just want to make sure
5 that I captured your testimony correctly.

6 On slide 136 of your presentation, are you
7 intending to define pred_0 multiplied by w_0 as a prediction?

8 A. If my memory -- we had multiple theories, but I
9 think at that point based on the outlining, that's correct.

10 Q. So one form of prediction for you is pred_0 times
11 w_0 .

12 A. That's correct.

13 Q. And let's please have slide RDX-5C.176.

14 I want to make sure I get this right, but a
15 second theory for you as for what Walker's prediction might
16 be was that a weight is in fact Walker's first prediction.

17 A. No, I'm sorry, I didn't mean to convey that. If
18 I did, I apologize, because that was not the intention.

19 This was just meant to show that the same
20 prediction we just talked about, pred_0 times w_0 , the same
21 prediction would meet Complainant's proposed construction of
22 precision. If there was confusion about it, I apologize.

23 Q. So on slide 176, just so the record is clear, if
24 one were to want to highlight the prediction according to
25 your theory, they would need to extend the highlighting to

1 cover pred0 w0.

2 A. For this particular theory, I addressed the
3 Complainants under three different theories, but for this
4 one, that would be correct.

5 Q. And the way I understand it is you had a first
6 theory with pred0 w0 as the prediction, and you're pointing
7 to the bitwidth of the result. You have a second theory
8 which is pred0 w0 as a prediction, and you're saying that
9 there are possible values of the weights that affect the
10 outcome?

11 A. No. Maybe I -- if you want, I would be happy to
12 summarize it again, but what you said right now is
13 incorrect.

14 Q. Okay. Why don't you give me a quick summary of
15 your three different theories of what Walker's prediction
16 are -- or is, rather.

17 A. So we are talking right now in this context only
18 about Complainants' proposed -- Nokia's proposed
19 construction of precision, and the three approaches are the
20 same approaches in the 1380 investigation, pred0 times w0,
21 and the point is it meets because the w0's are changing
22 values, potentially, as described here, and this is what
23 this is meant to address.

24 The second one is a separate slide, which is
25 pred0 by itself, with an interpolation filter which

1 increases precision. In Walker, the Nokia's proposed
2 construction, under their infringement theory, and then the
3 third one doing the same thing under the combination of
4 Walker with Srinivasan, again, pred0 by itself under Nokia's
5 infringement theory by itself.

6 Q. So for two of your theories, you're pointing to
7 pred0 w0; for one of your theories you're pointing to just
8 pred.

9 A. No. One theory, pred0 w0. Two theories are
10 pred0 by itself.

11 Q. Okay.

12 A. And this is only under Complainants' proposed
13 construction.

14 Q. All right. At the time of the '267 patent, a
15 person of ordinary skill in the art would understand that a
16 prediction involves the use of a predictor to provide an
17 estimate of the sample value or data element currently being
18 decoded.

19 A. Well, you are defining prediction in the context
20 of the '267 patent or in general or in a particular context?
21 I'm not sure if I follow you.

22 Q. Doctor, you understand that neither party in this
23 matter has offered a proposed construction of the term
24 "prediction," right?

25 A. No, they have not.

1 Q. And you understand that your role as an expert
2 witness in this matter is to provide the Court with evidence
3 about a person of ordinary skill in the art's understanding
4 of what the term prediction means, right?

5 A. Well, to at least understand it and explain it,
6 yes.

7 Q. And so my question to you, given that we don't
8 have a claim construction, is whether a person of ordinary
9 skill in the art would understand that a prediction involves
10 the use of a predictor to provide an estimate of the sample
11 value or data element currently being decoded.

12 A. I would say it's consistent with prediction, but
13 I'm not sure if I would limit it in this way. It at least
14 has to account for the dependent claim, like in 10, and I'm
15 not sure if your definition would or would not account for
16 it.

17 So if you ask me is that consistent with
18 prediction, I would say absolutely yes. Should it be
19 limited in this way, my instinct is to say no, and I would
20 have to think about it.

21 Q. Mr. Moreno, we can take that slide down.

22 Doctor, you agree that the pred in Walker's
23 pred0, pred1, that's shorthand for prediction, right?

24 A. He uses it as shorthand for prediction, that's
25 right.

1 Q. And Walker defines it's pred0 and pred1 as
2 samples from prediction blocks, right?

3 A. Either samples or interpolated samples, but it
4 refers to either the interpolated pixels or the original
5 integer pixels.

6 Q. In both cases Walker is defining its pred0 and
7 pred1 as samples from prediction blocks?

8 A. It's either -- well, in the case of interpolated
9 pixels they are not samples from -- they are filtered
10 versions of samples from prediction blocks.

11 Q. So in both cases we have pred0 and pred1, they
12 are either samples from prediction blocks or interpolated
13 samples from prediction blocks?

14 A. That's correct.

15 Q. I'd like to go to RDX-5C slide 104.

16 Doctor, you gave testimony with regard to slide
17 104 as part of a technical background of the '267 patent,
18 and I want to make sure that we have a common understanding
19 here.

20 So you agree that in your slide 104 the predicted
21 frame includes a block of pixels being predicted.

22 A. That's right.

23 Q. And you have a first and second motion vector in
24 the case of a bi-prediction. Those motion vectors will
25 point to reference blocks, each of which are in reference

1 frames.

2 A. That's correct. If you want, I could have drawn
3 those green arrows from the -- in the predicted frame
4 pointing to them. All it is is just showing the
5 displacement between corresponding blocks in the reference
6 block in the predicted frame -- sorry -- in the reference
7 frame of the predicted frame. Where you draw it is not --
8 it was not the intention -- that was not the point I was
9 trying to make.

10 Q. The point I'm trying to make is that we agree
11 that the predicted frame is different from the first
12 reference frame and the second reference frame.

13 Can we at least agree on that?

14 A. Typically, not always, of course, but typically,
15 yes.

16 Q. Well, the predicted frame may have common
17 elements that is common pixel values with the reference
18 frames, but conceptually a predicted frame is different from
19 the first reference frame and the second reference frame.

20 A. Conceptually, yes, and in almost all practical
21 cases, yes as well.

22 Q. Let's please have RDX-5C.146.

23 Doctor, I believe this is the first theory that
24 we went through when we summarized your three different
25 theories here for how Walker has a higher precision for its

1 predictions.

2 You're pointing to -- this is table 4 of Walker
3 on your slide 146 -- you're pointing to bitwidths involved
4 as being the second precision.

5 Do you see that?

6 A. I'm not sure if your characterization, it was
7 accurate, because I'm not sure if I put this slide in
8 connection with Complainants' proposed construction. I may
9 have. But I do see what you are highlighting -- what is
10 highlighted, yes.

11 Q. Let me ask you this. On slide 146 you've
12 highlighted some numbers under the column in table 4 of
13 Walker called bitwidths involved, and you've highlighted
14 that in yellow, and then corresponding highlights on the
15 claim limitations is a second precision which is higher than
16 said first precision.

17 Is that an accurate reading?

18 A. That's an accurate reading, yes.

19 Q. And now I'm looking for a true or false answer
20 from your understanding as an expert in this field.

21 Is bitwidth, in your view, the same thing as
22 precision?

23 A. It's hard to put it in yes or no. If I have to
24 stick to one of them, I would say yes. If I was allowed to
25 say three or four words it would be more accurate, but if

1 I'm forced to choose, yes.

2 Q. Now what I'd like to do is I'd like to go to your
3 slide RDX-5C.175. I'm going to ask you that same question,
4 Doctor, but I'm going to ask you in the context of each of
5 the parties' claim constructions.

6 If you look at Respondents' claim construction,
7 is it your view that bitwidth is the same thing as
8 precision?

9 A. As I understand it, it's consistent with
10 precision under Respondents' construction, yes.

11 Q. And now I'm going to look at Staff's proposed
12 construction of the term precision on your slide 175.

13 In your view, is bitwidth the same thing as
14 precision under Staff's proposed construction?

15 A. Potentially, yes. I'm not a hundred percent
16 certain. It depends on how Staff intended the distinct
17 alternative term.

18 Q. And now let's look at Nokia's proposed
19 construction. You have highlighted some additional language
20 there.

21 Under Nokia's proposed construction, in your view
22 as an expert, is precision the same thing as bitwidth?

23 A. For the bottom part, which is not highlighted,
24 potentially yes, again, just like it is in Staff, depending
25 on the interpretation of possible distinct alternative.

1 For the first part highlighted in yellow,
2 bitwidth, and what's highlighted in yellow, are very
3 different.

4 Q. Now what I'd like to do with reference to your
5 slide 175 showing the parties' claim constructions is to
6 focus in on the aspects of the constructions that at least
7 to me appear rather similar.

8 That is a number of bits needed to represent
9 possible values, the number of bits required to represent
10 each possible distinct alternatives, and then the same
11 language in Nokia's construction.

12 In your view, is the number of bits needed or the
13 number of bits required related or dependent on the number
14 of possible values a parameter might take?

15 A. For the number of bits needed, definitely not,
16 that's not how it's used in the '267 patent, that's not how
17 it's used in the dependent claims. So under Respondents'
18 claims I can say definitively no.

19 For the Staff and Nokia, for the second part
20 about the required, I'm a little cautious because I don't
21 know exactly the scope that the court and the parties view
22 the words "distinct alternative." For the part that is
23 highlighted in yellow, I have no ambiguity. It says it is
24 very different from the number of bits or the bitwidth.

25 And so I'm sorry to give such a nuanced answer,

1 but there are four moving pieces in the proposed
2 constructions, and I want to be cautious about interpreting
3 them and not taking liberty with the intended interpretation
4 for each of them.

5 Q. At least for Respondents' proposed construction,
6 your interpretation of it at least, the number of bits
7 needed to represent possible values is not dependent on the
8 number of possible values.

9 A. That's correct.

10 Q. What I'd like to do now is talk about --

11 A. Oh, sorry. On the number of possible realizable
12 values, which is what I understand Nokia's first part is
13 about. It is dependent on the number of values, not all of
14 which may be realizable.

15 Q. That is a nuanced distinction and I appreciate
16 that, Doctor. I will reask my question for clarity of the
17 record.

18 In your opinion the number of bits needed as
19 expressed in Respondents' proposed construction is not
20 dependent on the number of possible realizable values.

21 A. That's right. The number of bits needed for the
22 number of realizable could be very different. For example,
23 you might have only one value that's got -- that's a very
24 large number, and you only need one bit for that.

25 Q. Doctor, that's exactly the thing we're going to

1 explore next.

2 So I'd like to talk about left-shifting.

3 Left-shifting effectively performs multiplication by 2 for
4 each position shifted.

5 Do you agree with that statement?

6 A. Yes.

7 Q. And in your view a left shift effectively doubles
8 the value of a number and then it increases precision by 1
9 bit.

10 Do you agree with that statement?

11 A. Can you please repeat it? I'm sorry.

12 Q. Yes. In your view a left shift by 1 effectively
13 doubles the value of a number and it increases the precision
14 by 1 bit.

15 A. Correct.

16 Q. And the reason you have that view is because a
17 new 0 bit is added to the right with each left shift by 1.

18 A. That's absolutely correct, and it's all under
19 Respondents' proposed construction.

20 Q. So now I'd like to go through a couple examples
21 of how left-shifting works.

22 Before I begin that, Doctor, you and I can agree
23 that a bit, a binary digit, has one of two possible values,
24 0 or 1, correct?

25 A. That's the most common way of doing it, yes.

1 Q. So what I'm going to do is I'm going to put a
2 piece of paper here and on that piece of paper it says 1 bit
3 and we have our two possible values, 0 and 1.

4 Is this a fair representation of the two possible
5 values of the binary digit?

6 A. Of the what?

7 Q. Do you agree with me that as shown on this
8 demonstrative here are the two possible values of a binary
9 digit, 0 or 1.

10 A. Yes.

11 Q. And we'll mark that as CDX-23C.123.

12 And you agree that in decimal numbers, the 0 for
13 a binary digit corresponds to a value of 0, and a 1 in a
14 binary digit would correspond to a value of 1.

15 A. Yeah, that's correct.

16 Q. Doctor, I'm going to illustrate that with another
17 sheet of paper, another demonstrative, that we'll mark as
18 slide 124.

19 You agree that the text in red is the decimal
20 representation of the binary digit shown here?

21 A. I think it's consistent, yes.

22 Q. Now what I'd like to do is I'd like to shift each
23 of those bits to the left by 1. And the way we do that, I
24 think you and I just agreed, is we add a 0 to the right for
25 each bit.

1 A. Correct.

2 Q. So we're going to mark this as slide 125, but I
3 want to get your agreement that what we've done here is
4 accurate.

5 We started with a 0 or 1 and we added a 0 to the
6 right in each case. That's the left shift by 1.

7 Do you agree with that?

8 A. Sure.

9 Q. And I'll mark that as slide 125.

10 And now what I'd like to do is I'd like to get
11 your agreement on how the decimal math works out. So I'm
12 going to put another sheet of paper here, which will be
13 slide 126.

14 You agree, Doctor, that I've accurately captured
15 the decimal representation corresponding to each of these
16 two bits on each side of the paper?

17 A. Correct.

18 Q. And what we've done is consistent with what you
19 and I just agreed on is we effectively multiplied the value
20 of the number by 2 by left-shifting by 1.

21 A. Yeah. And just in case it comes up, we are just
22 talking here about unsigned representation, so we are
23 assuming if it were signed, it would be a different story.

24 Q. Right. If we wanted to figure out what the
25 signed representation would be, we could just put a negative

1 sign on the right side?

2 A. I mean, it is already negative if it were signed,
3 but --

4 Q. I'm sorry, Doctor. I didn't catch that.

5 A. It is already a negative number had it been
6 signed and it has a negative 0 value, so I don't mean to
7 make it complex, but because we were talking about the
8 arithmetic shifting and sign representation, in case it pops
9 up, in case it comes up, I just wanted to be cautious and
10 say we can stick to the unsigned, if you prefer.

11 Q. We can do unsigned, but you would agree with me
12 that left-shifting works the same way in both cases. In
13 both cases we add a 0 to the right.

14 A. We have to be careful, because when you add 0's
15 to the right signed, the signed bit cannot change, it has to
16 stay. You have to know what the signed bit is, or else you
17 have to redefine the representation.

18 JUDGE MCNAMARA: So you have to know whether it's
19 negative or positive.

20 A. Exactly, and that bit cannot move. You could put
21 other ones around it that will not change the value, but
22 that bit cannot move. So I'm just being cautious in case it
23 comes up, but if it's all positive, we can stick to what you
24 are doing.

25 Q. Let's go back here just to clarify something for

1 the record on this.

2 So I've got slide 123 here and we have our 2
3 bits. So if we were using signed representations, Doctor,
4 what would the value be of the 0 bit on the left-hand side
5 of slide 123?

6 A. It would just be 0.

7 Q. And what would the value of the 1 bit be on the
8 right-hand side of slide 123?

9 A. It has no meaning.

10 Q. Okay. Now let's go to the next sample.

11 A. Because we are -- you need 1 bit for the signed
12 bit and you cannot have a sign without a value. So I may
13 have made things more complicated than you intended for
14 them, but if it comes up, all of these issues will appear
15 again. If it stays positive, I don't have to address them.
16 So it's up to you if you want to go in that direction.

17 Q. I would like to get in the record how the
18 difference between signed and unsigned numbers works so this
19 doesn't become an issue later on in this proceeding. So
20 let's use this example instead. Actually, what I'll do is
21 I'll mark this one as slide 126.

22 Here you agree that, if we were using unsigned
23 numbers, the 2 bits on slide 126 on the left, that has a
24 value of 0, right?

25 A. Yes.

1 Q. And the 2 bits on the right, what value would
2 that have if we had a signed representation?

3 A. If this were a signed representation?

4 Q. That's right.

5 A. It would be negative 1.

6 Q. It would be negative 1.

7 And what would the values be if we were to left
8 shift that negative 1?

9 A. It would --

10 Q. Would it --

11 A. It depends on the size of the register and what
12 kind of shifting you are doing. So it makes the situation a
13 lot more complicated, because with signed representation you
14 have to be very cautious. The register size has to be
15 fixed, you have to define the most significant bit. It
16 cannot change. If you change it, you have to redefine the
17 whole number representation. So it's -- it throws a wrench.
18 And this kind of games you're not just simply moving things
19 to the left and right.

20 Q. Doctor, you understand that people in video
21 coding use something called Two's Complement
22 representations?

23 A. That's what I just did.

24 Q. So if we use a Two's Complement representation
25 here, which is what people in video coding do, what would

1 the value on the right-hand side of slide 126 be?

2 A. So assuming that 1 is the most significant bit,
3 it's negative 1, just like I said. All I did is a take the
4 complement and add 1 and then I take the sign from the
5 original, which is negative.

6 Q. And you agree with me that the H.265 and H.264
7 standards, they define arithmetic left shifts.

8 What would the value be, since we're in video
9 coding, we're doing what the standards say for
10 left-shifting, what would the value of your negative 1 be if
11 you left-shifted by 1?

12 MR. THOMPSON: Your Honor, I believe there were
13 two questions built into that. Maybe he could separate
14 those.

15 JUDGE MCNAMARA: Try again.

16 Q. First, Doctor, we agree that in the video
17 standards H.264 and H.265 the shifts that are defined are
18 shifts on Two's Complement numbers?

19 A. Yes. And I think I got the number. It's
20 negative 2. I think I got it wrong. It's negative 2.

21 Q. Let me reask that question.

22 So if we start with 10 in Two's Complement, and
23 we left-shifted by 1, we get negative 2.

24 A. Negative 2.

25 Q. And what we're doing is consistent with your

1 testimony before, which is we're effectively multiplying by
2 2 each time.

3 A. If you were to -- if it's a signed number and
4 you're shifting and reinterpreting it so that the most
5 significant bit moves, you're basically defining a new
6 structure from the point of view of the computer, then you
7 are multiplying it by 2 each time.

8 Q. Now I'd like to go back to the unsigned
9 representations and ask this question.

10 I've got slide 126, and I've got slide 124, and
11 I'm going to put them close by so we can see them both.

12 In your view, Doctor, are the numbers shown on
13 slide 126 more precise than the numbers shown on slide 124?

14 A. I assume that by 126 you mean the upper one?

15 Q. Yes. I'll mark it so you can see it in real
16 time.

17 A. So the number of bits needed to represent 1 is
18 smaller than the number of bits needed to represent 2,
19 because it's a bigger number, yes.

20 Q. And if we're talking about unsigned
21 representations, if we keep doing left shifts, if we keep
22 multiplying by 2, we keep increasing our precision.

23 A. The bigger the number the more bits you need.

24 Q. And the bigger the number, therefore, the more
25 precise that number is?

1 A. No. The more -- the higher the precision of the
2 representation of the number. The number is not any more or
3 less precise.

4 Q. That's fair. The bigger the number you're
5 representing the more precise that representation will be.

6 A. The higher the precision you need.

7 JUDGE MCNAMARA: Yes.

8 Q. I may have misstated that. Let me -- the bigger
9 the number we're representing the higher the precision.

10 A. The higher the precision you need. If you just
11 use 1 bit for it, the precision is lower, but you need more.

12 Q. And so in your view we can scale values up toward
13 infinity and the amount of precision we need increases with
14 the direct correlation.

15 A. It's not just my view. This is exactly what the
16 '267 teaches. It says here is the number, it needs so many
17 bits, therefore it has a higher precision.

18 Q. Let's have RDX-5C.137.

19 Doctor, this is your slide 137 where you cited
20 some 1380 -- some testimony you gave in the 1380 matter; is
21 that right?

22 A. Correct.

23 Q. And one of the patents you opined on, and I think
24 is evident from this slide, is the '267 patent.

25 A. Correct.

1 Q. Now, I might have gotten it wrong, but I believe
2 I heard you testify that there was not a dispute in that
3 case about the meaning of precision.

4 Did I hear that correctly?

5 A. You heard that correctly. That was my
6 recollection.

7 Q. Let's have RX-1945 at page 129.

8 Doctor, you provided several citations to the
9 determination in the 1380 matter during your direct
10 examination. And what I have here is page 123 of that
11 determination, RX-1945.129.

12 And, Doctor, you recall that you offered an
13 opinion in the 1380 matter, a noninfringement opinion, that
14 arithmetic shifts did not decrease precision but logical
15 shifts did.

16 A. That's correct. That was not a dispute about
17 precision. It's a dispute about whether an arithmetic shift
18 changed precision or not, but I agree with you about that
19 part.

20 Q. And the basis for your opinion shown here in
21 Judge Elliot's decision, page 123 of his decision, exhibit
22 page 129, is you said with arithmetic shifts the number of
23 bits that were used -- we're looking at the very top figure
24 on that page at the right-hand side -- those stay the same.
25 The number of bits stay the same; whereas, with logical

1 shifts, we lost bits, and, therefore, we reduce precision.

2 A. That's a fair characterization.

3 Q. And you understand that Judge Elliot found
4 against you on that point whether arithmetic shifts decrease
5 precision.

6 A. Absolutely. That's why I didn't present it.

7 Q. And what Judge Elliot pointed out is that what's
8 going on is that we're freezing the most significant bit in
9 the case of arithmetic shifts.

10 A. I don't remember his characterization of bits,
11 but I remember he disagreed with the conclusion, and he
12 found that it does -- that it does change position.

13 Q. Remind us. In the case of Two's Complement
14 numbers, what is the function of a most significant bit
15 labeled MSB in Judge Elliot's 1380 decision?

16 A. In his decision? I don't recall.

17 Q. Rather, as a person of skill in this field, what
18 is the function of MSB or most significant bit in a Two's
19 Complement representation?

20 A. To provide the sign of the number.

21 Q. And Judge Elliot said that even though
22 Dr. Schonfeld is pointing to the signed bit in the case of
23 arithmetic shifts, to distinguish precision between an
24 arithmetic shift and a logical shift, it doesn't matter,
25 because the possible values remain the same.

1 A. I don't recall what he said, but I'll take your
2 word for it.

3 Q. Mr. Moreno, can we just scroll down this page?
4 Keep going, please, to the top of the next page.

5 Right there, that figure.

6 In fact, what Judge Elliot put in his decision is
7 exactly that. Because what was elicited during your
8 testimony was it didn't matter the number of bits that were
9 used on the right-hand side associated with the arithmetic
10 shift. That's just bitwidth. What mattered was the number
11 of possible values corresponding to the different pixel
12 values or whatever it might be that a given prediction could
13 take.

14 A. I don't -- I didn't read it carefully, but my
15 understanding from this brief view, and my recollection is
16 it's not the number of possible values, but rather the
17 number of bits needed to represent the quantity, the size of
18 the number, regardless of how it's represented, and he later
19 on in his opinion talked about the number of bits
20 throughout.

21 So I would disagree that it's about the number of
22 possible values. It's about the size of the value.

23 Q. Dr. Schonfeld, as shown --

24 Mr. Moreno, could we please zoom out so we have
25 the page number.

1 As shown on page 124 of the determination,
2 RX-1945 at 130, in your view are the numbers on the
3 right-hand side of the page corresponding to your
4 demonstrative with arithmetic shifts more precise than the
5 numbers on the left-hand side of the page corresponding to
6 logical shifts?

7 A. This is an issue Judge Elliot already ruled on,
8 and in his view they are exactly the same, and I take no
9 issue with that.

10 Q. And if we were to apply the same approach to your
11 Walker grounds, you would agree that, if the bitwidth on the
12 right-hand side of Judge Elliot's figure here in his
13 decision, if the right-hand side corresponded to a larger
14 bitwidth, you would agree that that's not any more precise
15 than a smaller bitwidth as shown on the left-hand side of
16 Judge Elliot's figure from his determination?

17 A. I'm not sure what you have in mind, but I cannot
18 agree to that statement as you phrased it.

19 Q. Let's take, as an example, the bottom row.

20 Mr. Moreno, we can keep this view.

21 Let's take the bottom row, corresponding to the
22 value of negative 20 as shown in Judge Elliot's decision.

23 On the left-hand side you agree we have 6 bits,
24 101100?

25 A. That's right.

1 Q. On the right-hand side we have 8 bits, 11101100,
2 right?

3 A. That's right.

4 Q. Now my question to you is, the representation
5 with 8 bits corresponding to a value of negative 20, is that
6 more precise than the representation with 6 bits
7 corresponding to exactly the same value?

8 A. My -- I think in this case the answer is no,
9 because the point Judge Elliot made, and I accept it and I
10 agree with it, that you could have represented that number
11 by dropping all but the -- you can always take in signed bit
12 representation all of the numbers that are the same up to
13 the last one so -- and discard them.

14 So you can take the first two ones and discard it
15 and you are left with just the one on the far left, and then
16 you have the same precision. And I think that's the source
17 of his view and I accept it. I don't -- I think that's
18 consistent with Respondents' proposed construction.

19 My comment was that the computer would not be
20 able to do it, because the computer must look only at the 8
21 bits. And he said -- I'm paraphrasing very, very loosely
22 right now -- that it's not important what the computer does,
23 it's important what number -- what value it represents.

24 And I'm talking about issues that I haven't read
25 in a while, so I might have mischaracterized some of it, but

1 that was not the center of my -- of the focus of my
2 investigation in this case.

3 Q. I understand that. So let me ask you just a
4 question, a technical question.

5 As a factual matter, a computer system with an
6 8-bit number, it's going to need to look at all those bits,
7 right?

8 A. Right, but you cannot just simply discard the
9 first bits that are the same and just say it will work just
10 the same, because the computer looks for the most
11 significant bits for the sign, and sometimes -- and you
12 cannot just simply squish it down by discarding them.

13 Q. Right. And that exact same reasoning is true for
14 the 8-bit number shown in Judge Elliot's figure representing
15 negative 20, the computer system can't discard all those
16 bits, right?

17 A. In the case of the logical shift?

18 Q. I'm talking about in the case of just the
19 register displayed at the bottom of Judge Elliot's figure
20 corresponding to negative 20 under the arithmetic shift
21 column.

22 A. That is correct.

23 Q. Doctor, just so we're clear, do you agree that we
24 ought to take the same understanding and precision as shown
25 here in Judge Elliot's decision and apply it towards your

1 arguments regarding the Walker reference?

2 A. You're asking me a similar question to what you
3 asked me earlier, and I don't understand the question. I
4 don't know what you have in mind. So I can -- I don't see
5 the relationship of this to Walker at the moment. So I
6 cannot answer your question.

7 Q. I'd like to turn to your slide RDX-5C at 187.

8 Doctor, the equation that you provided on slide
9 187, your slide 187, is equation 13 from Walker, right?

10 A. That's correct.

11 Q. And equation 13 in Walker falls under the H.264
12 implementation in Walker.

13 A. It might. I don't recall. It is a -- it's a
14 bidirectional prediction, and H.264 may be an inspiration
15 for it.

16 Q. Mr. Moreno, can we please have JX-683 at page 17?

17 What I'd like to do is zoom in at first around
18 paragraph 58, 59, 60.

19 Professor, you see, starting at paragraph 58, we
20 see H.264 implementation?

21 A. We do.

22 Q. And now what I'd like to do is scroll down just a
23 few paragraphs below that. So let's just scroll down to the
24 top of the next page.

25 And if you zoom in here, Doctor, starting at

1 paragraph 62, we see case 1, paragraph 64 of Walker, we see
2 case 2, and let's keep scrolling down. And then at
3 paragraph 68 we see case 3 of the H.264 implementation.

4 Do you see that?

5 A. Under the heading, yes.

6 Q. And right underneath paragraph 68 we see equation
7 13.

8 A. Right underneath what? I'm sorry?

9 Q. Right underneath the paragraph 68 label in Walker
10 we see equation 13.

11 A. Correct.

12 Q. And does this refresh your recollection of
13 whether equation 13 is part of the H.264 implementation in
14 Walker?

15 A. It's done in that section, but my understanding
16 of Walker is it's discussing many different implementations,
17 and he says you can -- you can mix and match. It is a
18 design for universality on the coder side. So I view it as
19 a general prediction, but in Walker it is represented as
20 part of H.264.

21 Q. And in the H.264 standard, there were a few
22 different types of weighted bi-prediction, correct?

23 A. That's correct.

24 Q. One of those types of weighted bi-prediction was
25 a simple averaging, a default weighted prediction we might

1 call it.

2 A. Correct.

3 Q. Another one of those types of weighted
4 bi-prediction in the H.264 standard was known as explicit
5 weighting.

6 A. Correct.

7 Q. And in explicit weighting in the H.264 standard
8 weights are transmitted in the slice header, not the block
9 level.

10 A. Correct.

11 Q. Now, there's the third type of weighted
12 bi-prediction in the H.264 standard. That's known as
13 implicit weighted prediction.

14 A. Correct.

15 Q. And for implicit weighted bi-prediction, the
16 weights that are used are calculated based on the relative
17 temporal positions of the reference frames, not at the
18 individual block level.

19 A. Correct.

20 MR. VERBONCOEUR: Your Honor, I pass the witness.

21 JUDGE MCNAMARA: Okay. Thank you,
22 Mr. Verboncoeur.

23 Ms. Ducca?

24

25

1 EXAMINATION BY COUNSEL FOR ITC STAFF

2 BY MS. DUCCA:

3 Q. Good afternoon, Dr. Schonfeld.

4 A. Good afternoon.

5 Q. It's nice to see you again. My name is Marissa
6 Ducca from the Office of Unfair Import Investigations.

7 I'm going to start out with a couple of very
8 basic questions.

9 With respect to invalidity, is it your
10 understanding that anticipation means a single reference
11 discloses each limitation of the claim?

12 A. Correct.

13 Q. And you understand under obviousness that it's
14 not a single reference mentioned -- not a single reference
15 discloses each limitation in the claim, but one or more
16 limitations are obvious in view of one of ordinary skill in
17 the art, correct?

18 A. Correct.

19 Q. You have asserted two grounds of invalidity with
20 respect to the '267 patent, correct?

21 A. Correct.

22 Q. Ground 1 is obviousness in view of Walker alone,
23 correct?

24 A. Correct.

25 Q. And obviousness ground 2 is Walker in view of

1 Srinivasan.

2 A. Correct.

3 Q. Okay. I just want to make sure the record is
4 entirely clear.

5 Could somebody please put up RDX-0005C.115?

6 Dr. Schonfeld, I'm just using this slide as an
7 example to put up the claim limitations. I understand this
8 is just encoding claims.

9 My question for you is, with respect to your
10 first ground of obviousness, so Walker alone, which
11 limitation or limitations do you contend is not explicitly
12 disclosed in Walker?

13 A. I think, quite frankly, it's all disclosed. So
14 if it's anticipated, I think that makes it pretty obvious,
15 but I will say, to the extent that there is anything
16 potentially missing, there is a limitation that says wherein
17 the residual data is determined based upon a difference
18 between the combined prediction and the block of pixels.

19 And both sides and Judge Elliot have taken the
20 view that, if you put the clamp in between or a clip
21 operation, it's still true even if it's -- so even though
22 you don't have directly between the combined prediction, but
23 between the clipped combined prediction, both sides have
24 taken the view in this investigation that that means it's
25 literally, so that would still be anticipation.

1 In the previous investigation I took the view
2 that that clipping changes it. Judge Elliot disagreed. If
3 one agrees that it's changing, you need to make an
4 obviousness argument for that. Neither side took that view
5 in this investigation.

6 Secondly, for claim 8, under the second and third
7 theories of Walker alone and Walker combined with
8 Srinivasan, so Walker combined with Srinivasan is clearly an
9 obviousness argument because it's a combination.

10 In Walker alone, Walker does not -- it teaches
11 the prediction, and it teaches an interpolation filter with
12 half and half. It doesn't expressly say that the precision
13 would go up. It actually depicts it as 8 pixels of the
14 precision remain the same in its tables.

15 And so one -- and it says other particular
16 filters could be used for the interpolation filters. A
17 person of skill in the art would know how to use other
18 filters, which would have increased the precision, just like
19 the combination with Srinivasan, but this is under Walker
20 alone, and that's an obvious ground in view of Walker and
21 knowledge of a person of ordinary skill in the art.

22 Q. Okay. So, then, the obviousness argument is
23 really for the dependent claims; is that correct?

24 A. That's correct.

25 Q. Okay. All right. So that's helpful for me.

1 Let's explore that a little bit more. Another basic
2 question.

3 Dr. Schonfeld, can you explain what interpolation
4 is?

5 A. So if you are -- think of it like this. If I
6 tell you the value at the end of the stock market every day
7 for the past week, and then I ask you what was the value in
8 the opening every day of the past week, you have to guess.
9 You would look at the closing value of each day and you
10 would make an estimate of what the open -- what the midday
11 value would have been.

12 And that requires doing some kind of math to
13 guess. That's exactly what we're doing here, but we are
14 doing it with images.

15 So we are taking an image, let's say a size a
16 hundred by a hundred, and then we want to double it to 200
17 by 200, but we don't have the pixels, so we are just going
18 to find an estimate of the pixels in between.

19 So we use filters to guess what those values are,
20 and the reason we do it is so that the motion vector can
21 point in between pixels to what we call subpixels, and that
22 allows us to copy our estimates. And if they give smaller
23 error, we keep it. If they give bigger error, we throw it
24 away.

25 Q. Okay. So can you explain how the interpolation

1 filter that's disclosed in Walker increases precision under
2 Nokia's proposed claim construction?

3 A. I see. So this is the -- pred0 by itself, not
4 pred0 w0 is the prediction. And so in that case we have an
5 interpolation filter. That interpolation filter would be a
6 filter such as, for example, the one described in Srinivasan
7 or in the '267 patent.

8 It would increase precision definitely under
9 Respondents' proposed construction, because you take the
10 weights and multiply the weights. When you get the weight
11 in between, you get a number that's much, much larger. And,
12 therefore, you need more bits to represent it.

13 For example, in the HEVC you need 14 bits to
14 represent the output of the filter that's used for purposes
15 of infringement. So that meets Respondents' construction.

16 And if you -- in my view, Nokia hasn't addressed
17 it for under Complainants' construction, but it definitely
18 meets Respondents' construction. And, therefore, pred0 is
19 being the output of an interpolation filter like Srinivasan,
20 like the filter in '267, like the HEVC filter, all of them,
21 would require you to take the neighboring pixels, multiply
22 them by large numbers, add it up, and you need more bits to
23 represent it.

24 And that's -- and that's something that was
25 routinely done in video coding going all the way back to

1 MPEG-1. So only one standard did not use this type of
2 technique, H.261.

3 Q. But how would it meet the limitations under
4 Complainants' proposed construction where they are requiring
5 a series of bits that have more -- their precision involves
6 having more specific options with that bit series?

7 A. In my opinion, they haven't proven that they do
8 meet that. All they did, if you notice, in the direct
9 Nokia, on the decoding -- on the decoding side completely
10 ignored the second precision under any construction really.
11 On the encoding side they just said the number is bigger,
12 therefore, you need more bits. That's Respondents'
13 construction.

14 So Nokia hasn't presented a theory in this case,
15 in my view, under Complainants' proposed construction.

16 But if they wanted to, they would have to do
17 exactly what I'm going to describe now. They would have had
18 to take the possible input values that could be generated at
19 the input, the entire block, and count how many different
20 permutations you could have at the input, take the filter,
21 apply it to that, count how many different permutations you
22 get after applying the filters, and then I can show, that
23 when I apply Srinivasan, in the case of Srinivasan, you take
24 that and apply it to that block, and because it has --
25 because it looks at information that's not present in the

1 original block, it looks at information from other parts of
2 the image, you will get more possibilities.

3 Q. Okay.

4 A. I don't know how many. So the Complainants'
5 proposed construction requires that you actually -- I think
6 it's indeterminate. I don't know the number, but nobody
7 knows the number. It's too hard of a mathematical problem.

8 Q. Let me make sure I understand your position, and
9 then I'm going to ask a couple more questions about it.

10 If we apply the interpolation filter from
11 Srinivasan, we will end up with a precision that has a
12 higher number of distinct alternatives from which a value
13 can be determined; is that correct?

14 A. If you are looking at the number of possibilities
15 for the block as a whole, yes. If you are looking at the
16 individual pixels, for some of them, yes, for some of them
17 less, for some more, it will get too confusing. So I can
18 only discuss it as a block as a whole, and then the answer
19 is yes.

20 Q. Okay. Is the same true if you apply the
21 interpolation filter in Walker?

22 A. The one with the half and half, yes, that's
23 correct.

24 Q. Can you explain why?

25 A. Because you will go -- when you go through the,

1 let's say, a block, you would look at the edges. And so
2 instead of looking at only 4x4 you would look, because it
3 has two pairs, two elements, you would look at something
4 that's 6x6 and, therefore, the number of possibilities would
5 have been 6x6 -- sorry -- 2 to the power of 8, to the power
6 of 36, whereas the input would have been 2 to the power of
7 8, to the power of 16.

8 Q. Okay.

9 A. I don't know if that's --

10 Q. That's helpful.

11 A. -- if that's clear, but it does generate more
12 possibilities when you apply the interpolation filter in
13 that particular way.

14 Q. Okay. That's helpful.

15 Can you explain the difference between the
16 filter, the interpolation filter in Walker and the
17 interpolation filter in Srinivasan?

18 A. Sure. So in the case of the interpolation filter
19 in Walker, it's basically an array of interpolation filters,
20 because it gives one example of a half and half, but it says
21 a person of skill would have known how to use any, and there
22 are others -- we're not going to mention it here because
23 everybody knows about it. So I view the teachings of Walker
24 as being not limited to a half and half.

25 But if we were to take the example of Walker of a

1 half and half for the coefficients, and compare it to
2 Srinivasan, Srinivasan is a multistage filter with six
3 coefficients, and so it's a much more complex filter. It
4 allows you to go to accuracy that's not only half pixel but
5 subfractional pixel resolution, and it takes into account
6 many more values in estimating the current fraction of pixel
7 value than Walker does.

8 Q. Okay. And, finally, can you give me a little bit
9 more information as to why one of ordinary skill in the art
10 would modify Walker to include the one or both of the
11 interpolation filters from Srinivasan or from Walker to
12 arrive at the asserted claims in this case?

13 A. That's easy. Because the interpolation -- the
14 interpolation filter wants to get the best possible
15 prediction, so that the residual is the smallest possible,
16 the filters of a half and half will give you a larger
17 residual than the one that is more complex or the Srinivasan
18 version, they would give you a smaller residual and your
19 compression efficiency would increase.

20 Q. Just to make sure the record is clear, all of the
21 opinions we discussed today regarding the level of ordinary
22 skill, are they the same under both Nokia's proposed level
23 of ordinary skill and Respondents' level of ordinary skill?

24 A. Everything we just discussed would apply under
25 both and would be applicable under both, but it's primarily

1 needed to address Complainants' new proposed construction,
2 but it would be equally true in the other construction.

3 Q. Okay. Dr. Schonfeld, do you qualify as a person
4 of ordinary skill in the art under the proposed levels of
5 ordinary skill?

6 A. I do.

7 Q. Okay.

8 A. Thank you for asking.

9 Q. All right. Thank you. Thank you for your time.

10 MS. DUCCA: I'll pass the witness, Your Honor.

11 JUDGE MCNAMARA: Thank you, Ms. Ducca.

12 Mr. Thompson?

13 MR. THOMPSON: I'll try to be brief, Your Honor,
14 because I see we're creeping up on the 5:30 time.

15 JUDGE MCNAMARA: Well, unfortunately, if we have
16 to hold Dr. Schonfeld over, he knows what to do and so do
17 you all.

18 REDIRECT EXAMINATION

19 BY MR. THOMPSON:

20 Q. Dr. Schonfeld, you were asked during your
21 cross-examination about a Golomb-Rice coding.

22 Do you recall that?

23 A. I do.

24 Q. And it appears that perhaps you were being
25 criticized for not underlining or highlighting Golomb-Rice

1 coding on some of your presentation materials.

2 Do you recall that as well?

3 A. I got the sense. I'm not sure if it's accurate,
4 but that was a possibility.

5 Q. Dr. Schonfeld, were you in court when
6 Dr. Chrissan testified on the '701 patent?

7 A. I did. I was.

8 Q. Do you recall him mentioning Golomb-Rice coding a
9 single time?

10 A. No, I do not.

11 Q. Dr. Schonfeld, you were asked about the meaning
12 and interpretation of the phrase syntax elements.

13 Do you recall that line of questioning?

14 A. I do.

15 Q. And it appears there remains a dispute in this
16 case and maybe some ambiguity exists regarding what a syntax
17 element is or is not.

18 Do you agree?

19 A. That's my understanding, yes.

20 Q. And, likely, Her Honor and clerks will have to
21 dig into this and weigh the evidence.

22 Is that your understanding of how this generally
23 works?

24 A. At a very high level, yes.

25 Q. Can we bring up Dr. Schonfeld's slide 71, which

1 is RDX-0005.71.

2 Dr. Schonfeld, can you describe for me what's on
3 slide 71 and how does it impact your understanding of the
4 meaning of the term syntax elements?

5 A. So this is from the -- there are various
6 resources that were available that all contradict Nokia's
7 view as to what a syntax element is, and they include the
8 definition -- I'm sorry -- the examples -- not examples --
9 the list of all syntax elements from the H.265 standard, the
10 characterization that they must be bold and lowercase with
11 underscore in the 265 standard, the VQ Analyzer information
12 where it lists the syntax elements by name, and the
13 prosecution history describing what a syntax element is, and
14 the -- and the statement by the applicants at the time of
15 the prosecution about the fact of what it is not. In
16 particular, the binarization elements were not syntax
17 elements.

18 Q. Dr. Schonfeld, does this represent some of the
19 evidence on -- I'll call it the side of the syntax element
20 dispute that you fall on?

21 A. That's correct.

22 Q. And we heard on the other side, we have -- you
23 were asked about an article by Mr. Sullivan.

24 Do you recall that?

25 A. I do.

1 Q. And in that article the words "syntax elements"
2 appeared.

3 Is that your recollection?

4 A. It did.

5 Q. And did Mr. Sullivan in that article mention the
6 types of standards he was referencing to in the portion that
7 referenced the syntax elements?

8 A. My recollection, from what I saw today during the
9 cross-examination, that up on top it said something to the
10 effect of prior standards, something to that effect.

11 Q. You were also asked about a text book authored by
12 Dr. Richardson.

13 Do you recall that line of questioning?

14 A. I do.

15 Q. I have a copy of that textbook here.

16 JUDGE MCNAMARA: Which one? There were two
17 referenced.

18 MR. THOMPSON: "Coding Video, A Practical Guide
19 to HEVC and Beyond."

20 JUDGE MCNAMARA: What's the year on that release?

21 MR. THOMPSON: This is the 2024 textbook,
22 Your Honor.

23 Q. Now, referring to Dr. Richardson's textbook,
24 since there is an ambiguity about what is a syntax element
25 and what is not a syntax element, I wanted to quickly look

1 at what Dr. Richardson tells us what to do.

2 Dr. Schonfeld, can you read for me the sentence
3 starting, if there is?

4 A. "If there is any doubt or ambiguity about a
5 particular process that has been specified in one of the
6 standards, the standard document itself should be
7 consulted."

8 Q. Thank you.

9 For the record, Your Honor, this was CX-1964.

10 And so, Dr. Richardson's textbook tells us when
11 we're not sure, we should go to the standard. And so I'm
12 going to pull up -- I'm going to bring up on the ELMO here a
13 page from CX-5885. This is page 244.

14 Dr. Schonfeld, what do we see here on CX-5885?

15 A. We have the table with syntax elements and the
16 bin index indicating whether it's bypassed or not.

17 Q. And so does the 265 standard provide us with a
18 complete list of syntax elements defined by that standard?

19 A. Yeah, the entire list of all syntax elements in
20 the standard is written down.

21 Q. Now, Dr. Schonfeld, does Nokia's expert point to
22 non-zero transform coefficients as syntax elements?

23 A. He alleges them to be syntax elements for the
24 purpose of the claim. He does not point to syntax elements
25 in the standard.

1 Q. You actually probably got one question ahead of
2 me.

3 Does Nokia's expert ever point to any mention of
4 non-zero transform coefficient in the H.265 standard?

5 A. Not that I recall.

6 Q. As best you recall, does the H.265 standard use
7 the term non-zero transform coefficients when referring to
8 syntax elements?

9 A. When referring to syntax elements, definitely
10 not.

11 Q. Do you recall seeing in the '701 patent the use
12 of the term non-zero transform coefficients?

13 A. In where? I'm sorry?

14 Q. In the '701 patent specification, do you recall
15 seeing the use of the phrase non-zero transform
16 coefficients?

17 A. I remember seeing DCD coefficients.

18 Q. Do you recall seeing non-zero transform
19 coefficients?

20 A. In that phrase, in that way, no.

21 Q. And if we're looking for the use of the transform
22 coefficient in the standard, what will we find?

23 A. We'll find the definition up on top of this
24 particular slide talking about the decoding process.

25 Q. And do we have a separate definition for syntax

1 elements?

2 A. We do.

3 Q. And does the definition of transform coefficient
4 say it's one of the syntax elements?

5 A. It does not.

6 Q. Now, I believe you were asked whether you had
7 found a book that says non-zero transform coefficients are
8 not syntax elements.

9 Do you remember that?

10 A. I do remember the question, yes.

11 Q. And I think we all know in this field sometimes
12 it's difficult to prove a negative.

13 Do you agree with that?

14 A. I think I was asked if I know of a standard or a
15 book, I don't remember, but, yeah, it is difficult to prove
16 a negative.

17 Q. And sometimes, if things are so different, it's
18 unlikely that you'll have a text or an article that says A
19 is not B.

20 Would you agree with that?

21 A. For sure.

22 Q. And I don't mean to be flippant, but if I asked
23 you if you've ever seen a book that says a banana is not a
24 basketball, would you have a similar reaction?

25 A. It would be in that spirit, yes.

1 Q. Now, shifting to the '267 patent, you had some
2 discussion with counsel about truncation and right shifting.

3 Do you recall that?

4 A. I do.

5 Q. Now, can truncation and right shifting both be
6 used for the purpose of rounding.

7 A. Can be used for the purpose of achieving the
8 rounding result, yes.

9 Q. Does that mean they are the same thing?

10 A. No.

11 Q. Dr. Schonfeld, in your '267 patent invalidity
12 analysis under Nokia's proposed construction, did you rely
13 solely on bitwidth to show the claim's precision?

14 A. No.

15 Q. What did you rely on?

16 A. Under Nokia's proposed construction?

17 Q. Correct.

18 A. I relied on a few things. I relied on the range
19 of values of the weights. I relied on the fact that those
20 weights can change even in the context of H.264. I relied
21 on Nokia's infringement theory and the fact that they claim
22 it meets Complainants' construction under the obviousness
23 modifications of Walker and of the combination with
24 Srinivasan.

25 Q. Dr. Schonfeld, you were also asked to discuss

1 Judge Elliot's initial determination and some of the
2 discussion of precision.

3 Do you recall that line of questioning?

4 A. I do.

5 Q. Now, did Judge Elliot determine that the
6 precision requirement was found in Walker?

7 A. He did.

8 Q. And if we accept Judge Elliot's findings, and we
9 add the additional evidence you provided today to address
10 the pieces he felt were missing, where does that leave the
11 '267 patent?

12 A. In my opinion it's invalid under all proposed
13 constructions.

14 MR. THOMPSON: I'll pass the witness, Your Honor.

15 JUDGE MCNAMARA: Thank you, Mr. Thompson.

16 MR. VERBONCOEUR: Your Honor, I think everyone
17 will be pleased to hear that we have no further questions.

18 JUDGE MCNAMARA: Is that also true of you,
19 Mr. Cameron?

20 MR. CAMERON: Yes, Your Honor.

21 JUDGE MCNAMARA: Okay. Ms. Ducca?

22 MS. DUCCA: Same is true for Staff, Your Honor.

23 JUDGE MCNAMARA: Thank you very much.

24 Dr. Schonfeld, you may step down and go home for
25 the night.

1 A. Thank you.

2 JUDGE MCNAMARA: Yes. Take care.

3 Okay. So at this point we need to stop for the
4 evening. Is there anything that you would like me to
5 address quickly before we go? And by the way, we can hold
6 over exhibit issues until tomorrow.

7 MR. NEWCOMER: Nothing at this time for
8 Complainants, Your Honor.

9 JUDGE MCNAMARA: Okay. Thank you.

10 MR. CAMERON: There were several
11 cross-demonstratives that we labeled. What is you're
12 your Honor's procedure for how we deal with those?

13 JUDGE MCNAMARA: They are going to come in. They
14 have been cross-labeled. You should sign them. You were
15 the ones who created them. They should be dated. Show them
16 to the other side. Make sure they agree.

17 And then tomorrow, when you discuss all of the
18 exhibits, you can also tell me what you're doing about
19 those, but they should be properly labeled, dated, your
20 initials or name, so we know who created them.

21 MR. CAMERON: Yes, Your Honor. Thank you.

22 JUDGE MCNAMARA: Okay.

23 MS. ROBERTS: Your Honor, Stephanie Roberts for
24 Respondents. We have nothing.

25 JUDGE MCNAMARA: Thank you, Ms. Roberts.

1 Ms. Ducca?

2 MS. DUCCA: Nothing from the Staff, Your Honor.

3 JUDGE MCNAMARA: All right. We are finished for
4 the day, and I will see you tomorrow at 9 a.m.

5 Thank you, everyone. Have a great evening.

6 //

7

8 (Whereupon, at 5:30, the proceedings adjourned,
9 to reconvene the following day, March 11, 2026, at 9:00
10 a.m.)

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1 C O N T E N T S

2 INDEX OF WITNESSES

3

	WITNESS	DIRECT	CROSS	RE- DIRECT	RE- CROSS	STAFF
5	SHEILA HEMAMI.....			1231	1238	1222
6						1245
7	VICTOR CHENG.....	1249	1256	1274	1275	
8	DAN SCHONFELD.....	1278	1403	1479		1470

9

10

11

12 AFTERNOON SESSION.....1345

13

14

15

16

17 CONFIDENTIAL SESSION.....1223- 1247

18 CONFIDENTIAL SESSION.....1251- 1259

19 CONFIDENTIAL SESSION.....1262- 1277

20 CONFIDENTIAL SESSION.....1395- 1400

21 CONFIDENTIAL SESSION.....1439- 1441

22

23

24

25

1 EXHIBIT LISTS SUBMITTED FOR ADMISSION:
2 LIST OF EXHIBITS ADMITTED ON MARCH 9, 2026
3 CX-0299C
4 CX-0371
5 CX-0482C
6 CX-0497C
7 CX-0565C
8 CX-0569C
9 CX-0576C
10 CX-0587C
11 CX-0588C
12 CX-1418
13 CX-1555
14 CX-1808C
15 CX-1952C
16 CX-6351
17 CX-7192C
18 CX-7212
19 JX-0121C
20 JX-0122C
21 JX-0125C
22 JX-0134C
23 JX-0216C
24 JX-0222C
25 JX-0228C

1	JX-0231C
2	JX-0236C
3	JX-0249C
4	JX-0250C
5	JX-0252C
6	JX-0253C
7	JX-0254C
8	JX-0255C
9	JX-0256C
10	JX-0257C
11	JX-0258C
12	JX-0259C
13	JX-0260C
14	JX-0261C
15	JX-0262C
16	JX-0263C
17	JX-0264C
18	JX-0265C
19	JX-0266C
20	JX-0267C
21	JX-0268C
22	JX-0269C
23	JX-0270C
24	JX-0271C
25	JX-0272C

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2	JX-0274C
3	JX-0275C
4	JX-0276C
5	JX-0277C
6	JX-0278C
7	JX-0279C
8	JX-0280C
9	JX-0281C
10	JX-0282C
11	JX-0283C
12	JX-0287C
13	JX-0291C
14	JX-0293C
15	JX-0295C
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18	JX-0306C
19	JX-0308C
20	JX-0309C
21	JX-0310C
22	JX-0311C
23	JX-0315C
24	JX-0319C
25	JX-0321C

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3	JX-0326C
4	JX-0330C
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7	JX-0335C
8	JX-0336C
9	JX-0338C
10	JX-0339C
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12	JX-0341C
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14	JX-0344C
15	JX-0346C
16	JX-0348C
17	JX-0351C
18	JX-0354C
19	JX-0355C
20	JX-0356C
21	JX-0361C
22	JX-0364C
23	JX-0367C
24	JX-0370C
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4 JX-0399C
5 JX-0406C
6 JX-0442C
7 JX-0446C
8 JX-0726
9 RX-0204
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1 C E R T I F I C A T E

2 TITLE: CERTAIN VIDEO-CAPABLE LAPTOP, DESKTOP COMPUTERS,
3 HANDHELD COMPUTERS, TABLETS, TELEVISIONS, PROJECTORS, AND
4 COMPONENTS AND MODULES THEREOF

5 INVESTIGATION NO.: 337-TA-1448

6 HEARING DATE: March 10, 2026

7 LOCATION: Courtroom A

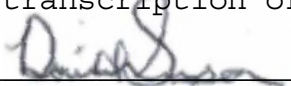
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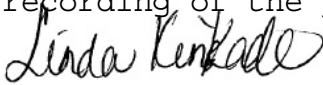
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UNITED STATES INTERNATIONAL TRADE COMMISSION

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In the Matter of Investigation No.

337-TA-1448

CERTAIN VIDEO-CAPABLE LAPTOP, DESKTOP
COMPUTERS, HANDHELD COMPUTERS,
TABLETS, TELEVISIONS, PROJECTORS, AND
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UNITED STATES INTERNATIONAL TRADE COMMISSION

Washington, D.C.

Before the Honorable MaryJoan McNamara

Administrative Law Judge

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In the Matter of Investigation No.

337-TA-1448

CERTAIN VIDEO-CAPABLE LAPTOP, DESKTOP

COMPUTERS, HANDHELD COMPUTERS,

TABLETS, TELEVISIONS, PROJECTORS, AND

COMPONENTS AND MODULES THEREOF

-----x

International Trade Commission

500 E Street, SW

Washington, D.C.

Evidentiary Hearing

Wednesday, March 11, 2026

Volume VI

The parties met pursuant to notice of the
Administrative Law Judge at 9:00 a.m. Eastern.

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13 *** Index appears at end of transcript ***

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15 PLEASE NOTE: Quotations from documents are reflected in the
16 transcript as read and may not constitute a verbatim quote.

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1 P R O C E E D I N G S

2 (In session at 9:00 a.m.)

3 JUDGE MCNAMARA: Good morning, everyone. Kindly
4 be seated.

5 I have the time. I have the updated time. Is
6 everybody in agreement that this is accurate?

7 MR. NEWCOMER: Yes, Your Honor.

8 JUDGE MCNAMARA: Okay. And it's diversion which
9 says that the total time for Respondents, in terms of
10 estimated time totals, 1244 minutes for Respondents and 1239
11 for Complainants and 201 for Staff?

12 MR. NEWCOMER: That sounds accurate, Your Honor.
13 I don't have it right in front of me, but very close.

14 JUDGE MCNAMARA: All right, good.

15 Any objections from the Complainants?

16 Good morning, Ms. Roberts.

17 MS. ROBERTS: No, Your Honor. Good morning.

18 MS. DUCCA: No objection from Staff, Your Honor.

19 JUDGE MCNAMARA: Okay. All right, before we get
20 started, is there anything that you would like me to
21 address?

22 MS. ROBERTS: Yes, Your Honor. We are going to
23 have one of our NEXT Advocates introduce the exhibits from
24 yesterday.

25 JUDGE MCNAMARA: Good. Thank you.

1 MS. ROBERTS: And Alex Harrison will be our NEXT
2 Advocate.

3 JUDGE MCNAMARA: Good morning.

4 MR. HARRISON: Good morning, Your Honor. We
5 would like to admit the exhibits, yeah, admit the exhibits
6 entered into the record yesterday with Dr. Schonfeld,
7 Dr. Hemami, and Dr. Cheng.

8 JUDGE MCNAMARA: Any objections?

9 MR. NEWCOMER: No objection, Your Honor.

10 JUDGE MCNAMARA: Thank you, Mr. Newcomer.

11 Ms. Ducca?

12 MS. DUCCA: No objection, Your Honor.

13 JUDGE MCNAMARA: All right. So I assume you have
14 a list?

15 MR. HARRISON: I do have a list. I have a copy
16 for Your Honor.

17 JUDGE MCNAMARA: Very good. And a copy for
18 Ms. Kinkade as well?

19 MR. HARRISON: Yes.

20 JUDGE MCNAMARA: Very good. All right. Then the
21 documents -- the exhibits that the parties have agreed upon
22 that were addressed by Dr. Schonfeld, Dr. Hemami, and
23 Dr. Cheng will be admitted into evidence without objection.

24 (Whereupon, the exhibits as recited by counsel
25 and reflected in the attached index were submitted and

1 received in evidence.)

2 MR. HARRISON: May I approach?

3 JUDGE MCNAMARA: Yes. Thank you.

4 All right. Has there been a rearrangement of
5 witnesses, it looks like? Where are we?

6 MS. ROBERTS: I believe the witness order is the
7 same right now.

8 JUDGE MCNAMARA: All right. So who are you
9 calling?

10 MS. ROBERTS: Sorry, Your Honor. We were just
11 conferring to make sure there were no additional issues.

12 JUDGE MCNAMARA: Yes. No, that makes sense.
13 That is fine.

14 MS. ROBERTS: At this time we're calling Dr. Zal
15 Phiroz.

16 JUDGE MCNAMARA: Very good.

17 Good morning, Dr. Phiroz.

18 A. Good morning.

19 JUDGE MCNAMARA: Would you kindly remain standing
20 and raise your right hand? And don't fall out of the
21 witness box. It is so easy to do.

22 ZAL PHIROZ,

23 having been first duly sworn or affirmed on
24 their oath, was thereafter examined and testified as
25 follows:

1 JUDGE MCNAMARA: Please state your full name.

2 A. Zal Phiroz.

3 JUDGE MCNAMARA: Thank you very much.

4 MS ROBERTS: May I proceed, Your Honor?

5 JUDGE MCNAMARA: Yes, thank you, Ms. Roberts.

6 DIRECT EXAMINATION

7 BY MS. ROBERTS:

8 Q. Good morning, Dr. Phiroz. Can you please state
9 your name for the record?

10 A. Good morning. My name is Zal Phiroz.

11 Q. Is your microphone turned on?

12 JUDGE MCNAMARA: It is now.

13 Q. Can you tell us about your education?

14 A. Certainly. So I have an undergraduate degree in
15 computer science, a bachelor of computer science from the
16 University of Windsor, a bachelor of science, honors,
17 computer information systems, also from the University of
18 Windsor, an MBA from Wayne State University, and a Ph.D. in
19 supply chain management from the University of Capetown.

20 Q. Can you provide a brief description of your work
21 after college?

22 A. Certainly. So immediately after college I went
23 into industry and worked for a company called TELLUS and
24 another company called Procter & Gamble, both in the area of
25 supply chain management.

1 And after that I left and entered academia as
2 well as engaged in a variety of consulting appointments. As
3 an academic, I have held teaching roles, professor roles at
4 the University of Southern California, the University of
5 California, San Diego, Michigan State University. I've held
6 faculty positions at Harvard University, all teaching and
7 developing courses, graduate and undergraduate level, within
8 the area of supply chain management and operations
9 management.

10 Q. I would like to show you what has been marked as
11 CX-6619.

12 And if we could turn to page 2, what is this
13 document?

14 A. This is my CV.

15 Q. Is this a true and accurate representation of
16 your educational and work history?

17 A. It is.

18 MS. ROBERTS: Your Honor, at this time I'd like
19 to tender Dr. Phiroz as an expert in supply chain
20 management.

21 JUDGE MCNAMARA: All right.

22 Mr. Newcomer?

23 MR. NEWCOMER: No objection.

24 JUDGE MCNAMARA: Thank you, Mr. Newcomer.

25 Again, please give us your names for the record

1 when you speak.

2 MS. DUCCA: Marissa Ducca on behalf of OUII. No
3 objection, Your Honor.

4 JUDGE MCNAMARA: Thank you very much.

5 Then Dr. Phiroz is accepted as a witness on the
6 topics for which he has been called to testify without
7 objection.

8 Q. Dr. Phiroz, did you review any materials in
9 forming your opinions in this investigation?

10 A. I did, yes.

11 Q. I would like to show you what has been marked as
12 CX-6620 and CX-6622. And if we could turn to page 2 on both
13 of these exhibits.

14 What are these documents?

15 A. These appear to be the documents that I was
16 provided to aid me in forming an opinion in this case.

17 Q. What aspects of this investigation are you here
18 to opine on today?

19 A. I'm here to opine on supply chain topics,
20 specifically the impact to a supply chain should an
21 exclusion order be put forward.

22 Q. Did you create any demonstratives to assist us
23 with your testimony?

24 A. I did.

25 Q. I would like to show you what has been marked as

1 RDX-10.

2 Are these the demonstratives that you prepared?

3 A. They are.

4 Q. If we could turn to RDX-10.2, have you formed any
5 opinions in this investigation relating to the supply chain?

6 A. I have. Notably, in a supply -- supply chain is
7 essentially a number of businesses that are interconnected,
8 all with the goal and objective of ensuring that a product
9 efficiently moves from a supplier to a manufacturer to a
10 distributor to a retailer to a consumer.

11 Any disruptions within the supply chain would
12 inevitably cause some form of reverberation throughout the
13 chain, and that might lead to a number of supply chain
14 impacts, which may include shipping delays or shortages or
15 changes in consumer behavioral patterns.

16 In this case specifically, if prices on PCs and
17 tablets increase, there is likely going to be an impact on
18 consumer behavioral patterns. And consumers, businesses,
19 educational facilities, all of the contracts that are held
20 with the Respondents will likely be affected based on the
21 fact that there are going to be changes in pricing.

22 Q. If we could turn to RDX-10.3, can you tell us a
23 little bit about how supply chains operate and what happens
24 if there are disruptions in the supply chain?

25 A. Certainly. So as I mentioned, a supply chain is

1 an interconnected set of businesses, and any sort of change
2 within a supply chain will inevitably have some sort of a
3 ripple effect, some sort of reverberation.

4 In this case, Acer and ASUS purchase certain
5 components and sell them to ODMs, components like CPUs,
6 GPUs, memory and storage, and other components are sourced
7 directly by the ODMs, but within this case there's no reason
8 to make certain assumptions. There is no reason to assume
9 that some of the components that are owned by the
10 Respondents, so Acer and ASUS, would be readily distributed
11 to their competitors.

12 Furthermore, that opens up the door for other
13 questions in terms of substitutability or
14 interchangeability. And there are certain components that
15 are not interchangeable, specifically CPUs, for example,
16 which also opens up the door for other considerations, like
17 extended lead times because of the need to ensure that
18 certain components are available.

19 Q. If we could turn to RDX-10.4.

20 If an exclusion order issues for Acer and ASUS's
21 products, would there be any effect on Respondents or other
22 entities?

23 A. Yes. So there would be direct impact to Acer and
24 ASUS, for example. Acer has 400 and more U.S. employees.
25 ASUS has between 350 and 400 U.S. employees. So these

1 employees would theoretically be directly impacted. There
2 would be employees at other supply chain entities along the
3 chain, warehouses, logistics providers, component vendors,
4 et cetera. They would be potentially indirectly impacted.

5 Customers of Acer and ASUS would be impacted.
6 Customers like schools and school boards and school
7 districts.

8 So there would be a definite impact to the supply
9 chain.

10 Q. You testified earlier that prices may increase
11 due to the exclusion of Acer and ASUS products. Can you
12 explain your opinion?

13 A. Certainly. So, in general terms, within a supply
14 chain, what we typically assume is that price has a
15 relatively direct impact on demand. That's determined by
16 elasticity, but that impact is inevitably there.

17 When you remove a competitor, in this case Acer
18 and ASUS, what you're effectively doing is you're removing
19 price competition. In other words, there is no need for
20 competitors to compete on price so they don't necessarily
21 have to keep their prices lower to attract customers.

22 Q. Were you here when Mr. Dastmalchi and Dr. Akemann
23 testified?

24 A. I was, yes.

25 Q. If we could turn to RDX-10.5.

1 Mr. Dastmalchi testified that there is sufficient
2 product inventory of Respondents' competitors' PCs in the
3 channel to avoid a supply shortage if Acer and ASUS's
4 products are excluded.

5 Do you agree with this?

6 A. I don't. Mr. Dastmalchi's testimony ignores
7 certain inventory management factors that are quite
8 important. He appears to ignore transport costs, holding
9 costs. He doesn't necessarily acknowledge costs that are
10 associated with holding inventory, shrinkage costs,
11 obsolescence, depreciation, the potential for an item going
12 missing or being stolen or being damaged, the actual costs
13 associated with holding that unit.

14 Determining the optimal level of inventory is
15 critical within the world of a supply chain. It's under the
16 umbrella of supply chain optimization, and it doesn't seem
17 to be considered by Mr. Dastmalchi.

18 Mr. Dastmalchi also appears to have disregarded
19 the importance of acknowledging lead times and the impact of
20 a long lead time.

21 Q. If we could turn to RDX-10.6.

22 Mr. Dastmalchi calculated inventory for Acer and
23 ASUS and for Acer and ASUS's competitors.

24 Do you agree with his inventory calculations?

25 A. I don't. Mr. Dastmalchi appears to have relied

1 on publicly accessible data, data from Yahoo Finance, which
2 shows inventory for Acer and ASUS and Acer and ASUS's
3 competitors, but it also -- it shows all the inventory for
4 these companies.

5 Acer and ASUS sell other products, as do their
6 competitors, and Acer and ASUS provide reliable inventory
7 data, which Mr. Dastmalchi did not use, for example.

8 Acer and ASUS's competitors, like Lenovo, sell
9 accessories like docking stations and keyboards and audio
10 accessories. Dell sells servers and racks and headsets, and
11 HP with printers and monitors, Apple with watches and
12 phones.

13 All of these products are not products that we
14 are considering in this case, and all of these products and
15 units of inventory weren't considered by Mr. Dastmalchi when
16 he should have isolated just the product in question.

17 Q. If we could turn to RDX-10.7.

18 Mr. Dastmalchi testified that there are
19 sufficient flexibility parameters in the electronic supply
20 chain to prevent a supply shortage if Acer and ASUS's
21 products are excluded.

22 Do you agree with this opinion?

23 A. I don't. Mr. Dastmalchi doesn't seem to have
24 taken into account a number of different areas. For one,
25 his flexibility standards or the flexibility standards that

1 he mentioned didn't seem to have any support. He doesn't
2 seem to take into account the lead time for moving existing
3 inventory that's at the ODMs, nor does he seem to take into
4 account the fundamental aspect of this case, which is
5 interchangeability of components and the fact that certain
6 components cannot be interchanged.

7 Based on all of this, there are a number of
8 different logistics complexities that need to be considered
9 that Mr. Dastmalchi does not seem to have acknowledged or
10 considered in his analysis.

11 Q. Mr. Dastmalchi testified that Acer's corporate
12 witness on supply chain was not credible when she testified
13 about Acer's flexibility parameters.

14 Do you agree with this opinion?

15 A. So I disagree. I disagree simply because each
16 supply chain is different, and, as such, having experience
17 in one area of a supply chain, like Ms. Joyce Cruts did,
18 would be extraordinarily valuable in understanding the
19 intricacies of the supply chain.

20 And so I did not -- I didn't understand why
21 Mr. Dastmalchi disregarded that testimony, and I do believe
22 that Ms. Cruts would be in a very strong position to be able
23 to outline the intricacies of the supply chain and the
24 fundamental areas that need to be considered.

25 Q. And do you understand that Ms. Cruts is the vice

1 president of supply chain and operations for Acer?

2 A. I do.

3 Q. Does the dynamic of a supply chain relationship
4 ever change?

5 A. It does. So a supply chain is essentially a
6 moving relationship, and it inevitably adjusts with changes
7 in business and changes in a variety of different impacts.
8 As such, yes, the supply chain does change.

9 There are oftentimes the need for a supply chain
10 to adjust based on market conditions, based on a number of
11 different factors that might be impacting one or two nodes
12 within the supply chain or several nodes within the supply
13 chain.

14 Q. Does the fact that Ms. Cruts' testimony about
15 Acer's flexibility parameters is different than the
16 flexibility parameters of a 2011 master agreement with an
17 ODM affect your opinion?

18 A. So there was an agreement that was put in place.
19 However, the agreement that was put in place was, as you
20 mentioned, in 2011. That's 15 years ago. Ms. Cruts'
21 testimony was within the last year.

22 Effectively, that would speak to the fact that
23 Ms. Cruts, in her role and with having access to recent and
24 current information, would be in a much better and suitable
25 position to discuss the intricacies of the supply chain as

1 opposed to relying on a contract that's 15 years old.

2 Q. If we could turn to RDX-10.8.

3 Mr. Dastmalchi testified that OEMs' reported
4 inventory levels are lower than the actual levels.

5 Do you agree with this opinion?

6 A. Again, I disagree with Mr. Dastmalchi's opinion.
7 Mr. Dastmalchi's opinion seems to be contrary to some of the
8 evidence, and the reason for why is because ODMs in this
9 case don't hold inventory. Acer's ODMs don't hold finished
10 goods. ASUS's ODMs don't hold finished goods. Within the
11 supply chain, the role of an ODM is not to hold inventory.

12 Furthermore, Mr. Dastmalchi doesn't seem to
13 provide any sort of evidence of higher inventory levels that
14 are held by OEMs as well.

15 Q. If we could turn to RDX-10.9.

16 Mr. Dastmalchi testified that because of the
17 commoditized nature of the electronics supply chain, Acer
18 and ASUS's competitors will be able to make up for any
19 shortfall caused by the exclusion of Acer and ASUS's
20 products.

21 Do you agree with this opinion?

22 A. I don't disagree -- I don't agree, sorry, because
23 it disregards one of the fundamental aspects of this case,
24 and that is component interchangeability. Components are
25 not interchangeable. Some components are brand-specific, so

1 they might be branded as Acer components. But even within
2 the brand, interchangeability is somewhat limited.

3 Q. If we could turn to RDX-10.10.

4 In your opinion, if Acer and ASUS's products are
5 excluded, would components be rerouted from Respondents to
6 other OEMs?

7 A. So in this case components are not
8 interchangeable necessarily. And there are key components
9 that are purchased by Acer and ASUS, but there is no
10 evidence to suggest that Acer and ASUS are going to be
11 inclined to sell these components to their competitor,
12 which, therefore, opens up the conversation about actual
13 acquisition of these components, and, as such, long lead
14 times need to be considered when getting these components to
15 the ODMs.

16 Q. If we could turn to RDX-10.11.

17 Mr. Dastmalchi testified that, if their products
18 were excluded from the U.S., Acer and ASUS could just sell
19 their products in other countries.

20 Do you agree with this?

21 A. I don't agree, because there are a number of
22 factors that need to be considered. For one, there are a
23 number of barriers and costs associated with actually moving
24 inventory from one country to the other. Importing and
25 exporting costs include tariffs. There might be contractual

1 commitments that need to be considered.

2 Furthermore, the supply chain is designed in a
3 specific way to meet specific geographic needs. Changing
4 that supply chain network would inevitably incur costs.
5 Furthermore, there are products that are specific for
6 certain markets, products that are designed for certain
7 markets. Regulatory compliance needs to be taken into
8 account. Customer demand needs to be taken into account.

9 So there are a variety of different factors that
10 actually do need to be considered before oversimplifying the
11 fact and assuming that a product can just be rerouted
12 seamlessly.

13 Q. If we could turn to RDX-10.12.

14 Mr. Dastmalchi testified that the business
15 continuity plans that OEMs have in place provide the
16 foundation for responding to changes in the supply chain.

17 Do you agree with this opinion?

18 A. I don't. In my professional and academic career,
19 I have not seen any sort of business continuity plan that
20 would include consideration for an exclusion order for a
21 competitor, nor for the need to absorb a competitor's
22 inventory into a supply chain. This is not necessarily
23 something that I've ever seen in a business continuity plan.
24 I don't necessarily agree that this would be in line with
25 business continuity.

1 Q. If we could turn to RDX-10.13.

2 Mr. Dastmalchi testified that ODMs have
3 additional manufacturing capacity that can be used to make
4 up for any shortage due to Acer and ASUS's products being
5 excluded.

6 Do you agree with this opinion?

7 A. I don't agree. Mr. Dastmalchi assumes that
8 manufacturing plants and ODM sites operate at less than 100
9 percent capacity. This is not an incorrect assumption.
10 However, Mr. Dastmalchi assumes that spare capacity equals
11 available capacity. This is a wrong assumption.

12 There is a specific reason for why a node within
13 the supply chain might not operate at a hundred percent.
14 It's to maintain flexibility. It's to ensure that they can
15 adjust when demand levels slightly go up or slightly go down
16 or if there is any sort of unforeseen circumstance that
17 takes place within the supply chain.

18 This is not in anticipation of an exclusion order
19 or in anticipation of potentially absorbing a competitor's
20 inventory level.

21 Q. If we could turn to RDX-10.14.

22 Mr. Dastmalchi and Dr. Akemann testified that
23 ODMs can easily shift production to other OEMs. I believe
24 Mr. Dastmalchi testified that it would only take eight
25 minutes.

1 Do you agree with this opinion?

2 A. I disagree. There needs to be a number of
3 different factors that are considered. For one, lead times.
4 Based on the fact that components are not interchangeable,
5 there is no ability for the ODMs to adjust production within
6 the first 30 days. Semiconductor lead times, for example,
7 are approximately four months.

8 There are different supply chain networks that
9 are designed for specific geographic coverage, which means
10 that distribution networks are optimized specifically to the
11 supply chain that they are in.

12 There's also inventory that is allocated for
13 specific retailers and a number of forecasting and
14 replenishment processes and protocols that are currently in
15 place based on the way business is moving.

16 MS. ROBERTS: Your Honor, at this time I pass the
17 witness.

18 JUDGE MCNAMARA: Thank you, Ms. Roberts.

19 Mr. Newcomer?

20 MR. NEWCOMER: Josh Newcomer for Nokia. May I
21 proceed?

22 JUDGE MCNAMARA: Yes.

23 CROSS-EXAMINATION

24 BY MR. NEWCOMER:

25 Q. Good morning, Mr. Phiroz.

1 A. Good morning, Mr. Newcomer.

2 Q. Dr. Phiroz?

3 A. Either way.

4 Q. You don't claim to have specialized experience in
5 the electronics supply chain, do you?

6 A. I don't. However, a supply chain is a network of
7 businesses. The objectives and goals are relatively
8 universal.

9 Q. Outside of this case, you've never worked for or
10 with an OEM?

11 A. I have not.

12 Q. Your consulting firm, Pier Consulting, has never
13 had an OEM client?

14 A. Not that I recall.

15 Q. Never negotiated contracts with OEMs?

16 A. I've negotiated several contracts within the
17 area -- within supply chain networks. I don't recall if
18 I've negotiated a contract specifically with an OEM.

19 Q. Now, you haven't, have you?

20 A. As I said, I don't -- I don't recall having done
21 so.

22 Q. You've never participated in developing
23 forecasting processes for OEMs?

24 A. I've worked in developing numerous forecasting
25 protocols, processes, and analysis across supply chains,

1 both in industry and academia. I don't believe that I've
2 worked in developing a forecast for an OEM.

3 Q. Right. The answer is no, right?

4 A. Correct.

5 Q. You've never worked with an ODM, such as Compal,
6 I Inventec, Wistron?

7 A. No. However, I have reviewed all the contracts
8 that have been associated with this case.

9 Q. Your consulting firm has never had an electronics
10 ODM as a client?

11 A. Correct.

12 Q. Unlike Mr. Dastmalchi, you've never actually
13 visited an ODM, right?

14 A. I have not. However, as I mentioned, within the
15 supply chain there are a set of objectives and goals that
16 are relatively universal. I have evaluated the ODM
17 contracts in this case, and I am well aware of some of the
18 conflicts and constraints that particular supply chains
19 would exhibit based on the data that I've been able to
20 review.

21 Q. I appreciate that, but my question was, have you
22 ever visited an ODM, and I think the answer is no, correct?

23 A. Correct.

24 Q. You've not evaluated contracts with electronics
25 ODMs outside this case, right?

1 A. Outside this case, I don't believe I have. I
2 have reviewed the contracts associated with this case,
3 however.

4 Q. How about component suppliers; you've never
5 worked with or for any electronics component supplier in any
6 capacity, have you?

7 A. I have not worked with an electronics component
8 supplier in my academic career, short of having hosted
9 numerous guest speakers and having developed cases and used
10 case studies at various classes at Harvard and UCSD for
11 various supply chain analytics courses.

12 Q. Yeah, I appreciate that, but, again, the question
13 was, you've never worked with any electronics component
14 supplier in any capacity in your professional career, right?

15 A. I don't believe so, no.

16 Q. Never worked with a chipmaker like AMD or NVIDIA?

17 A. I have not.

18 Q. You've never worked with distributors in the
19 electronics supply chain that have been noted in this case,
20 have you?

21 A. Distributors that have been noted in this case?
22 No.

23 Q. All right. Let's turn to your opinions, if I
24 could have RDX-10.2.

25 These are the summary of your opinions you just

1 went over, right?

2 A. They are.

3 Q. I want to focus on the second and the third
4 bullet points here, and then I'll get back to the actual
5 supply chain opinions you've offered.

6 Prices on PCs you say are likely to increase,
7 right?

8 A. I believe so, yes.

9 Q. You haven't quantified the amount of increase?

10 A. I have not quantified the amount of increase. I
11 was not hired to quantify the actual dollar figure of
12 increase. However, I can say, and as I did say, if there is
13 less competition, there is less of a need to compete on
14 price, and if you remove competitors from a market and have
15 fewer competitors, the price competition essentially goes
16 lower.

17 Q. Yeah, that's like Econ 101, is what you're
18 talking about?

19 A. Well, I can't comment on that. I don't recall
20 Econ 101. But I can comment on Supply Chain 101, and that
21 certainly does fall under that bracket.

22 Q. All right. Setting that aside, just to be clear,
23 you haven't quantified the likelihood or the magnitude of
24 any price change here.

25 A. I haven't quantified the likelihood. I haven't

1 quantified the magnitude. I have qualified the potential.

2 Q. All right. Let's go to the third bullet point.

3 You say that these various consumers and agencies
4 will likely be affected due to changes in pricing and
5 features due to an exclusion order, right?

6 A. I do.

7 Q. We just discussed pricing, so I want to talk
8 about features.

9 You don't do any side-by-side comparison -- you
10 didn't offer ALJ McNamara any side-by-side comparison of
11 Acer product features or ASUS product features in any
12 competitors' features, right?

13 A. Have I offered that in my testimony today? I
14 have not, no.

15 Q. All right. Let's go to your supply chain
16 opinions now.

17 Let's talk about OEMs in the supply chain. You
18 agree there are a lot of them, right?

19 A. OEMs in the supply chain?

20 Q. Yes.

21 A. Sure.

22 Q. And if I could have --

23 MR. NEWCOMER: We need to go on the parties' CBI
24 record real quick, Your Honor.

25 (Whereupon, the hearing proceeded in confidential

1 session.)
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1 O P E N S E S S I O N

2 JUDGE MCNAMARA: Okay.

3 MR. MILLER: Zach Miller for Respondents,
4 Your Honor. Respondents call their next witness, Dr. Scott
5 Acton.

6 JUDGE MCNAMARA: Good morning, Dr. Acton.

7 A. Good morning, Your Honor.

8 JUDGE MCNAMARA: All right. Would you kindly
9 raise your right hand.

10 SCOTT ACTON,

11 having been first duly sworn or affirmed on
12 their oath, was thereafter examined and testified as
13 follows:

14 JUDGE MCNAMARA: Please state your full name.

15 A. Scott Acton.

16 JUDGE MCNAMARA: Thank you. You may be seated.

17 MR. MILLER: And may I proceed, Your Honor?

18 JUDGE MCNAMARA: Yes. Thank you.

19 DIRECT EXAMINATION

20 BY MR. MILLER:

21 Q. Dr. Acton, can you please introduce yourself to
22 the Court?

23 A. Yes. I'm Scott Acton, a professor at the
24 University of Virginia.

25 Q. And have you prepared some demonstratives to help

1 with your testimony today?

2 A. I have.

3 Q. Can we pull up RDX-6C?

4 Are these the demonstratives you prepared?

5 A. They are.

6 Q. Now, Dr. Acton, are you here to provide
7 infringement or invalidity testimony?

8 A. I am not.

9 Q. And did you do a limitation-by-limitation
10 analysis of any products, prior art, or standards in this
11 case?

12 A. I did not.

13 Q. So if we move to RDX-6C.2, can you explain what
14 your testimony does relate to?

15 A. Sure. So there's an economics expert, his name
16 is Dr. Mario Lopez, sitting in the back of the room. He
17 analyzed the value of Nokia's Patent Portfolio and used two
18 pools called MPEG LA and Access Advance as a comparison.

19 Now, Nokia, Complainants, rebutted his report and
20 asserted that the Nokia Patent Portfolio was technically
21 superior to that of the two existing pools. And my
22 assignment was to address that very question: How are the
23 contributions technically of the Nokia Patent Portfolio --
24 how do they compare to the two pools, MPEG LA and Access
25 Advance.

1 Q. And if we move to RDX-6C.3, can you just
2 summarize what your analysis was?

3 A. Sure, Mr. Miller.

4 There's three key steps. The first is
5 identifying the key technical improvements in the standards.
6 Those standards are H.264, H.265, and, finally, AV1.

7 Second, I compared the coverage of the Nokia
8 Patent Portfolio with that of the two pools, MPEG LA and
9 Access Advance, only for the standards we're talking about
10 in this courtroom.

11 And, third, I evaluated specific patents from
12 both groups and looked at their technical contributions.

13 Q. Before we get into the substance of your
14 opinions, I'd like to talk about your background.

15 Can we move to 6C.4? Already at 6C.4.

16 Can you provide an overview of your educational
17 background?

18 A. Sure. I received my bachelor's of science in
19 electrical engineering just down the road at Virginia Tech,
20 and then I went on to join the Laboratory for Image and
21 Video Engineering at the University of Texas, and received
22 my master's and Ph.D. under well-known video coding quality
23 expert, Al Bovik.

24 Q. What's your current position?

25 A. My current position is professor and chair of the

1 electrical and computer engineering department down at UVA.

2 Q. Do you do any work in video labs?

3 A. I do. I direct the Virginia Image and Video
4 Analysis Laboratory, and I've been teaching video coding for
5 32 years and been involved in image and video research for
6 38 years.

7 Q. Do any of the classes you teach include
8 discussion of the H.264, H.265, or AV1 standards?

9 A. They do. In particular, my image and video
10 processing course covers all three standards.

11 Q. And can you describe any recognitions you've
12 received over the years?

13 A. Sure. Real briefly, I was named IEEE Fellow and
14 I was named Eta Kappa Nu Outstanding Electrical Engineer.
15 Those are two.

16 Q. And have you done any other work with the IEEE?

17 A. I have. Probably most notably for this
18 proceeding is that I was Editor-in-Chief of the flagship
19 journal transactions on image processing for four years.
20 That journal covers video coding, video enhancement, video
21 analysis, et cetera.

22 MR. MILLER: At this time, Your Honor, we tender
23 Dr. Acton as an expert in image and video processing,
24 including the H.264, H.265, and AV1 standards.

25 JUDGE MCNAMARA: Mr. Verboncoeur?

1 MR. VERBONCOEUR: Mitch Verboncoeur for Nokia.

2 No objections, Your Honor.

3 JUDGE MCNAMARA: Ms. Ducca?

4 MS. DUCCA: No objection from Staff, Your Honor.

5 JUDGE MCNAMARA: All right. Then Dr. Acton is
6 accepted as an expert on the subject matter for which he has
7 been called to testify without objection.

8 Q. Can we turn to RDX-6C.5?

9 Can you remind us, Dr. Acton, what your first
10 step of your analysis was?

11 A. Sure. The first step was identifying key
12 technical improvements found in the standards. I did this
13 based on my experience of 32 years of teaching that I
14 mentioned and 38 years of research, and also in light of
15 many references, probably most importantly the standards
16 themselves, looking at the past standards and the ones we're
17 talking about in this courtroom.

18 Q. And what are the ones we're talking about today?

19 A. H.264, H.265, and AV1.

20 Q. Turning to RDX-6C.6, and starting with H.264, can
21 you explain what you identified in H.264?

22 A. Sure. And I'll say, too, Your Honor, that I'm
23 going to be brief, not to be curt but because you've already
24 heard four experts explain the introduction to these
25 patents -- to these standard, excuse me.

1 So in H.264 I looked at key contributions and
2 secondary contributions. In terms of key contributions, I
3 listed the new modes of interprediction, variable block
4 sizes within the context of motion compensation,
5 quarter-pixel motion estimation, energy transforms that I
6 really like because they are efficient, and the allowance of
7 multiple reference frames.

8 Q. And if we move to RDX-6C.7, can you summarize
9 your thoughts on the H.265 standard?

10 A. So for H.265, what really stood out to me as like
11 a step forward were the coding tree units that were flexible
12 and also larger than what we found in H.264, and a couple of
13 techniques used to parallelize the processing, including
14 tiles and wavefronts.

15 Q. Finally, turning to RDX-6C.8, what about AV1?

16 A. So for AV1, you know, it was a collection of a
17 lot of minor improvements, but what jumped out at me in
18 terms of the advance was their flexible partitioning tree
19 and then some motion models that were unique in that they
20 allowed 3D motion and global motion. You can think of when
21 the entire scene is changing, not just a baseball going
22 across the field of view, but the entire scene might be
23 panning or tilting or whatever.

24 Q. Moving to RDX-6C.9, what was the second part of
25 your analysis?

1 A. So in the second part I did a numerical
2 comparison of Nokia's portfolio with MPEG LA and with Access
3 Advance. And when we talk about MPEG LA, there's two
4 versions, H.264 and H.265.

5 Q. Moving to RDX-6C.10, can you walk through in a
6 little bit more detail what this numerical analysis
7 consisted of?

8 A. Sure. For Nokia, I was only interested in U.S.
9 patents that related to H.264 and H.265. And for the pools,
10 same thing, U.S. patents for H.264 or H.265. And as I
11 mentioned, we can divide it into three pools, noting that
12 MPEG LA has both an H.264 pool and H.265 pool.

13 Q. Why did you look at those three pools?

14 A. Well, first of all, that was what Dr. Mario Lopez
15 used in his comparison, and, second, those are the basic
16 pools that people license for H.264 and H.265.

17 Q. Continue on with your explanation of your
18 analysis for this part of your analysis.

19 A. Thanks, Mr. Miller.

20 So there were a lot of numbers, so I created
21 tables and the tables were long, and then I created graphs
22 that illustrated basically coverage within those graphs.

23 And then I was able to analyze the breadth of
24 coverage, both in an overall sense and for key sections of
25 the two standards.

1 Q. Let's move to RDX-4C.11.

2 MR. MILLER: At this time, Your Honor, let's go
3 on the Nokia confidential record.

4 (Whereupon, the hearing proceeded in confidential
5 session.)

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1 O P E N S E S S I O N

2 BY MR. MILLER:

3 Q. Dr. Acton, can you explain the third part of your
4 analysis?

5 A. Yes. So I wanted to dial down and dig in, so I
6 looked at some specific Nokia patents and some specific
7 Patent pool patents.

8 Q. And why did you look at specific individual
9 patents?

10 A. Well, one reason was to respond to the assertion
11 that all of the patents in the Patent Pools were weak.

12 Q. And did you hear an assertion about that during
13 opening statements?

14 A. I recall something vaguely on opening day about
15 the pools attracting weaker patents.

16 Q. Now, turning to RDX-6C.23, what Nokia patents did
17 you look at?

18 A. I looked at the patents-in-suit, '701, '714,
19 '267, and '321.

20 Q. And why did you look at those four Nokia patents?

21 A. One reason was, I figured if Nokia was bringing
22 these patents to suit, they are probably bringing their
23 strong art to litigation.

24 Q. Now, turning to RDX-6C.24, can you -- we've heard
25 a lot about the '701 patent already, so can you briefly

1 explain your analysis?

2 A. Sure. Real briefly, this patent, the '701, is
3 basically CABAC related in the sense that it establishes a
4 threshold, a threshold for frequency of occurrence of syntax
5 elements, and when you hit that threshold, you switch modes
6 in CABAC.

7 Q. And if the '701 patent is found to cover aspects
8 of the H.265 patent -- or H.265 standard, which I know you
9 didn't individually analyze, but if it is found to cover it,
10 does it cover key or important features of the standard?

11 A. I would say the contribution of this patent is
12 incremental.

13 Q. And can you explain why?

14 A. Well, CABAC was already known. This is H.265,
15 and H.264, of course, had CABAC and existed, as you heard
16 from the other experts, before H.264.

17 And, in addition, this didn't really advance
18 something that I teach, which is entropy coding.

19 Q. Turning to RDX-6C.25, can you briefly explain
20 your analysis for the '714 patent?

21 A. Sure. We've heard a lot about the '714 patent.
22 Basically you have a list of motion vectors that you want to
23 explore, and it makes sense to not look at redundant motion
24 vectors so they are removed from the list.

25 Q. Again, if the '714 patent is found to cover

1 aspects of H.265, do you believe it relates to a key or
2 important part of that standard?

3 A. I don't. I think it's a minor contribution.

4 Q. And why is that?

5 A. Well, essentially there is a lot of motion
6 compensation schemes in H.265, including advanced -- the
7 advanced motion vector estimation mode. You know, to the
8 extent this is related to the list of motion vectors, I
9 agree that it's smart to take off redundancies, but I'm not
10 sure that it would improve efficiency overall.

11 Q. Turning to RDX-6C.26, can you explain your
12 analysis for the '267 patent?

13 A. Okay. So the '267 patent sets as the context
14 this bidirectional and multidirectional prediction where
15 you're using multiple frames to predict one block in the
16 frame you're coding or decoding.

17 And essentially a well-known trick from when I
18 was in school is, when you're averaging a couple of numbers
19 or doing a weighted average of a couple of numbers, it's
20 well known that you will lose precision if you disregard the
21 fractional bits, the bits to the right of the binary point
22 in this case.

23 So this patent, '267, says, hey, keep some more
24 bits and you won't sacrifice precision.

25 Q. And, again, if the '267 patent is found to cover

1 aspects of H.265 or AV1, in your opinion is it related to
2 important or key features of those standards?

3 A. This is probably the least important of the four
4 just because it was a well-known computer arithmetic trick
5 to keep these more bits and did not significantly advance
6 coding in either H.265 or AV1.

7 Q. Finally, turning to the RDX-6C.27, what was your
8 analysis for the '321 patent?

9 A. Okay. So the '321 patent is the patent that
10 says, hey, if you're doing random seek, seeking to the
11 middle of a video, or maybe you're doing reverse or
12 fast-forward, you don't want to end up in the middle of an
13 independently decoded block, you want to end up at the
14 beginning, so give a flag and tell us where that first frame
15 occurs. And that's what the '321 patent does.

16 Q. And if the '321 patent is found to cover aspects
17 of H.264, H.265, or AV1, does it cover key or important
18 aspects of those standards?

19 A. I would say not.

20 Q. Can you explain why?

21 A. So when -- my last year of graduate school MPEG-1
22 was officially released. We knew about it a couple years
23 earlier in prereleases. But MPEG-1 seems to have this sort
24 of flag that demarcates a group of pictures.

25 Q. And any other reason why?

1 A. To the extent that this is trying to be related
2 to the network abstraction layer unit, I disagree. I don't
3 see it. And I do believe that NAL, the NAL, is really
4 important and was a significant advance in H.264, but I
5 don't see this flag contributing to that packetization of
6 video that's very robust.

7 Q. Turning to RDX-6C.28, what Patent pool patents
8 did you review?

9 A. So when I looked at the pool, it was huge. I
10 told you that there were 3,000 Access Advance patents. And
11 so I needed to dial it down.

12 And when I saw there were Fraunhofer patents in
13 the pool, I became excited because, as we've heard from both
14 sides of the aisle, Fraunhofer Heinrich-Hertz Institute was
15 a leader in H.264 and H.265 and made several significant
16 contributions.

17 So to answer your question, I looked at three
18 Fraunhofer patents.

19 Q. What's shown on the left of slide RDX-6C.28 here?

20 A. So these three gentlemen you've heard about. The
21 person in the center, Tomas Wiegand, several times in this
22 hearing in the way of praise for his contributions. You've
23 got Detlev Marpe on the left, and you've got Heiko Schwarz
24 on the right, and they were inventors from Fraunhofer in
25 Berlin, and they contributed heavily to H.264 and H.265.

1 And, of course, Dr. Wiegand was the chair of that 264
2 committee.

3 Q. And is -- the Fraunhofer Institute, is that a
4 commercial entity?

5 A. I would say it's a not-for-profit.

6 Q. Okay. Now, turning to RDX-6C.30, can you explain
7 your analysis with respect -- sorry, 29 -- can you explain
8 your analysis with respect to the first Fraunhofer patent,
9 the '924 patent?

10 A. Sure. So I'm going to look at three. The '924
11 patent is basically a network abstraction layer patent, and
12 it gives the ability to determine borders.

13 So if you're playing video on a CD-ROM or on a
14 DVD, you control the world, you control the network. But if
15 you're actually sending a video, like we do today, to
16 cellphones and to computers in a wireless fashion, you have
17 to share the network, and you also have to be ready for
18 error.

19 So we break up video into very, very small
20 packets. That's what NAL does. And what Fraunhofer gave is
21 the ability to determine the beginning and end of those
22 packets so you could deal with lost packets and you could
23 deal with damaged packets.

24 JUDGE MCNAMARA: Just for the record, please just
25 say what the acronym "NAL" stands for.

1 A. Network abstraction layer.

2 JUDGE MCNAMARA: Good. Thank you.

3 A. Thank you.

4 Q. And so in your opinion was the '924 patent
5 directed to important aspects of H.264 and H.265?

6 A. Yes.

7 Q. Turning to RDX-6C.30, can you explain your
8 analysis with respect to the second two, or the 2 and 3, of
9 the Fraunhofer patents, the '710 and '608?

10 A. Certainly. So I'm going to discuss both of these
11 together because they both relate to content-adaptive binary
12 arithmetic coding, or CABAC.

13 Now, the '608 is really cool because it tells you
14 how to select the context model, which is at the core of
15 CABAC. And this was a really interesting contribution that
16 minimized bitrate.

17 The '710 patent basically took that technology
18 and allowed the coding of syntax elements, providing
19 additional efficiency.

20 Q. And so in your opinion were these two patents
21 related to important aspects of H.264 and H.265?

22 A. They were, and I covered those aspects in my
23 first step of the analysis.

24 Q. So, overall, what did your analysis of these
25 three Fraunhofer patents -- well, before I get there, we

1 looked at these three Fraunhofer patents. Were they in any
2 of the Patent Pools that you looked at?

3 A. Yes. They were in both MPEG LA and Access
4 Advance.

5 Q. And which MPEG LA Patent Pool were they in?

6 A. The H.264 MPEG LA.

7 Q. And so, overall, what did these Fraunhofer
8 patents tell you about these -- those Patent Pools?

9 A. I say, overall, it dispels the myth that there
10 are no strong contributions in either of these pools,
11 MPEG LA or Access Advance. And looking at the
12 patents-in-suit versus the Fraunhofer patents, one might say
13 there's even higher quality patents in the pools.

14 MR. MILLER: I'll pass the witness, Your Honor.

15 JUDGE MCNAMARA: Thank you, Mr. Miller.

16 MR. VERBONCOEUR: Mitch Verboncoeur for Nokia.

17 JUDGE MCNAMARA: Thank you, Mr. Verboncoeur.

18 MR. VERBONCOEUR: May I proceed?

19 JUDGE MCNAMARA: Yes.

20 CROSS-EXAMINATION

21 BY MR. VERBONCOEUR:

22 Q. Good morning, Dr. Acton.

23 A. Good morning, Mr. Verboncoeur.

24 Q. Can we please have RDX-6C.3?

25 Dr. Acton, during your testimony today, you went

1 through a few Fraunhofer patents and then you walked us
2 through the asserted patents, right?

3 A. Yes, in the reverse order.

4 Q. One of the conclusions you drew is that the
5 Fraunhofer patents covered more important features to the
6 H.264 and H.265 standards than the Nokia asserted patents
7 here?

8 A. I believe that's roughly correct, yes.

9 Q. But during any of your analysis you did not
10 consider what the asserted patents in this case cover and
11 what they don't?

12 A. That's incorrect.

13 Q. Sorry. You said that's incorrect?

14 A. Yes, sir.

15 Q. And, Doctor, you stand behind that testimony
16 today?

17 A. Well, the tables that I showed you have the
18 identified subsections to which they pertain, and those four
19 were certainly included in my numerical analysis.

20 Q. Do you recall giving a deposition in this case?

21 A. I do.

22 Q. And before that deposition began you raised your
23 right hand and you swore to tell the truth?

24 A. Yes, sir.

25 Q. You took that same oath today?

1 A. I did.

2 Q. Mr. Moreno, can we please have CDX-19.2?

3 Doctor, in your deposition you were asked the
4 question:

5 Did you do any analysis of any of the asserted
6 patents in this case to determine what the claims of those
7 asserted patents cover and what they don't?

8 And you answered:

9 If I'm understanding you correctly, I wasn't
10 asked to do that analysis, and I did not do it?

11 Did I read that correctly?

12 A. You did. And the keyword is "claims." As I
13 spoke before, I have no opinion on infringement or validity
14 or essentiality or claim construction.

15 JUDGE MCNAMARA: Sorry about that.

16 Could you go back, Mr. Verboncoeur, to the
17 previous slide and give us the date of the deposition, the
18 page and line numbers?

19 MR. VERBONCOEUR: Yes, Your Honor. Thank you.

20 The date of the deposition was December 15th,
21 2025, and the page and line numbers of that deposition that
22 I'm citing here are page 57, lines 6 through 12.

23 JUDGE MCNAMARA: And I didn't mean to interrupt.
24 Sorry about that.

25 Q. Let's please go back to RDX-6C.3.

1 Doctor, of course, you understand that the claims
2 of a patent define the metes and bounds of an invention.

3 A. I do, but I was looking at the subsections that
4 were covered in H.264 and H.265.

5 Q. You also told us, as part of your analysis, that
6 the Patent Pools are directed or cover or relate to more
7 important features of the standards than the Nokia patents,
8 correct?

9 A. I believe my testimony was roughly that the
10 Patent Pools had more coverage in important areas.

11 Q. And when I hear someone say that a patent has
12 coverage over a certain feature, what I imagine they are
13 saying is something akin to, you know, those patent claims
14 map onto the standard; that is, those patents cover
15 something that is actually in the standard.

16 Is it your testimony that the Patent pool patents
17 you considered actually map onto something that's present in
18 the standards today?

19 A. So my testimony is that I took Nokia at their
20 word and the pools at their word as to what subsections
21 pertained to the various patents in their portfolios.

22 Q. That's right. You took Nokia at its word and you
23 took the Patent Pools at face value, and you're not offering
24 any opinions about whether any patent is essential to any
25 standard.

1 A. Could you repeat that question?

2 Q. You're not offering any opinion about whether any
3 patent at issue in this case, whether it's from Nokia or the
4 pools, is in fact essential to any standard.

5 A. Yes, I think we covered that in deposition.

6 Q. And, of course -- I think you and I will agree on
7 this point -- a patentholder can declare a patent claim to
8 be standard and essential, but those patent claims might not
9 actually be essential.

10 A. I agree with that.

11 Q. Something else I want to cover with reference to
12 your slide 3. You didn't present today or in your report
13 any analysis of an objective metric in video coding to
14 determine whether the pool patents provide more important
15 features than Nokia's patents; is that correct?

16 A. So I believe we discussed some of those measures
17 in deposition, and at the level I was at, comparing apples
18 and oranges, I had to compare things like a CABAC
19 contribution which gives you fewer bits to an integer
20 transform that gives you more efficiency.

21 And, really, the particular measures, there
22 wasn't one measure that I could calculate and compare those
23 various features that, as I said, were like apples and
24 oranges.

25 Q. Doctor, you're familiar with the Joint Video Team

1 who developed the H.264 standard?

2 A. I am.

3 Q. You're familiar with the Joint Collaborative Team
4 on Video Coding, the one that developed the H.265 standard?

5 A. I am.

6 Q. And you understand that, as part of the process
7 of providing contributions into the standards, those
8 contributions are subjected to analysis that includes test
9 reports and other consideration before the standard decides
10 to adopt the contribution?

11 A. Yes. You're making my point perfectly. If you
12 were trying to evaluate three different CABAC methods, it
13 might be important to look at the bitrate that they led to,
14 but if you're comparing various and sundry features that are
15 unrelated, that measurement would not yield a fair
16 comparison.

17 MR. VERBONCOEUR: Your Honor, we need to go on
18 the parties' CBI record now.

19 (Whereupon, the hearing proceeded in confidential
20 session.)

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1 O P E N S E S S I O N

2 BY MR. VERBONCOEUR:

3 Q. Doctor, you discussed three Fraunhofer patents
4 that you analyzed, right?

5 A. I did.

6 Q. And those three patents that you presented today,
7 those three patents were not chosen at random?

8 A. I missed your question.

9 Q. The three patents that -- from Fraunhofer that
10 you discussed today, those three patents were not chosen at
11 random?

12 A. No, sir.

13 Q. And, in fact --

14 JUDGE MCNAMARA: Wait. Is that, no, they were
15 not chosen at random, or you agree with the question or you
16 disagree with the question?

17 A. I agree with Mr. Verboncoeur that I did not
18 choose them at random.

19 JUDGE MCNAMARA: Okay. Thank you.

20 Q. In fact, you had during your analysis some quick
21 glances at other patents, and you said, well, that's not the
22 one I'm looking for.

23 A. That's fair.

24 Q. Now what I'd like to do is talk about how your
25 work related to Dr. Mario Lopez.

1 So, Doctor, you understand -- or, rather, let me
2 ask you this. Did Dr. Mario Lopez instruct you to do this
3 analysis as an input to his conclusions in this case?

4 A. "Instruct" is probably a strong word. Basically,
5 through counsel, which was Morgan Lewis and Fish, I was
6 asked to do the assignment that's shown at the bottom of
7 RDX-6C.2.

8 Q. Did you collaborate closely with Dr. Mario Lopez
9 on your work here?

10 A. No.

11 Q. Did you ever have a conversation with Dr. Mario
12 Lopez about your work?

13 A. Yes.

14 Q. Did you tell Dr. Mario Lopez that you didn't
15 consider whether any patent that you analyzed was essential
16 to the H.264 or H.265 standards?

17 A. I can't recall.

18 Q. Did you tell Dr. Mario Lopez that you didn't
19 consider what the asserted patents in this case cover and
20 what they don't?

21 A. I think he realized I didn't have a
22 claim-by-claim analysis as to infringement or invalidity. I
23 don't know if we discussed that.

24 Q. Did you share with Dr. Mario Lopez that you
25 truncated the subclauses of the standards such that we would

1 go from 7.3.2.2 all the way to 7.3?

2 A. I believe so, because the tables and the graphs
3 were such.

4 Q. Did Dr. Mario Lopez express any concerns to you
5 that perhaps a non-random sampling of three patents from a
6 pool with thousands of patents may not be representative?

7 A. I don't believe we had that conversation, no.

8 MR. VERBONCOEUR: No further questions,
9 Your Honor.

10 JUDGE MCNAMARA: Thank you, Mr. Verboncoeur.

11 Ms. Ducca?

12 MS. DUCCA: No questions from the Staff,
13 Your Honor.

14 JUDGE MCNAMARA: Mr. Miller, any redirect?

15 MR. MILLER: Nothing further, Your Honor.

16 JUDGE MCNAMARA: Okay. Thank you, Dr. Acton.
17 You may step down.

18 A. Thank you, Your Honor.

19 MS. ROBERTS: Your Honor, is this a good time for
20 our morning break?

21 JUDGE MCNAMARA: Sure. We can do that. I'll see
22 you back here in 15 minutes.

23 (Whereupon, the proceedings recessed at 10:35
24 a.m.)

25 (In session at 10:50 a.m.)

1 JUDGE MCNAMARA: Thank you, everyone. Please be
2 seated.

3 MR. COLAIANNI: Good morning, Your Honor.

4 JUDGE MCNAMARA: Good morning, Mr. Colaianni.

5 MR. COLAIANNI: Joseph Colaianni for Respondents.

6 Respondents call as their next witness Professor
7 Timothy Simcoe.

8 JUDGE MCNAMARA: Yes.

9 Good morning, Dr. Simcoe.

10 A. Good morning.

11 JUDGE MCNAMARA: Would you kindly stand and raise
12 your right hand?

13 TIMOTHY SIMCOE,

14 having been first duly sworn or affirmed on
15 their oath, was thereafter examined and testified as
16 follows:

17 JUDGE MCNAMARA: Please state your full name.

18 A. Timothy Sean Simcoe.

19 JUDGE MCNAMARA: Thank you very much.

20 MR. COLAIANNI: May I proceed, Your Honor?

21 JUDGE MCNAMARA: Yes. Thank you.

22 DIRECT EXAMINATION

23 BY MR. COLAIANNI:

24 Q. Good morning, Professor Simcoe.

25 A. Good morning.

1 Q. Would you please introduce yourself to
2 Judge McNamara?

3 A. Good morning, Your Honor.

4 JUDGE MCNAMARA: Good morning. By the way, do
5 you prefer doctor or professor?

6 A. I go with professor. My wife says I can only --
7 doctor is reserved for medical professionals.

8 JUDGE MCNAMARA: OKAY. Whatever you choose.

9 Q. Did you prepare some demonstratives to assist
10 with your testimony today?

11 A. Yes.

12 Q. Mr. Davis, could we please have RDX-0008.

13 Are these the demonstratives you prepared,
14 Professor Simcoe?

15 A. Yes, they are.

16 Q. And could we begin by having you please briefly
17 describe your background?

18 A. Sure. So I am presently a professor at Boston
19 University in the Questrom School of Business, where I'm the
20 chair of the strategy and innovation department.

21 In terms of my academic background, I have an
22 undergraduate degree in applied math with economics from
23 Harvard and a master's in economics and a Ph.D. in business
24 administration from the University of California at
25 Berkeley.

1 I've been at BU for about 16 years, having come
2 from the University of Toronto, which was my first job after
3 graduate school as a professor.

4 I have other appointments, presently at the
5 National Bureau of Economic Research, and I'm a co-faculty
6 director at something called the Technology and Policy
7 Research Initiative at BU. That's sort of a joint
8 initiative of the business school and the law school. I
9 previously served as a senior economist on the President's
10 Council of Economic Advisers.

11 Q. For the record, Professor Simcoe is referring to
12 RDX-0008C.2.

13 What relevant courses have you taught in your
14 career, Professor Simcoe?

15 A. For a long time I taught a course to master's in
16 business administration students called technology strategy.
17 I teach a course in econometrics to the Ph.D. students.

18 At present, because my department chair duties
19 involve a fair amount of administration, I only teach one
20 class, and that's this sort of huge undergraduate lecture,
21 kind of a Business 101 class.

22 Q. And what are some of your relevant areas of
23 research during your career?

24 A. I would say broadly my research relates to the
25 economics of innovation. I've had an interest in standards

1 and the economics of standards going back to my
2 dissertation, which was finished up in 2004. I've written
3 many papers about that. That pulled me into doing research
4 and writing on standard-essential patent and patent
5 licensing and the economics of intellectual property more
6 generally.

7 Q. Have you been qualified as an expert witness in
8 prior matters?

9 A. Yes.

10 MR. COLAIANNI: Your Honor, at this time
11 Respondents tender Professor Timothy Simcoe as an expert in
12 economics, standard-setting organizations, and RAND
13 licensing.

14 JUDGE MCNAMARA: Are there any objections?

15 MR. FOUNTAIN: Erik Fountain for Nokia. No
16 objection, Your Honor.

17 JUDGE MCNAMARA: Thank you, Mr. Fountain.

18 Ms. Ducca?

19 MS. DUCCA: No objection from Staff, Your Honor.

20 JUDGE MCNAMARA: All right. Then Professor
21 Simcoe is accepted as an expert for the subject matter upon
22 which he has been called to testify without objection.

23 MR. COLAIANNI: Thank you, Your Honor.

24 Q. Professor Simcoe, what were you asked to do in
25 this investigation?

1 A. In this matter I was retained by the Respondents,
2 and I was asked to provide opinions as to Nokia's compliance
3 with its RAND commitments and the disclosure policies of
4 relevant standard-setting organizations, to offer opinions
5 on the effects of exclusionary relief on competitive
6 conditions in the U.S. economy and U.S. consumers, and to
7 respond to some of the opinions of Dr. Akemann.

8 Q. And have you been present at the evidentiary
9 hearing over the past week?

10 A. Yes. Not all of it. I was here for openings.
11 I've been here for the majority of Dr. Akemann's testimony.
12 I've reviewed the transcripts of fact witnesses and so
13 forth.

14 Q. We've heard much about RAND over the past week.
15 Professor Simcoe, let's start with, what does the acronym
16 RAND stand for?

17 A. The acronym RAND stands for reasonable and
18 nondiscriminatory.

19 Q. Where did the RAND concept originate?

20 A. Professor Jorge Contreras, who is a legal scholar
21 at the University of Utah, actually has done some writing on
22 the history of RAND.

23 He traces it back to a series of antitrust cases
24 in the United States in the first half of the 20th century.
25 And so as remedies in these antitrust cases, which involved

1 different kinds of patent licensing practices, courts issued
2 remedies that contain language similar to RAND. So an
3 example is this Hartford-Empire case, where the Supreme
4 Court ordered uniform reasonable royalties without
5 discrimination or restriction, and then indicated that in
6 the event of a disagreement, parties could apply to the
7 court for a determination of a reasonable royalty.

8 And then Professor Contreras points to a period
9 in the 1950s, sort of around the time when the Department of
10 Justice was engaged in kind of a large series of antitrust
11 matters with AT&T, that ultimately led to AT&T agreeing to
12 license all its patents related to computers so firms could
13 enter the computer business.

14 And so the RAND concept was there. At that
15 moment a group that at the time was called the American
16 Standards Association, which later became the American
17 National Standards Institute, or ANSI, they adopted a patent
18 policy, and in that patent policy they used language like
19 reasonable terms. And so, from there, the notion of RAND
20 sort of made its way into other standard-setting bodies,
21 intellectual property policies.

22 Q. For the record, Professor Simcoe is referring to
23 RDX-0008C.3.

24 In those early court cases, Professor Simcoe,
25 what would happen if a licensor and a licensee could not

1 agree on a reasonable rate?

2 A. What Professor Contreras writes is that nearly
3 all of these remedial patent licensing decrees gave the
4 Court entering the decree authority to determine a
5 reasonable royalty when the parties could not agree on one.

6 Q. In the context of RAND, what does "reasonable"
7 mean to an economist?

8 A. So if we sort of fast-forward to today, there's
9 been a lot of economics writing about RAND and what it
10 means. And there's a relatively broad consensus among
11 economists that RAND means the ex ante incremental value of
12 patented technology relative to alternatives that were
13 available at the time of standardization.

14 So to unpack that, I have sort of a demonstrative
15 here. So on the demonstrative right now is just the idea
16 that there's an alternative. So we'll call that
17 technology A. Technology A might have been incorporated
18 into the standard, but in fact technology B was.

19 And the incremental value of B, in an ex ante
20 sense, is the difference between a group of implementers who
21 would have to license this technology, their willingness to
22 pay for B, over their willingness to pay for A.

23 The idea here is that this kind of reproduces
24 what happens in a normal licensing market, where it's
25 possible to -- if the price gets too high for one approach,

1 to sort of pivot or switch or design around and choose
2 another approach. That's what economists think of as normal
3 competition in a normal licensing market.

4 So that's kind of the ex ante period, sort of in
5 that framework, the appropriate license is the sort of light
6 blue bar here.

7 And then when we sort of go forward in time,
8 there is a lot of investment in implementation of the
9 standard and adoption of the standard by consumers, such
10 that the willingness to pay for the standard itself may rise
11 and technology A get eliminated as a potential substitute,
12 because it's the standard that's being demanded, not
13 necessarily the particular patented technology.

14 And so the incremental value of an SEP
15 corresponds to the middle bar on this chart. And economists
16 think that that strikes a reasonable balance such that the
17 patentholder is appropriately compensated, they are entitled
18 to the middle slice here, but the benefits of competition
19 are still preserved for consumers, and the value of the
20 standard, which reflects investments by parties other than
21 the SEP holder, are preserved for the parties that made
22 those investments.

23 Q. And for the record, Professor Simcoe is referring
24 to RDX-0008C.4.

25 Do you have evidence that other economists share

1 this view of the meaning of reasonable that you've
2 described?

3 A. Yes. In my -- the reports that I submitted, I
4 provided a large number of quotes. Here is a selection of
5 them. I won't read them all. Let me just highlight one.

6 This is a quote that comes from an article by the
7 same Professor Contreras I was just talking about and a
8 Dr. Anne Layne-Farrar. I picked this because Dr. Farrar, or
9 Layne-Farrar, has served as an expert witness for licensors
10 on many occasions.

11 They write that the general consensus has emerged
12 that a good benchmark for a FRAND rate is for a given set of
13 SEPs is the licensing fee and related terms and conditions
14 that those SEPs could have commanded during the development
15 of the standard, when they were likely competing with other
16 technologies for inclusion in the standard, ex ante. The
17 competition and lack of any possible technology lock-in
18 render these early rates reflective of market valuations and
19 are free of holdup costs.

20 So essentially they're endorsing the idea that
21 the SEP licensor is entitled to the middle slice on my last
22 slide.

23 Q. For the record, Professor Simcoe is referring to
24 RDX-0008C .5 and 6.

25 Has this view of RAND that you're describing been

1 adopted outside the field of economics?

2 A. Yes. It's not just economists who have taken
3 this view. So on this slide I show Nokia making statements
4 that are consistent with that perspective. I also provide a
5 quote from the Federal Circuit in the Ericsson v. D-Link
6 decision, where they describe steps that are necessary to
7 ensure that the royalty award in this case for a
8 standard-essential patent is based on the incremental value
9 that the patented invention adds to the product, not any
10 value added by the standardization of that technology. So
11 avoiding awarding the licensor with the red slice on my
12 previous slide.

13 Q. Professor Simcoe is referring to RDX-0008C.7, for
14 the record.

15 How does this economic view of RAND relate to the
16 idea of holdup?

17 A. Well, holdup is really just the idea that it's
18 possible that prices could exceed a RAND level. Holdup
19 occurs when investments made by other parties are
20 appropriated by a licensor by charging too high a price.
21 Economic models of bargaining suggest that if there's no
22 constraint in the ex post licensing environment, then holdup
23 can occur.

24 Q. Could you explain how exclusionary remedies might
25 lead to holdup?

1 A. Yes. The basic idea is that the cost to a
2 licensee of being denied access to the market of exclusion
3 is often very large and likely exceeds what would be a RAND
4 royalty for a patent covering a small part of a single
5 standard, in a single component, in a large product.

6 And so in this kind of a situation where a
7 prospective licensee is facing, with certainty, exclusion
8 from the market or has the other alternative of paying an
9 above RAND rate, but the above RAND rate is less costly than
10 the cost of exclusion from the market, they will take the
11 lesser of two evils.

12 Q. Professor Simcoe is referring to RDX-0008C.8.

13 Has Nokia made any public statements regarding
14 holdup?

15 A. Nokia has offered many public statements about
16 holdup. Again, this slide is full of text. These are
17 statements from Nokia made between 2006 and 2013. I'll
18 choose an illustrative one.

19 Here's from 2006 Nokia describing patent holdup
20 problems and saying that, because of the substantial
21 investment manufacturers must make in developing products
22 and interoperability standards, a Patent Owner may be able
23 to hold up manufacturers for royalties that far exceed the
24 harm to the Patent Owner from the infringement or the
25 intellectual value of the patent.

1 Q. And you're referencing RDX-0008C.10 and 11,
2 correct?

3 A. Correct.

4 Q. Did Nokia suggest any ways to avoid holdup?

5 A. Yes. Nokia suggested in this case in public
6 interest comments that, to avoid holdup, exclusion orders
7 should not be available against willing licensees.

8 In particular, they say, where a manufacturer is
9 willing to take a license on FRAND terms, permitting a
10 holder of declared essential patents to obtain an exclusion
11 order would be antithetical to the FRAND bargain. It would
12 threaten to turn SSOs into hotbeds of anticompetitive
13 behavior and would harm the public through increased prices
14 on standards-compliant products, decreased supply, decreased
15 innovation, and product quality.

16 Q. Do other economists or authorities take a similar
17 position on the question of exclusionary remedies for
18 standard-essential patents?

19 A. Yes. The idea that exclusionary relief should
20 not be available except in unusual circumstances or
21 certainly as a first line remedy for these kinds of patents
22 has been adopted in a variety of places. So here are three
23 examples.

24 One is a law professor, Tom Cotter. Another is
25 an article by some economists who previously served as the

1 chief economist at the Department of Justice and the Federal
2 Trade Commission. The third is a consent decree that the
3 Federal Trade Commission entered into with Google, who had
4 bought Motorola Mobility, and in that consent decree the
5 FTC -- a term was included that says Respondents are
6 prohibited from obtaining or enforcing covered injunctive
7 relief during the pendency of a request for a FRAND
8 determination.

9 Q. You're referring here to RDX-0008C.13, correct?

10 A. Correct.

11 Q. Professor Simcoe, several of the quotes you've
12 presented from Nokia mention willing licensees. What is
13 your understanding of what it means to be a willing
14 licensee?

15 A. I guess a starting point for discussing
16 willingness is what I heard Dr. Akemann testify to
17 yesterday. He said something to the effect of he was not
18 going to opine on willingness because he didn't think it's
19 an economic concept. I respectfully disagree with that.
20 For example, in introductory economics courses we teach
21 about the demand curve.

22 One way to understand what a demand curve is, is
23 that the demand curve is just the distribution of a
24 consumer's willingness to pay for a given product or service
25 in that market.

1 A more, I guess, generous interpretation of
2 Dr. Akemann's testimony, a way in which I can agree with
3 him, is that I think economists rarely do talk about
4 willingness, without talking about price, right? Economists
5 would say not say there's a willing buyer or a willing
6 seller. What I say all the time is that this buyer has a
7 willingness to pay or this seller has a willingness to
8 accept.

9 So you think of willingness as a function of
10 price, and that kind of illustrates here that the dispute is
11 probably not about willingness per se or in an abstract.
12 It's about are the parties willing to enter into an
13 agreement on RAND terms and conditions. The price is what's
14 at issue.

15 And there's one more concept from economics
16 that's useful here. I think it's the idea of revealed
17 preference. So economists also sort of take the view that
18 to understand whether someone is or is not willing to pay a
19 given price or to accept a given price, you have to make
20 that offer and see if they will enter into a transaction at
21 that price. It's about what they say, not what they do.

22 The takeaway from all of that is to understand,
23 if a party is a willing licensee or a willing licensor, in
24 my view, the way to proceed is to treat them both as willing
25 provisionally until we establish what a RAND rate is and

1 offer them the chance to transact at that price.

2 Q. In this investigation, is there an example of
3 anyone asking a neutral third party to determine a RAND
4 rate?

5 A. Yes. The Respondents have asked the UK Court to
6 establish a RAND rate.

7 Q. Have either Nokia or the Respondents indicated
8 they would be willing to accept the results of that process?

9 A. My understanding is the Respondents have
10 committed to accept the results of the United Kingdom RAND
11 rate determination, but that Nokia has not.

12 Q. What do you conclude from that?

13 A. My view is that this should be sufficient to
14 treat the Respondents as provisionally willing to license.
15 I think it raises questions about Nokia's willingness to
16 grant a license on those terms.

17 Q. Professor Simcoe, if a court or some other
18 neutral third party is tasked with determining a RAND rate,
19 how could they go about doing that?

20 A. This is a -- it's a big question. A lot has been
21 written about it. I don't think we're going to cover the
22 entire topic today.

23 Broadly, there are three approaches that have
24 been proposed or used in combination with each other. One
25 is this idea of a bottom-up valuation, where you start with

1 kind of objective technical evidence on the relative
2 performance of different methods for accomplishing a
3 functionality.

4 And then you try to link the technical evidence
5 up to demand or willingness to pay, which I was just talking
6 about, and then sort of establishing an incremental added
7 value of the technology and sort of build the royalty or the
8 valuation that way. It turns out to be very hard to do
9 that. It is not widely employed because it's hard to do at
10 scale for a whole portfolio.

11 The next approach is top down. People sometimes
12 find a way to justify a maximum total aggregate royalty
13 burden for a standard. They say all the patents that read
14 on this standard command no more than a few percent,
15 whatever the number is. And then they apportion that out
16 amongst different licensees by counting patents and valuing
17 the patents and trying to come up with a way of dividing the
18 total royalty.

19 And then there's an approach that we've heard a
20 lot about in this case which is an analysis of license
21 agreements or comparables. I don't think any one of these
22 is the gold standard. It depends on the facts and
23 circumstances of the case.

24 Q. You're referring here to RDX-0008C.15; is that
25 correct?

1 A. Yes.

2 Q. How can one evaluate whether a standard-essential
3 patent license would make a good comparable for establishing
4 a RAND royalty?

5 A. That's also a question about which much has been
6 written and we could spend a lot of time on it.

7 I think an important piece of what you need to
8 understand about comparables is that it's a complex type of
9 analysis that involves many different characteristics or
10 dimensions, and you don't want to overweight a single
11 characteristic of a license in making a judgment as to
12 what's comparable.

13 So here's some examples of the kinds of things
14 that matter: Is the technology similar? Might not be
15 exactly the same portfolio of patents, but patents that
16 relate to the same, you know, sort of broad functionality.
17 What's the size of the deal? That's not the size of the
18 company. Not revenues or assets. It's how much is at stake
19 in the negotiation, what is the exposure of the party --

20 JUDGE MCNAMARA: Pardon me for just a moment.

21 Mr. Colaianni --

22 MR. COLAIANNI: Yes, Your Honor.

23 JUDGE MCNAMARA: -- in terms of the slide, since
24 you are going to cover a fair amount of material on this
25 slide, would you at least announce the slide at the

1 beginning so we know what the coverage is on the material?
2 In other words, it started with the issue of comparable
3 license evaluation. So if we could start there, and then
4 when we move to the next slide, it will start with the next
5 topic, that would be helpful.

6 MR. COLAIANNI: Absolutely. I'm sorry. I've
7 been announcing the slide --

8 JUDGE MCNAMARA: I know, at the end, yes.

9 MR. COLAIANNI: -- at the end of his testimony.
10 I'll be happy to adjust, if that's helpful.

11 JUDGE MCNAMARA: That would be very helpful.
12 Thank you.

13 MR. COLAIANNI: Absolutely.

14 Q. So let me do that right now.

15 For the record, Professor Simcoe is testifying in
16 connection with RDX-0008C.16.

17 A. Thanks. I'll go on a little. I'll try to keep
18 myself to a reasonable amount between slides so you can
19 follow.

20 Characteristics of the deals that matter include
21 technology, value at stake, deal size. As we've heard, the
22 pricing structure can matter, it can be quite difficult to
23 translate a running royalty with multiple tiers into a
24 per-unit price.

25 Sometimes it's possible, but it involves

1 assumptions.

2 Often aspects of the deal that I will lump under
3 this category of complexity can matter. Are there terms
4 like a release from prior liability, a standstill on
5 litigation, are patents being cross-licensed.

6 Another one that I think has been sort of omitted
7 in discussion thus far, do the parties in question have
8 other agreements between them, right? We shouldn't assume
9 that every license agreement or every piece of paper we see
10 is negotiated in isolation. When there are multiple kinds
11 of interaction or agreements, you can sort of move value
12 between them.

13 And then I guess the last one I'll talk about is
14 in the standard-essential patent context. It is actually
15 quite useful to assess whether these are sort of more --
16 negotiated in a more ex ante environment, where there is a
17 sense that the market's ability to pivot to a different
18 standard or a different technology if the prices are too
19 high has some salience in setting the rates.

20 Or if it's a license negotiated in an ex post
21 environment, where if there's no meaningful RAND constraint,
22 the prices could exceed a RAND benchmark or there could be
23 holdup.

24 So all of these factors matter.

25 Q. I believe you mentioned this, but, just briefly,

1 is any one of the factors you just mentioned always the most
2 important consideration?

3 A. No. In particular, I think, it's important to
4 avoid this view that everywhere and always only licenses
5 covering the patents-in-suit are eligible to be comparable.
6 So to illustrate that, let me show you some examples of how
7 comparables can go bad if you only focus on one dimension.

8 If you have a real estate comparables evaluation
9 and you say, I'm only going to look at houses in exactly the
10 same neighborhood, and you focus on that and nothing else,
11 you could end up in this situation, where the houses are
12 clearly not comparable but they are in the same location.
13 Or you could decide you've made this mistake and you're
14 going to focus on houses that look exactly the same, but you
15 miss the fact that they are on different pieces of land that
16 have different contributions to the value.

17 So, overall, there's this mistake that can occur
18 of sort of focusing on a single dimension to the exclusion
19 of everything else and kind of missing the larger picture.

20 Q. And you're referring here to RDX-0008C.17 and 18,
21 correct?

22 A. Correct.

23 Q. Could you expand a bit on the risks of relying
24 too heavily on one license characteristic when assessing
25 comparability?

1 A. I guess that's what I've done here, you know,
2 sort of I've showed that the risk of relying on one
3 characteristic is that you'll miss other characteristics,
4 like the difference between the houses or the difference
5 between the different plots of land.

6 Q. Given these challenges, what are the risks that
7 occur if courts don't rigorously screen comparable license
8 agreements?

9 A. If courts don't make kind of a serious effort to
10 rigorously screen comparable licenses, then what can happen
11 is parties have an incentive to try and manipulate the
12 evidence that comes before the Court.

13 This sort of goes back to a fundamental issue
14 with the method of comparables, which is sort of the
15 circularity of the logic. There is no comparable when the
16 first agreement is negotiated. Whatever the first price,
17 wherever it comes from, that then becomes the comparable for
18 the second agreement, and the second for the third, and so
19 you can sort of pile up on a price that is sort of based on
20 whatever was going on in that very first negotiation.

21 This is well-understood. It can lead to problems
22 that I've heard described --

23 Q. Before you go any further, this is RDX-0008C.19.
24 Please continue.

25 A. Thank you. There's an issue or an example of

1 this kind of manipulating the evidentiary record as to
2 comparables that sometimes is called the rollup strategy.
3 In openings it was characterized as the minnows and the
4 whales strategy. And the basic idea is that by entering
5 into negotiations early, with the minnows before proceeding
6 to the whales, it's possible to sort of exploit that
7 circularity in the logic of comparables to build a record
8 that is sort of a high quantity of low quality agreements.

9 A couple of important things to understand about
10 this that I -- one is the point I just made earlier, that
11 when we talk about the size of the prospective licensee in
12 this strategy, it's not the size of the company, it's the
13 size of the deal, right?

14 Company C in this illustrative example might have
15 billions of dollars in revenue and billions of dollars in
16 assets. But if they are negotiating over a hundred dollars
17 in royalty, they are going to be willing to accept five
18 dollars a unit, whatever price the licensor wants to put in
19 the agreement to just get them to go away, okay? That's one
20 point.

21 Now, sometimes there will be more at stake to the
22 point where parties, you know, sort of may enter into
23 dispute resolution or litigation, and I heard Dr. Akemann
24 testify that in those cases the cost of litigation cuts both
25 ways.

1 This is true, but what he didn't mention is that
2 there's an extreme asymmetry in benefits, because one party
3 is able to use that agreement as a comparable in future
4 negotiations, potentially with a whale, and the other is
5 just hoping to conclude the agreement.

6 And so in the end I think sort of this is a
7 danger that we have to be aware of and that sort of relies
8 heavily on courts screening carefully all of the agreements
9 put before them when thinking about the kind of evidence
10 that we're going to rely on when looking at other license
11 agreements.

12 Q. With respect to RDX-0008C.20, have you ever seen
13 Patent Pool licenses used as comparables?

14 A. I have seen Patent Pool licenses used as
15 comparables in a RAND context.

16 The first case that I worked on as an expert was
17 this Microsoft v. Motorola case that we have heard a little
18 bit about here. In that case my testimony was related to
19 some of the characteristics of Patent Pools that are
20 relevant for assessing whether they provide a good RAND
21 benchmark.

22 The kinds of things that I think are relevant are
23 the market acceptance. The fact that these licenses are
24 rather transparent, it's much easier for a licensee to
25 understand in a negotiating context what the content of the

1 license is, the fact that they read on the same technology
2 or the same standards.

3 A point that sort of didn't come up during
4 Dr. Akemann's testimony but essentiality, it turns out the
5 pools have a third party to review patents and assess
6 whether those patents are essential before they get allowed
7 into the pool.

8 And the timing. Here I think actually it's
9 useful to note that when pools are negotiated or those rates
10 are set in kind of an ex ante environment, that can be a
11 nice characteristic.

12 So at the end of the day, you know, Judge Robart
13 used pools as comparables.

14 Q. Did you hear Dr. Akemann testify earlier this
15 week about his opinion that it's not necessary or useful to
16 consider Patent Pool rates as comparables?

17 A. Yes.

18 Q. Did you agree with his opinion?

19 A. Respectfully, I disagree with Dr. Akemann. And I
20 disagree with some of the statements respectfully that I
21 heard from Staff in opening about the value of Patent Pools
22 as potential comparables.

23 So on this demonstrative, which is number 21,
24 we -- I sort of respond to three of these points.

25 The first is this idea that Patent Pools set

1 below RAND rates to gain more pool members for
2 cross-licensing. As I just explained, having looked at
3 pools in the context, for example, of the Microsoft v.
4 Motorola case, my view is that pools aim to strike a balance
5 between encouraging adoption of the standard, which is the
6 goal of the standards organization, no value for anyone if
7 the standard isn't out there in the market, and rewarding
8 appropriately patent owners who have their patents in the
9 pool.

10 I think this kind of statement that, you know,
11 sort of their scheming to sort of manipulate rates down just
12 isn't supported. There are many pools that are sort of
13 alleged to be dominated by licensors and pushing very
14 aggressively on the price.

15 The second point here is that pools attract weak
16 or insignificant patents. I think Dr. Acton's testimony is
17 informative on this point. I don't think that there's
18 evidence in this case or evidence more generally to support
19 the idea that Patent Pools are somehow selecting the weakest
20 technologies. I think the Fraunhofer -- example of one of
21 the Fraunhofer patents is illustrative.

22 The last point, sort of statements were made that
23 there are weak incentives to enforce patents in pools. The
24 fact is, pools do enforce. I have received calls myself on
25 more than one occasion from companies that find themselves

1 in litigation with Patent Pool Patent Owners.

2 Q. Did you hear Dr. Akemann say that he understood
3 in the Microsoft v. Motorola case you just mentioned,
4 Judge Robart ultimately did rely on Patent Pool rates but
5 only after he concluded that there were no comparable
6 licenses that he could use instead?

7 A. Yes, I did hear that.

8 Q. Do you agree with that statement?

9 A. Respectfully, no. My recollection of the case
10 and my reading of the opinion was not that Judge Robart said
11 anywhere there's a procedure which involves first looking at
12 bilateral agreements, and only if I can find none of them,
13 to move on to pool evidence.

14 My understanding was that he looked at all the
15 evidence in front of him and treated it on an equal basis,
16 concluded that the comparables were not appropriate, and
17 turned to the pools as a benchmark. And after some
18 adjustments, that's how he determined what the RAND rate
19 would be in that case.

20 Q. Do market participants use Patent Pools as RAND
21 benchmarks when they negotiate?

22 A. Yes. Slide 0008C.22 sort of illustrates the
23 reason for this. I think it's kind of clear, if you put
24 yourself in the shoes of a prospective licensee in a
25 bilateral negotiation, they often lack the sort of

1 information that we have here today to evaluate agreements
2 that are put forward as potential comparables.

3 If they only see a rate and they know nothing
4 about volume, they know nothing about what's at stake in the
5 deal, they know nothing about the other terms in the
6 agreement, they know nothing about the parties, in that kind
7 of an environment it's just more attractive to look at a
8 benchmark which is transparent, and that's what a Patent
9 Pool provides in those kinds of negotiating environments.

10 You can often go to the website of the pool, see
11 what all the patents are -- that's how Dr. Acton was able to
12 do his analysis in a sense. He went to the lists of patents
13 provided by the pools that showed where they fed into
14 different parts of the standard. You can see who the
15 licensors are. You can see how many licensees have taken a
16 license. You can download often the license and look at the
17 terms.

18 And so that's a benchmark that's attractive,
19 because it is just way more transparent. You have much more
20 information on which to base your own offer than you do in
21 the scenario that's sort of on the left hand of this slide.

22 Q. Has Nokia licensed its patents through pools?

23 A. Yes, Nokia has licensed its patents through
24 pools.

25 Q. Has Nokia been involved in setting rates for any

1 of the pools in this investigation?

2 A. Nokia was present at the negotiation of the rates
3 for the H.264 MPEG LA pool. So what slide 0008C.23 shows
4 are some clips from notes taken by a Microsoft employee who
5 was at those negotiations, and his notes indicate that at
6 the time, Nokia was arguing for a rate for all of the
7 patents in the pool of 50 cents per unit with some lower
8 prices at different volume tiers.

9 Q. Has Nokia made any public statements about
10 whether other market participants should use Patent Pools as
11 a RAND benchmark?

12 A. Yes. Slide 0008C.24 shows a statement or sort of
13 part of a website that Nokia published until recently that
14 noted that a complicating factor is that licenses are often
15 subject to confidentiality provisions and so not available
16 to third parties.

17 So Nokia is acknowledging that, in a bilateral
18 negotiation, licensees often don't have all of the
19 information they may need to formulate a notion of what a
20 FRAND price would be.

21 And then Nokia encourages them to look to public
22 announcements on royalties or to look at the rates charged
23 by Patent Pools.

24 Q. And which demonstrative are you referring to,
25 Professor Simcoe?

1 A. It's RDX-0008C.24.

2 Q. Thank you. We've been discussing RAND quite a
3 bit. I'd like to back up a bit and discuss where these RAND
4 commitments came from.

5 Could you tell us what standard-setting
6 organizations developed the H.264 and H.265 standards?

7 A. We've heard a bit about this already. Slide
8 RDX-0008C.25 shows the International Telecommunications
9 Union, the International Organization for Standards, and the
10 International Electrotechnical Commission. So these are the
11 parent organizations that collaborated through the Joint
12 Video Team, or JVT, and the Joint Coordination Team for
13 Video Coding, the JCT-VC, these are the groups of engineers
14 that actually got together and drafted the H.264 and H.265
15 specifications.

16 Q. And do these standard-setting organizations have
17 rules or policies relating to patents?

18 A. Yes. They have what are commonly called
19 intellectual property policies, which typically have two
20 prongs to them, rules about disclosure of patents during the
21 standard-setting process and rules about making licensing
22 commitments so that implementers can access patented
23 technology on at least RAND terms and conditions.

24 Q. What are the licensing commitments you're
25 referring to?

1 A. Well, the licensing commitments are the RAND
2 commitment. So, for instance, a firm that wishes to make a
3 RAND commitment can download a form from the ITU website,
4 and this form allows them to check a box that indicates
5 whether they are or are not willing to license their
6 patents.

7 If they check the first box on this form, that
8 says that they are willing to grant a license on a
9 royalty-free basis. If they check the second box on this
10 form, which is what Nokia did in the case of all of the
11 patents at issue here, that says that they are prepared to
12 grant on the basis of reciprocity a license to an
13 unrestricted number of applicants on a nondiscriminatory
14 basis, on reasonable terms and conditions. That's the RAND
15 commitment.

16 If they check the third box, that says they are
17 not willing to make a royalty-free or RAND commitment, and
18 in that case the standards organization has rules and
19 procedures that typically require the contribution to be
20 withdrawn or certainty to be achieved that the patent isn't
21 in fact essential.

22 Q. Which demonstrative are you referring to,
23 Professor Simcoe?

24 A. RDX-0008C.26.

25 Q. Thank you. And what are the disclosure rules you

1 mentioned a moment ago?

2 A. Well, disclosure rules are the other part of the
3 policy. Here is an example from the ITU patent policy.
4 Section 1 here says that it's desirable that the fullest
5 available information should be disclosed. Therefore,
6 organizations putting forward a standardization proposal
7 should from the outset draw the attention of the standards
8 body to known patents or known pending applications of their
9 own or of others.

10 This is slide 0008C.27.

11 Q. Why do standard-setting organizations have
12 disclosure rules?

13 A. There's two reasons, broadly, for disclosure
14 rules. One reason is so that participants in the standards
15 process can make an informed decision about whether to
16 include technology in the standard or not. That informed
17 decision should depend on all of the costs and benefits to
18 implementation, including that technology, and one of the
19 costs is the cost of patent licensing.

20 And so it's useful for them to know that
21 including a particular contribution in the standard could
22 lead to a necessity of licensing standard-essential patents.

23 Q. Is that the entire policy?

24 A. The other reason is that the disclosure rules
25 trigger the request for licensing commitments.

1 Q. Do you have a demonstrative to accompany that
2 testimony?

3 A. Sure. So the demonstrative RDX-0008C.28, that
4 illustrates additional disclosure rules in this case of the
5 JVT. So to implement the section 1 that I showed on the
6 last demonstrative, the JVT developed its own rules, and
7 here you can see that they say, on a best-effort basis, all
8 firms that make a proposal must include a fully filled-out
9 patent disclosure form.

10 Q. In terms of timing, when are companies supposed
11 to disclose patents that might be essential to a standard?

12 A. The next slide here, which is 0008C.29, talks
13 about disclosure and disclosure timing.

14 This is an excerpt from the patent policy
15 guidelines of ITU. It says that the term from the outset,
16 as it appears in that first paragraph that we saw two slides
17 ago, implies that information should be disclosed as soon as
18 possible, that is, as soon as it's becoming clear that a
19 draft recommendation will, in fact, fully or partly include
20 patented elements, and it says that that information should
21 be provided on a best effort basis.

22 Q. Are you aware of companies having been found to
23 violate standard-setting organization disclosure rules?

24 A. Yes. The problem of violating disclosure rules
25 is not holdup. There's a separate term people use, it's

1 called patent ambush, and there has been a series of cases
2 on that. The first one I'm aware of was a case where the
3 FTC litigated against Dell.

4 There was a series of cases related to a company
5 called Rambus that participated in a standards organization
6 called the Joint Electronic Device Council. There was a
7 case between Broadcom and Qualcomm in which firms were found
8 to have violated disclosure rules.

9 Q. Were you present for opening statements in this
10 investigation when Nokia's counsel contended that RAND does
11 not apply to its encoding patent claims?

12 A. Yes.

13 Q. What do the standard-setting organization
14 policies say about disclosure when some claims of the patent
15 may be essential to a standard and others might not be
16 essential?

17 A. So on slide 0008C.30, I have excerpts from the
18 guidelines for implementation of the patent policy where
19 they consider that scenario, where the Patent Owner wishes
20 to sort of characterize different claims differently. It
21 says multiple forms are appropriate if the patent holder has
22 several patents and classifies them in different options of
23 the licensing declaration or if the patentholder identifies
24 different claims of a complex patent in different options of
25 the licensing declaration.

1 So what this is saying is that if some claims are
2 essential and some claims are sort of not -- those are going
3 to be licensed on RAND terms and other claims are not going
4 to be licensed on RAND terms, it's appropriate to make that
5 information available to the participants in the
6 standard-setting process by disclosing multiple forms using
7 different licensing commitments.

8 Q. Did Nokia submit multiple declarations to the
9 standard-setting organization for its encoder and decoder
10 patent claims?

11 A. No, not that I'm aware of.

12 Q. What do you believe would have happened if Nokia
13 had submitted multiple declarations?

14 A. I think it's a hard question to answer because
15 I'm not aware of that circumstance ever having arisen. So
16 we can't point to what did occur.

17 I think it's safe to say that, at a minimum, it
18 would cause a commotion inside the standard-setting
19 organization. As I mentioned earlier, there are rules that
20 say if a RAND commitment is not available, then the
21 committee has to satisfy itself that there is a workaround
22 or the contribution has to be withdrawn so that there's no
23 essential patents that are not available on RAND terms and
24 conditions.

25 MR. COLAIANNI: Your Honor, could we please go on

1 the Nokia confidential record briefly?

2 (Whereupon, the hearing proceeded in confidential
3 session.)

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1 O P E N S E S S I O N

2 MR. COLAIANNI: Thank you.

3 BY MR. COLAIANNI:

4 Q. Have you reviewed Dr. Akemann's testimony that
5 AV1 is not subject to a RAND commitment?

6 A. Yes.

7 Q. From an economic perspective, what would happen
8 to the negotiated royalties for an H.264 or H.265 license if
9 Nokia was granted an exclusion order on the basis of
10 implementing AV1?

11 A. I think an exclusion order on the basis of AV1
12 puts us back into the position of that slide where we had
13 the high bar for the cost of an exclusion order and then a
14 royalty offer that may exceed a RAND level.

15 If the H.264 and H.265 license is tied to the AV1
16 license, then I would expect there to be above-RAND rates.

17 In the longer term, it does seem like there's
18 more market use and value in the H.264 and H.265 standards,
19 so I would expect the implementation of AV1 and products to
20 decline and the H.264 and H.265 licenses to be negotiated
21 separately.

22 Q. Professor Simcoe, could you remind us why firms
23 invest in standards and what benefits they produce?

24 A. Yes. Here on slide 0008C.32, I list some of the
25 benefits that standards produce. Broadly speaking, the

1 reason why we let firms cooperate, even though that's
2 sometimes frowned upon from an antitrust perspective when
3 they are setting standards, is that standards produce a lot
4 of benefits in terms of competition and benefits for
5 consumers.

6 They allow products produced by different firms
7 to work together well. By taking away the ability to
8 differentiate on standardized aspects of product design,
9 they promote competition. In particular, competition among
10 the supplier of inputs. That lowers the cost to producers
11 of final goods, which provides value to consumers.

12 Ultimately, you get industrywide economies of
13 scale, and standards can sort of catalyze growth in new
14 markets, you know, sort of you get an upgrade cycle in your
15 computer or your phone. That's very valuable to everyone in
16 the ecosystem -- the licensors, the implementers, and the
17 consumers. And so sort of standards produce a wide variety
18 of benefits.

19 Q. Why, in your opinion, would an exclusion order in
20 this investigation not be in the public interest?

21 A. Broadly, exclusion orders for standard-essential
22 patents raise concerns about holdup. If licensors don't
23 face a meaningful RAND constraint in an ex post licensing
24 environment, they will set prices such that the balance
25 described in my slide about the economic notion of RAND is

1 undone. They will capture some of the value associated with
2 investments by implementers, and some of the value that is
3 due to consumers through the benefits of ex ante
4 competition.

5 That could lead to sort of gaming of the
6 standards process. It can lead to prices that are too high,
7 reduced competition in component markets. Kind of take all
8 the things that I described as benefits on the last slide
9 and put a negative in front of them.

10 I guess I would say that I'm aware that this is
11 sort of harm to competitive conditions in the U.S. economy
12 and harm to U.S. consumers at a very broad level, but I also
13 think that that's the level at which the U.S. trade rep in
14 the decision to disallow the exclusion order in the Apple v.
15 Samsung dispute characterized the potential risks with
16 exclusion orders for standard-essential patent licensing.

17 Q. And just for the record, which demonstrative are
18 you referring to?

19 A. This is RDX-0008C.33.

20 Q. Thank you, Professor Simcoe.

21 MR. COLAIANNI: I'll pass the witness at this
22 time.

23 JUDGE MCNAMARA: Thank you, Mr. Colaianni.

24 MR. FOUNTAIN: Erik Fountain for Nokia. I
25 believe we have some cross-binders.

1 JUDGE MCNAMARA: Okay.

2 MR. FOUNTAIN: While those are being passed out,
3 Your Honor, if we could go on the Nokia confidential record
4 to begin.

5 (Whereupon, the hearing proceeded in confidential
6 session.)

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1 O P E N S E S S I O N

2 BY MR. FOUNTAIN:

3 Q. Let's pull up RDX-8C.23.

4 Do you recall testifying about this handwritten
5 note in your direct testimony?

6 A. Yes.

7 Q. This wasn't written by Nokia, correct?

8 A. It was -- as I testified, it was handwritten
9 notes by a Microsoft employee.

10 Q. Who was the Nokia representative making these
11 statements reflected here?

12 A. I don't know.

13 Q. And have you read the transcript that accompanies
14 this exhibit?

15 A. What transcript? I'm not sure what you're
16 referring to.

17 Q. The one that you refer to when you say Glanz
18 testimony, November 13, 2012. Have you read that?

19 A. At some point, yeah.

20 Q. Okay. And you can confirm, then, that the
21 proposal being discussed was not a formal proposal, it was
22 what was called a strawman proposal?

23 A. That's what they call all proposals until the
24 final determination of terms and conditions, is my
25 understanding of how these joint negotiations work.

1 Q. Okay. And, in any event, whether it was a
2 strawman proposal or a final proposal, Nokia never agreed to
3 join the MPEG LA pool, correct?

4 A. Yeah, I don't know that they -- I won't quibble.
5 I agree with you, Nokia did not join the pool.

6 Q. Let's go back to the cross deck, please.

7 Now, you have some opinions on patent policies
8 and disclosure rules; is that correct?

9 A. That's correct.

10 Q. You consider yourself an expert in
11 standard-setting organizations?

12 A. Yes.

13 Q. You've never been a member of any
14 standard-setting organization; is that right?

15 A. Well, I think at some point I became a member of
16 IEEE or paid something to IEEE, and they have a IEEE
17 standards association. But I think it's a fair
18 characterization, yeah.

19 Q. Okay. In this case, the relevant
20 standard-setting organization is the ITU, correct?

21 A. Correct.

22 Q. And you've offered some opinions today about the
23 applicable ITU policies, correct?

24 A. Yes.

25 Q. And you're aware that Nokia has retained Mr. Art

1 Levin to respond to some of your opinions?

2 A. Yes.

3 Q. And he worked there for 18 years; you're aware of
4 that?

5 A. I'll take your word that it was 18 years.

6 Q. And you're aware that he was part of the group
7 that drafted the very policy that you're opining on?

8 A. I think you should ask Mr. Levin about his CV.

9 Q. You are aware he disagrees with your
10 interpretation of the policies he worked on, correct?

11 A. I believe that's the case, yes.

12 Q. And you're not a member of the ITU, correct?

13 A. No, I've never been a member of the ITU.

14 Q. You've never been employed by the ITU?

15 A. No.

16 Q. And you weren't part of the group that drafted
17 the ITU policies at issue in this case?

18 A. No, I was not part of an ITU committee that
19 drafted a policy.

20 Q. And the working groups relevant to the
21 development of the standards at issue in this case are known
22 as the JVT and the JCT-VC, correct?

23 A. Yes.

24 Q. You haven't attended a meeting of the JVT,
25 correct?

1 A. No, I've never attended a meeting of either of
2 these committees.

3 Q. All right. You are an academic and you've
4 written articles about patent disclosure policies, correct?

5 A. Sorry. Would you repeat?

6 Q. You've written articles, academic articles about
7 patent disclosure, correct?

8 A. Yes, I've written many articles about
9 intellectual property rights policies.

10 Q. And moving on to CDX-24.6, in fact, this is a
11 textbook that you recently contributed a chapter to called
12 The Economics of Competition, Regulation, and Antitrust. Do
13 you recall that?

14 A. Not specifically, but I've written some book
15 chapters.

16 Q. Okay. I'll represent to you that you wrote a
17 chapter in this textbook. Do you dispute that at all?

18 A. No.

19 Q. In that six-page chapter, you disclose -- or you
20 state some information about the policies, and what we have
21 highlighted in red on CDX-24.6 is you say, "Some policies
22 require participants to disclose specific patents or patent
23 applications if they wish to assert them."

24 Do you see that?

25 A. Yes.

1 Q. And other SSOs allow firms to make blanket
2 disclosures that indicate a willingness to license without
3 pointing to any particular IP rights.

4 Do you see that?

5 A. Yes, you read it correctly.

6 Q. And on slide CDX-24.7, if we were to take that
7 division between policies that allow blanket disclosures and
8 policies that require specific disclosures, which side would
9 the ITU fall on?

10 A. I think it's a mischaracterization of obligations
11 under the ITU policy. So as I testified, the ITU policy
12 puts a best efforts obligation on participants in the
13 standards process to disclose patents and patent
14 applications that they know about as early as possible.

15 The point about blanket disclosures conflates a
16 couple of issues. So a blanket disclosure is allowed
17 because it's desirable to let firms that may not know that
18 they own any patents or patent applications to still make a
19 FRAND licensing commitment.

20 So a firm can disclose, not list any patents, but
21 check box 2 saying that they are willing to license any
22 patents that might become essential on RAND terms and
23 conditions. This is great, because it provides more
24 certainty to those who are developing the standards about
25 the costs and benefits.

1 But in terms of whether blanket disclosures are
2 allowed or specific disclosures are required, I would just
3 put ITU in the box of specific disclosures are required on a
4 best effort basis, if you know about the patents that you
5 have related to a contribution that you're making to the
6 standard.

7 Q. You've actually published an article called
8 "Disclosure Rules and Declared Essential Patents" where you
9 actually do the categorization, do you not?

10 A. What categorization?

11 Q. Let's move on to CDX-24.9.

12 And before we get to that, the definition that
13 you use in your article about a blanket disclosure is,
14 quote, "A blanket disclosure indicates that a participant
15 believes its own relevant IP, without revealing any
16 identifying information about specific patents or patent
17 applications."

18 Do you see that?

19 A. Yes.

20 Q. Okay. And in your article you include a chart
21 called SSO Intellectual Property Policies at Table 1. Do
22 you see that?

23 A. Yes.

24 Q. And on the left-hand side it lists a bunch of
25 standards organizations top to bottom, correct?

1 A. Correct.

2 Q. And in the second column titled General Patent
3 Disclosure Statements, it goes through and states whether
4 blanket disclosures are allowed or not specified or allowed
5 with certain conditions, correct?

6 A. That's correct.

7 Q. And in your article for the ITU, it says,
8 allowed, with a parenthetical, (not allowed when unwilling
9 to license).

10 Do you see that?

11 A. I do see that.

12 Q. We can agree that Nokia made blanket disclosures
13 that cover their H.264 and H.265 patents, correct?

14 A. I would say that they made blanket licensing
15 commitments.

16 Q. Okay. In fact, in 2001 on JX-179C Nokia, made a
17 general patent statement and licensing declaration, correct?

18 A. Yes.

19 Q. And you reviewed that in the course of your work
20 on this case?

21 A. I don't specifically recall reviewing it, but
22 that seems likely, yes.

23 Q. You can see there that they checked box 2,
24 meaning they are willing to commit -- license their IP on
25 RAND. Do you understand that?

1 A. Yes.

2 Q. And Nokia subsequently made additional
3 declarations with regard to the H.264 and H.265 standards on
4 JX-184 and 185, correct?

5 A. Yes. They made -- Nokia has made many
6 declarations and entered into various kinds of licensing
7 commitments.

8 Q. Okay. Now, in the prehearing brief and in your
9 expert report, as shown on CDX-24.12, there's repeated
10 reference to the ETSI IPR Policy.

11 Do you see the highlighted ETSI terms there?

12 A. Yes.

13 Q. We can agree that none of the patents asserted in
14 this case were declared as essential to ETSI?

15 A. I haven't done any analysis to ascertain one way
16 or the other.

17 Q. And you haven't pointed to any evidence
18 suggesting that Nokia made a licensing declaration that --
19 to ETSI that relates to the asserted patents, correct?

20 A. My references to ETSI were related to a point I
21 made on direct that you can observe Nokia's disclosure
22 practices at ETSI and make an inference about their ability
23 to make specific disclosures on a timely basis.

24 I think that's unrelated to what you're asking
25 about here. I think we can probably agree that ETSI is not

1 the ITU.

2 Q. And ETSI is not the standard-setting organization
3 that oversaw the development of the H.264 or H.265
4 standards, correct?

5 A. Correct.

6 Q. And, in fact, in that same article that we were
7 just looking at in CDX-24.13, you say that, ETSI is the only
8 SSO in our sample to mandate specific disclosure.

9 Do you see that?

10 A. Yes.

11 Q. One other thing on your article I wanted to
12 mention is, you calculate a metric called disclosure lag in
13 Table 2 as shown on 24.14. Do you see that?

14 A. Yes. I believe that's the elapsed time between
15 when a patent is applied for and granted and when the --
16 when it's listed in a specific disclosure.

17 Q. Okay. And your calculations in your paper show
18 that the average disclosure lag is five years for the ITU,
19 correct?

20 A. For the patents that are specifically declared to
21 the ITU, yes.

22 Q. When there's been a specific declaration on
23 average, there's a five-year lag between the time that
24 patent is applied for and when it's specifically disclosed
25 to the ITU; is that right?

1 A. Yes.

2 Q. And you provided no evidence today about what
3 Nokia's disclosure lag is for either the asserted patents or
4 the portfolio at large, correct?

5 A. In Nokia's case there's a lot more information
6 available here because we've taken depositions and there's
7 production, and so I can observe sort of Nokia's -- or
8 indicators of Nokia's knowledge about the patents that I
9 can't for these others. So I didn't think it was really
10 necessary to calculate average disclosure lags.

11 Q. So that's a no.

12 You have not disclosed a numerical calculation
13 for Nokia's disclosure lags, correct?

14 A. That's correct.

15 Q. And you haven't given an opinion about whether
16 their disclosure lag would be greater than, equal to, or
17 less than the average for the ITU, correct?

18 A. Yes.

19 Q. You mentioned the disclosure forms, and on JX-185
20 you see an H.265 disclosure form. Can you confirm that?

21 A. Yes.

22 Q. And the disclosure form has three options that a
23 Patent Owner can select, 1, 2, and 3. Do you see that?

24 A. Yes.

25 Q. The first option is if the Patent Owner is

1 willing to license on a royalty-free basis, correct?

2 A. Yes, that's the first box.

3 Q. And the second box is the patentholder is willing
4 to grant a license on RAND terms, correct?

5 A. Yes.

6 Q. And the third box is when a patentholder is
7 unwilling to grant a license either free or on RAND terms,
8 fair?

9 A. Yes.

10 Q. In that case the disclosure form says, in this
11 case, the following information must be provided to the ITU,
12 and that lists grant patent number or patent application
13 number, correct?

14 A. Elsewhere in the policy there is language that
15 says to make a best effort to disclose known patents or
16 known pending patent applications, but, yes, in sort of -- I
17 think what you're doing here is conflating to some extent
18 the disclosure obligation and the licensing commitment, but
19 it's true that, when you are making the licensing
20 commitment, if you are unwilling to commit to RAND or
21 royalty-free licensing, the ITU requests that you provide
22 specific patent numbers.

23 Q. And if we go to the next slide on JX-415, these
24 licensing -- or these forms frequently have a patent
25 information form on the back. You've seen that, correct?

1 A. Yes, I've seen this.

2 Q. And it provides tables where a Patent Owner can
3 list specific patent applications or patent numbers. Do you
4 see that?

5 A. Yes, I see the place on the form where you can
6 disclose specific numbers.

7 Q. And it says, the patent information is desired
8 but not required for options 1 and 2. And option 1 being
9 the free license and 2 being the RAND license, correct?

10 A. There's a couple of other relevant pieces of
11 information. One is that this is the form from 2012 and
12 it's not the relevant form for contributions to JVT, right,
13 so we're not looking at the form that doesn't have this
14 language that JVT used, and that's relevant for at least one
15 of the patents here.

16 The other thing is, again, this conflation of
17 licensing commitments and disclosure rules. If you're going
18 to make a generic licensing commitment if you're not going
19 to list any patents, then it's not required that you list
20 any patents. You may not know about patents. The policy
21 says that there's no requirement to conduct a patent search.

22 But because it's still desirable to allow firms
23 to make RAND or royalty-free commitments, there's no
24 requirement here, but there's still a best efforts
25 requirement to list known pending patents or applications.

1 Q. Professor Simcoe, I appreciate that. I was
2 merely asking whether the form on JX-415 says, the patent
3 information is desired but not required for options 1 and 2.

4 Did I read that correctly, sir?

5 A. The form says that, yes.

6 Q. And it says, the information is required in the
7 ITU for option 3, which would be if somebody checked the
8 unwilling licensor box, correct?

9 A. Yes, the form also says that.

10 Q. And you understand in this case, looking at
11 CDX-24.18, that Nokia has argued that there are three
12 contributions that relate to their patents-in-suit. You
13 were here for opening?

14 A. Yes, I've heard this.

15 Q. And each and every one of those, in JX-208,
16 JX-201, and JX-205, Nokia said, we have or may have IP that
17 covers this technical contribution, but we're willing to
18 license on RAND terms, correct?

19 A. It's boilerplate, yes.

20 Q. And you presented no evidence that Nokia has ever
21 checked a box 3 saying, we're unwilling to license, correct?

22 A. Yes, I sort -- I testified about this scenario
23 that arises relative to the encoding patents where there may
24 have been an obligation to fill out multiple forms and
25 potentially check box 3, but I'm not aware of Nokia ever

1 checking box 3.

2 Q. Thank you.

3 Now, you have been hired by some of the largest
4 implementers of standards to offer opinions about FRAND and
5 holdup and injunctions; is that right?

6 A. I've been hired by large firms to offer opinions
7 in this area, yes.

8 Q. Apple has hired you repeatedly?

9 A. Yes.

10 Q. Microsoft, HTC, Lenovo, correct?

11 A. Yes.

12 Q. And hired by Amazon, LG, HP, right?

13 A. That's correct.

14 Q. And, of course, in this case Hisense, Acer, and
15 ASUS have all retained you, correct?

16 A. Yes.

17 Q. And collectively those companies have sold
18 billions of devices that implement different standards,
19 cellular standards or video standards. We can agree on
20 that?

21 A. These are companies that own patents on standards
22 and implement standards as well. But, yes, they
23 collectively, I would guess, have sold billions of units.

24 Q. And they, of course, pay you for your expert
25 testimony and consulting work?

1 A. Yes, I'm compensated for my consulting work.

2 Q. And, on average, about 50 percent of your
3 personal income comes through that work; is that right?

4 A. I think it's very hard to estimate. There's
5 years when consulting is relatively little and there's years
6 when I make more in consulting than I make as an academic.
7 At my deposition I've stipulated 50 percent, but I've never
8 tried to figure it out.

9 Going back to my wife, she's always worried that
10 the consulting income will go away but the tenured job
11 won't.

12 Q. Now, in your reports you refer to a consensus
13 view on economists that economists hold with respect to the
14 issues you've discussed today?

15 A. Yes.

16 Q. And you cite various academic papers in your
17 report reflecting those consensus views; is that right?

18 A. Yes.

19 Q. And when you refer to the consensus views of
20 economists on this issue, you include your views as part of
21 that, correct?

22 A. I'm part of that community, yeah.

23 Q. And, in fact, in your reports I counted eight or
24 ten citations to your own research to support your opinions.
25 Does that sound about right?

1 A. I have no idea.

2 Q. Okay. And isn't it true that some of the biggest
3 technology companies in the world have directly funded your
4 research? Is that true?

5 A. I would say that, in terms of direct research
6 funding, I received a \$200,000 grant from Intel to do work
7 that's unrelated to this. It was just sort of go into the
8 Census Bureau's secure research data center and study
9 essentially the relationship between capital constraint and
10 R&D investment.

11 Q. Okay.

12 A. And then I wrote -- there was one paper that was
13 sort of directly funded that's relevant to this topic where
14 Google made a contribution to this technology policy
15 research initiative, and I wrote a paper -- it's not clear
16 that I would have written the paper or not without the
17 Google funding, but it was a paper about disclosure of
18 standard-essential patents -- this one, patenting inventions
19 or inventing patents.

20 Q. Okay. And just so the record is clear, you've
21 received direct funding from Google and Intel, but the Intel
22 funding didn't have anything to do with this paper; is that
23 right?

24 A. I think that's right.

25 Q. Okay. In the paper on CDX-24.20 there's an

1 acknowledgment at the bottom saying that, the authors also
2 thank Google Inc. and Intel Corp. for their financial
3 support.

4 Do you see that?

5 A. Yes.

6 Q. You know, you served a CV in this case that lists
7 out all your articles; is that right?

8 A. Yes.

9 Q. There was one I found online that was actually
10 omitted from your CV called "Does Patent Monetization
11 Promote SSO Participation?" Are you aware of that?

12 A. I do remember writing this, yeah.

13 Q. Okay. It wasn't on your CV.

14 If we look at the bottom there, it says, "All
15 views expressed in the manuscript are those of the authors.
16 Unified Patents provided financial support for Qing Zhang,
17 who is a coauthor of the paper." Is that right?

18 A. Yes. I apologize for forgetting this paper. It
19 was a pretty small piece of work, but I should have
20 disclosed it.

21 Q. Do you know how much Unified Patents paid your
22 coauthor on this paper?

23 A. No.

24 Q. Did Unified Patents get drafts of this paper
25 before it went out?

1 A. No.

2 Q. Okay. And Unified Patents, what are they?

3 A. Unified Patents is a business that's involved in
4 patent licensing. I think that they do a number of things.
5 They have datasets that they produce related to litigation.
6 They also file IPRs.

7 Q. And on balance, you would agree that Unified
8 Patents tend to be pro -- more pro implementer than pro
9 patentholder. We can agree on that characterization, at
10 least?

11 A. I think that's fair.

12 Q. Now, in your report you also repeatedly talk
13 about the Qualcomm v. Broadcom case, and you mentioned it
14 again today.

15 A. Yes, I mentioned this case.

16 Q. Have you read that case?

17 A. Yes.

18 Q. There was an egregious misconduct in that case,
19 is there not?

20 A. I think it's fair to say that Qualcomm in that
21 case engaged in conduct that was pretty egregious, yes.

22 Q. And, for instance, the Federal Circuit found that
23 Qualcomm had made repeated false claims during discovery,
24 trial, and post-trial by their attorneys and witnesses that
25 Qualcomm didn't participate in the H.264 standard. Do you

1 recall that?

2 A. Yes.

3 Q. Nokia has not made such false representations
4 about their participation in the standard, have they?

5 A. Not that I'm aware of.

6 Q. In fact, the attorneys and the witnesses in this
7 courtroom have proudly explained their participation in the
8 standards, correct?

9 A. I won't speak to their pride, but I think that's
10 fair.

11 Q. Okay. It also came out that Qualcomm withheld
12 46,000 documents showing their participation in the JVT. Do
13 you recall that?

14 A. I'll take your word for it.

15 Q. Well, I'm quoting the opinion that you cite
16 repeatedly. There were 200,000 pages of relevant emails,
17 explicit document massive -- showing documents --
18 documenting massive participation in the JVT proceedings.

19 Do you see that?

20 A. Yes.

21 Q. And the Court found that Qualcomm intentionally
22 organized a plan to shield those patents from consideration
23 by the Working Group, correct?

24 A. Yes.

25 Q. And Qualcomm suggested monitoring the Working

1 Group, the JVT, from a distance and refraining from making
2 any submissions. Do you recall that?

3 A. Yes.

4 Q. And they hired an outside consultant to go in and
5 keep tabs on what was happening at the standard. Do you
6 recall that?

7 A. Not specifically, but that sounds reasonable.

8 Q. And the conduct was so egregious that the judge
9 referred six attorneys to the California State Bar. Do you
10 recall that?

11 A. I do recall that.

12 Q. And I'm sure you're not suggesting anybody at
13 Nokia should be referred to the state bar for any reason,
14 right?

15 A. The reason for citing this case is not related to
16 Qualcomm's conduct, it's related to what the opinion had to
17 say about the requirements to make a best effort. But I
18 don't disagree with anything on your slide.

19 Q. Lastly, Professor Simcoe, you offered some
20 opinions about willingness, right? And as I understand it,
21 you opine today that, because Acer and ASUS have indicated a
22 willingness to accept a RAND determination through the
23 UK Court, that makes them willing licensees?

24 A. I think my testimony was that that should be
25 sufficient to treat them provisionally as a willing licensee

1 until we establish what a RAND rate is, and then kind of
2 based on the revealed preference idea that I explained, give
3 the parties an opportunity to enter into a transaction on
4 RAND terms and conditions.

5 Q. You're aware that four courts have evaluated
6 Nokia's program rates and have not found a RAND violation.
7 You're aware of that, sir?

8 A. I think that was phrased very carefully. I'm not
9 sure I -- you know, I have points where I respectfully
10 disagree with some of those courts, but I know that there
11 are decisions where Nokia has been found -- you know, I
12 guess the way it's been put is that insufficient evidence
13 was brought to sort of conclude that Nokia was demanding
14 rates above a RAND level.

15 Q. Let's pull up CDX-21C.15.

16 And, in fact, very recently the German court
17 issued a finding that found that, plaintiff -- which was
18 Nokia -- has demonstrated that it has established its
19 licensing program for H.264 and H.265 on the market and that
20 the rate it demands is therefore FRAND.

21 Did I read that correctly?

22 A. So I read this decision last night, and I think,
23 interestingly, the German court makes a bunch of statements
24 that suggest that it equates RAND with the entire value of
25 the standard or the total amount that can be negotiated on

1 an ex post basis.

2 And if that's how they are defining FRAND, my
3 view is that a royalty at the upper end of the FRAND
4 corridor is necessarily above how economists look at it or
5 how the Federal Circuit described it in the Ericsson case.

6 Q. In any event, we can agree that, notwithstanding
7 these rulings, Acer and ASUS obviously have not agreed to
8 accept Nokia's offers at the program rates. That's why
9 we're here today, right?

10 A. We are here because there is a disagreement over
11 what a RAND rate is.

12 Q. Okay. Thank you.

13 MR. FOUNTAIN: I pass the witness.

14 JUDGE MCNAMARA: Thank you, Mr. Fountain.

15 Ms. Ducca?

16 MS. DUCCA: No questions from Staff, Your Honor.

17 JUDGE MCNAMARA: All right. Any redirect,
18 Mr. Colaianni?

19 MR. COLAIANNI: Just a few brief questions,
20 Your Honor, if I may.

21 REDIRECT EXAMINATION

22 BY MR. COLAIANNI:

23 Q. Professor Simcoe, during cross-examination just
24 now counsel was asking you questions about the disclosure
25 rules in certain of the standards organizations. Do you

1 recall that?

2 A. Yes.

3 Q. And you indicated, I think a few times, that he
4 was conflating the disclosure rules and the licensing
5 commitments. Do you recall that?

6 A. Yes, that's correct.

7 Q. Do you want to explain what you mean by that?

8 A. Well, I just mean that there are parts of these
9 forms -- you know, as I described in my direct testimony,
10 one purpose of the disclosure rule is to trigger the
11 requests for a licensing commitment, and so then the forms
12 provide a place where a firm that knows that it has patents
13 or patent applications can indicate their knowledge, you
14 know, of specific patents or patent applications on the
15 form.

16 But I also explained that it's desirable to allow
17 for generic disclosures, so a firm that doesn't know that it
18 owns patents or patent applications that might become
19 essential can still commit to RAND licensing using the same
20 form. And so the form contemplates and allows for a generic
21 disclosure without listing patents or a specific one if a
22 firm has knowledge of the patents.

23 The sense in which the things were conflated is,
24 you know, sort of what are you required to disclose versus
25 what are you required to list when you enter into a

1 licensing commitment.

2 Q. You were also asked a few questions about a
3 German decision just a few moments ago. Do you recall that?

4 A. Yes.

5 Q. Did the German court say anything in its opinion
6 about Respondents' willingness as licensees?

7 A. When I looked at the decision last night, it said
8 that they -- I think on the basis of the -- well, both
9 because the Respondents follow the series of steps that the
10 German courts use to assess willingness, and something
11 related to the UK rate determination, you know, set for the
12 purposes of their ruling, it has to be assumed that
13 Respondents are willing licensees.

14 Q. Did the German court assess the ex ante value of
15 the H.264 or H.265 standards?

16 A. Not to my knowledge.

17 MR. COLAIANNI: Nothing further, Your Honor.
18 Thank you.

19 JUDGE MCNAMARA: Thank you.

20 Mr. Fountain?

21 MR. FOUNTAIN: No further questions.

22 JUDGE MCNAMARA: Ms. Ducca?

23 MS. DUCCA: No questions, Your Honor.

24 JUDGE MCNAMARA: I have a quick question.

25 Professor Simcoe, you have not offered an

1 economic valuation of the comparative pools, have you, in
2 this investigation?

3 A. I think that's right. I have not.

4 JUDGE MCNAMARA: Okay. And Dr. Acton has not
5 offered an economic value of the comparative pools that he
6 cited in his documents, did he?

7 A. May I ask what you mean by a "comparative"
8 evaluation?

9 JUDGE MCNAMARA: No, I asked you specifically a
10 comparative economic valuation, the price of the pools, the
11 price of the individual -- or the value -- let me put it
12 this way. The value of the patents in those pools, he did
13 not provide that, did he?

14 A. So my understanding of the testimony we just saw
15 from Dr. Acton was that he made technical comparisons of the
16 patents that Nokia is attempting to license and the patents
17 that are in the H.264 and H.265 pools, but he did not
18 translate that technological comparison into dollars.

19 JUDGE MCNAMARA: Or value.

20 A. That's tricky. Value is sort of -- I think that
21 the sort of technological significance is typically -- when
22 I talked about the bottom-up approach to doing a RAND
23 assessment, one way to get at economic value is what's the
24 technological contribution. So I don't think it's
25 irrelevant to economic value.

1 JUDGE MCNAMARA: Right. But he didn't value the
2 technological contributions by themselves, did he, from an
3 economic standpoint?

4 A. That's right.

5 JUDGE MCNAMARA: Okay. I just wanted to be sure.
6 Thank you.

7 Thank you very much. I think you may step down.

8 A. Thank you, Your Honor.

9 JUDGE MCNAMARA: Thank you.

10 Good afternoon. I'm waiting for Dr. Lopez.

11 MR. HAWKINS: Good afternoon, Your Honor.

12 JUDGE MCNAMARA: And to you too.

13 MR. HAWKINS: Thank you. It is afternoon this
14 time.

15 JUDGE MCNAMARA: It sure is.

16 Good afternoon, Dr. Lopez. Would you kindly
17 raise your right hand.

18 MARIO LOPEZ,
19 having been first duly sworn or affirmed on
20 their oath, was thereafter examined and testified as
21 follows:

22 JUDGE MCNAMARA: Please state your full name.

23 A. Mario Lopez.

24 JUDGE MCNAMARA: Thank you very much. Please be
25 seated.

1 MR. HAWKINS: Thank you, Your Honor. Again, I'm
2 Brent Hawkins on behalf of Acer, and you have already sworn
3 in Dr. Lopez.

4 DIRECT EXAMINATION

5 BY MR. HAWKINS:

6 Q. But could you introduce yourself?

7 A. Yes. My name is Mario Lopez. I am a vice
8 president and economist at Charles River Associates. That's
9 a financial and economic consulting firm.

10 Q. Dr. Lopez, have you created any demonstratives to
11 assist your testimony today?

12 A. Yes, I have.

13 Q. If we could have RDX-0009C.

14 Are these your demonstratives?

15 A. Yes, they are.

16 Q. And if we could have slide RDX-9C.2.

17 Would you please describe your educational
18 background?

19 A. Yes. So I got a BA in economics at the
20 University of California at Berkeley. I followed that up
21 with a Ph.D. back at Berkeley. I have written several
22 papers on FRAND issues and FRAND methodologies in various
23 contexts.

24 Q. And could you briefly describe your work
25 experience as well?

1 A. Yes. So I frequently for the last 18 years have
2 been working on RAND or FRAND issues related to
3 standard-essential patents. I've worked both in a
4 consulting capacity advising both SEP holders and
5 implementers on issues and royalty rates for
6 standard-essential patents.

7 Q. And, Dr. Lopez, have you ever been qualified as
8 an expert in a RAND rate-setting matter?

9 A. Yes, I have. I've been retained in several
10 matters in the UK where they conduct a detailed rate-setting
11 assessment that's a little bit different from what we're
12 going to be talking about here.

13 MR. HAWKINS: Your Honor, Respondents enter
14 Dr. Lopez as an expert in economics and valuation of RAND
15 royalties for standard-essential patents.

16 MR. LIPSCHITZ: Warren Lipschitz for Nokia. No
17 objection.

18 JUDGE MCNAMARA: Ms. Ducca?

19 MS. DUCCA: No objection from Staff, Your Honor.

20 JUDGE MCNAMARA: All right. Then Dr. Lopez is
21 accepted as an expert on the topics for which he has been
22 called to testify without objection.

23 MR. HAWKINS: Thank you, Your Honor.

24 Q. Dr. Lopez, what was your assignment in this case?

25 A. So I was asked to look at the FRAND -- sorry,

1 RAND issues in this matter, to look at Nokia's offers and to
2 assess whether those were RAND, and to look at the
3 Respondents' offers and to look at those and whether those
4 were RAND.

5 Q. If we can turn to RDX-9C.3.

6 Did you offer opinions in the 1379 and 1380
7 investigations?

8 A. Yes, I did.

9 Q. And what were you asked to evaluate in those
10 investigations?

11 A. So, like here, I was asked to evaluate certain
12 RAND issues related to Nokia's SEPs in this matter.

13 Q. And are there any distinctions between your
14 analysis in those investigations and your analysis in this
15 one?

16 A. Yes. There's a large degree of overlap. The
17 biggest distinction, I think, is the framework that we're
18 working under, and this is -- and this is different than the
19 framework that the Commission asked about in terms of how we
20 evaluate -- in particular, how we evaluate offers as opposed
21 to a final RAND determination.

22 Q. What do you mean when you say the wrong economic
23 framework was applied in the prior investigation?

24 A. So if you look at the initial determinations
25 there, there's a lot of language and discussion that

1 conflates two issues, and I think this is important,
2 conflates on the one hand what is a RAND offer in a
3 negotiation and what is a final RAND-determined rate,
4 because those are really two distinct things.

5 And a lot of the language we're hearing here
6 today also conflates those two things as being one being an
7 offer, whether there's reasonable basis for it, and the
8 other whether it's a final RAND-determined rate.

9 Q. And what about Nokia's offers do you specifically
10 want to evaluate under the correct framework?

11 A. So Nokia's offers need to be evaluated in the
12 context that they are asking for an exclusion order. There
13 is no dispute between me, an economist, or me and
14 Dr. Akemann that SEPs bear the risk of holdup, that you are
15 able to -- you may be able to charge more than you are able
16 to when there was competition. So there's no dispute about
17 that.

18 So the burden here is higher. What the ITC is
19 being asked to do is not to determine a final rate or the
20 terms of a license, but, instead, to determine whether the
21 Respondents and Nokia's offers were RAND. Were they
22 consistent with RAND principles and was there a basis, a
23 reasonable basis, for those offers.

24 Q. Now, is this the same when you're evaluating the
25 Respondents' offers?

1 A. So, no, and the context is a little bit
2 different. The Respondents have agreed to a rate-setting.
3 The main dispute between the parties is whether or not --
4 what's the price that we are going to agree upon, and so
5 that hasn't been determined yet. And so the whole purpose
6 of a rate-setting is to make them whole.

7 Q. Now, if we can turn to RDX-9C.4.

8 Is the evidence and analyses you've relied upon
9 in this investigation identical to those in those prior
10 investigations?

11 A. No, not exactly. There's two things here. We
12 have additional evidence and additional analysis.

13 We have some additional internal Nokia documents
14 that are going to shed light on some of their internal
15 strategies. We have additional lump sum licenses.

16 We also have additional analysis that's been
17 conducted. I think some of the questions that the
18 Commission raised go to comparison of Nokia's patents,
19 patents to those in the pool, and you've heard Dr. Acton
20 talk a little bit about those comparisons. And then I've
21 done additional analysis of Nokia's licenses, those
22 particularly with the lump sum licenses with larger deal
23 sizes.

24 Q. And have you formed any opinions about the offers
25 of the parties in the context of this framework?

1 A. Yes, I have.

2 MR. HAWKINS: Your Honor, I think now we have to
3 go on the Nokia's confidential record.

4 JUDGE MCNAMARA: Okay.

5 (Whereupon, the hearing proceeded in confidential
6 session.)

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1 O P E N S E S S I O N

2 JUDGE MCNAMARA: Okay.

3 BY MR. HAWKINS:

4 Q. Welcome back, Dr. Lopez.

5 A. Good afternoon.

6 Q. As part of your work in the investigation, did
7 you also calculate a benchmark rate for Nokia's portfolio
8 based on Patent Pools?

9 A. Yes, I looked to the rates the pools were
10 charging as a benchmark.

11 Q. If we look at RDX-9C.26, how did you go about
12 calculating benchmark rate based on Patent Pools?

13 A. So it really just proceeds in four steps. So
14 we're going to look at what the pool rate would be for Acer
15 and ASUS, that's kind of our starting place. And then, as
16 the second step, we're going to look at what Nokia's
17 proportional share is to the pool, and take those two
18 numbers, and that's going to be at least a starting place to
19 look at what a benchmark rate would be for Nokia.

20 I'm going to do that once for H.264 and then
21 again for H.265.

22 Q. Okay. Well, let's turn to RDX-9C.27.

23 What did you do to determine the per-unit rate
24 Respondents pay to MPEG LA H.264 pool?

25 A. Yes. So on the left-hand side it shows what the

1 MPEG LA rates are. There's some volume base here. When you
2 apply Acer and ASUS's units to that, you get to
3 approximately 19 cents. For Acer, and with rounding, you
4 also get 19 cents for ASUS.

5 Q. If we move on to 9C.28, and that's step 2, can
6 you tell us what you did here?

7 A. Yes. So I looked at Nokia's portfolio as of
8 January 1st. There's only a handful of patents left at this
9 point for H.264. You look at MPEG LA. I've also taken out
10 expired patents from there. It shows that Nokia has about
11 8.55 percent, a little bit less than 9 percent, compared to
12 the pools.

13 Q. Now, how did you calculate the number of patents
14 in the MPEG LA pool?

15 A. They publicly make their list available. And so
16 that number is 117. A few years ago it was twice that
17 amount. So this is looking at the current counts. I've
18 done alternative calculations just to kind of test the
19 sensitivity, do some robustness checks, and so that's in my
20 backup calculations.

21 Q. And that's indicated here on slide 9C.28,
22 correct?

23 A. Correct.

24 Q. And now if we can turn to 9C.29, please.

25 Now you have Respondents' rates and Nokia's

1 proportional share of the pool. What did you do next?

2 A. Yes. So I took -- I just multiplied the two by
3 this amount. I just want to note that this doesn't assume
4 that Nokia would just share in the pool rate. It's getting
5 something proportional so it's on top of what the pools
6 charge. If you multiply those two numbers together, you get
7 1.7 cents per unit.

8 Q. Okay. And did you do a similar analysis for the
9 H.265 pool?

10 A. Yes, I did.

11 Q. Okay. And if we turn to slide 9C.30, what did
12 you do here?

13 A. So there's two pools. You have the MPEG LA and
14 the Access Advance. Those rate structures vary a bit
15 between those two pools. I calculated what the rates were
16 for each one, for Acer and ASUS respectively. And then I
17 wanted to look at the aggregate rate between those two
18 pools, which gives you 41 cents and 57 cents for Acer and
19 ASUS respectively.

20 Q. Now, if we turn to 9C.31, how did you calculate
21 the benchmark rate for Nokia?

22 A. So, again, I looked at Nokia's portfolio, 27
23 patent families as of January 25th -- January 2025. I
24 looked at what the total patents, unique patents were
25 between MPEG LA and Access Advance, and it shows that they

1 actually have a relatively smaller share of 3.75 percent.

2 And, again, I did other calculations to test the
3 robustness of this, which is shown on 9C.31.

4 Q. Now, if we turn to 9C.32, and putting together
5 all of that, what pool benchmark rates did you calculate for
6 Nokia's portfolio?

7 A. So for H.265, I do the same math of multiplying
8 the share times the aggregate rate. It gives you 1.5 cents
9 for Acer and 2.1 cents for ASUS.

10 And then in step 4 I combined them, so take the
11 total value for H.264 and H.265, and assuming that those are
12 separate royalty rates and add them up together.

13 Q. Now, turning to 9C.33, how did Nokia's program
14 rates compare to the pools?

15 A. So --

16 Q. Excuse me. 34, please.

17 A. So we want to now get a sense of what Nokia's
18 rates are relative to the pool. So on the left-hand side
19 here, you can see Nokia is charging 71 cents. We talked
20 about how it far exceeds what the pool, MPEG LA, charges, is
21 19 cents. So Nokia is asking for over three times the
22 amount for far fewer patents. So you're getting far less
23 and having to pay much more.

24 When you go to H.265, you can see Nokia --
25 Nokia's rates exceed kind of the upper end on the pools that

1 I've calculated at 57 cents, and here they have actually a
2 much smaller share, so they are paying more for many, many
3 fewer rights for H.265.

4 Q. Again, have you seen any evidence of a higher
5 value that should be contributed to Nokia's portfolio to
6 justify the disparity?

7 A. No. And so we haven't seen any evidence to
8 justify this. And so if we go to the next slide...

9 Q. And now you're on slide 9C.35?

10 A. Yes.

11 Q. Okay. What does your analysis tell us about --
12 tell us here?

13 A. So in this slide I'm looking at Nokia's offer to
14 ASUS and Nokia's offer to Acer, 47 euro cents and 48 euro
15 cents. I've translated my pool benchmarks into euros, and
16 so that's approximately 3 cents and 4 cents for Acer and
17 ASUS.

18 And so the important consideration here --

19 MR. LIPSCHITZ: I'm sorry, Your Honor. I believe
20 we're getting into CBI.

21 JUDGE MCNAMARA: I think we are.

22 Are we?

23 MR. HAWKINS: I guess we're in Nokia's
24 confidential information.

25 JUDGE MCNAMARA: Yes. Okay.

1 (Whereupon, the hearing proceeded in confidential
2 session.)
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1 O P E N S E S S I O N

2 BY MR. LIPSCHITZ:

3 Q. Okay, I'm sorry, I'm not sure if I got an answer.

4 You've been retained before by Amazon, correct,
5 sir?

6 A. That is correct.

7 Q. Oppo?

8 A. Yes, that is correct.

9 Q. TCL?

10 A. My company was retained by TCL, and I was
11 retained as an expert for TCL.

12 Q. You listed it on your CV, right?

13 A. I was a consulting expert in the TCL v. Ericsson.
14 I'm making a distinction between my earlier career, where
15 I'm a consulting junior economist, and a testifying expert.

16 Q. You were also hired by HTC?

17 A. Yes.

18 Q. ZTE?

19 A. Yes.

20 Q. Netflix?

21 A. That is correct.

22 Q. Google?

23 A. Yes.

24 Q. Vivo?

25 A. Yes.

1 Q. Xiaomi in three cases on your CV?

2 A. That sounds correct.

3 Q. Acer, ASUS, and Hisense; is that correct, sir?

4 A. Yes.

5 Q. Are there any others?

6 A. I'd have to go back to my CV.

7 Q. Okay. Fair to say you've been paid a lot of
8 money by implementers over the years, right?

9 A. My firm has been paid a lot of money. My salary
10 is dependent upon that, but, yes.

11 Q. I'm going to start by asking you some
12 straightforward yes-or-no questions about some of Nokia's
13 licenses that you reviewed, and we shouldn't yet need to get
14 on the confidential record. Okay?

15 A. Okay.

16 Q. You did not unpack any H.264 or H.265 video rates
17 from the Microsoft, Huawei, or LG licenses, correct? In
18 this case, correct, sir?

19 A. That is correct.

20 Q. And you previously testified that you did not do
21 so because Nokia has thousands of cellular patents, and
22 these are cellular-driven licenses, correct?

23 A. Yes, that is correct.

24 Q. I'm going to list off a few other agreements and
25 get you to confirm the same.

1 You didn't unpack any H.264 or H.265 video rates
2 from the Lenovo, Apple, Xiaomi, Google, and Samsung cellular
3 agreements, correct?

4 A. Agreed. And just for the Court, it's Samsung
5 cellular agreements, not the ones -- the TV agreements that
6 we were talking about. But, yes, that is correct.

7 Q. Now, could we have slide 6, please, Mr. Moreno.

8 Now, have you seen this testimony from ASUS and
9 Acer?

10 A. Yes.

11 Q. And for the record, we're showing the deposition
12 testimony of Ms. Cruts from September 12, 2025, at 40:15-18,
13 and Mr. Morquecho, September 26, 2025, at 31:4-7.

14 Now, do you dispute HP is one of Acer and ASUS's
15 primary competitors?

16 A. No, not at all.

17 Q. We're going to compare what HP paid to the RAND
18 rate that you calculated, okay, sir?

19 A. Very good.

20 MR. LIPSCHITZ: And at this point, Your Honor, we
21 do need to go on to the confidential record. This is Nokia
22 CBI.

23 (Whereupon, the hearing proceeded in confidential
24 session.)

25

1 O P E N S E S S I O N

2 PALLAVI SETH,

3 having been first duly sworn or affirmed on
4 their oath, was thereafter examined and testified as
5 follows:

6 JUDGE MCNAMARA: Please state your full name.

7 A. Pallavi Seth.

8 JUDGE MCNAMARA: Thank you very much.

9 DIRECT EXAMINATION

10 BY MS. ROBERTS:

11 Q. Good afternoon, Dr. Seth. Can you tell us about
12 your education?

13 A. I have a Ph.D. in economics from Boston College.

14 Q. Can you provide a brief description of your work
15 after college?

16 A. I am a partner at The Brattle Group and cochair
17 of the firm's intellectual property practice. I have been
18 at Brattle for over 18 years. Brattle is an economic
19 consulting firm, a leading firm, with offices all across the
20 U.S. and worldwide.

21 Q. How many ITC cases have you been involved with?

22 A. Over 60.

23 Q. What aspects did you analyze in those ITC cases?

24 A. The full range of economic issues: Domestic
25 industry, public interest, commercial success, economic

1 injury, remedy, to name a few.

2 Q. I would like to show you what has been marked as
3 CX-6598, and turn to page 2.

4 What is this document?

5 A. This is my CV.

6 Q. Is this a true and accurate representation of
7 your educational and work history?

8 A. Yes.

9 MS. ROBERTS: Your Honor, at this time I would
10 like to tender Dr. Seth as an economic expert in the
11 economic prong of the domestic industry, remedy, and public
12 interest.

13 JUDGE MCNAMARA: All right.

14 Mr. Lipschitz, any objection?

15 MR. LIPSCHITZ: No objection, Your Honor.

16 JUDGE MCNAMARA: Ms. Ducca?

17 MS. DUCCA: No objection from Staff, Your Honor.

18 JUDGE MCNAMARA: Then Dr. Seth is accepted as an
19 expert witness on the topics for which she has been called
20 to testify without objection.

21 Q. Dr. Seth, did you review any materials in forming
22 your opinions in this investigation?

23 A. Yes, I reviewed various pleadings in this
24 investigation, written discovery submitted by the parties,
25 expert reports, depositions, and also publicly available

1 information.

2 Q. I would like to show you what has been marked as
3 CX-6585 and CX-6599, and if we can turn to page 2 of these
4 documents.

5 What are these documents?

6 A. These are the materials I considered.

7 Q. What aspects of this investigation are you here
8 to opine on today?

9 A. I was asked by counsel for Respondents to provide
10 opinions regarding domestic industry, public interest, and
11 remedy, and also to provide rebuttal opinions to Dr. Akemann
12 and Mr. Herrington's economic analysis related to these
13 areas.

14 Q. Did you create any demonstratives to assist you
15 with your testimony today?

16 A. Yes.

17 Q. I would like to show you what has been marked as
18 RDX-11C.

19 Are these the demonstratives that you prepared?

20 A. Yes.

21 Q. I would like to talk briefly about the parties.
22 If we could turn to RDX-11C.2.

23 Could you tell me a little bit about Nokia?

24 A. Nokia Corporation is a Finnish organization.
25 Approximately 42 percent of Nokia's employees are based in

1 Europe, with an additional 23 percent based in India.

2 According to Nokia Technologies -- according to
3 Nokia, Nokia Technologies manages Nokia's Patent Portfolio
4 and monetizing of Nokia's intellectual property, with the
5 majority of Nokia Technologies' revenues coming from its
6 patent monetization.

7 Nokia is relying on Samsung and Microsoft for its
8 domestic industry in this investigation.

9 Q. If we could turn to RDX-11C.3, can you tell me a
10 little bit about Acer?

11 A. Acer, Inc., is a Taiwan-based company, and Acer
12 America Corporation is headquartered here in California. It
13 conducts research, design, marketing, sales, and support of
14 its PCs in the U.S.

15 Acer and its subsidiaries have locations in
16 Texas, as well, in addition to California. And Acer America
17 and Acer Services employed about 460 people in the U.S. as
18 of December 2024. Acer sold over 3 million PCs in the U.S.
19 in 2024.

20 Acer has the fifth largest U.S. market share for
21 PCs and notebooks, about 6.2 percent in 2024, and its
22 worldwide market share of Chromebooks in the first quarter
23 of 2024 was 32 percent.

24 A few other market shares that are relevant, as
25 we talk through my testimony, Acer has about 15.5 percent

1 market share in the U.S. education segment, about 20.8
2 percent market share in the Chromebook education segment,
3 and 47.5 percent in the low-price band gaming notebook
4 segment, and about 25.4 percent in the \$500 to \$1,000 gaming
5 notebook segment.

6 Q. If we could turn to RDX-11C.4.

7 Can you tell me a little bit about ASUS?

8 A. ASUS Computer, Inc., is also a Taiwan-based
9 company. ASUS Computer International is focused on North
10 America. It primarily is engaged in the service, support,
11 and sales of its PCs in the U.S.

12 It had the sixth largest U.S. market share for
13 PCs and notebooks at 4.2 percent in 2024. It had about 350
14 to 400 U.S. employees as of 2025 in various service
15 locations in the United States. And they sold about 2.5
16 million PCs in the U.S. in 2024.

17 In Q1 2024, ASUS global Chromebook market share
18 was about 18 percent. It was the leader in the U.S. gaming
19 notebook segment with a 28 percent market share. And a
20 global leader with 70 percent market share in the thin and
21 light gaming notebook segment as of Q2 2024.

22 Q. I'd like to talk about your domestic industry
23 opinions first.

24 If we could turn to RDX-11C.5?

25 Do you have an opinion on what the relevant DI

1 products are in this investigation?

2 A. The CPUs, SoCs and GPUs, which I refer to as
3 components, are the articles protected by the asserted
4 patents in this investigation.

5 The alleged DI products, which are the end-user
6 products, are not the articles protected by the asserted
7 patents.

8 Q. Were you here when Mr. Herrington testified?

9 A. Yes.

10 Q. Mr. Herrington claims that the DI products are
11 the downstream products including the Microsoft Xbox,
12 Microsoft Surface, and Samsung Galaxy products.

13 Do you agree with this?

14 A. No.

15 Q. Why not?

16 A. There are several deficiencies in
17 Mr. Herrington's analysis. I have listed those on this
18 slide. I will present them at a high level and I'll discuss
19 them in more detail during this presentation.

20 The first, Mr. Herrington ignores evidence that
21 the components are separately sold in commerce and that the
22 Android OS is open source and publicly available.

23 Mr. Herrington also does not provide evidence
24 that components for all the DI products are customized or
25 that any alleged customization of these components or

1 Android OS is specific to the asserted patents.

2 He also does not provide any evidence and in fact
3 ignores evidence that the components in Android OS do not
4 have an exclusive operational relationship with the asserted
5 patents.

6 And, finally, Mr. Herrington fails to show that
7 any of the alleged domestic industry expenditures and
8 activities he relies on have a direct relationship to the
9 exploitation of the patented technology.

10 Q. If the relevant DI products are the CPUs, SoCs,
11 GPUs, and Android OS, has Mr. Herrington shown that a
12 domestic industry exists for Samsung or Microsoft?

13 A. No, he has not provided any evidence of
14 expenditures, which are specific to the components, or the
15 Android OS, or the customization of the components or the
16 Android OS. He has not made any effort to allocate the
17 domestic industry investments either to the components,
18 integration of the components, or the customization of the
19 components, or any customization of the Android OS.

20 In fact, Mr. Herrington, when asked at trial,
21 said he had not made that effort.

22 Q. If we could turn to RDX-11C.6.

23 Did you consider any factors in forming your
24 opinion regarding the patent-practicing article?

25 A. Yes. I relied on and considered the Magnetic

1 Tape factors, which the Commission considers, including the
2 first factor, which is whether the patented technology is
3 sold as a separate entity or article of commerce.

4 The second factor, which is whether it is an
5 essential component of the downstream product.

6 And the third factor, whether the domestic
7 industry activities have a direct relationship to
8 exploitation of the patented technology.

9 Q. If we could turn to RDX-11C.7.

10 Can you explain your opinions regarding whether
11 the patented technology is sold as a separate article of
12 commerce?

13 A. The patented technology, the components, are sold
14 as separate articles of commerce by Intel, AMD, NVIDIA,
15 Qualcomm, to Microsoft and Samsung. I understand from
16 Dr. Schonfeld and Dr. Hemami that Microsoft and Samsung did
17 not produce any source code relating to the components or
18 the Android OS, and that Microsoft and Samsung simply
19 purchased the components which are designed and developed by
20 Intel, AMD, NVIDIA, and Qualcomm, for instance.

21 Q. Mr. Herrington claims that because Microsoft and
22 Samsung do not sell the CPUs and GPUs, they are not articles
23 of commerce.

24 Do you agree with this opinion?

25 A. I do not. It's my understanding that the

1 relevant inquiry is not whether Nokia or Microsoft or
2 Samsung sell the components separately, but, rather, if
3 anybody, anyone sells those components separately. And, in
4 fact, here Intel, AMD, NVIDIA, and Qualcomm sell the
5 components to other OEM -- OEMs, as well.

6 Q. According to Mr. Herrington, the chips in the DI
7 products are not intended to be replaced by the consumer
8 because they are often soldered in place.

9 Does this affect your opinion?

10 A. No. As I understand from Dr. Hemami, this would
11 be true for all electronic items where components are
12 soldered in those -- in the end product. Again, as I
13 understand from her, that the functionality that is enabled
14 by the asserted patents here resides in the component.

15 Q. Certain of the chips in the DI products are
16 customized. How if at all does this affect your opinion?

17 A. Again, as I understand from Dr. Schonfeld and
18 Dr. Hemami, the technical experts, that the functionality
19 that's enabled by the asserted patents resides in the
20 component, and there is no evidence that there has been any
21 customization of the patented technology. In fact, I
22 understand that the patented technology are standards.

23 Q. If we could turn to RDX-11C.8, let's discuss the
24 alleged customization of the Microsoft DI products.

25 In your view, does the fact that AMD performs

1 some customization of the chips that are used in the Xbox
2 make the chips not a separate article of commerce?

3 A. AMD's customization is not limited just to the
4 Microsoft DI products. In fact, according to AMD's own
5 financial filings, their 10-Ks, they note that they provide
6 semi custom chips and perform customization for Sony
7 PlayStation, specifically they mention the PlayStation 5 in
8 their recent 10-K filings. They also perform customization
9 for the Valve Steam Deck PC.

10 Again, as I understand from the technical
11 experts, there is no evidence that any of this alleged
12 customization is related to the video-coding technology.

13 Q. Are you aware of any customization of the chips
14 for the Surface DI products?

15 A. Only two out of the 21 DI products, the Microsoft
16 Surface DI products, are claimed to have a custom chip in
17 this investigation. One of them is the Surface Laptop 3,
18 the 15-inch Microsoft Surface Edition, is claimed to have a
19 custom chip. However, again, I understand from
20 Dr. Schonfeld and Dr. Hemami that there's no evidence of
21 customization relating to video-coding technology in this
22 product.

23 The other product which belongs to the Surface
24 Laptop 3 is that 13.5 inch, which uses a certain Intel core
25 processor, which is readily available for purchase on the

1 web, and a snapshot of that I've provided on the right-hand
2 side bottom of this slide.

3 There's also the Surface Pro 95G which is claimed
4 to have a custom chip. Again, according to the technical
5 experts, there is no evidence that any customization is
6 related to the video-coding technology.

7 In fact, there are 19 other DI Surface products,
8 Microsoft Surface products, which use readily available
9 chips and are also used in non-DI products, such as the
10 Dynabook and the Dell XPS.

11 In fact, one of those Surface DI products uses a
12 specific Intel core processor, which I was able to identify
13 for purchase even on Amazon, and a picture of that is
14 available on the right-hand side on the top of this slide.

15 Q. If we could turn to RDX-11C.9.

16 Mr. Herrington claims that certain of the
17 different Galaxy DI products contain a customized Qualcomm
18 chip that was made exclusively for Samsung.

19 How, if at all, does this affect your opinion?

20 A. Again, my understanding is that any alleged
21 customization is not related to the video-coding technology,
22 the functionality that's enabled by the asserted patents
23 here, but, as I understand, the Snapdragon Gen 2 chip from
24 Qualcomm is alleged to be a custom chip. And there are also
25 non-custom versions of it which are available and also used

1 in the ASUS, Motorola, Nubia, Sony, OnePlus, and many other
2 smartphones.

3 It is my understanding that, and, again,
4 Mr. Herrington has not shown, any evidence showing
5 differences between the custom chip and the non-custom chip,
6 which is available for ASUS, Motorola, et cetera,
7 specifically related to the video-coding technology.

8 A list of these where the Snapdragon 8 Gen 2 is
9 used is readily available on the web and again on the
10 right-hand side of the slide shows that list. Snapdragon 8
11 Elite is another chip that is claimed to be custom. Again,
12 there's no evidence whether the custom chip and the
13 non-custom chip which is used by ASUS, OnePlus, Xiaomi,
14 are -- if there are any differences between those chips
15 related to the video-coding technology.

16 Q. Does Mr. Herrington claim that all of the Samsung
17 DI products have custom processors?

18 A. No. There are 14 DI products which are not
19 claimed to have any custom chips in them. Amongst these DI
20 products, some use the Snapdragon 888 chip, which is readily
21 available and used by Motorola, Sony, and Lenovo.

22 Another chip that is used in these -- amongst the
23 14 DI products is the Snapdragon 8 Plus Gen 1, which is also
24 used in Motorola and Xiaomi.

25 Q. Did you look at the license agreements between

1 Qualcomm and Samsung?

2 A. I did.

3 Q. How, if at all, do those license agreements
4 affect your opinion?

5 A. There was no evidence in those license agreements
6 that any customization effort is related to the asserted
7 patents or to the video-coding technology that is enabled by
8 the asserted patents in this investigation.

9 Q. Mr. Herrington alleges that the Samsung DI
10 products include a custom Android operating system that was
11 developed for the Samsung DI products and thus is not a
12 separate article of commerce.

13 Do you agree with this opinion?

14 A. No. The Android OS is open source code and it's
15 publicly available, as I understand from Dr. Schonfeld,
16 Dr. Hemami, and also Dr. Chrissan noted that during his
17 testimony here.

18 I understand, again, from the technical experts,
19 that the Android OS is commonly customized by other phone
20 makers as well, such as OnePlus, Oppo, Xiaomi, and the
21 customization has nothing to do with the core functionality
22 of Android OS, rather to do with providing some very basic
23 features that differentiate a product maybe.

24 So Samsung is not unique to this customization.
25 And any customization that's being done, according to

1 Dr. Schonfeld, would not impact the video-coding technology
2 that is again being -- that is in question in this
3 investigation.

4 Q. If we could turn to RDX-11C.10.

5 Did you consider whether the chips are an
6 essential component of the downstream products?

7 A. Yes. Again, my understanding is that these chips
8 have a variety of functions, not just limited to the
9 video-coding technology. And, in fact, the technical
10 experts mentioned that the video-coding functionality can
11 also be offered via software.

12 Moreover, the DI products, while they need a GPU
13 or a CPU, the experts -- the technical expert explained that
14 they do not need these specific GPUs or CPUs to function.
15 They can be replaced, of course with some effort, to another
16 GPU or CPU, and the video-coding technology could be offered
17 via software functionality.

18 My understanding also is that to evaluate this
19 factor, one must look at whether there is an exclusive
20 operational relationship between the patent-practicing
21 article and the patented technology. As I note on this
22 slide, the downstream DI products are not the only means to
23 exploit the patented technology. In fact, Qualcomm, AMD,
24 NVIDIA, Intel, they all provide the components to other OEMs
25 as well, and Nokia itself licenses the patented

1 technologies -- technology to other OEMs too.

2 And just noting again, that as I understand from
3 the technical expert, there are other ways to encode and
4 decode, including software.

5 Q. Mr. Herrington claims that the CPUs and GPUs do
6 not encode or decode without being incorporated into an
7 end-user device such as the DI products.

8 How if at all does this statement affect your
9 opinion?

10 A. I understood from Dr. Hemami that's true, that a
11 chip just sitting on a shelf can't do much and it has to be
12 incorporated into a device. However, as she explained to
13 me, that the functionality that's being -- that's enabled by
14 the asserted patents here, which is video coding, actually
15 resides in the component.

16 Q. If we could turn to RDX-11C.11.

17 Did you consider whether the domestic industry
18 activities have a direct relationship to the exploitation of
19 the patented technology?

20 A. Yes. Mr. Herrington did not provide any evidence
21 of the fact that any activities he is relying on for the
22 domestic industry relates to the patented technology. As I
23 noted earlier, he did not provide any DI investments, any
24 expenditures, or discussions of activities that were
25 specific to either customization aspects of it, to the

1 integration of the components, and, as I understand, the
2 customization that is being alleged is not even related to
3 the video-coding technology.

4 Moreover, it's my understanding, again, that the
5 patented technology can be and is being exploited in other
6 products, as I mentioned in the previous slide.

7 Q. At this time I would like to talk about your
8 public interest opinions. If we could turn to RDX-11C.12.

9 What are your opinions relating to public
10 interest?

11 A. It is my opinion, having looked at the evidence
12 in this investigation and analyzed that evidence, that
13 remedial orders would cause undue harm to the U.S. public
14 interest.

15 First, the accused products are used extensively
16 in the U.S., particularly in certain segments, such as the
17 education segment and gaming segment.

18 Nearly all of the Acer and ASUS PCs that are sold
19 in the United States are accused in this investigation. In
20 2024, notebooks accounted for nearly 80 percent of PC
21 computers that were sold in the U.S. Acer and ASUS
22 accounted for approximately 32.5 to 44 percent of the U.S.
23 education segment.

24 Acer accounts for about 35 percent of the U.S.
25 market for Chromebooks, and Acer and ASUS also account for

1 about 35 percent of the U.S. gaming segment.

2 All these factors are indicating to the
3 widespread use of these products in the U.S., particularly
4 in certain segments.

5 Q. Dr. Akemann criticizes your use of certain market
6 share percentages, such as a reference to 32.5 to 44 percent
7 of the U.S. education market because it's based off of
8 deposition testimony rather than IDC data.

9 Do you agree with Dr. Akemann's criticism?

10 A. I rely on both IDC data and also deposition
11 testimony from Ms. Cruts. All my calculations are based on
12 the IDC data. However, Ms. Cruts is closest to Acer's
13 business and the market, and I rely on her to fully
14 understand and appreciate Acer's presence in the U.S.
15 market.

16 Q. If we could turn to RDX-11C.13, did you consider
17 whether products offered by other OEMs would be readily
18 available alternatives to the Acer and ASUS accused
19 products?

20 A. Yes. Acer and ASUS both play a critical role in
21 the U.S. education segment for notebooks, as I noted
22 earlier, and consumers have revealed a preference --

23 MR. LIPSCHITZ: Objection, Your Honor.

24 JUDGE MCNAMARA: Just a moment, Dr. Seth.

25 Mr. Lipschitz, your objection?

1 MR. LIPSCHITZ: Yes, Your Honor. This appears to
2 be leading. This has been happening throughout the
3 direction examination. We'll put up a slide just full of
4 text and the witness will just read the entire slide to us.

5 JUDGE MCNAMARA: I think a lot -- I think you can
6 just restate this question and reask it.

7 BY MS. ROBERTS:

8 Q. Dr. Seth, did you consider whether products
9 offered by Acer and ASUS's -- strike that.

10 Dr. Seth, do you have an opinion on whether there
11 are readily available alternatives to the Acer and ASUS
12 accused products?

13 A. My analysis indicates that there is a lack of
14 readily available alternatives for the Acer and ASUS accused
15 products. As I had started noting, Acer and ASUS both have
16 a significant market share and presence in the education
17 segment. Consumers have also revealed a preference for the
18 ASUS gaming notebooks in the U.S.

19 I have listed here on this slide some of the
20 reasons why there's a lack of readily available alternatives
21 given the large presence that Acer and ASUS have. The first
22 one relates to the fact that both Acer and ASUS offer
23 notebooks that provide high performance for a lower price.
24 There are significant switching costs when you are trying to
25 switch between operating systems, making it difficult,

1 especially for certain segments, such as the education
2 segment, to switch between different types of laptops or
3 notebooks, which are running on different operating systems.

4 The lack of ability of other OEMs was also an
5 aspect that was discussed by Dr. Phiroz, indicating that
6 it's difficult for OEMs to ramp up their production
7 immediately, and I'll discuss this in more detail later.

8 Again, Dr. Phiroz had also discussed in depth how
9 there are certain supply chain bottlenecks and that there
10 are not enough components that might be readily available
11 due to component shortages and long lead times for
12 alternative notebooks.

13 Q. If we could turn to RDX-11C.14.

14 Did you consider any factors in your public
15 interest analysis?

16 A. Yes. I considered the four public interest
17 factors, including the impact on public health and welfare,
18 on competitive conditions in the U.S. economy, on the
19 production of like or directly competitive articles, and,
20 finally, the impact on consumers in the United States.

21 MS. ROBERTS: At this time, Your Honor, we need
22 to go on the Acer and ASUS CBI record, and all corporate
23 representatives will need to leave.

24 JUDGE MCNAMARA: Thank you very much.

25 (Whereupon, the hearing proceeded in confidential

1 session.)
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1 O P E N S E S S I O N

2 JUDGE MCNAMARA: Okay.

3 BY MS. ROBERTS:

4 Q. Dr. Seth, did you consider the U.S. market share
5 for Acer and ASUS in your analysis?

6 A. Yes. Acer and ASUS have about a 10 percent
7 market share in the U.S. If you look at the broad market
8 for notebooks or for PCs, as I'll discuss later and during
9 my presentation, looking at the broad market for PCs does
10 not take into consideration how the industry, the PC
11 industry, themselves look at the market.

12 There are some facts and some data that I've
13 included on this slide, including the fact that about
14 desktops and notebooks sold in the U.S. for education,
15 government, accounted for about 60 percent of the sales. In
16 fact, education accounted -- Chromebooks accounted for
17 nearly 70 to 80 percent of Chromebooks -- of sales of PCs to
18 the education segment.

19 Laptop sales have increased between 2014 and
20 2024. Similarly, there is growth predicted for the
21 education PCs and for U.S. market for PCs and tablets.

22 Q. If we could turn to RDX-11C.17.

23 Mr. Dastmalchi and Dr. Akemann look at the whole
24 PC market and criticize you for looking at different
25 segments. Why did you consider different segments in your

1 analysis of the PC market?

2 A. As I noted before, looking at the broad PC market
3 to identify whether there are readily available alternatives
4 or not, as Dr. Akemann and Mr. Dastmalchi do, ignores all
5 evidence that the PC industry perceives the market in
6 segments.

7 In fact, IDC data, industry reports, vendors like
8 Best Buy, Amazon, OEMs themselves, they all provide their
9 products in various different segments. As I've noted here
10 on this slide, some of the key segmentation categories
11 include form factors, and these include -- form factors can
12 be desktops, workstations, notebooks, tablets.

13 And the concept behind a form factor is all of
14 these different products are trying to find a balance
15 between portability and the functionality that they are
16 providing.

17 Again, operating systems is another segment that
18 the market -- that the market perceives as a segment in this
19 industry. We're all aware of Windows, which is commonly
20 used, and Chrome OS, which is -- which has seen significant
21 growth, both in the education segment and in the low-cost
22 segment of PCs in the U.S.

23 Mac OS is exclusively provided with Apple and its
24 Apples hardware, usually on the more costly side.

25 Price for performance is simply a measure that

1 seems to be used often in this industry, where the industry
2 provides their products or segmentation based on performance
3 categories, like entry level, midrange, high end. And the
4 idea there is the amount of functionality, the performance
5 and characteristics you are providing. And then there is
6 price as well, which are price segments in which the
7 products are offered.

8 A lot of OEMs are trying to find a balance
9 between price for performance, and Acer, for instance,
10 particularly provides high performance for a low price.

11 End use is another segment that is commonly
12 provided including in the IDC data and even by OEMs. The
13 end use can be whether it's for education, whether it's for
14 a specialized segment such as gaming, for everyday use, or
15 business.

16 Q. I would like to talk about some of the different
17 segments you just mentioned, if we could turn to RDX-11C.18.

18 Did you consider any different pricing segments
19 in your analysis?

20 A. Yes. In this table I've presented the IDC data,
21 market share by different price bands. As you can see in
22 this table, Acer and ASUS combined accounted for about 28
23 percent of the lowest price band, which is the 50 to 200
24 band. Even in the following bands, like the 200 to 300
25 band, Acer and ASUS accounted for nearly 20 percent of the

1 market.

2 Q. If we could turn to RDX-11C.19.

3 Did you consider the education segment for Acer
4 and ASUS's PCs?

5 A. Yes. I broke them down by just the pure
6 education segment and also Chromebooks for education, since
7 Chromebooks accounted for a majority of the sales of PCs or
8 notebooks for the education segment in the U.S.

9 Acer and ASUS combined accounted for about 19
10 percent in 2024 of the larger education segment in the U.S.
11 And for the Chromebook segment, Acer and ASUS combined
12 accounted for about 23 percent of the market in 2024.

13 Q. If we could turn to RDX-11C.20.

14 Did you look at the gaming segment for Acer and
15 ASUS's PCs?

16 A. Yes. As you can see in this table, ASUS was the
17 market leader for gaming, with a 28 percent market share in
18 2024.

19 Q. If we could turn to RDX-11C.21.

20 Would educational institutions using Acer and
21 ASUS's products be able to easily switch to another OEM's
22 products?

23 A. Evidence indicates that educational institutions
24 are typically locked in for a certain period to using
25 products from a particular -- from vendors that they have

1 signed up with.

2 This is also evident from Ms. Cruts' deposition
3 where she noted, which is highlighted on the right-hand side
4 of this slide, that RFPs are not typically done on a yearly
5 basis, but rather they are done over periods of three, five,
6 or seven years. And she also noted that schools do not like
7 changing the brands that they work with very often.

8 Now, Acer and ASUS products are being used in
9 some of the -- some large public school districts in the
10 U.S., including L.A. Unified public schools, New York public
11 schools, and another example is Troy City schools. These
12 are not the only schools they are being used, but these were
13 some of the larger schools that were identified by
14 Ms. Cruts. She identified L.A. Unified and New York public
15 schools.

16 Now, going back to the locked-in aspect of it, as
17 I noted before, there can be high-switching costs when you
18 are trying to switch from one brand of laptop to another.

19 Just to remind everyone here, nearly all of Acer
20 and ASUS's accused PCs are accused in this investigation.
21 So should there be an exclusion order, schools or consumers
22 who are using Acer and ASUS products, want to get more of
23 them, will not have access to any Acer or ASUS products
24 because nearly all of them are accused in this
25 investigation.

1 So they have two options. They could switch away
2 from a Chromebook to different OEMs product, which would
3 require them switching to a different operating system, or
4 they could switch from Acer and ASUS Chromebooks to
5 another -- different type of Chromebook.

6 There are going to be switching costs,
7 regardless, and the concept of switching costs can be --
8 there can be transactional costs, which are monetary costs,
9 that someone would have to incur to get new products, or
10 there can be learning costs where you have to learn about
11 new operating system, you have to learn how to operate a new
12 computer.

13 IT departments have to learn how to repair and
14 service a new brand and a new operating system. In fact,
15 academic research indicates that operating systems have the
16 highest switching costs in almost all industries in the
17 United States.

18 So some of the transactional costs and learning
19 costs that I indicated would be relevant when you're switch
20 away from the accused products to alternative Chromebooks,
21 but those switching costs could be even higher when you are
22 switching away from Chromebooks to a different operating
23 system.

24 You might need to do a significant amount of
25 device deployment. Data security is different across

1 different operating systems. Chromebook is known to have
2 stronger security, especially in the education segment.
3 Moreover, Chromebooks typically have a lifespan of about six
4 to eight years, which would indicate that there would be
5 some churn that would have to be replaced as well.

6 Q. If we could turn to RDX-11C.22.

7 If Acer and ASUS's products are excluded, did you
8 consider whether other manufacturers could replace Acer and
9 ASUS's products in the education segment?

10 A. Yes, I did. And I just want to note that in the
11 \$50 to \$200 price band, Acer has about 28 percent of the
12 market, and in the next price band, Acer and ASUS have about
13 18 percent of the market.

14 And I did a calculation -- I did several
15 calculations to understand how much other OEMs would have to
16 increase their manufacturing to meet that lost supply. So
17 as you can see in the bullets below, those are the
18 calculations that I did.

19 In the under \$500 market, OEMs would need to
20 increase their manufacturing by 30 percent each. In the
21 next band, which is the \$50 to -- in the next band, which is
22 \$50 to \$200, they would have to increase their manufacturing
23 by 40 percent each.

24 And in the \$200 to \$300 band, they would have to
25 increase their manufacturing by 22 percent each to meet the

1 lost supply from Acer and ASUS.

2 Q. Dr. Akemann criticized your use of different
3 price bands. Do you agree with his criticism?

4 A. No. As I indicated before, price band is a
5 common segmentation method that is routinely used, and
6 that's how data is presented, in fact, even in IDC, in other
7 industry reports, by vendors themselves like Best Buy,
8 Amazon, by OEMs on their website.

9 There isn't a universally accepted price band,
10 like how you split those price bands. But even if you had
11 to change these price bands slightly to maybe something that
12 Amazon has on their website or Best Buy has, it would not
13 change the results in any significant way.

14 Q. If we could turn to RDX-11C.23.

15 If Acer and ASUS's products are excluded, did you
16 consider whether other manufacturers could replace Acer and
17 ASUS's products in the gaming segment?

18 A. Yes. ASUS, particularly in this table, has
19 nearly 45 percent of the gaming segment market in the
20 \$2,000-plus price band. And Acer has about nearly 50
21 percent in the \$50 to \$500 price band.

22 Now, increasing manufacturing by other OEMs in
23 the highest -- in the higher price band of the \$2,000 plus
24 would require other OEMs to increase their manufacturing by
25 nearly 81 percent each. And looking at the lowest price

1 band, \$50 to \$500, other OEMs would, again, need to increase
2 their manufacturing by nearly 91 percent each.

3 Q. If we could turn to RDX-11C.24.

4 You just testified about how much other OEMs
5 would have to ramp up their manufacturing to account for the
6 exclusion of Acer and ASUS's products in certain segments.

7 Would other OEMs be able to ramp up their
8 manufacturing to account for this?

9 A. As I understood from Dr. Phiroz and the evidence
10 I have seen, increasing manufacturing, even if it is for an
11 existing product, is not necessarily a quick process, as I
12 note on this slide.

13 Dr. Phiroz indicated a number of reasons why it's
14 not easy for ODMs to increase their manufacturing quickly.
15 One is capacity issues. Companies rely on multi- -- like
16 multiple interdependent components, and those components
17 come from multiple sources. There's a lot of logistics that
18 goes into it and being able to get all those in a timely
19 manner.

20 In addition, Dr. Phiroz had noted how there can
21 be significant lead times for certain types of components,
22 such as semiconductors or displays.

23 He had also noted that some of the components are
24 brand-specific, and you can't -- they are not
25 interchangeable. You can't just switch them out and put it

1 into a different brand product.

2 In addition, he had noted that there were other
3 risks, such as tariffs that we have seen more recently.
4 There can be logistical disruptions as well. And, of
5 course, there can be surges in demand which can also disrupt
6 whether the ODMs are able to ramp up production to meet
7 other demand changes in the market as well.

8 In addition to this, there are -- some of the
9 OEMs are not licensed and could face similar litigation --
10 Dell is one of them -- which may impact their incentive and
11 motivation to ramp up production.

12 As evidence indicates in this investigation, that
13 the OEMs do not manufacture in the United States, most of
14 them manufacture outside the United States, and I have not
15 seen any evidence that they have excess capacity to be able
16 to meet the type of ramp-up that I had calculated in the
17 earlier slides.

18 Q. If we could pull up CDX-10C.44, which is one of
19 Dr. Akemann's demonstratives that he used on direct.

20 Dr. Akemann showed this demonstrative and
21 testified that shipment data showing spikes during the
22 pandemic supports his claim that ODMs can switch production
23 between brands to ramp up quickly.

24 Do you agree with his opinion?

25 A. I do not. As I understand from Dr. Phiroz as

1 well, this is shipment data. Shipment data doesn't show
2 whether manufacturers, ODMs, can switch or not. You could
3 get this result even on a quarter-to-quarter basis even if
4 the manufacturing stays exactly the same. There could be
5 other reasons for why you might see these quarter-to-quarter
6 changes.

7 But, again, this is shipment data and not
8 actually manufacturing data or allocation data that would
9 show how ODMs can actually switch between one vendor product
10 to another vendor product.

11 Q. Mr. Dastmalchi and Dr. Akemann testified that the
12 electronic manufacturing industry has enough flexibility to
13 adjust for an exclusion order in part because other ODMs
14 already produce products for other PC OEMs.

15 Do you agree with this opinion?

16 A. I do not. Again, as I understand from
17 Dr. Phiroz, and as I've seen evidence in this investigation,
18 existence of providing or making products for multiple
19 vendors is not -- it is not an indication that you can
20 switch easily from one vendor to another.

21 Dr. Phiroz indicated that there could be
22 significant amount of engineering/retooling that would be
23 required from switching from one vendor's production to
24 another vendor's production, as the production can be very
25 specific depending on the type of product you are making for

1 them.

2 Q. If we could turn to RDX-11C.25.

3 Dr. Akemann claims that there are no barriers to
4 entry in the PC market.

5 Do you agree with his opinion?

6 A. I do not. This market -- clearly the evidence
7 indicates there are barriers to entry here. Between 2014
8 and 2024 only six companies which already had some presence
9 in the larger PC market were able to enter the market. Out
10 of those, only four are active as of 2024. This is Google,
11 Sharp, Microsoft, and LG.

12 Again, these are familiar names who already had
13 some presence in other forms in the PC market, and yet none
14 of them have been able to make a significant mark in the PC
15 market. As you can see, their market shares are less than
16 1 percent even as of today in the PC market.

17 Q. If we could turn to RDX-11C.26.

18 Did you consider whether there would be any
19 impact to public health and welfare if exclusion and/or
20 cease and desist orders were issued against Acer and ASUS?

21 A. Yes. As I indicated earlier, Acer and ASUS have
22 a significant presence in the U.S. education segment,
23 particularly in the low-cost, in the low-price band where
24 Acer is a significant supplier.

25 Again, as I noted before, there's a lack of

1 readily available alternatives for all the reasons I
2 mentioned, indicating that there could be large-scale
3 disruptions if there is not a continued availability of Acer
4 and ASUS accused products.

5 This is exacerbated by the fact that nearly all
6 Acer and ASUS products that are sold in the U.S., PCs that
7 are sold in the U.S., are accused in this investigation.

8 More recently we're seeing tariffs and their
9 pressure on prices, particularly on the PC industry, and an
10 exclusion order could further exacerbate those pressures on
11 prices as well.

12 Q. You just talked about the impacts to public
13 health and welfare in the event of an exclusion order. Is
14 it important to protect patent innovation such as the
15 asserted patents in this investigation?

16 A. I understand from both Dr. Simcoe and Dr. Lopez
17 that one of the negative impacts would be on innovation,
18 incentives to innovate, actually, for Acer and ASUS, as all
19 their products, all their PCs that are sold in the U.S., are
20 going to be excluded from the U.S. market.

21 I also understand from Dr. Simcoe and Dr. Lopez
22 that any value of the Nokia asserted patents here is
23 significantly less than the harm that an exclusion order
24 would cause here.

25 Q. If we could turn to RDX-11C.27.

1 Did you consider the impact on competitive
2 conditions in the U.S. economy in your public interest
3 analysis?

4 A. Yes, I did. I undertook a pretty significant
5 economic modeling exercise to truly understand what would
6 the impact of an exclusion order be both on competition and
7 on prices in the United States.

8 I relied on an industrial organization, IO, model
9 that is routinely used by antitrust authorities, like FTC
10 and DOJ, to evaluate the impact of mergers. So they are
11 typically trying to evaluate what the impact of a merger
12 would be. I'm borrowing from that concept to evaluate what
13 would happen if you remove two significant players from the
14 market.

15 And there are two channels through which
16 competition and prices would be impacted in the U.S. One is
17 called a scarcity effect channel, where if the supply is not
18 met in the U.S., then the quantity available would go down
19 and prices would go up. The other channel is called a
20 market power effect, where even if the supply is met by the
21 existing other non-Acer/ASUS vendors in the market, removing
22 two significant players from the market, especially one
23 low-cost provider of these products, would reduce incentives
24 that these existing vendors have to keep prices competitive.
25 And that lack of competition would also put pressure on

1 prices to increase.

2 The scarcity model is -- is easily depicted in
3 this chart that I have up here where you can capture the
4 loss in consumer surplus by looking at this demand curve.

5 And when there is no exclusion order, the
6 quantity being supplied, including Acer and ASUS's Q1, at
7 prices of P1.

8 When an exclusion order goes into effect,
9 quantity falls down by the amount Acer and ASUS were
10 supplying, and that puts pressure on prices, and prices go
11 up because the demand is still somewhat staying the same.

12 The original consumer welfare is the area under
13 A, B, and C. When the prices go up, the consumer welfare is
14 A, and the difference between those two gives you the loss
15 to consumer welfare. And the loss to consumer welfare is
16 coming from both the fact that prices are going up so
17 existing consumers are going to have to pay a higher price,
18 but there are some consumers who are just not going to buy
19 the product because they can't afford to buy that product
20 anymore or that variety is not there, the product that they
21 wanted to buy is not in the market.

22 Now, the market power effect is a little more
23 harder to depict in the figure, but essentially the
24 right-hand side bottom of this slide shows the equation that
25 I solved to be able to capture the market power effect.

1 The first part of this equation is the loss to
2 consumers from variety, not being able to buy a product both
3 because prices have increased and they don't have access to
4 products which are particularly low cost. And then the
5 second part of this equation captures the loss to consumer
6 welfare from increased prices.

7 Q. If we could turn to RDX-11C.28.

8 What is shown here?

9 A. These are the results from the economic modeling
10 exercise where I used IDC data and some publicly available
11 information to find out what the impact would be from an
12 exclusion order in this case.

13 As you can see from the top table, that's the
14 scarcity effect model, and that indicates that the total
15 welfare loss would be nearly \$880 million. Those can be
16 decomposed into the two piece that is we talked about.

17 And the market power effect, that even if you
18 match the supply, there would still be a consumer welfare
19 loss, and that welfare loss is nearly a billion dollars, and
20 this is for one year.

21 And those can also be decomposed into the two
22 aspects that I talked about: the lack of variety, not being
23 able to purchase the product you wanted to purchase, and
24 also the loss from higher prices.

25 Q. Dr. Akemann criticizes your calculations because

1 there's only a 1.4 percent increase in price.

2 Do you agree with his criticism?

3 A. 1.4 percent is small. However, if you look at it
4 in the context of this market and this industry where Acer
5 and ASUS sell millions of these products, clearly the model
6 is indicating that you would see nearly a billion dollars in
7 consumer welfare loss even from that small increase in
8 price.

9 Q. If you could turn to RDX-11C.29.

10 Did you consider whether there would be any
11 impact to third parties if ASUS and Acer's products are
12 excluded?

13 A. Yes. While there would be direct lost sales from
14 the loss of Acer and ASUS's -- their own sales in the U.S.
15 of nearly \$3.1 billion, based on 2024 data, there could also
16 be impact on suppliers, Acer and ASUS's suppliers in the
17 U.S. and their suppliers' suppliers. I mean, a typical
18 supply chain linkage is what I've shown in this chart here.

19 Q. If we could turn to RDX-11C.30.

20 Did you consider whether there would be any
21 impact on production of like or directly competitive
22 articles in the U.S.?

23 A. So neither Nokia makes -- manufactures PCs or
24 other patent-practicing articles in the U.S., and we know
25 that -- I haven't seen evidence of any other OEMs conducting

1 manufacturing here. So, overall, there would not be a
2 negative impact or a positive impact on manufacturing here.

3 However, Acer and ASUS's U.S. operations, where
4 they have about 400 employees each which provide service,
5 repair, and other support to Acer and ASUS's products, could
6 be impacted.

7 Q. If we could turn to RDX-11C.31.

8 Did you consider whether there would be any
9 impact on U.S. consumers if Acer and ASUS's PCs were
10 excluded?

11 A. Yes. As I discussed in the competition analysis,
12 the economic modeling exercise and the data that I've looked
13 at indicates that there would be pressure on prices to
14 increase and there would be consumer welfare losses. If the
15 supply is not met, it could be about \$870 million. If the
16 loss supply is met, but due to the lack of competition or
17 the competition effects, there could be consumer welfare
18 losses of up to a billion dollars for a year.

19 Q. Dr. Akemann and Mr. Dastmalchi testified that
20 Acer and ASUS's U.S. market share is small and would have a
21 negligible effect on the PC industry.

22 Do you agree with this?

23 A. I do not. For this whole calculation and
24 analysis that I did, I actually used the market share that
25 Dr. Akemann is referring to as small. And even with those

1 market shares, this is the -- this is the type of loss that
2 we would see.

3 However, as I noted before, there are certain
4 segments where Acer and ASUS both have significantly larger
5 presence, including in the education and gaming segments.

6 Q. Dr. Akemann testified that any consumer impact
7 from an exclusion order in this investigation would be short
8 because consumers could use existing products in the market.

9 Do you agree with this opinion?

10 A. Again, as I indicated earlier during my
11 testimony, there's a lack of readily available alternatives
12 for several reasons, but also the fact that consumers have
13 revealed their own preference in the large market shares
14 that Acer and ASUS have particularly in certain segments of
15 the market.

16 Q. If we could turn to RDX-11C.32.

17 I'd like to talk about your opinions regarding
18 remedy.

19 Could you explain your opinions for us?

20 A. My analysis and the evidence I've seen indicates
21 that an exclusion order would cause undue harm to the
22 public. To the extent the Commission is going to issue an
23 exclusion order, my recommendation is that they may consider
24 tailoring it to mitigate some of the disruption that could
25 come.

1 First, I understand that there is a rate-setting
2 action that's pending in the UK and that the Respondents
3 have agreed to be bound by the result of that proceeding.
4 So if the Commission would consider delaying an exclusion
5 order until that rate is set, then any disruption,
6 particularly to the education segment and to consumers, can
7 be mitigated.

8 Another tailored remedy that I'm recommending is
9 a carveout for the education segment to, again, mitigate the
10 large scale of disruptions that could happen.

11 And, finally, a warranty and repair exemption so
12 that Acer and ASUS could meet their obligations for warranty
13 and repair and consumers could meet their right to repair as
14 well.

15 MS. ROBERTS: Your Honor, at this time I pass the
16 witness.

17 JUDGE MCNAMARA: Thank you, Ms. Roberts.

18 Mr. Lipschitz?

19 MR. LIPSCHITZ: Yes, Your Honor. May I proceed?

20 JUDGE MCNAMARA: Yes.

21 CROSS-EXAMINATION

22 BY MR. LIPSCHITZ:

23 Q. Hello, Dr. Seth. I'm Warren Lipschitz. I
24 represent Nokia. It's nice to meet you.

25 A. Nice to meet you as well.

1 Q. So let's start with your public interest
2 opinions.

3 So it is your opinion that excluding Acer and
4 ASUS products would cause undue harm to the public interest,
5 correct?

6 A. Yes.

7 Q. And, now, Acer and ASUS are certainly not the
8 only companies out there selling computers and tablets in
9 the U.S. today, right?

10 A. That is correct.

11 Q. If we could have slide 3, please.

12 And this was the data from the ITC -- I'm
13 sorry -- IDC that you relied on in your report, and I
14 believe it's also slide 16 in your presentation today.

15 Does that look right to you?

16 A. Yes, that is correct.

17 Q. So you're relying on this data from the source,
18 the IDC; is that correct?

19 A. Yes.

20 Q. Okay. Now, this shows U.S. desktop and notebook
21 market shares by vendor, correct?

22 A. Correct.

23 Q. And according to this chart, Acer has only about
24 a 5 to 6 percent share of the market; is that correct?

25 A. Yes.

1 Q. And ASUS is there at 3 to 4 percent, right?

2 A. Yes. Of the broad desktop and notebook market,
3 that's correct.

4 Q. And we are going get into the more granular data
5 as well, but we're going to start here.

6 So Apple, Dell, HP, Lenovo, they all have larger
7 market shares than Acer and ASUS in the U.S., right?

8 A. That's correct.

9 Q. And all three of Dell, HP, and Lenovo sell
10 Microsoft-based computers?

11 A. Sorry, would you repeat that, please?

12 Q. Yes. Dell, HP, and Lenovo all sell
13 Microsoft-based computers?

14 A. That's correct.

15 Q. And they all sell Chromebooks as well, right?

16 A. Yes.

17 Q. And they all sell in the education segment,
18 right?

19 A. I believe they do.

20 Q. Okay. And they also sell computers at many
21 different price points, correct?

22 A. Yes. They may not always have significant
23 presence in certain price bands, but I believe you're right
24 that they do sell across different price bands.

25 Q. And I've got slide 4 here, which is Table 12 from

1 your expert report. Do you recognize that?

2 A. Yes.

3 Q. And this is also based on IDC data; is that
4 correct?

5 A. Yes, that is correct.

6 Q. Okay. So let's look at ASUS first. In the
7 lowest price band there, \$50 to \$200, they only have a
8 0.7 percent share of the market, right?

9 A. Yes.

10 Q. And ASUS's biggest share is in the \$1,500 and
11 higher price range, correct?

12 A. Yes.

13 Q. And that would be, for example, the gaming
14 laptops?

15 A. Typically, yes.

16 Q. And even there, ASUS's competitors supply over
17 90 percent of the market, correct, in that price band?

18 A. That is correct.

19 Q. Okay. And let's look at Acer. For Acer, the
20 higher the price gets, the lower its market share, fair?

21 A. Yes. Acer has a significant presence in the
22 low-cost markets.

23 Q. Right. Acer's biggest market share on the top
24 two price bands there, \$50 to \$200 and \$200 to \$300, right?

25 A. That is correct.

1 Q. But Acer has big competitors there too, correct?

2 A. Yes, but if you look at the lowest price band,
3 it's the second largest competitor there.

4 Q. HP has a 39 percent market share for products in
5 the \$50 to \$200 range, correct?

6 A. Yes.

7 Q. Dell is at 14 percent?

8 A. Correct.

9 Q. Lenovo at 16 percent?

10 A. Yes.

11 Q. And at the high-end laptops, Acer has a very low
12 market share, only 0.4 percent, correct?

13 A. Yes.

14 Q. Okay. Now, you testified about the education
15 segment in your testimony. Do you recall that?

16 A. Yes.

17 Q. Okay. Let's go to slide 5.

18 And here I've got Table 13 from your report. Do
19 you see that?

20 A. I do.

21 Q. And this is also based on IDC data, right?

22 A. Yes.

23 Q. And the IDC data is the most reliable information
24 to show the percentage of the market in the education
25 notebook segment, correct?

1 A. Could you ask me that question again, please?

2 Q. Sure. The IDC data is the most reliable
3 information we have to show the percentage of the market in
4 the education notebook segment, correct?

5 A. It is the most detailed data we have in this
6 investigation, correct.

7 Q. The most reliable, right?

8 A. It is a reliable source, yes.

9 Q. The most reliable, right?

10 A. I don't know if it's the most reliable.

11 Q. Do you recall having your deposition taken?

12 A. Yes.

13 Q. And that was on December 22nd, 2025?

14 A. It sounds right.

15 Q. If we could pull that up, Mr. Moreno, and let's
16 go to 342:5-11.

17 Do you believe -- the question was:

18 Do you believe that the IDC data is reliable to
19 show percentage of the market in the educational notebook
20 industry?

21 Answer. That's the only data, honestly,
22 available here, which gives me, also, information on other
23 competitors. So, conservatively, this might be the most
24 reliable information we have.

25 Did I read that correctly?

1 A. Yes. That's consistent with what I said. This
2 is the only detailed data we have here, and it's reliable.

3 Q. Well, you said the most reliable in your answer
4 there, didn't you?

5 A. Sure. You can add "most" to it.

6 Q. Okay. Thank you.

7 Now, you provided far higher market share numbers
8 in your testimony for Acer's market share, correct?

9 A. I provided -- could you say that again, please?

10 Q. Sure. We see here Acer's market share at 12 to
11 15 percent on the IDC data, correct?

12 A. Yes.

13 Q. And you provided far higher market share numbers
14 in your testimony for Acer's share of the education segment,
15 correct?

16 A. Ms. Cruts provided some education segment market
17 share information, which is also consistent with Acer's own
18 internal presentations they have put together. However, as
19 I noted before, while I rely on her to understand the Acer
20 market, all my calculations that I did is based on the IDC
21 data that you have put in front of me.

22 Q. This is a yes-or-no question, Dr. Seth. You
23 provided far higher market share numbers in your testimony
24 for Acer's market share in this notebook for education
25 segment, correct?

1 A. I did not provide. Ms. Cruts provided. I do
2 rely on it.

3 Q. And you relied on it in your testimony, right?

4 A. That's correct.

5 Q. And you relied on the deposition testimony from
6 an Acer employee --

7 MR. LIPSCHITZ: Actually, Your Honor, at this
8 time I think I should probably go on the confidential
9 record.

10 (Whereupon, the hearing proceeded in confidential
11 session.)

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1 C O N T E N T S

2 INDEX OF WITNESSES

3

	WITNESS	DIRECT	CROSS	RE- DIRECT	RE- CROSS	STAFF
5	ZAL PHIROZ.....	1508	1522	1540	1541	
6	SCOTT ACTON.....	1543	1569			
7	TIMOTHY SIMCOE.....	1581		1647		
8	MARIO LOPEZ.....	1652	1717	1780		1777
9	PALLAVI SETH.....	1785	1825			

10

11

12 AFTERNOON SESSION.....1683

13

14 CONFIDENTIAL SESSION.....1529- 1542

15 CONFIDENTIAL SESSION.....1551- 1561

16 CONFIDENTIAL SESSION.....1575- 1577

17 CONFIDENTIAL SESSION.....1616- 1617

18 CONFIDENTIAL SESSION.....1622- 1625

19 CONFIDENTIAL SESSION.....1658- 1683

20 CONFIDENTIAL SESSION.....1690- 1718

21 CONFIDENTIAL SESSION.....1722- 1784

22 CONFIDENTIAL SESSION.....1805- 1805

23 CONFIDENTIAL SESSION.....1833- end

24

25

1	EXHIBIT LISTS SUBMITTED FOR ADMISSION:
2	Ex. No.
3	CX-1964
4	CX-2586C
5	CX-2588C
6	CX-6348C
7	CX-7025C
8	CX-7076
9	CX-7213
10	CX-7215
11	CX-7216
12	JPX-0002SC
13	JPX-0008SC
14	JX-0061
15	JX-0136
16	JX-0188
17	JX-0683
18	JX-0695
19	JX-0696
20	RPX-ACER-001C
21	RPX-ACER-002C
22	RPX-ACER-003C
23	RPX-ASUS-001C
24	RPX-ASUS-002C
25	RPX-ASUS-003C

1	RPX-ASUS-004C
2	RPX-ASUS-005C
3	RPX-ASUS-006C
4	RPX-ASUS-007C
5	RPX-ASUS-008C
6	RPX-ASUS-010C
7	RPX-ASUS-011C
8	RPX-ASUS-012C
9	RX-1692
10	RX-1693
11	RX-1694
12	RX-1695
13	RX-1696
14	RX-1697
15	RX-1698
16	RX-1945
17	RX-1945
18	RX-1976
19	RX-1977
20	RX-1991
21	RX-1996
22	RX-1998
23	RX-2024
24	RX-2233C
25	RX-2261

1 RX-2268
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3 RX-4032
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1 C E R T I F I C A T E

2 TITLE: CERTAIN VIDEO-CAPABLE LAPTOP, DESKTOP COMPUTERS,
3 HANDHELD COMPUTERS, TABLETS, TELEVISIONS, PROJECTORS, AND
4 COMPONENTS AND MODULES THEREOF

5 INVESTIGATION NO.: 337-TA-1448

6 HEARING DATE: March 11, 2026

7 LOCATION: Courtroom A

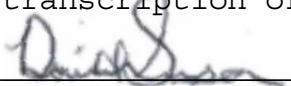
8 NATURE OF HEARING: Evidentiary Hearing

9 I hereby certify that the foregoing/attached
10 transcript is a true, correct and complete record of the
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Commission. Date 3/10/26

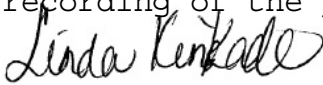
11 Signed: 
12 ss//
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13 1150 Connecticut Avenue, NW, Suite 305
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14 Signature of the Contractor or the Authorized Contractor's
15 Representative

16 I hereby certify that I am not the court reporter
and that I have proofread the above-referenced transcript of
17 the proceedings of the U.S. International Trade Commission
against the aforementioned court reporter's notes and
18 recordings for accuracy in transcription in the spelling,
hyphenation, punctuation and speaker identification and did
19 not make any changes of a substantive nature. The
foregoing/attached transcript is a true, correct and
complete transcription of the proceedings.

20 Signed: 
21 ss//

22 I hereby certify that I reported the
above-referenced proceedings of the U.S. International Trade
Commission and caused to be prepared from my record media
23 and notes of the proceedings a true, correct and complete
verbatim recording of the proceedings.

24 Signed: 
25 ss//

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In the Matter of Investigation No.

337-TA-1448

CERTAIN VIDEO-CAPABLE LAPTOP, DESKTOP

COMPUTERS, HANDHELD COMPUTERS,

TABLETS, TELEVISIONS, PROJECTORS, AND

COMPONENTS AND MODULES THEREOF

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Pages: 1846 through 2198 (with excerpts)
Place: Washington, D.C.
Date: March 12, 2026

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UNITED STATES INTERNATIONAL TRADE COMMISSION

Washington, D.C.

Before the Honorable MaryJoan McNamara

Administrative Law Judge

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In the Matter of

Investigation No.

337-TA-1448

CERTAIN VIDEO-CAPABLE LAPTOP, DESKTOP

COMPUTERS, HANDHELD COMPUTERS,

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International Trade Commission

500 E Street, SW

Washington, D.C.

Evidentiary Hearing

Thursday, March 12, 2026

Volume VII

The parties met pursuant to notice of the
Administrative Law Judge at 9:00 a.m. Eastern.

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UNITED STATES INTERNATIONAL TRADE COMMISSION

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Investigation No.

337-TA-1448

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13 *** Index appears at end of transcript ***

14

15 PLEASE NOTE: Quotations from documents are reflected in the
16 transcript as read and may not constitute a verbatim quote.

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1 P R O C E E D I N G S

2 (In session at 9:00 a.m.)

3 JUDGE MCNAMARA: Good morning, everyone. Please
4 be seated.

5 All right. So we are on the last day. Is there
6 anything that you would like me to address?

7 MR. NEWCOMER: I think a couple of administrative
8 issues, Your Honor.

9 JUDGE MCNAMARA: Sure.

10 MR. NEWCOMER: First, Joseph Micheli is going to
11 handle source code, how to submit it.

12 JUDGE MCNAMARA: Okay. Very good.

13 MR. NEWCOMER: He is one of our NEXT Advocates.

14 JUDGE MCNAMARA: Good. I am glad to hear that.

15 MR. MICHELI: Your Honor, Joseph Micheli for
16 Nokia.

17 JUDGE MCNAMARA: Yes.

18 MR. MICHELI: I wanted to briefly address the
19 source code exhibits. The parties met and conferred, and we
20 wanted to give you the option of either receiving all of the
21 source code or the files to which we cited in
22 demonstratives.

23 JUDGE MCNAMARA: Well, for me, that is an easy
24 choice, just those to which you have cited. And if we need
25 more because we want to see context, we will ask for more,

1 but at this point just what you cited.

2 MR. MICHELI: Understood, Your Honor. Thank you.

3 JUDGE MCNAMARA: Thank you very much.

4 MR. FLEMING: Kyle Fleming for Respondents. Just
5 a quick follow-up on timing. Is that to be submitted today
6 or could the parties have a couple days to --

7 JUDGE MCNAMARA: You have several days to get it
8 in. I will be out next week anyway, so you have some time.

9 MR. FLEMING: Thank you, Your Honor.

10 JUDGE MCNAMARA: And I think you should just look
11 at the scheduling order. You will start to work with
12 Ms. Ekweonu on getting the final exhibit lists in, but I
13 will talk about that later today.

14 MR. FLEMING: Thank you, Your Honor.

15 JUDGE MCNAMARA: Okay.

16 Anything, Ms. Ducca?

17 MS. DUCCA: Nothing from Staff, Your Honor.

18 JUDGE MCNAMARA: Good.

19 Mr. Newcomer?

20 MR. NEWCOMER: Are there still any slide
21 objections or are we good on those?

22 MS. ROBERTS: Yes, I think we have -- we're going
23 to have one of our NEXT Advocates, Ann Le, introduce the
24 exhibits from yesterday, and then there are slide
25 objections.

1 JUDGE MCNAMARA: Okay. From yesterday or today?

2 MS. ROBERTS: The objections are for
3 Dr. Richardson, who is up next.

4 JUDGE MCNAMARA: Yes. Okay.
5 Good morning, Ms. Le.

6 MS. LE: Good morning, Your Honor. We would like
7 to admit the exhibits that were entered into the record
8 yesterday with Dr. Phiroz, Dr. Acton, Dr. Simcoe, and
9 Dr. Lopez.

10 JUDGE MCNAMARA: Okay.
11 Are there any objections from Nokia's side?

12 MR. NEWCOMER: No objections.

13 JUDGE MCNAMARA: All right.

14 Then the list of exhibits that you have
15 identified, Ms. Le, will be admitted into evidence without
16 objection.

17 (Whereupon, the exhibits as recited by counsel
18 and reflected in the attached index were submitted and
19 received in evidence.)

20 JUDGE MCNAMARA: And, Ms. Ducca, I should have
21 asked you, do you have any objections?

22 MS. DUCCA: No objection from Staff, Your Honor.

23 JUDGE MCNAMARA: Okay, good. Then they will be
24 admitted, and presumably you have a list now to hand to me
25 and to Ms. Kinkade?

1 MS. LE: Yes, Your Honor. May I approach?

2 JUDGE MCNAMARA: Yes, please.

3 Thank you.

4 MR. MILLER: Your Honor, Zach Miller for
5 Respondents.

6 JUDGE MCNAMARA: Good morning.

7 MR. MILLER: I don't know if we are on the
8 confidential record or public. We can probably be on the
9 public record, but I see the confidential sign there.

10 JUDGE MCNAMARA: All right.

11 MR. MILLER: There was one objection to three
12 slides by Dr. Richardson.

13 Can we pull up CDX-11.124 and start there?

14 It's the same objection, generally, Your Honor.
15 This is Dr. Richardson's rebuttal to Dr. Hemami's testimony
16 regarding the MPEG-1 alone obviousness combination for the
17 '321 patent.

18 Dr. Richardson identifies Respondents' Step 1,
19 which was that it would be obvious for a decoder to use a
20 closed GOP with no leading B-frames, and then Step 2, which
21 is performing one of two sets of modifications.

22 And then if we look at CDX-11.125 and 126,
23 Dr. Richardson has comments and opinions regarding the two
24 methods as part of Step 2.

25 Your Honor, our objection is that, in his report,

1 Dr. Richardson only commented/criticized Step 1. He didn't
2 provide opinions with respect to Step 2.

3 If we pull up his report, that's CX-6465C, and if
4 we go to paragraph 277, this is where the section starts
5 with him addressing this limitation.

6 And I want to pull up paragraph 282 at the bottom
7 of page 92, and this is where Dr. Richardson identifies that
8 Dr. Hemami's argument is based on the premise that it would
9 have been obvious to a POSITA to create or implement a
10 modified version of MPEG-1 that only permitted the first
11 form of closed GOPs. That's the form without the leading
12 B-frames, and that's what all of his analysis is.

13 Your Honor, I understand that you often -- often
14 your practice on this type of issue is to let it in and then
15 have parties file a motion to strike. And so if that's what
16 you'd prefer, that's fine, but I just wanted to raise the
17 objection.

18 JUDGE MCNAMARA: I appreciate that, Mr. Miller.

19 Ms. Ducca?

20 MS. DUCCA: I was going to propose the same
21 thing. So as I understand it -- I haven't had a chance to
22 dig into the expert report --

23 JUDGE MCNAMARA: Me either.

24 MS. DUCCA: -- but the Respondents say it's not
25 there, the Complainants say it is. So I think the most

1 logical way to go about this is a motion to strike.

2 JUDGE MCNAMARA: That is why I put the ground
3 rule in, because it is very hard sometimes on the fly, when
4 you are not -- when you don't have the entire context and
5 when you don't have the trial transcript in front of you to
6 see what was said and not said to make that decision.

7 So I appreciate your suggestion, and it is kind
8 of nice. It is like you put up the flag before, you know,
9 and gave us the alternative without just the -- and I like
10 that. That is a good --

11 MR. MILLER: Of course, Your Honor. And as far
12 as timing on the motion to strike, is there a specific time
13 you want? I know your ground rules have it, I think, by
14 tomorrow, but --

15 JUDGE MCNAMARA: Yes. No, that is fine. I am
16 going to be out of town. I am going to be taking a week
17 out. So I am going to give you a week. And then you will
18 have -- the Complainants will have time to respond.

19 MR. MILLER: Thank you, Your Honor.

20 JUDGE MCNAMARA: You are welcome.

21 Okay. Is there anything else?

22 MR. NEWCOMER: That's all, Your Honor.

23 JUDGE MCNAMARA: Thank you, Mr. Newcomer.

24 Mr. Lipschitz?

25

1 MR. LIPSCHITZ: Yes.

2 PALLAVI SETH,

3 having been previously duly sworn or affirmed
4 on their oath, was thereafter examined and testified further
5 as follows:

6 JUDGE MCNAMARA: Good morning, Dr. Seth.

7 A. Good morning.

8 JUDGE MCNAMARA: I hope you found it pleasant
9 last night.

10 A. Yes, I got to spend some time with my kids, so
11 that's great.

12 JUDGE MCNAMARA: Oh, that's good. That's good.

13 I have the time. Has everyone agreed on the
14 time?

15 MR. NEWCOMER: I think we're in agreement on the
16 time, Your Honor, and I think, based on both sides' current
17 budget, we'll finish with a little bit of time left at the
18 end of the day, not a lot, just a little bit if Warren
19 sticks to his budget.

20 JUDGE MCNAMARA: Okay, that sounds good.

21 All right. Please, be seated. Thank you.

22 MR. LIPSCHITZ: May I proceed, Your Honor?

23 JUDGE MCNAMARA: Yes, thank you.

24 MR. LIPSCHITZ: Let's go on the Acer confidential
25 record, Your Honor.

1 (Whereupon, the hearing proceeded in confidential
2 session.)
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1 O P E N S E S S I O N

2 MR. VERBONCOEUR: Good morning, Your Honor. For
3 Nokia's first witness in its rebuttal case, it will call
4 Dr. Iain Richardson.

5 JUDGE MCNAMARA: All right. Very good.

6 Good morning, Dr. Richardson.

7 A. Good morning.

8 IAIN RICHARDSON,

9 having been previously duly sworn or affirmed
10 on their oath, was thereafter examined and testified further
11 as follows:

12 JUDGE MCNAMARA: You are still under oath, so you
13 can just sit, make yourself comfortable.

14 MR. VERBONCOEUR: We will begin on the public
15 record. I expect we will remain there.

16 DIRECT EXAMINATION

17 BY MR. VERBONCOEUR:

18 Q. Good morning, Dr. Richardson.

19 A. Good morning.

20 Good morning, Your Honor.

21 Q. Let's jump right in. Did you prepare a set of
22 slides to assist you with your testimony?

23 A. I did.

24 Q. Can you tell us why you're here?

25 A. If we could go to the next slide, please,

1 slide 2.

2 JUDGE MCNAMARA: Can we have those?

3 MR. VERBONCOEUR: Yes, I'm sorry, Your Honor. I
4 apologize, Your Honor. They are coming right up.

5 JUDGE MCNAMARA: Thank you.

6 Q. Dr. Richardson, can you tell us why you're here?

7 A. I'm looking at slide 2. I'm here to talk about
8 validity today, Your Honor, specifically of the '267 patent,
9 the '714 patent, and the '321 patent.

10 Q. Let's have slide 3, please.

11 Before we get into those validity grounds,
12 Doctor, can you remind us what a person of ordinary skill in
13 the art is for the four patents at issue here?

14 A. So a person of ordinary skill in the art, or a
15 POSITA, for all four patents at issue in this hearing would
16 have at least a bachelor's degree in a relevant field with
17 around two years of experience in video decoding or
18 encoding.

19 Q. Did you qualify as a person of ordinary skill in
20 the art as of the time of the inventions in each of the four
21 patents at issue in this case?

22 A. Yes.

23 Q. Let's have slide 4.

24 Doctor, can we get started with the '267 patent?

25 A. Okay.

1 Q. Let's have slide 5.

2 Doctor, can you explain for us what led to the
3 '267 patent?

4 A. So the '267 patent is about technology in video
5 coding called bidirectional prediction. I'm going to talk
6 more about that later, Your Honor, but, very briefly, the
7 '267 patent inventors identified a problem with existing
8 methods of bidirectional prediction, which involved creating
9 a prediction P1 from a first reference frame, creating a
10 picture -- a prediction P2 from a second reference frame,
11 and combining those to make a prediction shown as P on my
12 slide 5, which is Fig. 10 of the '267 patent.

13 And the problem was that in prior art methods at
14 doing this, P1 was created at the input bit-depth, P2 was
15 also created at the input bit-depth, and the combined
16 prediction P was at the same bit-depth, and the inventors
17 recognized that there was a problem, potential problem with
18 the accuracy of resulting prediction.

19 Q. Let's have slide 6, please.

20 And, Doctor, can you explain to us how in the
21 prior art these predictions P1 and P2 were formed?

22 A. So you've heard about interpolation, Your Honor.
23 So the first stage of these predictions, which I've
24 highlighted in green on my slide 6, is a filter, and in each
25 case that's a way of combining integer pixel values to

1 create a combined value, and then in blue I've highlighted a
2 pair of processes in each case that convert that if you like
3 back down to the input bit-depth that I talked about
4 earlier.

5 Q. Were there any prior art attempts to address the
6 rounding error problem?

7 A. So this problem of the accuracy of prediction,
8 which was also known as the rounding error problem, this
9 was -- if you would go to slide 7, please -- this was a
10 known problem.

11 At the time of the invention, the committee, the
12 JCT-VC that was working towards developing the H.265
13 standard, had identified this problem. Various attempts
14 were made to solve it, but it was not resolved by this
15 stage, and the whole draft standard had been split into what
16 they called high efficiency and low complexity parts, partly
17 because of this problem with rounding error and prediction
18 inaccuracies.

19 Q. Let's have slide 8, please.

20 Did Nokia attempt to solve the rounding error
21 problem?

22 A. They did. And this is an extract from a
23 contribution to that standardization committee made by
24 Nokia, on my slide 8, and the proposed Nokia solution is
25 essentially to avoid converting or constructing P1 and P2,

1 those predictions, to avoid constructing them at the input
2 bit-depth, but instead to keep them at a higher precision so
3 that a more accurate prediction could be performed.

4 Q. Let's have slide 9, please.

5 So, Doctor, what happened after Nokia made its
6 contribution?

7 A. So these are extracts from a JCT-VC document, and
8 the proposal was to harmonize the two separate
9 configurations, the high complexity and the low complexity
10 configurations, to keep these prediction signals at a high
11 precision, as I've highlighted at the top of this
12 demonstrative, and the result, which I have extracted at the
13 bottom of this slide 9, is that the proposal was adopted,
14 and the text there says adopted into the HM, and HM was the
15 draft version of the standard which ultimately became the
16 H.265 standard.

17 Q. Let's have slide 10.

18 Now, Doctor, I'd like to turn to the prosecution
19 history of the '267 patent.

20 Was there anything noteworthy in the prosecution
21 history that we ought to consider before diving into the
22 validity grounds at issue here?

23 A. If we go to slide 11, please.

24 So this, Your Honor, is an extract of the file
25 history of the priority application for the '267 patent, and

1 I've highlighted some text here which relates to a reference
2 "Ye" or "Ye," and that reference disclosed a very similar
3 issue to one that we're going to talk about today, which is
4 the concept of scaling prediction blocks, such as P0 and P1,
5 by a weighting factor.

6 And I've highlighted this text: As discussed
7 during the interview, and that's between the applicant and
8 the Examiner, these weighted values do not have increased
9 precision relative to, and these are the original prediction
10 values, P0 and P1, and instead simply serve to change the
11 range of values.

12 And, as a result, the Examiner concluded that the
13 Ye reference fails to teach or suggest any increase in
14 precision from the reference blocks to the first and second
15 predictions.

16 Now, I'm going to explain the context of that
17 shortly, but, in my view, this is the same issue that was
18 one of the grounds brought up by Dr. Schonfeld earlier in
19 this hearing, and so the Examiner had already addressed and
20 the applicant had overcome this issue during prosecution.

21 Q. Let's have slide 12, please.

22 Doctor, what are the invalidity grounds that
23 Respondents advance against the '267 patent?

24 A. If we go to slide 13, there are two grounds.
25 There's a reference called Walker, an obviousness ground,

1 and the second ground is Walker with another reference,
2 Srinivasan, also an obviousness ground.

3 Q. Let's have slide 14, please.

4 What's the Walker reference?

5 A. Walker is directed to something called weighted
6 bidirectional prediction. And, again, I'm going to talk
7 further about that shortly, Your Honor, but Walker's purpose
8 was to construct what Walker describes as a universal
9 formula or a single implementation for decoding four
10 different specifications using one formula or one
11 methodology, and those specifications were the MPEG-4 part 2
12 standard, something called RV9, something called WMV9, and
13 something we are more familiar with, the H.264 standard.

14 Q. Let's have slide 15, please.

15 Doctor, what is weighted bi-prediction?

16 A. Okay. So I've got a video here. I'm going to
17 talk for a moment and then we'll play it again, because you
18 missed that. It's so quick you miss it.

19 So weighted bi-prediction is something that is in
20 the H.264 standard. And it's to do with constructing
21 predictions from two reference frames, and it's particularly
22 relevant or useful when we consider fading. And fading is
23 when one scene fades into another. We see this a lot on TVs
24 and in movies.

25 So I'm about to ask for this video to be played

1 and you're just going to see a few seconds where it's fading
2 from one scene with a crowd of people into another scene
3 with traffic. One more time, please.

4 (Video clip played.)

5 A. I've slowed it down. The whole fade here lasts
6 about two seconds in the original video.

7 If we go to the next slide, please, this is in
8 color, a figure from one of my books, where I used this
9 exact scene to illustrate bi-prediction and weighted
10 bi-prediction.

11 And if we consider the frame in the middle at the
12 top here, I've outlined a white block or macroblock. So
13 consider how we want to predict that block, we have a
14 previous frame with the first scene, a future frame with the
15 second scene.

16 So the weighted prediction is a way of getting an
17 efficient prediction of these kinds of blocks, and, as
18 Walker says, weighting factors, such as the ones I'm going
19 to talk about, can be beneficial when one scene fades into
20 another.

21 So if we go to the next slide, slide 17, so I've
22 now just expanded on this diagram somewhat. So on the left
23 we've got a frame from the crowd scene, on the right we've
24 got a frame from the city scene. And in green I've shown a
25 block in a frame right in the middle.

1 So, for that block we've got 50 percent of the
2 crowd, 50 percent of the city. So it makes sense if we're
3 using bi-prediction to use equal weightings, equal
4 prediction from both of those scenes.

5 The blue block slightly to the left, in that
6 frame we are closer in time to the crowd scene, and there's
7 more of the crowd scene in the fading image. So it makes
8 sense from an encoding perspective to weight the crowd scene
9 more to give it a three-quarters weight, .75, and to give a
10 weighting to the city scene of .25, so that we kind of
11 adjust the prediction depending on which of the reference
12 frames is a better match for the current frame.

13 And, finally, with the red block, we're, again,
14 weighting it the other way around. It's now got more of the
15 city scene. So with weighted bi-prediction, the encoder can
16 weight the contribution of the city scene by three quarters
17 and the crowd scene by one quarter.

18 So this idea of shifting weights between the two
19 frames or increasing one and decreasing the other, this is
20 what we mean by weighted bi-prediction, and this is what
21 Walker is about, it's about a way of implementing this.

22 Q. Let's have slide 18, please.

23 So, Doctor, we're talking about the Walker
24 reference.

25 What in Walker are the predictions you're talking

1 about here?

2 A. So I've shown a figure from Walker. A lot going
3 on here, Your Honor, but if we focus on the yellow
4 highlighting, we have two blocks, 520 and 580. And 520 is
5 what Walker describes as a best matching macroblock for a
6 current macroblock being encoded.

7 So that's, I would say, you would consider an
8 example of a prediction. It's trying to predict that
9 current macroblock. It's trying to estimate that
10 macroblock. So that we can get a good prediction and a good
11 match.

12 And then 580 is the same idea. It's a prediction
13 for the block from a second reference frame. So 520 and
14 580, if you think of those as comparable to those two arrows
15 coming into the predicted block in the previous slide.

16 So these are predictions. And in my view a
17 person of ordinary skill in the art would recognize these as
18 predictions. They are estimating a value that's to be
19 encoded, such as a block, pixels of a block or samples of a
20 block.

21 Q. Let's have slide 19, please.

22 We just spoke about the top part of that Fig. 5
23 from Walker.

24 Would a person of ordinary skill in the art also
25 recognize what the predictions would be on the bottom part?

1 Let's go back to slide 18.

2 So we spoke about the top part of Fig. 5.

3 There's also the bottom part of Fig. 5.

4 Would a person of ordinary skill in the art also
5 understand what the predictions are from the bottom part of
6 Fig. 5?

7 A. Yes. And I haven't highlighted these,
8 Your Honor, but Walker basically puts the encoder on the top
9 line in this middle section of Fig. 5, and the decoder on
10 the bottom line. The decoder, I know that because it's
11 going Q minus 1, that's inverse quantizing or rescaling,
12 inverse transform, and then add the predictions. And the
13 predictions now on the bottom are 565 and 590. And these
14 would be constructed in an identical manner in the encoder
15 and in the decoder.

16 Q. Let's have slide 20, please.

17 Now what I'd like to do is let's walk through
18 what the predictions are in each of Walker's
19 implementations.

20 So what's the prediction, in your view, in the
21 MPEG-4 implementation in Walker?

22 A. So I mentioned that Walker tries to implement
23 four specifications or standards in one design. The first
24 one here is MPEG-4 part 2, and the predictions here are
25 pred1ij and pred2ij, and these are 8-bit samples.

1 Q. Let's have slide 21, please.

2 What does Walker call the predictions in the RV9
3 or RealVideo 9 implementation?

4 A. So this is another specification for video
5 coding, and, again, Walker identifies two prediction
6 signals, pred1ij, pred2ij, and, again, these are 8-bit
7 predictions.

8 And if I could just move forward, Your Honor, if
9 you go to the next slide, slide 22, similarly for the
10 Windows Media Video 9 specification, yet another video
11 coding specification, again, Walker identifies prediction
12 samples predij -- sorry -- pred1ij and pred2ij, and, again,
13 these are 8-bit samples in the prediction.

14 And one more, slide 23, and this is now the more
15 familiar H.264 standard, and, again, Walker identifies two
16 prediction inputs, pred0 and pred1, which, once again, are
17 8-bit prediction blocks of 8-bit prediction samples.

18 Q. Doctor, I want to ask you a question about slide
19 23. You've highlighted pred0 and pred1 as samples from
20 prediction blocks.

21 Now, you understand that the Respondents in this
22 matter allege that the weighted w times pred0, w0 times
23 pred0, is a prediction.

24 Do you have a response to that?

25 A. In my view that is simply not a prediction,

1 Your Honor. A person of ordinary skill in the art, reading
2 Walker, sees throughout Walker a consistent reference to
3 prediction blocks. As we can see, they all have -- all
4 these blocks have pred in the title, they are all 8-bit, all
5 consisting of 8-bit samples.

6 So in my view Respondents are identifying a value
7 that is not a prediction; it's some other value in the
8 process.

9 Q. So now let's turn to slide 24, please.

10 You also mentioned the Srinivasan reference
11 earlier. What is Srinivasan?

12 A. Srinivasan is a patent and it's concerned, not
13 directly with bi-prediction, it's concerned with
14 interpolation, this process of generating interpolated
15 samples between integer or existing pixel values.

16 And I'm just highlighting here, I'll come back to
17 this, but I'm highlighting Fig. 8 of Srinivasan, and the
18 abstract where Srinivasan is concerned with starting with
19 8-bit pixel values at the top left of Fig. 8, carrying out a
20 series of operations, and ending up with 8-bit filter to
21 output values at the lower right of Srinivasan Fig. 8.

22 Q. Let's please have slide 25.

23 Now what I'd like to do is I'd like to turn to
24 Respondents' invalidity theories for the '267 patent.

25 Can you remind us what the two grounds were that

1 Respondents assert?

2 A. If we go to slide 26, please, so Respondents have
3 two main grounds, and, as I understood Dr. Schonfeld's
4 testimony, he splits up ground 1 into three theories, which
5 I have called the bitwidth theory, the variable weight
6 theory, and a theory involving alleged precision from
7 interpolation in the Walker reference itself.

8 And then in ground 2, I'm going to describe his
9 theory as what I believe to be alleged precision from the
10 Srinivasan interpolations.

11 Q. Let's have slide 27, please.

12 Can you tell us what Respondents are pointing to
13 as far as Walker is concerned?

14 A. So in Respondents' analysis of Walker, they point
15 to values of the encoder and decoder. They are actually
16 slightly different in Walker. In the encoder they point to
17 values pred0 times $w0$, and pred1 multiplied by $w1$. And in
18 the decoder they point to a slightly different variant into
19 this.

20 Q. Let's have slide 28.

21 What do Respondents point to in the decoding
22 claims in Walker?

23 A. I got ahead of myself. This is the decoding
24 side. Respondents point specifically to -- I'll try and
25 read it out -- pred0 times weight A or w_a , and then the

1 result of that right-shifted by 6 binary places. And they
2 point to a similar quantity involving pred1 and wb and,
3 again, a right-shift.

4 And Respondents, for the encoding and decoding
5 side, they start by pointing to these values and then
6 identifying these as predictions in Walker.

7 Q. Let's have slide 29.

8 And, Doctor, I'd like to start with what you've
9 called the bitwidth theory from Respondents. But before I
10 do, I want to ask you the broader question.

11 Do you agree with any of Respondents' invalidity
12 grounds?

13 A. I do not with respect to the '267 patent, no.

14 Q. So I'd like to walk through those various
15 theories now.

16 Let's have slide 30.

17 What is your response to the Respondents'
18 bitwidth theory for Walker?

19 A. So, as I understand the theory, to get to the
20 answer that they get to, to get the conclusion Respondents
21 get to, they misidentify elements of Walker as predictions.

22 If we actually look at the bottom of slide 30,
23 I've highlighted in blue one of the Walker equations that
24 Dr. Schonfeld relied on the other day. There are three
25 predictions in that equation. You can actually see them

1 from the variable names, they are described as predictions,
2 pred0, pred1, and the output, which is called final_pred.

3 Instead of considering these to be predictions,
4 Respondents consider, at the top of my slide 30, these
5 quantities I mentioned to be predictions, pred0 times w0,
6 and pred1 times w1.

7 Q. Let's have slide 31, please.

8 Can you explain to us the relationship between
9 what Respondents are calling Walker's predictions and what
10 you've called Walker's predictions?

11 A. To be honest, in my opinion, these are Walker's
12 predictions, but I'll accept your question.

13 I've highlighted Fig. 8 of Walker, part of Fig. 8
14 of Walker, on my slide 31. This is a diagram of Walker's
15 universal decoder that I mentioned.

16 Walker in this diagram has, for example, pred1
17 and pred0, which I've shown highlighted in blue. Walker
18 describes these in the specification as predictions as 8-bit
19 predictions.

20 Respondents for the decoding claims have pointed
21 to this, these arrows that I've highlighted in red. They
22 don't actually have a name in Fig. 8 of Walker. And you'll
23 see they are immediately to the right of Walker's box, units
24 855 and 860 in Fig. 8 of Walker.

25 And in my view this is an arbitrary choice of

1 something that is not described as a prediction in Walker,
2 and a person of ordinary skill would not recognize as a
3 prediction in Walker.

4 Q. Let's go to slide 32, please.

5 We just spoke about Walker's predictions, which
6 you've identified as pred0, pred1. Now what I'd like to do
7 is talk about this concept of a second precision in Walker.

8 Do you agree with Respondents that w times pred
9 has a second precision which is higher than the first
10 precision as claimed in the '267 patent?

11 A. No. In my opinion, even if I were to accept
12 Respondents' identification of what they call predictions,
13 what they identify does not have a higher precision than the
14 input pixel values as required by the claims.

15 Q. Let's have slide 33.

16 Before we jump into that topic, are there any
17 claim construction proposals we should consider?

18 A. Yes. In particular, the parties' proposed
19 constructions of the term "precision" are highly relevant in
20 my -- in forming my opinion.

21 I have formed my opinions and reached my opinions
22 in the light of all three of the proposed construction for
23 precision, and the most important aspect is that all
24 three -- or an important aspect is that all three specify
25 precision as a number of bits needed or required to

1 represent possible values or distinct alternatives. And
2 I've considered all three of these.

3 Q. Doctor, I want to make sure the record is clear
4 on this point.

5 Are you saying that your opinions on the '267
6 patent invalidity grounds are the same across all three
7 proposed constructions?

8 A. With respect to my conclusions that the
9 references do not invalidate the '267 patent, yes.

10 Q. Before we dive in, you mentioned the term
11 "bitwidth." What is bitwidth?

12 A. So if we go to slide 34, this is actually one of
13 Dr. Schonfeld's demonstratives. And at the lower right he
14 has highlighted these -- two of these terms I mentioned,
15 pred0 times w0, pred1 times w1. And I think this is his
16 highlighting. He has also highlighted what Walker described
17 as the bitwidth of an operation result.

18 And so bitwidth is the number of bits that Walker
19 has chosen to store these combined values, pred0 times w0,
20 pred0 times w1.

21 Q. In your view are bitwidth and precision the same
22 concepts?

23 A. They are not. Precision, especially under the
24 three proposed claim constructions, is the number of bits
25 needed or required to represent possible values.

1 Bitwidth is the number of bits used in a
2 particular implementation. I can use more bits than I need
3 to represent a value. And in my view that's exactly what
4 Walker has done here.

5 Q. Now what I'd like to do is discuss that last
6 point you made, the number of bits needed or required to
7 represent possible values or distinct alternatives.

8 Can we turn to slide 35?

9 Can you explain to us what you mean by this
10 distinction between the number of bits needed to represent
11 possible values and bitwidth?

12 A. Your Honor, I think this is a very important
13 point. I think the record may not be entirely clear up to
14 this stage.

15 And so I've moved away from numbers briefly,
16 because I think numbers can actually be a source of
17 potential confusion. The constructions all talk about
18 representing possible values or possible alternatives.

19 On the left of slide 35 I have shown eight
20 colors. Let's say I want to identify any one of those eight
21 colors, how many bits do I need. Maybe I want to paint by
22 numbers. How many bits do I need if I identify each of
23 these values in binary.

24 And the answer is 3 bits, because, with 3 bits, I
25 can represent one color with 000, another one with 001, all

1 the way up to 111. So 3 bits is what I need to represent
2 these 8 possible values.

3 You consider the right of slide 35, I've shown a
4 different collection of colors. Now I've got four possible
5 colors, only four. How many bits do I need to represent
6 this set of four colors, and the answer is 2, 00, 01, 10,
7 11. I could use more, but I only need 2 bits to represent
8 the choice of colors on the right.

9 So hopefully that's a clear illustration of
10 what's actually meant by the number of bits needed to
11 represent possibilities.

12 Q. I want to hone in here on slide 35 and see if we
13 can discuss this in the context of our everyday experiences.

14 How does what you're showing on slide 35 relate
15 to what a user or a viewer would see on their screen when
16 watching video?

17 A. So it's quite analogous in that to show
18 full-color video, we might use, let's say -- let's say we
19 use 256 possible values, and we get 8-bit, let's go, maybe
20 it's black and white, 8-bit black and white or monochrome
21 image. If we increase the number of possibilities,
22 something called high dynamic range, we need more bits per
23 pixel to represent those possibilities.

24 Q. And is a user going to perceive any difference
25 between sort of the fewer possible values and more possible

1 values when watching a video?

2 A. Yes. As we increase the number of possible
3 colors and brightnesses and so on, you see what looks like a
4 more realistic image, as the number of colors and
5 possibilities increases.

6 Q. Let's have slide 36, please.

7 Now what I'd like to talk about is this concept
8 of multiplying a set of possible values by another number.

9 Does scaling increase the number of possible
10 values?

11 A. It does not. And I'm illustrating this on slide
12 36, and I'll put it in context in a moment, but, for the
13 moment, just focus on the four unique values on the left, 4,
14 8, 12 and 16. And now I'm back to numbers. Hopefully the
15 basic concept is in the record.

16 And now four unique values. If I want to
17 represent these in bits, I actually only need 2 bits,
18 because I only have four possibilities.

19 Let's say we ignore the ones on the left and we
20 look at the ones on the right. There are still only four
21 possible values, 8, 16, 24, and 32. I might choose to use
22 more bits, but I only need 2 bits to represent the values on
23 the right. And the relationship, of course, is that I got
24 to the ones on the right by doubling them, doubling the
25 numbers on the left. So that's scaling by a constant.

1 So scaling by a constant by itself does not
2 increase the number of possible values, and, therefore,
3 under all the constructions, does not increase precision.

4 Q. Slide 37. Now I want to ask you that question in
5 the context of the sort of predictions in Walker we're
6 talking about.

7 Does scaling Walker's predictions increase the
8 number of possible values?

9 A. No, it does not. And so this is slide 37. And
10 we're now directly in the territory that there's a dispute
11 about.

12 If I have a very small block, a 3x3 block on the
13 left of slide 37, let's say that is pred_0 , in that block
14 there are four unique values. If I scale that block by a
15 constant of 2, so every sample within that block is scaled
16 by the same amount, I get a new block on the right. Let's
17 call that pred_0 times w_0 .

18 The numbers are different, but there are still
19 only four unique values. So under all the constructions of
20 precision, the precision has not changed, and hopefully they
21 link to my previous diagram and now it becomes a bit
22 clearer.

23 On the right-hand side of slide 37, I've
24 represented four unique values before scaling, four unique
25 values after scaling. So the scaling itself has not

1 increased the number of possible values. The scaling has
2 not increased precision.

3 Q. Doctor, what can we conclude, then, with respect
4 to the Respondents' bitwidth theory for Walker?

5 A. So Respondents pointed to w_0 times w_0 as one
6 of their alleged predictions. They pointed to the bitwidth
7 that Walker uses for that quantity and used that, as I
8 understand, to say that the precision has increased. But
9 because w_0 is a constant across the block, in my opinion,
10 the precision has not increased. It's still -- if it was 8
11 bits before, it's still 8 bits after scaling.

12 Q. Let's have slide 38, please.

13 Now what I'd like to do is turn to the variable
14 weight theory that you discussed earlier.

15 What is Respondents' variable weight theory for
16 the Walker ground?

17 A. If we go to slide 39, as I understand it, the
18 Respondents' theory here is, roughly speaking, to, if you
19 like, rebut what I just said, and they are pointing to a
20 description in Walker, Table 1, which says that the
21 weighting factor w_0 can range from minus 128 to plus 127.

22 So, as I understand it, the counterargument to
23 me, to my earlier argument, is that Walker's weight 0 can
24 vary, and, therefore, because it can vary, it can increase
25 the number of possible values and therefore the precision.

1 I disagree with that statement.

2 Q. Let's have slide 40.

3 Is it true that Walker's weights for a given
4 block of pixels can have a range of possible values?

5 A. So remember that Walker has four specifications
6 or standards that are being implemented. For the MPEG-4
7 part 2 implementation there is no weighted prediction, so
8 the question is effectively irrelevant.

9 Q. Let's have slide 41.

10 For the Windows Media Video 9 or WMV9
11 implementation, does Respondents' variable weight theory
12 apply?

13 A. It does not apply, because, again, for Windows
14 Media Video 9, the averaging process is the same as MPEG-4
15 part 2. There is no weighted prediction, so it's not a
16 relevant question.

17 Q. Let's have slide 42.

18 What about the H.264 and RealVideo 9
19 implementations?

20 A. So now we need to consider weighted prediction,
21 what it is, what it's doing, and I've already explained
22 that, Your Honor.

23 So Walker itself explains that the weights, when
24 they are in use, are not variable at the block level. And
25 I've shown on my slide 42 an annotated version of Walker

1 Fig. 5.

2 I've highlighted the previous reference frame 510
3 in blue, and the next reference frame or future reference
4 frame 585 in green. And I've highlighted them, the whole
5 frame, in blue or green to emphasize the fact that in H.264,
6 across all the blocks of a frame or slice, the weights are
7 constant. In fact, they are tied to the reference frame.

8 So if my reference frame is frame 10, the
9 weighting across frame 10 or across the blocks of the slice
10 of frame 10 is the same. It's constant across that frame or
11 slice.

12 Q. And I want to make sure we capture this point
13 clearly.

14 Is it the case that in Walker the weights can
15 vary, but only on the reference frame level, not on the
16 block level?

17 A. So for a given frame, if it uses reference frame
18 10, the weights for that reference frame are constant across
19 the frame. I'm going to talk -- I think I'm going to talk
20 about a situation where blocks can use different reference
21 frames, but the weights are constant across the reference
22 frame.

23 Q. Let's have slide 43.

24 I want to ask you about the RealVideo 9
25 implementation, which I don't think we've mentioned yet.

1 Do the weights vary for blocks of pixels in the
2 RealVideo 9 implementation of Walker?

3 A. So in RealVideo 9 the weights are, and the
4 highlighted text on slide 43 is, the weights are computed as
5 relative temporal positions of the B-frame with respect to
6 the two reference frames.

7 So to decode that sentence, if you remember the
8 diagram I had with five frames for my fading sequence, the
9 reference frames were the ones we were predicting from. The
10 temporal position of the B-frame here is the position of the
11 frame in the middle.

12 So the relative temporal positions, that's
13 exactly what I was talking about, as you get closer to a
14 reference frame, the weight increases in RealVideo 9. As
15 you get further away, it decreases. So it's relating to the
16 relative positions of the frames, not the blocks.

17 Q. Let's have slide 17 again just so we can turn
18 back to that point.

19 17, please.

20 Doctor, this is the image you showed us earlier
21 of weighted bi-prediction.

22 Can you explain what you mean when you say that
23 the weights are based on the temporal distance of a frame
24 and its reference frame?

25 A. Yes. So now if we remember that sentence from

1 the RealVideo 9 description, it said something along the
2 lines if the weights depend on the relative temporal
3 distance of the B-frame, so that would be our way in the
4 frame with the blue box, the green box or the red box, and
5 the relative temporal distance to the reference frames,
6 which here are the first and last frames on slide 17.

7 Q. And I want to ask you about something on your
8 slide 17. Let's look at the blue box you have on the
9 left-hand side of the slide.

10 Will the weights that are listed above the blue
11 box, will those change for the blocks of pixels that you've
12 identified?

13 A. Those weights are constant within that blue box
14 for every single sample value.

15 Q. Let's please go to slide 44.

16 So we talked about the MPEG-4, WV9, and
17 RealVideo 9 implementations.

18 What about H.264 implementations in Walker?

19 A. So Dr. Schonfeld was asked about this, and I
20 broadly agree with his answers that he gave earlier in the
21 hearing, which are shown on my -- an excerpt of them are
22 shown on my slide 44.

23 And if I could draw your attention to a couple of
24 questions and answers.

25 Halfway down my slide 44, and in explicit

1 weighting in the H.264 standard weights are transmitted in
2 the slice header, not the block level.

3 Dr. Schonfeld agreed with that statement. I
4 agree with that statement.

5 And then the final question, for implicit
6 weighted bi-prediction, the weights that are used are
7 calculated based on -- and I think there might be a
8 typographical error -- I'll read it as based on the relative
9 temporal positions of the reference frames, not at the
10 individual block level.

11 Dr. Schonfeld agreed with that statement. I
12 agree with that statement with regards to H.264.

13 Q. Let's have slide 45, please.

14 Is there anything in Walker that confirms your
15 understanding of how H.264 weighted bi-prediction would
16 work?

17 A. Yes. Here Walker is talking about direct mode
18 weighting based on temporal distance to past and future
19 frames.

20 Once again, Walker is talking about this concept
21 of depending on your temporal distance to the reference
22 frames, the weights are directly based on that.

23 Q. Now let's have slide 47.

24 Can you walk us through sort of a real example of
25 how Walker would apply its weights to given predictions?

1 A. So this is, if you like, it's an extension of
2 some of these illustrations I've provided already,
3 Your Honor.

4 Slide 47, the top right, I have a block in my
5 current frame 10, call it block A. That block is made up of
6 pixel or sample values. We'll assume Walker's scenario
7 where all of those sample or pixel values are 8 bits and
8 have 256 possible values.

9 Let's say that the encoder has chosen frame 9 as
10 the reference frame for block A. The prediction from frame
11 9 in Walker pred0 is also 8 bits, as I showed you earlier.
12 It also has 256 possible values per sample. And let's
13 assume that the weight is 5. That's a constant of 5.

14 So what happens is that those prediction samples
15 can be 256 possible values, they are all scaled by the same
16 amount, 5, so we have a scaled prediction, or I think
17 Respondents called it a weight -- weighted prediction, w_0
18 times pred0, which, again, has 256 possible values.

19 So the number of possible values has not changed.
20 Just comparing that to the claim language, finally back to
21 the claim, on the left, we're decoding a block of pixels,
22 block A, we're determining a reference block, we are using
23 the reference block to obtain a first prediction, pred0, or
24 even pred0 multiplied by the weight.

25 And the whole point that I'm trying to make here

1 is that first prediction, whether it's pred0 or pred0 times
2 $w0$, does not have a second precision higher than the first
3 precision.

4 In Walker, the number of possible values is still
5 256, the weight is constant, and, therefore, under all three
6 possible claim constructions, the weight, the prediction,
7 does not have a higher precision than the original pixels.

8 Q. Let's have slide 48.

9 Now, Doctor, you understand that you could have,
10 for different blocks of pixels in a frame, different
11 reference frames.

12 Does the fact that you might have a different
13 reference frame for a different block of pixels change your
14 opinions on this question?

15 A. No, it does not. On slide 48, Your Honor, I'm
16 illustrating another block in frame 10 immediately below
17 block A, we'll call it block B. Let's say it uses a
18 different reference frame, frame 8, and let's say that the
19 weight is now 3.

20 But for block B, which is now the current block,
21 the same argument applies. For that current block, the
22 first reference block, the first prediction, either pred0 or
23 pred0 times $w0$, both of those blocks have the same number of
24 possible values and, therefore, the same precision under all
25 three claim constructions, and that precision is not higher

1 than the precision of the pixel values. So the claim is not
2 satisfied for either block in my opinion.

3 Q. Let's have slide 49, please.

4 Doctor, I'd like to now turn to the sort of third
5 theory under the Walker ground.

6 Can you explain to us how Walker does
7 interpolation?

8 A. So if we go to slide 50, this is the whole of
9 Fig. 8 from Walker showing Walker's universal decoder or
10 combined decoder. There's a block 835, which I've
11 highlighted, which is the pixel interpolation stage. That
12 feeds into block 840. And there are two outputs of block
13 840, pred0 and pred1. And as I have explained and as Walker
14 explains, these are both predictions made up of 8-bit
15 samples.

16 So pixel interpolation -- I didn't really answer
17 your question. I apologize. Pixel interpolation, you've
18 heard explained before, Your Honor, it's a process of
19 generating these subpixel predictions, which we use in
20 motion compensated prediction, but the important point here
21 is that Walker's pixel interpolation does not generate
22 anything other than 8-bit prediction values.

23 Q. Let's have slide 51.

24 Is there anything else in Walker that confirms
25 your understanding of how the interpolation process works?

1 A. So Walker talks about pixel interpolation, for
2 example, in paragraph 114, which is on the left of slide 51.
3 But the reason I know that Walker's interpolated predictions
4 are not at a higher precision is that pred0 on Table 4 of
5 Walker, which Respondents point to or rely on, pred0
6 comprises 8-bit values. The output of the whole of this
7 process, that's the combined prediction in Walker, Walker
8 also describes as having 8-bit values.

9 So because pred0 comes from at least indirectly
10 the interpolation block, Walker's interpolated pixel values
11 are not anything greater than 8 bits.

12 Q. Based on your understanding of how Walker's
13 interpolation works, what conclusions can you reach about
14 whether Respondents are correct that Walker's interpolation
15 has a second precision higher than the first precision?

16 A. My conclusion is it does not, and that is
17 entirely supported by Walker's description of the inputs and
18 outputs of each of its stages, as I've explained earlier.

19 Q. Let's have slide 52.

20 What I'd like to do now is turn to ground 2,
21 which is the Walker plus Srinivasan ground.

22 What is your understanding of Respondents'
23 argument for the Walker plus Srinivasan ground?

24 A. So if we go to slide 53, and this is an extract
25 from Dr. Schonfeld's testimony on the left, and the

1 demonstrative on the right that I believe he was describing,
2 his slide 166.

3 And he identifies some extracts from Srinivasan,
4 which is describing interpolation. And he talks about bit
5 values of x or $x+1$. He talks about supposed arbitrary
6 extension of bit-depth and of output values with dynamic
7 ranges of different bit-depth.

8 And I think what he -- the position that he
9 attempts to reach is that Srinivasan can produce higher
10 precision interpolations, and that it would be obvious to
11 somehow insert those higher precision interpolations into
12 the Walker reference to get to this desired outcome of
13 precisions at -- sorry -- predictions at a higher precision.

14 Q. I want to ask you about something on your slide
15 53, which cites to Dr. Schonfeld's slide 166.

16 There's a red underline under "extended
17 arbitrarily." And I think the sentence says, the
18 intermediate values can be extended arbitrarily.

19 What is your understanding of what the
20 intermediate values refers to there?

21 A. So the intermediate values are, in a sort of
22 analogous way to the pred0 times $w0$ values, are what
23 Srinivasan describes as just that, as values that are
24 calculated during the interpolation process, but they are
25 not -- the intermediate values are not the output of the

1 interpolation process.

2 Q. Are the intermediate values inside of an
3 interpolation filter, are those predictions?

4 A. No, they are not.

5 Q. Let's have slide 54.

6 Is there anything in Srinivasan that informs your
7 understanding of whether the outputs of Srinivasan's
8 interpolation filters would have a higher precision?

9 A. So, first of all, if we look at the right of my
10 slide 54, these are three extracts from Srinivasan. In each
11 case Srinivasan consistently describes the final output
12 value as being 8-bit. So that is not at a higher precision
13 than the original pixel values, which were also 8 bits.

14 And there is also reference in Srinivasan to the
15 $x+1$, which Dr. Schonfeld referred to, but that is covered in
16 Srinivasan, for example, in the two excerpts on the left of
17 my slide 54. And that extra bit, which is at the last but
18 one stage in Srinivasan, is there to deal with overflow and
19 underflow, and it's not part of the output, the final
20 interpolated value of Srinivasan.

21 Q. Can you tell us what overflow and underflow
22 refers to here in Srinivasan?

23 A. So at the lower left of my slide 54, Srinivasan
24 explains that in some cases they can reach an almost final
25 value, which is actually out of the required range of 0 to

1 255. It could be negative or slightly larger than 255. So
2 Srinivasan keeps one extra bit and then uses it at the very
3 final stage of what we call clipping or clamping to convert
4 that value to a correct 8-bit value, which can range from 0
5 to 255.

6 Q. Let's have slide 155. Sorry. 55, slide 55.

7 Do you have any additional support for your
8 understanding of Srinivasan's interpolation filters?

9 A. So my slide 55 is Srinivasan's Fig. 8. It has
10 input pixel values at the top left, 8-bit values, and output
11 pixel values at the lower right, also 8-bit pixel values.

12 I'll draw your attention, Your Honor, to the box
13 just before that clamp output value. That's the stage where
14 Srinivasan's method deals with potential overflow and
15 underflow.

16 And so, again, this supports my opinion that,
17 even though intermediate pixel values -- intermediate values
18 could be higher than 8 bits in Srinivasan, the result of
19 interpolation is the original bit-depth, which in this
20 example is 8 bits.

21 Q. Let's have slide 56.

22 What about the $x+1$ that Dr. Schonfeld referred to
23 in his testimony earlier?

24 A. So Srinivasan Fig. 14, which I show on my slide
25 56, has an output value 1436, and my recollection is that

1 this is the value that Srinivasan describes as x or x+1 bit.
2 But reading Srinivasan, it explains that the x+1 there is
3 the extra bit that's used to make sure that the clamping
4 process works correctly and that we don't have an overflow
5 or underflow.

6 Q. Does the extra bit you refer to that ensures the
7 clamping process works correctly, does that add additional
8 possible values to Srinivasan's predictions?

9 A. No. It's really just dealing with a potential,
10 once again, rounding error problem.

11 Q. And let's have slide 57.

12 Do you have any opinions about whether a person
13 of ordinary skill in the art would have been motivated to
14 combine Srinivasan with Walker?

15 A. So my opinion is they wouldn't have been
16 motivated to do so in the way that Dr. Schonfeld and
17 Respondents suggest.

18 And just briefly, I've put up Fig. 8 of Walker
19 again. And I think Dr. Schonfeld's proposal is that
20 Walker's pixel interpolation unit 835 would be, if I
21 understand correctly, replaced with Srinivasan's
22 interpolator.

23 Let's assume for the sake of argument that that
24 produces higher bit-depth output, such as 9-bit output
25 instead of 8 bits, I don't think that's correct, but, if we

1 assume that, we still have to deal with how do we use those
2 9-bit values in the motion compensation, how do we create
3 pred0 and pred1, which Walker says remain at 8 bits, and how
4 do we then carry out Walker's operations thereafter, and how
5 do we do that in such a way that we deal with all the
6 possible integer and subpixel positions that the motion
7 vectors would be pointing to.

8 And Dr. Schonfeld -- I didn't hear Dr. Schonfeld
9 or read Dr. Schonfeld explain at any point how one would
10 actually do that. And, in my view, one would not have a
11 reasonable expectation of success without identifying and
12 solving a number of problems, which I don't know how to
13 solve.

14 Q. Quickly on this point, do the opinions you've
15 expressed as far as motivation to combine Srinivasan with
16 Walker, do they also apply to the sort of Walker-alone
17 obviousness ground?

18 A. They would, because, again, Walker -- with the
19 Walker-alone argument, as I understand it, is to somehow
20 modify pixel interpolation unit 835 and allow it or break it
21 open so that it can produce higher bit-depth outputs, but
22 then the same problems occur of how do you deal with those
23 outputs for pred1, pred0, and the combinations in Walker,
24 and how do you deal with all the possible integer and
25 subpixel motion vector locations.

1 Q. Let's have slide 58, please.

2 Can we turn to the '714 patent now?

3 A. Sure.

4 Q. Let's have slide 59.

5 Doctor, please remind us what led to the '714
6 patent.

7 A. So there was a known issue, if you like, in the
8 motion compensation process in the draft H.265 standard at
9 this point where we had this idea of predicting a current
10 block and choosing one of a number of candidate blocks and
11 inheriting or using motion information from those blocks.

12 So the process of identifying candidates
13 involved, in the prior art, an exhaustive comparison between
14 what is shown here as 5 candidate positions. So all the
15 vectors of -- motion vectors of those positions had to be
16 compared each with each other, and that was considered to be
17 a problem, because of the computation required to do that,
18 and because of the fact it could be done in parallel.

19 So Nokia made a proposal to the joint -- to the
20 JCT-VC committee, and their proposal resulted in decreased
21 computational complexity by reducing the number of candidate
22 duplication checks from 10 to 5, in the worst case, in such
23 a way that these values could be computed in parallel.

24 Q. Let's have slide 60, please.

25 And, Professor, can you remind us what happened

1 with Nokia's contribution?

2 A. So it was tested in what they called a core
3 experiment in the committee, and the decision was to adopt
4 both aspects of the proposal, and I've shown that in the
5 highlighted extract on my slide 60 of the JCT-VC meeting
6 minutes shown at the top left.

7 Q. Let's have slide 61.

8 What is Acer's invalidity ground with respect to
9 the '714 patent?

10 A. It's based on a combination of two references, a
11 reference called Rusert and a reference called Karczewicz
12 '721 patent.

13 Q. Let's have slide 62.

14 Can you tell us about the Rusert reference?

15 A. So Dr. Hemami described this reference in some
16 detail, Your Honor. So just briefly, the Rusert reference
17 talks about a current block position, which on slide 62 is
18 shown in red in the center of that diagram.

19 And Rusert describes a process of stepping
20 through a number of neighboring locations in a scan order,
21 and there's numerical order here, 1, 2, 3, 4, 5 and so on.
22 And at some point at the end of that process Rusert ends up
23 with a set of motion vector prediction candidates.

24 Q. Is Rusert a parallel or sequential process?

25 A. In my opinion Rusert is a sequential process.

1 Rusert describes, still on slide 62, considering candidate
2 location 1, then considering candidate location 2, and then
3 3, and 4, and so on.

4 Q. Let's have slide 63.

5 What was the state of the art prior to the '714
6 patent?

7 A. So on the left of slide 63, I've shown an excerpt
8 from Dr. Hemami's demonstratives, her slide 19. And she
9 described the state of the art prior to the '712 patent and
10 contribution as a situation where, and this is her color
11 coding and illustration, when considering a current block,
12 all five of these neighboring candidates were exhaustively
13 compared. And Dr. Hemami demonstrated that with this
14 checkbox illustration where each of the candidates on the
15 left is compared with each of the possible candidates at the
16 top of her illustration.

17 So everything is compared with everything else,
18 and so you end up, in the worst case, with 10 comparisons
19 for 5 candidate neighbor positions.

20 Q. Let's have slide 64.

21 How does the prior art that we just discussed
22 compare to the Rusert reference?

23 A. So, in my opinion, it works in the same way with
24 respect to exhaustively comparing candidates. And I will
25 come back to this later, but, just briefly, if we consider

1 Rusert's first 5 positions, 1, 2, 3, 4, 5, as I'll explain,
2 as Rusert steps through those positions, every possible
3 candidate, if available, is compared with every other
4 possible candidate, if available.

5 And so, essentially, if one were to redraw
6 Dr. Hemami's checkbox table, all of the same boxes would be
7 checked. And I'll explain that further and demonstrate that
8 shortly.

9 Q. Let's have slide 65.

10 We talked about Rusert. What is Karczewicz?

11 A. The Karczewicz '721 reference is -- discloses
12 coding units, coding trees, and prediction units. And these
13 are basically data structures that were part of what I think
14 at that time was the early draft of the H.265 standard. It
15 wasn't the standard yet, but the same concepts end up in the
16 standard, and the concepts are these variable-sized and
17 shaped coding blocks and prediction blocks.

18 Q. Let's turn to slide 66.

19 Which claims did you consider for your analysis
20 of the Rusert and Karczewicz ground?

21 A. I considered the two decoding claims and the two
22 encoding claims, which I understand to be asserted in this
23 investigation. And for the decoders, as I've shown on slide
24 66, that's claims 9 and claim 23.

25 Q. And then let's have slide 67.

1 Are these the encoding claims you considered?

2 A. Yes, the encoding claims 1 and 15 of the '714
3 patent.

4 Q. Let's have slide 68.

5 Are there any proposed constructions relevant to
6 the '714 patent?

7 A. There is a claim term "first spatial motion
8 vector prediction candidate," and all three parties have
9 proposed a construction of this claim term.

10 Q. Let's have slide 69.

11 I want to ask you about Respondents' proposed
12 construction.

13 Does Rusert combined with Karczewicz render the
14 claims of the '714 patent obvious under Respondents'
15 proposed construction?

16 A. No.

17 Q. Why not?

18 A. Because under Respondents' proposed construction
19 the candidate for processing in Rusert is always candidate
20 1, if it's available. So whatever that first -- if it's
21 candidate 1, whatever that first candidate is, it's not
22 compared with anything in Rusert. So it couldn't satisfy
23 the asserted claims.

24 Q. Let's have slide 70.

25 Now I'd like to turn to claim limitation [C] from

1 claims 1, 9, 15 and 23.

2 In your opinion, does the Rusert and Karczewicz
3 combination disclose limitation [C]?

4 A. No. And that opinion holds across each of these
5 four claims 1, 9, 15, and 23. And -- sorry -- this
6 limitation is -- I'll probably call it the determining a
7 subset limitation.

8 Q. Let's have slide 71.

9 What does Acer call the subset for purposes of
10 the determine a subset limitation?

11 A. So when considering the Rusert reference, Acer
12 points to something in Rusert that is called PMV_CANDS, and
13 that PMV_CANDS is a list of candidates that Rusert has
14 developed.

15 Acer points to that as the alleged subset of
16 motion vector prediction candidates from the '714 patent
17 claims.

18 Q. Do you agree with that position?

19 A. Well, if that is the subset, it is also the set
20 in Rusert, because, in my view, that PMV_CANDS list, at any
21 point in Rusert's proces, PMV_CANDS contains all of the
22 possible or available candidates for comparison.

23 Q. I want to ask you about your slide 71, which
24 cites to Dr. Hemami's slide 24.

25 We see on these slides that there is a candidate

1 6 in blue.

2 At the time Rusert is considering candidate 6,
3 does it know anything about whether there are candidates
4 beyond that point?

5 A. It does not. And I'll explain further in a
6 moment, Your Honor, what becomes important there is what
7 Rusert calls availability.

8 Rusert does not know whether any of those further
9 candidates, 7, 8, 9, up to f, are actually even available
10 let alone potential candidates.

11 Q. And we'll turn back to the availability point,
12 but first let's go to slide 72.

13 What is Acer's argument for why any determined
14 subset is based on the location of the block associated with
15 the first spatial motion vector prediction candidate?

16 A. So on slide 72 I've shown an excerpt from
17 Dr. Hemami's testimony. Her slide 80, I believe.

18 And as I understand it, Acer's argument or
19 Respondents' argument is that, when Rusert is considering
20 Candidate 4, assuming that candidates 1, 2, and 3 are
21 PMV_CANDS, that the chosen subset, that's 1, 2, and 3, is
22 somehow dependent on where block 4 is positioned.

23 In my view, that subset is not dependent on the
24 position of block 4 or the location of block 4.

25 Q. Let's have slide 78.

1 Can you walk us through how the PMV_CANDS list
2 that Acer calls the determined subset is built?

3 A. So we start on the left of my slide 78,
4 Your Honor. Let's say we are considering Rusert's candidate
5 location 1. There is no subset at this point or alleged
6 subset. There is no PMV_CANDS. Rusert says that, if
7 location 1 is available, then that location goes into
8 PMV_CANDS.

9 So once we've done that, we now have PMV_CANDS,
10 contains a 1. We don't know the next candidate location,
11 and I'll explain that further a little bit later. But then
12 assuming they are all available, let's go to location 2,
13 which is the next column.

14 Our subset was 1 previously. If 2 is available,
15 and if it's not the same as 1, it's compared with 1, and
16 then added to PMV_CANDS. So now we have the subset 1, 2.
17 Alleged subset, sorry. PMV_CANDS is now 1, 2. We don't
18 know the next location.

19 In the middle, Rusert goes to location 3, if it's
20 available, it gets considered, and this carries on. And on
21 the right I've shown Rusert considering candidate location
22 5.

23 If we assume that PMV_CANDS contains all the --
24 well, it does contain all of the available nonidentical
25 candidates up to that stage, if we assume that they are 1,

1 2, 3, and 4, 5 is compared with each of those, if it's
2 different to all of them, it's added to PMV_CANDS and the
3 alleged subset.

4 Q. And I want to ask you about your slide 78. You
5 have a question mark where it says PMV candidate location
6 and resulting PMV_CANDS in each of your charts on your
7 slide.

8 Why do you put a question mark there?

9 A. Because in Rusert's method, let's say we process
10 candidate locations 1 and 2, we don't know the location at
11 that point in Rusert of the next candidate.

12 Q. Your slide 78 says PMV Candidate Location.

13 Is candidate the same thing as a location?

14 A. No. These are Rusert's locations. And the
15 location is a relative position. The location may or may
16 not have motion information in it, and that's the heart of
17 what Rusert describes as availability.

18 Q. And what specifically is a spatial motion vector
19 prediction candidate?

20 A. A spatial motion vector prediction candidate in
21 the claims is a -- the candidate is the motion information
22 associated with a block neighboring the current block that
23 has previously been coded.

24 Q. Earlier you mentioned that a candidate, this
25 motion information, may or may not be available at a given

1 location.

2 Can we have slide 79, please?

3 What do you mean by availability here?

4 A. So this slide, Your Honor, this is a screenshot
5 from a video sequence. I've used an analyzer software
6 program to superimpose colors that show the types of blocks
7 in the frame. And I've zoomed in on some of those blocks on
8 the right of my slide 79.

9 Near the center of that zoomed-in portion there
10 is a current block with a white border highlighting it. And
11 then there are a number of neighboring and further away
12 blocks. Red in this diagram means that the neighboring
13 block is intra-coded or does not have an associated motion
14 vector. In Ruser's terms, that would be an unavailable
15 neighbor.

16 Blue means, in this example, that the block has
17 -- the neighboring block has a motion vector and is not
18 intra-coded. So in Ruser's terms that would be an
19 available neighbor.

20 And just briefly, looking at the image on the
21 left, Your Honor, you'll see that this is a very typical
22 video frame. Many of the blocks have unavailable neighbors,
23 some have available neighbors.

24 Q. Let's have slide 80.

25 Earlier you testified that you disagree that in

1 Rusert a subset is determined based on the location of the
2 block associated with the first spatial motion vector
3 prediction candidate.

4 Can you walk us through why?

5 A. So here, again, back to Rusert, back to Rusert's
6 locations 1 and 2, so let's assume on the left that we've
7 processed 1 and 2 and PMV_CANDS contains the alleged subset
8 of 1 and 2.

9 What comes next in Rusert? What comes next
10 depends on availability. If location 3 is available, so if
11 it's inter-coded and has a motion vector, then Rusert says
12 it's available, and it's the next candidate to be evaluated.

13 If location 3 is not available, then location 4
14 would be the next candidate to be evaluated.

15 So we have a single subset here, which is -- or
16 alleged subset, which is 1 and 2, but we have two possible
17 next candidate or alleged first spatial motion vector
18 candidate locations shown.

19 So, in my opinion, this illustrates that the
20 subset does not and cannot depend on the location of the
21 first spatial motion vector prediction candidate in Rusert,
22 because, one, we don't know that location when the subset
23 is -- alleged subset is finalized, and, two, that location
24 changes depending on availability.

25 Q. And, Doctor, I want to follow up with something

1 on your slide 80. This might be a potential source of
2 confusion.

3 The numbers on your slide 80, they refer to
4 locations around what you have as sort of a green or teal
5 dot in the center of each of your plots, right?

6 A. That's correct. And these are the locations
7 marked out by Rusert in that figure from Rusert that we've
8 seen many times. So these are locations.

9 Q. And you've also referred to candidates by number.
10 So next candidate is 3 or next candidate is 4.

11 Can you explain how we differentiate between a
12 block location and a candidate?

13 A. Okay. Maybe I've been a little bit compact with
14 my terminology here.

15 When I say in this demonstrative slide next
16 candidate is 3, I mean that the next candidate in Rusert is
17 going to be the motion vector prediction information which
18 exists at location 3. And, similarly, when I say next
19 candidate is 4, I mean that the motion vector information
20 that exists at location 4.

21 Q. Let's have slide 81.

22 Doctor, does your position or your understanding
23 of how the PMV_CANDS process works with respect to the '714
24 patent claims, does that opinion apply to all of the
25 positions in Rusert?

1 A. Yes. Yes, it does. And what I've illustrated on
2 slide 81 are the two examples I just took you through and a
3 new one. All of these are what I called iteration 2, so I'm
4 assuming that Rusert has processed locations 1 and 2, put
5 the motion information into PMV_CANDS, so we have the same
6 subset at all three, and depending on availability, the next
7 position that Rusert evaluates could be 3, could be 4, it
8 could be 8, it could be f, depending on which of the
9 intervening blocks are available, which are not available.

10 Q. So we spoke about different PMV_CANDS sets at
11 different positions in Rusert's scan order.

12 Can the same position have different PMV_CANDS
13 lists depending on availability?

14 A. It can. I've illustrated that in slide 82.

15 So now I'm just -- these are all examples
16 compatible with Rusert's disclosure. I'm sort of flipping
17 it now and thinking, well, let's say that in Rusert, Rusert
18 is evaluating position 4. What is the content of PMV_CANDS?
19 What could it be?

20 It could actually be empty at this point or it
21 could be the candidates at positions 1, 2, and 3. That's
22 the example on the left. If 3 is unavailable, it could be
23 the position, the candidates or positions 1 and 2. If 4
24 is -- sorry. If 3 and 2 are unavailable, it could be just
25 the single candidate at position 1. And actually we've got

1 more possible combinations than this.

2 So not only does the subset not depend on the
3 location, the location doesn't depend on the subset. So the
4 two are, if you like, not -- can't be based on each other.

5 MR. VERBONCOEUR: Your Honor, I'm mindful that
6 it's now 11:00 in the morning. If you would like to take
7 the morning break, I'm happy to, but I'm also happy to
8 proceed.

9 JUDGE MCNAMARA: It might be a good time to take
10 a break. I see some nods. So I'll see you back here in 15
11 minutes.

12 (Whereupon, the proceedings recessed at 11:02
13 a.m.)

14 (In session at 11:20 a.m.)

15 JUDGE MCNAMARA: All right. Thank you, everyone.
16 Please be seated.

17 MR. VERBONCOEUR: Mitch Verboncoeur for Nokia.

18 JUDGE MCNAMARA: Yes, thank you.

19 MR. VERBONCOEUR: May I proceed, Your Honor?

20 JUDGE MCNAMARA: Yes.

21 MR. VERBONCOEUR: Thank you.

22 Q. Can we have slide 83, please.

23 Doctor, I'd like to turn to limitation [D] in
24 claims 1, 9, 15, and 23. I'll call this the comparing
25 limitation.

1 What does Acer identify as the set of spatial
2 motion vector prediction candidates for purposes of this
3 limitation?

4 A. If we go to slide 84, please.

5 SO on slide 84, I've shown an excerpt from
6 Dr. Hemami's demonstratives. This is her slide 86, I
7 believe. And Acer and Dr. Hemami identify all of the
8 positions in Rusert Fig. 3n as candidates in the set, the
9 set of spatial motion vector prediction candidates.

10 Q. Let's have slide 86.

11 And how does Rusert build PMV_CANDS?

12 A. So, again, on slide 86, this is an excerpt from
13 Dr. Hemami's demonstratives, her slide 59.

14 And as Dr. Hemami describes it, showing in the
15 figure on the right here, I think she showed an animation
16 where Rusert evaluates each of the available candidates in a
17 sequential order, and she -- Dr. Hemami, rather, illustrated
18 that with a spiral shown on this demonstrative.

19 Q. Mr. Moreno, can we please have slide 87.

20 Are you able to show us that spiral animation?

21 A. So this is Dr. Hemami's slide, which I gather
22 Respondents have kindly provided. And if we could play the
23 animation, if that's possible. So Rusert begins with
24 position 1, if available.

25 Okay, I can just talk through it. But my

1 recollection, Your Honor, was that as the spiral progresses,
2 Dr. Hemami's animation highlighted position 1 in yellow, and
3 then position 2 in yellow, and then position 3, 4, 5, 6, and
4 so on in this spiral order, spiraling out from the central
5 position.

6 Q. And can you explain to us how that progressive
7 spiraling relates to whether Rusert knows if a candidate
8 exists at a given position?

9 A. So I explained earlier, Your Honor, about
10 availability in Rusert, and, as I explained several times
11 now, when Rusert is evaluating a particular position, let's
12 say, the candidate at position 5, it does not know whether
13 the candidates at further positions in Fig. 3n are going to
14 be available or not. It doesn't know whether 6 is available
15 or 7. It specifically describes completing the processing
16 of location 5 before considering the next candidate with the
17 next location.

18 Q. Let's go back to slide 86, please.

19 Based on your understanding of how the PMV_CANDS
20 scan order works in Rusert, what should we call Rusert's set
21 of spatial motion vector prediction candidates?

22 A. In my view, if one were to try and label a set of
23 or find a set of spatial motion vector candidates, when
24 considering Rusert's method, the entire set would be all of
25 the candidates that had been evaluated and placed in

1 PMV_CANDS before the current neighboring location that
2 Rusert is considering.

3 Q. Now could we please have slide 90.

4 Now I want to talk about how comparisons work in
5 Rusert. Can you walk us through that?

6 A. Certainly. So I've talked about this briefly
7 before, Your Honor, so I'm on slide 90 now.

8 And Rusert points out that when each of its
9 neighboring locations is evaluated, it compares the new
10 vector that's in this example, that would be the vector in
11 location 4, with the candidates already in the list. And if
12 all of 1, 2, and 3 were available, if they were all
13 different from each other, then the list at this point,
14 PMV_CANDS would contain 1, 2, and 3.

15 And Rusert says that the new vector or the new
16 candidate at position 4 is compared with all of the
17 candidates that are already in the list. So 4 is compared
18 with 1, 4 is compared with 2, 4 is compared with 3.

19 So taking it a step further, if one were to
20 consider all four of these potential candidate locations, 1,
21 2, 3, 4, at location 2, 2 is compared with 1, so the
22 comparison is 2 with 1. At location 3, 3 is compared with
23 1, 3 is compared with 2. And at location 4, 4 is compared
24 with 1, and with 2, and with 3.

25 So if you keep going here, you can see that each

1 new candidate is compared with every previously considered
2 and stored candidate. So this is an exhaustive comparison
3 process.

4 Q. In your opinion, does Rusert disclose without
5 making a comparison of each candidate pair -- of each
6 possible candidate pair from the set of spatial motion
7 vector prediction candidates?

8 A. No, it doesn't, in my view, because, as I've
9 illustrated in this example, all of the possible candidates,
10 by the time Rusert gets to location 4 and processes
11 location 4, all of the possible candidate pairs between 1,
12 2, 3, and 4 have been compared with each other.

13 So there is no -- there is a comparison of each
14 possible candidate pair from the set, alleged set of spatial
15 motion vector prediction candidates in Rusert, so that claim
16 15 -- so the claim elements [D] I've shown on slide 90 are
17 not satisfied.

18 Q. And let's have slide 92, please.

19 I'd like to shift topics a bit into whether a
20 person of skill in the art would have been motivated to
21 combine Rusert and Karczewicz.

22 Do you have any opinions on that?

23 A. In my view, a person of ordinary skill in the art
24 would not be motivated to combine these two references in
25 the way that Respondents propose.

1 Q. Let's have slide 93.

2 What is Respondents' position as far as the
3 combination of Karczewicz and Rusert?

4 A. So my recollection is that Respondents point out
5 that Rusert, I think, came after H.264, that H.264 included
6 the concept of -- or a concept of blocks or macroblocks
7 being divided into various size and shape partitions.

8 Karczewicz '721, I've shown an excerpt on the
9 right of slide 93, showing that the coding unit in
10 Karczewicz's system does not have the same limitations as
11 the macroblocks of H.264, and what's actually happening in
12 Karczewicz is that you can have many possible combinations
13 of neighboring prediction block sizes.

14 Q. Let's have slide 94.

15 Do you have a response to Respondents' contention
16 regarding a motivation to combine Karczewicz with Rusert?

17 A. So on the left of my slide 94, I've shown Rusert
18 Fig. 3n, which we have seen many times, and that shows
19 Rusert's scan order.

20 On the right of slide 94, I've shown a figure I
21 adapted from one of my books showing a current block in
22 light blue. And I've shown 1, 2, 3, 4, 5 neighboring
23 blocks.

24 And this is quite a typical or perfectly feasible
25 way blocks could be split up in Karczewicz's system with

1 variable-sized prediction units or prediction blocks. And
2 it's also perfectly feasible in the context of, for example,
3 the H.265 standard.

4 So, for example, the current block is a
5 horizontal rectangle, and I'll draw your attention, Your
6 Honor, to the two blocks immediately above the current
7 block. So Rusert's scan order, Fig. 3n, says that
8 position 1 is immediately above the current block. But
9 there's no guidance in Rusert as to how you deal with this
10 situation on the right, where that vertical neighbor is
11 split into two, which one do you choose as your candidate.

12 And another problem is illustrated on the left of
13 the current block, where, in my example, the left-hand block
14 is twice as tall in the vertical direction. Rusert Fig. 3n
15 says you should consider candidates at locations 2 to the
16 left of the current block, and 5 to the lower left of the
17 current block, but in Karczewicz's partitions, these could
18 both be in the same block.

19 So how do you deal with that? Again, Rusert is
20 silent about that. Karczewicz is silent about that. So
21 this is one reason why, in my view, one would not have a
22 reasonable expectation of success combining these two
23 references in the way that Respondents suggest.

24 Q. Let's have slide 95, please.

25 What was Acer's explanation as far as why a

1 person of skill in the art would be able to make that
2 combination with the different block sizes you described?

3 A. So Dr. Hemami pointed out on the right here in
4 her, part of her slide 65, pointed out correctly that Rusert
5 does talk about potential embodiments with different
6 partition sizes, and I think that's consistent with these
7 larger and smaller block sizes I just talked about.

8 But what I'm highlighting in green on the right,
9 so I've added the green highlighting, Rusert says that, if
10 you have different partition sizes, motion vectors with more
11 weight are placed further in the beginning of a PMV_CANDS
12 list.

13 So what Rusert is saying is that, if you have
14 variable partition sizes, you modify the processing order
15 and the order of candidates in PMV_CANDS. And Dr. Hemami
16 and Respondents haven't given any guidance as to how one
17 deals with that.

18 And, you know, to summarize, it is my opinion
19 that Rusert's further embodiments with variable-size
20 partitions would not be compatible with the scan order of
21 Rusert 3n as described by and as relied on by Respondents.

22 Q. Let's have slide 96 now.

23 Doctor, can we turn to the '321 patent?

24 A. Of course.

25 Q. And let's have slide 97.

1 What was the problem that was addressed by the
2 '321 patent?

3 A. So I mentioned this a week ago, Your Honor. It
4 seems like a long ago. The '321 patent was trying to
5 address a problem particularly with what was called
6 reference picture selection, which was a flexible method of
7 picking reference pictures for prediction, which was
8 considered as part of the H.264 standard development.

9 And the problem was to deal with situations such
10 as the one on the right, where the end user might wish to
11 start browsing a video file from the middle, this random
12 access challenge.

13 Q. How were reference pictures handled in the prior
14 art?

15 A. If we go to slide 98, and this is similar to
16 diagrams we've seen before, Your Honor. This is what I've
17 called here the classic group of pictures prediction
18 structure, and this would be -- was in existence in
19 standards such as MPEG-1 and MPEG-2, which we've heard
20 about, and in this I would say well-defined and somewhat
21 constrained structure, we know that the prediction of any
22 current frame is going to be from a frame that's nearby.
23 For a B picture, it's going to be an immediately or a very
24 close neighbor I or P picture, for example.

25 Q. Let's have slide 99.

1 How did reference picture selection change the
2 classic group of picture structure?

3 A. So in H.264, the possibilities for predicting a
4 current block have increased dramatically. And, for
5 example, here I'm illustrating that in the current picture
6 shown on the right, I can have predictions from the past,
7 predictions from the future, but these could be from a whole
8 range of different frames.

9 And these can include what H.264 calls long-term
10 references. And I've shown one there with lots of dots on
11 the left-hand side. And these could be tens or hundreds of
12 frames in the past.

13 So there's no longer this well-described
14 contained prediction structure to rely on, and so you have a
15 potential problem when you want to join a video sequence
16 partway through and it's referring to a picture that might
17 be hundreds of frames in the past.

18 Q. Let's have slide 100.

19 How did the '321 patent solve the issue in the
20 art with random access in reference picture selection?

21 A. And, again, as I summarized last week, Your
22 Honor, the proposal of the '321 patent, or the invention of
23 the '321 patent is about identifying a new type of picture
24 called an IDR picture, an instantaneous decoder refresh
25 picture.

1 And the decoder can find that picture, the number
2 of the initiation images is set to zero, and from that point
3 the decoder can start decoding without reference to any of
4 these older reference pictures that I mentioned.

5 Q. Let's have slide 101.

6 Professor, I believe you talked to us about it
7 last week, but was there a contribution made by Nokia
8 relating to this patent?

9 A. There was, as I recall, a series of
10 contributions. So this slide 101 shows an excerpt from the
11 first of those, JVT-B041, where Nokia proposed this concept
12 of starting an independently decodable sequence and
13 resetting a picture number to zero.

14 Q. Let's have slide 102.

15 You mentioned there was a series of
16 contributions. What was the next one in sequence after
17 B041?

18 A. So this is another contribution at the same
19 meeting, and so I should have said this was at the joint
20 video team meetings that led to the publication of H.264.

21 And so this JVT-B109, which I'm excerpting on my
22 slide 102, talks about the, again, the concept proposed by
23 Nokia, the start of a group of pictures indication,
24 instantaneous decoder refresh, and this is where we start to
25 see the IDR, instantaneous decoder refresh, terminology.

1 Q. Let's have slide 103.

2 Did Nokia submit any subsequent contributions
3 after the JVT's B meeting?

4 A. Yes. So this is the next meeting of the JVT, the
5 joint video team, in May 2002. And as the excerpt on the
6 lower left says, this contribution recaps the main points of
7 those two earlier contributions.

8 And, again, at the top right it talks about the
9 two aspects, identifying random access positions, now this
10 is done with a specific network abstraction layer packet
11 type and a picture number update rule, and that's the
12 resetting that we've heard a lot about.

13 Q. Let's have slide 104.

14 Was Nokia's contribution adopted?

15 A. Yes. All these aspects were proposed and
16 adopted. So this was the point where the joint video team
17 at their May 2002 meeting decided to adopt this and put it
18 into what became the H.264 standard.

19 Q. Let's have slide 105.

20 What are Respondents' invalidity grounds against
21 the '321 patent?

22 A. If we go to the next slide, slide 106, there are
23 three grounds, as I understand.

24 Number 1 is a modified version of the MPEG-1
25 standard, that's an obviousness ground; ground number 2 is

1 MPEG-1 combined with a reference called Adolph, that's an
2 obviousness ground; and number 3 is a software program
3 called VLC version 0.7.2, and that is an anticipation
4 ground.

5 Q. Let's have slide 107.

6 Let's start with MPEG-1. What is MPEG-1?

7 A. MPEG-1 is a standard. We've heard a lot about
8 standards. This one was first published in 1993 by the
9 ISO/IEC standardization body, and it's about video coding.

10 Q. What are the parts of MPEG-1 that are relevant to
11 Respondents' invalidity theories here?

12 A. Three concepts in particular. The concept of a
13 temporal reference, the concept of closed and open groups of
14 pictures, or GOPs, and the concept of neighboring reference
15 pictures.

16 Q. You mentioned that Respondents had a modified
17 MPEG-1 ground. Let's have slide 108.

18 How do Respondents propose modifying MPEG-1?

19 A. So there's two steps, as I understand. The first
20 one is to propose a decoder that only decodes closed GOPs
21 with no leading B frames. And I think you heard the details
22 of that from Dr. Hemami a few days ago.

23 And then there's a Step 2, as I understand it,
24 where this decoder has to do one of two things. The method
25 on the left, Method (i), as I described it -- no, sorry,

1 this is from Dr. Hemami's description.

2 So this is Dr. Hemami's description. And Method
3 (i), the, decoder decodes something called a
4 closed_gop_flag, ignores or skips a decoding process, sets a
5 temporal reference to 0, and decodes following temporal
6 reference values. And Dr. Hemami also described Method
7 (ii), with the difference that the temporal reference is
8 decoded, and then reset, and then further frames are
9 decoded.

10 Q. Let's turn to slide 109.

11 There was also the Adolph reference. What's
12 that?

13 A. So this is a patent application publication, and
14 the concepts in here that I think are particularly relevant
15 are Adolph's internal frame counter variable or variables,
16 Adolph's handling of certain display order problems in
17 sequences such as MPEG-1 or MPEG-2 video sequences, and
18 Adolph's usage of headers in MPEG-1 or MPEG-2.

19 Q. Let's have slide 110.

20 How do Respondents propose to combine the
21 MPEG-1 -- or, sorry, how do Respondents propose to combine
22 MPEG-1 and Adolph?

23 A. They propose, first of all, to have a closed GOP
24 set to restrict the MPEG-1 syntax. That's a definition in
25 the standard of a video sequence restricted to only closed

1 groups of pictures.

2 They -- Dr. Hemami rather, or Respondents,
3 propose to use closed_gop_flag equal to 1 as an indication
4 of a first frame. Respondents propose to use either
5 temporal reference or IP counter values as identifier
6 values. And they propose that Adolph -- they propose --
7 sorry -- they suggest that Adolph -- I'm sorry.

8 Respondents suggest that Adolph discloses
9 resetting of IP counter values by its decoder.

10 Q. Doctor, I didn't ask this, but do you agree with
11 Respondents' modified MPEG-1 theory?

12 A. So this -- could you actually go back a slide,
13 please?

14 Q. Yes.

15 A. And one more slide.

16 So I disagree with both step 1 of Respondents'
17 proposed MPEG-1 modification and also step 2 in either
18 Method (i) or Method (ii).

19 Q. For the record, we're on slide 108.

20 Now I'd like to turn back to slide 110.

21 Do you agree with the proposed MPEG-1 and Adolph
22 combination?

23 A. I do not, no.

24 Q. Let's have slide 111.

25 You reference the Adolph -- you reference

1 Adolph's IP counter. What's that?

2 A. So Adolph generally describes a device that
3 carries out standards-compliant video decoding, and I think
4 Adolph mentions one or both of MPEG-1 and MPEG-2 video.

5 And it describes what I understand to be a method
6 on top of that, so not something that's specified in either
7 standard, which includes counting I, P, and B-pictures. And
8 the way Adolph proposes to do that is sort of a tally count.

9 So every time the device receives an I-picture or
10 a P-picture, it increments a counter called the IP counter.

11 Every time the device receives a B-picture, it
12 increments another counter called the B-counter.

13 Q. You used the term "tally counter" to describe the
14 IP counter. What do you mean by tally counter?

15 A. This would be analogous, if you go to the theater
16 and there is somebody at the door and they are clicking a
17 counter to count up the number of people coming in, and so
18 it's a count of how many I and/or P-frames have, if you
19 like, come into the decoder.

20 What it's not doing is identifying any particular
21 frames. For example, if you look at the numbers in the
22 highlighted row of this figure from Adolph on my slide 111,
23 you'll see that the IP tally counter with IP counter goes 1
24 and then 2, 2, 2, and so the counter is remaining at 2 even
25 though several frames have been received.

1 And then it gets to 3, and so by the time it's
2 reached 3, we know that three I and/or P-frames have been
3 received, but we don't know what they are or what numbers
4 they have from this counter.

5 Q. Let's turn to slide 112.

6 What is the relevance of Adolph's IP counter to
7 Respondents' MPEG-1 and Adolph combination?

8 A. My recollection is that the Respondents are
9 identifying -- or pointing to Adolph's IP counter, and the
10 fact that it's incremented when certain pictures are
11 identified, and the fact that Adolph describes it as being
12 reset after a GOP header, and so my recollection is that
13 Respondents propose that that satisfies certain elements of
14 the asserted claims.

15 Q. Do you agree with Respondents on this point?

16 A. No.

17 Q. And we'll turn back to your disagreement, but,
18 first, let's have slide 113.

19 Tell us what the VLC ground is.

20 A. So this is a ground that I understand to be -- to
21 rely on software which is VLC version 0.7.2, which
22 Respondents identify as being available at least as of
23 May 21st, 2004.

24 Q. Do you agree that VLC version 0.7.2 is prior art
25 to the '321 patent?

1 A. No.

2 Q. Let's have slide 114.

3 What claims did you analyze for purposes of your
4 validity analysis?

5 A. Claims 8 and 10 of the '321 patent.

6 Q. Are there any claim constructions to consider
7 here?

8 A. Yes. If we go to slide 115, there are two claim
9 terms that are relevant. There's the "identifier value," is
10 one claim term, and "reset" or "resetting" is another claim
11 term. And in each case all three parties have proposed
12 constructions of these terms.

13 Q. Did you consider the grounds at issue here for
14 the '321 patent under Staff and Nokia's proposed
15 constructions?

16 A. I did.

17 Q. Let's have slide 116.

18 Can we start with the modified MPEG-1 ground?

19 A. Okay.

20 Q. Which limitation shall we discuss from claims 8
21 and 10 of the '321 patent with respect to the modified
22 MPEG-1 ground?

23 A. If we go to slide 117, I'd like to focus on
24 limitations 8[A], 10[A], 8[D], and 10[D]. So these are --
25 8[A] and 10[A] are the decoding and indication limitations,

1 and 8[D] and 10[D] are the resetting identifier value
2 limitations.

3 And, I'm sorry, I would like to point out in case
4 I forget later, Your Honor, these are all claims relating to
5 decoding.

6 Q. Let's have slide 119.

7 What do Respondents point to for the decoding
8 indication of a first image frame limitation, which I
9 believe you've labeled as 8[A]/10[A]?

10 A. So I've shown on my slide 119 one of Dr. Hemami's
11 demonstrative slides, her slide 129. And Respondents
12 identify a flag in the MPEG-1 group of pictures header.

13 And that flag is closed_gop, and they
14 specifically identify that flag when it is set to 1 and
15 decoded with a value of 1 as the claimed indication.

16 Q. For the record, I realize that Dr. Richardson's
17 slides label the decoding and indication limitations as 8[A]
18 and 10[A], and I see that Dr. Hemami's slides label that
19 same limitation as 8[B] and 10[B]. So I just want to put
20 that in the record.

21 Let's have slide 120.

22 Doctor, do you agree with Respondents' position
23 that the closed_gop_flag is an indication of the first image
24 frame as claimed?

25 A. I don't agree. The closed_gop_flag in MPEG-1 is,

1 at most, information about a group of pictures, not about
2 any one picture.

3 Q. Let's have slide 121.

4 Where does closed_gop_flag fit into MPEG-1's
5 syntax structure?

6 A. So slide 121 is two illustrations that I created.

7 At the top, I've shown graphically an MPEG-1
8 bitstream, and I've tried to illustrate that there's a group
9 of pictures header, which is shown as a black box, followed
10 by in bitstream order a group of pictures. Within that
11 group of pictures are a number of coded pictures, which can
12 be of types I, P, and B, as you've heard at some length.
13 And the closed_gop_flag, in my opinion, says something about
14 the entire GOP. So at the most, one could say that it
15 indicates the entire group of pictures.

16 It doesn't do what the claim requires, which I've
17 highlighted in blue, which is to indicate a particular image
18 frame.

19 Q. Let's have slide 122.

20 Does MPEG-1 have other indications for image
21 frames that Respondents haven't identified here?

22 A. There is information about an image frame in
23 MPEG-1, and each image frame has an associated picture layer
24 header, and I've highlighted that in a light green color on
25 my slide 122. I've highlighted some of the syntax of that

1 on the left of the slide. And highlighted its position in
2 the syntax on the right-hand side of the slide. Both of
3 these are extracts from MPEG-1.

4 There's a different layer of the syntax called a
5 group of pictures layer, as I mentioned, and I've
6 highlighted that in blue.

7 Q. I want to ask a follow-up question about
8 closed_gop_flag. If the decoder receives a closed_gop_flag,
9 does it know about the existence of any particular image
10 frame?

11 A. No, it does not. It just knows something about
12 the GOP that it expects to follow the current GOP header.
13 And there are many situations where there could be all sorts
14 of things happening, such as errors during transmission or
15 reading errors if this is a stored media. And so those
16 pictures might not even exist.

17 Q. Let's have slide 123.

18 I'd like to turn now to what I'll call the reset
19 limitation.

20 What's your understanding of how Respondents
21 address the reset limitation for the modified MPEG-1 ground?

22 A. So if we go to slide 124, and this is the reset
23 limitation, which, again, has to happen in a decoder.
24 That's my understanding. It has to happen in a decoder.
25 And so my understanding, as I've already said, is that

1 Respondents address this by creating a modified decoder,
2 which only decodes closed GOPs with no leading B frames, and
3 which carries out decoding in two particular ways, which I
4 mentioned earlier, which Dr. Hemami describes as Method (i)
5 or Method (ii).

6 Q. Let's have slide 125.

7 What do you think of Respondents' modified
8 MPEG-1?

9 A. So this is Dr. Hemami's Method (i). So assuming
10 this method, I simply don't think it makes sense to make all
11 of these modifications from -- I certainly don't think it
12 would be obvious, for a number of reasons, including the
13 reasons I've listed on the right.

14 First of all, Dr. Hemami's modified decoder still
15 has to parse or read the bits of the temporal reference
16 syntax element or value. And this is a 10-bit value in the
17 bitstream. It's always 10 bits. The decoder has to read
18 those 10 bits, and it seems to me that Dr. Hemami is
19 proposing to read those bits and then not look at them in
20 the decoder, ignore -- don't look at what they might be.

21 Which doesn't make sense, I think, given that the
22 information is there.

23 Also, as a result of that, in my view, this
24 modification -- or that particular modification would mean
25 that the decoder no longer could identify or handle certain

1 bitstream errors. What if there's been an error, some
2 frames are missing, and the next temporal reference is
3 actually not zero.

4 And this happens all the time in decoding video.
5 You get glitches, freeze-frames, and so on.

6 In Dr. Hemami's method, we don't know that that
7 error has occurred because she has ignored -- in her method,
8 Dr. Hemami has ignored that value that would tell us what
9 the temporal reference is of the next frame.

10 It would no longer be possible to decode that
11 initial I-picture without a GOP header, as I understand it,
12 because Dr. Hemami says do not decode the temporal reference
13 value. I cannot decode that I-picture successfully without
14 that value.

15 In my view, Dr. Hemami's rewriting what's
16 disclosed in MPEG-1 using what she is looking for in the
17 '321 patent as a roadmap.

18 And then, finally, at least on this list, what
19 has been described in Dr. Hemami's Method (i) is no longer
20 an MPEG-1 decoder. It's a nonstandard decoder. It doesn't
21 follow the standard. It's departed significantly from the
22 standard for no obvious reason that I can see.

23 Q. So slide 126, what's your response to sort of the
24 other potential modification of MPEG-1?

25 A. So, once again, in my view, the series of steps

1 in Dr. Hemami's Method (i) would not be obvious -- they just
2 don't make sense to me, at least for the reasons on the
3 right, most which are the same, but now Dr. Hemami says to
4 decode the temporal reference and then ignore it or discard
5 it and reset it, even if it's 0 to reset it, which I don't
6 understand why one would do that.

7 I think it still has the problem of not handling
8 bitstream errors, because if the temporal reference was
9 anything other than 0, I think Dr. Hemami is saying reset it
10 to 0 even if it's 32 or 200. I don't understand that.

11 And then the final point on the right, I won't
12 read out the ones I've already read out, it's not an MPEG-1
13 decoder, and now it's first decoding a reference value, or
14 some sort of an indication value, and then it's resetting.
15 And that's nowhere in MPEG-1. That's nowhere in the '321
16 patent or any of the standards we've been discussing.

17 So I just don't understand where this comes from,
18 apart from rewriting what's disclosed in MPEG-1.

19 Q. Let's go back to slide 124, please.

20 Doctor, I have a quick follow-up question here.
21 What are -- at the top of your slide 124 there's a reference
22 to leading B-frames.

23 What are those?

24 A. So I think Dr. Hemami actually described this in
25 some detail earlier in the week. And it's a little bit

1 difficult to explain with no diagram, but, just briefly, in
2 MPEG-1, in display order, a GOP can start with an I-picture
3 or it can start with one or more B-pictures, and these are
4 known as leading B-pictures or leading B-frames.

5 Q. What do you think about the Respondents'
6 contention that it would have been obvious for a decoder to
7 use a closed GOP with no leading B-frames?

8 A. I don't agree with that. As I understand
9 Dr. Hemami's and Respondents' proposal, they are proposing a
10 decoder that simply cannot decode anything other than a
11 closed GOP with no leading B-frames. That's no longer an
12 MPEG-1 decoder.

13 I don't -- I genuinely don't understand why one
14 would limit the decoder in such a way, because if you don't
15 want to use leading B-frames, you can just control the
16 encoder to not put them in the bitstream. There's no need
17 to rewrite or redesign a decoder so that it's not
18 standard-compliant. I genuinely don't understand why one
19 would do this.

20 Q. Let's have slide 127, please.

21 And let's turn to the MPEG-1 and Adolph ground.

22 Let's have slide 128.

23 What do Respondents point to for the indication
24 of the first image frame in the MPEG-1 and Adolph ground?

25 A. Once again, Respondents point to closed_gop_flag

1 in the group of pictures layer, particularly when it's set
2 to 1.

3 Q. Do you have the same response as to the
4 closed_gop_flag in MPEG-1 that you did in the modified
5 MPEG-1 ground?

6 A. Yes. I disagree that this would be an indication
7 of the first image frame as claimed for the same reasons.

8 Q. And let's have slide 129.

9 Earlier we were talking about Adolph's IP
10 counter. You called it a tally counter. Where does the IP
11 counter fit in?

12 A. In my view, the IP counter disclosed in Adolph is
13 not a decoded value. It's not decoded at all. In my
14 opinion, based on my reading of the reference, it is an
15 internal counting variable that's not part of the MPEG-1 or
16 MPEG-2 decoding process.

17 Q. Let's have slide 130.

18 Does Adolph's IP counter identify an image frame?

19 A. In my opinion, it does not. And I actually
20 previewed some of this earlier.

21 If one were to look at the IP counter that's part
22 of one of the highlighted rows on my slide 130, there's a,
23 if you like, a weak correlation with frames, but one cannot
24 work backwards from the IP counter and identify a specific
25 image frame. For example, for the IP values of 2, IP

1 counter is 2 for a series of image frames. It doesn't
2 identify any individual image frame for that value.

3 Q. Let's have slide 132, please.

4 Doctor, in your view, does Adolph teach the
5 resetting limitations of claims 8 and 10 of the '321 patent?

6 A. In my view, no, because the IP counter disclosed
7 in the reference, the reference says this counter is reset
8 after a GOP header has been correctly found.

9 So this is different from resetting for an image
10 frame. This is resetting after something has happened with
11 a header, and this doesn't meet the limitation for similar
12 reasons to the ones I described earlier. A GOP header does
13 not -- isn't related to a specific image frame.

14 Q. Let's have slide 133.

15 Do the Respondents have any alternative theories
16 with respect to what they label as identifier values?

17 A. Yes. As I mentioned earlier, I understand
18 Respondents to propose two alternatives, identifier values
19 being IP counter values or identifier values being
20 temporal_reference values.

21 Q. Let's have slide 134.

22 What are your opinions about the sort of proposed
23 alternative theories for the MPEG-1 and Adolph ground?

24 A. So I've mentioned already that for the Adolph
25 ground, or Adolph ground, the IP counters, in my view, don't

1 identify frames. They are not reset for an indicated first
2 image frame. They simply count a tally of how many frames
3 of a certain type have been received.

4 And also they are not decoded. They are not part
5 of the coded bitstream. They are not part of the decoding
6 process specified in MPEG-1. And in the MPEG -- in the
7 alternative, temporal reference and MPEG-1 does say
8 something about the display order of frames, but the decoder
9 doesn't reset temporal_reference. And it's about the
10 display order rather than the bitstream order.

11 Q. Let's have slide 135.

12 I want to quickly turn to the last ground, VLC
13 version 0.7.2. Remind us, is VLC prior art to the '321
14 patent?

15 A. Not in my opinion.

16 Q. Can we have slide 136?

17 Can you give us a timeline of VLC with respect to
18 the '321 patent here?

19 A. So I explained last week, Your Honor, why, in my
20 view, the '321 patent is entitled to a priority date of the
21 23rd of January 2002.

22 A little over a year later, H.264 was published
23 for the first time in May 2003. In May 2004, specifically
24 21st of May, 2004, this version of VLC was published for the
25 first time.

1 Q. And, Doctor, does VLC version 0.7.2 include
2 Nokia's contributions to the H.264 standard?

3 A. I believe it does because it includes an
4 implementation of H.264 video encoder and actually also, as
5 I recall, includes an implementation of an H.264 video
6 decoder. And H.264, in my view, includes the contribution
7 and invention of the '321 patent.

8 Q. Let's have slide 137.

9 Can you remind us -- I believe it was the
10 resetting limitation that Respondents challenged for the
11 '321 patent's priority date. Can you remind us where you
12 found that in the Finnish Patent Application?

13 A. So last week, Your Honor, I pointed you to
14 paragraph 49 of the Finnish Patent Application for the '321
15 patent, which I've shown at the left of slide 137.

16 And, particularly, the language decoder sets the
17 identifier of the first image frame, preferably an I-frame,
18 of the independently decodable sub-sequence at zero.

19 And in my opinion, from the perspective of a
20 person of ordinary skill in the art, that is the decoder
21 resetting that identifier.

22 Q. There's also an excerpt from JVT-B041 on the
23 right-hand side of slide 137. What are you showing us
24 there?

25 A. So I mentioned this document earlier, Your Honor.

1 This is an extract from the JVT-B041 standards contribution
2 that Nokia made after the -- on the same day, actually, as
3 the filing date of the Finnish application. And I've
4 highlighted text in this proposal: We propose that the
5 picture number shall be reset to zero in the first picture
6 of an independently decodable GOP.

7 And my recollection is that that is done in the
8 decoder in that proposal.

9 Q. Doctor, do you think a person of ordinary skill
10 in the art would perceive any material difference between
11 the language, the decoder preferably sets the identifier at
12 zero and the picture number shall be reset to zero?

13 A. In my view, no, particularly from the perspective
14 of a POSITA. We learn about resetting at quite an early
15 stage in engineering education, and these two are, in my
16 opinion, entirely consistent.

17 Q. Let's have slide 138.

18 What was Respondents' rebuttal to your position
19 on priority date for the '321 patent?

20 A. On my slide 138, I've included Dr. Hemami's slide
21 164. And my recollection is that Respondents' position at
22 this point was to look at -- or to identify an extract from
23 the '321 patent itself, I think, that talks about an
24 encoding process, and that identifier values for pictures
25 are encoded and the indicated first picture of an

1 independent sequence is reset.

2 Q. Does Respondents' citation here on your slide 138
3 change your opinion about the priority date of the '321
4 patent?

5 A. It doesn't, firstly, for the reasons I've already
6 explained, and, secondly, this is -- this part of the '321
7 patent is talking about the encoder doing something, the
8 encoder resetting a value.

9 Q. And, Mr. Moreno, we can take the slides down.
10 Dr. Richardson, I just have a few follow-up
11 questions.

12 Were you in the courtroom when Dr. Scott Acton
13 was testifying about sort of the value -- or the coverage, I
14 think I should say coverage of Nokia's patents vis-à-vis
15 patent pool patents?

16 A. I was.

17 Q. What did you think of that testimony?

18 A. Generally, I didn't agree that the conclusions
19 Dr. Acton reached were supported by the evidence that he
20 gave in the hearing yesterday.

21 Q. If one wanted to determine whether a certain
22 concept or idea in the field of video coding was more
23 meritorious or valuable than another idea, how would a
24 person of skill in the art go about that process?

25 A. So, for example, during the development of the

1 standards, including H.264 and H.265, a lot of technical
2 ideas and contributions are evaluated, they are compared,
3 and they are done using certain well-defined and well-known
4 objective mechanisms and metrics.

5 Q. And you mentioned H.264. I think it was the
6 joint video team that developed the H.264?

7 A. Yes.

8 Q. And H.265 was a joint collaborative team on video
9 coding?

10 A. Yes.

11 Q. What are some objective metrics that the joint
12 video team and joint collaborative team on video coding
13 might use to evaluate the merits or value of a proposal?

14 A. So it could be quite a lot of them, but they
15 include, off the top of my head, picture quality, well-known
16 ways of measuring decoded picture quality. They include the
17 bitrate, so that's how much the video has been compressed
18 by.

19 They can and did and have included computation,
20 and that might include processing speed, memory usage, and
21 also the concepts such as the ability to parallelize the
22 concept.

23 They might also include usability issues. So,
24 for example, there's a whole field of research into quality
25 of experience, and one can measure things like how does the

1 decoder handle errors and recover from errors and what's the
2 effect from the user's perspective.

3 Q. Did contributions to the joint video team or
4 joint collaborative team on video coding include any
5 empirical testing?

6 A. Yes. So, generally, yeah, in general, if one
7 were to submit a contribution for a, potentially,
8 modification to the draft standard, one would, in my
9 experience, include test data to support that contribution,
10 and that would actually follow agreed processes, agreed
11 video sequences, agreed measures of quality, agreed measures
12 of bitrate and so on.

13 Q. I want to quickly touch on another topic.

14 Are you familiar with the H.264 and H.265
15 standards?

16 A. Yes, very familiar.

17 Q. What is a subclause in the context of the H.264
18 and H.265 standards?

19 A. So I think Dr. Acton pointed out that these are
20 very big documents, many, many pages. You've probably seen
21 printouts of them, Your Honor. And in that document there
22 are sections, numbered sections, and there are subsections
23 and sub-subsections.

24 So, for example, I might have section 3,
25 subclause 7.3, subclause of that is 7.3.1, 7.3.2, and there

1 are many of these particularly in some parts of the
2 standard, some sections of the standard.

3 Q. Are subclauses like 7.3.2.2 interchangeable with
4 other subclauses like 7.3.2.1?

5 A. No, they are not. Generally each subclause is
6 describing a distinct part of the decoding process or the
7 syntax or whatever it's describing.

8 MR. VERBONCOEUR: Your Honor, I pass the witness.

9 JUDGE MCNAMARA: Thank you, Mr. Verboncoeur.

10 CROSS-EXAMINATION

11 BY MR. WILSON:

12 Q. May I proceed, Your Honor?

13 JUDGE MCNAMARA: Yes, Mr. Wilson.

14 Q. Jack Wilson on behalf of the Respondents, ASUS.
15 Dr. Richardson, good to see you again this
16 morning.

17 A. Likewise, good afternoon, or -- it's just
18 afternoon.

19 Q. I'm hoping we can start by having you clear
20 something up that we've talked about in the hearing.

21 There's been some discussions about what a video
22 codec is, right?

23 A. Yes.

24 Q. And you were here when Dr. Moulin testified that
25 a video codec is hardware, correct?

1 A. I believe so. I would just point out that for
2 some of the portions of testimony I had to leave the room,
3 but -- could you ask the question again? Sorry.

4 Q. You were here when Dr. Moulin testified that a
5 video codec is hardware, correct?

6 A. I remember him talking about software and
7 hardware in relation to video coding.

8 Q. Mr. Davis, could we bring up the trial transcript
9 from March 5th at pages 358 at lines 13-22?

10 Dr. Richardson, you were here -- this is
11 Dr. Moulin's testimony -- and he was talking about the
12 codec, the extension that he downloaded, and at lines 13 he
13 was asked: Okay. And that extension could be an AV1 codec,
14 browser, extension or media player?

15 His response: No, no, no, the codecs is
16 hardware. And he continues.

17 You were here for that testimony, sir?

18 A. I'm honestly not sure because -- yeah, I'm
19 honestly not sure.

20 Q. You were here when Dr. Chrissan testified about
21 what a video codec is, correct?

22 A. Again, I was here for at least portions of
23 Dr. Chrissan or Chrissan's -- I think it's Chrissan --
24 testimony, but only portions. I'm sorry to interrupt.

25 Q. Do you understand that Dr. Chrissan testified

1 that video codecs are hardware only, correct?

2 A. I don't recall that specific testimony.

3 Q. Mr. Davis, can we bring up the March 5th trial
4 testimony again at page 458 at lines 13-18?

5 This was Dr. Chrissan testifying.

6 Question. Do you recall being asked on direct
7 whether you agreed with Dr. Moulin that video codecs are
8 hardware only?

9 Answer. Yes.

10 And you testified that you agreed with him,
11 correct?

12 Yes.

13 Were you here for that testimony, sir?

14 A. Again, I'm really not sure because it would
15 depend on whether the confidential record sign was up.

16 Q. But, sir, you would agree with me that a video
17 codec can be software, correct?

18 A. A video codec can be software, Your Honor, yes.

19 Q. So when Dr. Moulin and Dr. Chrissan testified
20 that it's hardware, they are incorrect, fair?

21 A. I genuinely don't know the context or remember
22 the context of those discussions. Personally I would, as I
23 think I explained in the opening, my opening portion, Your
24 Honor, it's my experience that video coding can be done in
25 software only, it is often done in consumer devices using a

1 combination of software and hardware. And in the early part
2 of my career, Your Honor, I worked with video codecs that
3 were hardware only.

4 Q. Respectfully, Dr. Richardson, I have a little bit
5 of a time budget, so I'm going to ask you to focus on my
6 question. I want to talk about the '267 patent.

7 You were here -- were you here when Dr. Moulin
8 testified that when pixel values are interpolated, the
9 result is a prediction at a higher second precision?

10 A. In the -- that could have been in the context of
11 the '267 patent. I think in the context of the '267 patent,
12 predictions are at a higher precision. I'm not sure if that
13 was the context of that testimony.

14 Q. In particular, he pointed to interpolation as
15 resulting in the higher precision prediction, correct?

16 A. I don't recall precisely that testimony.

17 Q. Do you recall having your deposition taken in
18 this case?

19 A. I do.

20 Q. And you agreed that, in deposition, that
21 interpolation is one way to increase precision, correct?

22 A. So interpolation can increase precision. I agree
23 with that.

24 Q. Right. It's one way. There are multiple ways.
25 But interpolation is one way, correct?

1 A. I'm pretty sure we had that discussion, yeah. I
2 think I would -- I think I would still agree with that.

3 Q. Now, in your direct you testified that weighted
4 prediction, on the other hand, doesn't provide any
5 additional precision, correct?

6 A. In the context of the Walker reference, in the
7 context of H.264, weighted prediction, and in the context of
8 a particular step in that, which is applying a multiplier,
9 such as w0 or w1, to a prediction value, that does not
10 increase precision.

11 Q. And then in the opening counsel for Nokia
12 explained that when the prediction pred0 has 256 potential
13 values, and when we multiple by weight w0, we still have 256
14 potential values, we're not getting any precision here,
15 we're not getting any additional information, we're just
16 scaling.

17 Do you agree with that, sir?

18 A. If the multiplication is simply a scaling and if
19 it's done specifically with the same multiplication factor
20 for all pixels or samples of a current block, then the
21 precision is not increased under any of the three claim
22 constructions.

23 Q. And you would agree that you're not getting any
24 new additional information by doing that weighted scaling,
25 correct?

1 A. I would put it in the way I just put it. I'm not
2 going to introduce new words such as "information."

3 Q. Now, Dr. Richardson, you've read the 1380 Initial
4 Determination, correct?

5 A. I believe I recall reading at least parts of it.
6 I'm not sure that I've read all of it, yeah.

7 Q. You cited the 1380 Initial Determination as part
8 of your analysis for this case, correct?

9 A. I recall citing it at least in my -- in one or
10 more of my expert reports.

11 Q. And you were present when Dr. Schonfeld testified
12 in this case, correct?

13 A. Yes. Again, I was present except for certain
14 points. If he was on the confidential record for source
15 code, third-party source code, then I would not have been
16 present.

17 Q. You were here when Dr. Schonfeld discussed the
18 1380 Initial Determination in the context of Walker, right?

19 A. I remember quite a lot of discussion in
20 Dr. Schonfeld's testimony of the 1380 hearing determination
21 with respect to the Walker reference.

22 Q. And in your direct testimony today you didn't
23 discuss the 1380 investigation, correct?

24 A. I don't recall citing it in my direct testimony
25 today.

1 Q. And, sir, you didn't attempt to reconcile the
2 positions you're taking in this case with the Initial
3 Determination in the 1380 investigation, correct?

4 A. I don't recall discussing that in my testimony
5 today.

6 Q. You're aware, sir, that Judge Elliot found that
7 the Walker reference invalidated claims of the '267 patent
8 as he wrote in the 1380 Initial Determination, correct?

9 A. That's roughly my recollection. I don't recall
10 the details of which claims and which claim elements.

11 Q. But there were claims of the '267 that Judge
12 Elliot concluded were invalid in view of the Walker
13 reference in the 1380 investigation, correct?

14 A. That's broadly consistent with my recollection.

15 Q. And, in particular, Judge Elliot found that
16 Walker's equations show variables and then a bit-depth of
17 16, i.e., precision, correct?

18 A. That's -- I broadly recall something similar to
19 that. I don't recall the exact wording.

20 Q. Mr. Davis, could we bring up Judge Elliot's
21 initial determination, at RX-1945, and specifically page
22 141.

23 Let's just zoom in on that top paragraph before
24 that figure.

25 Dr. Richardson, in the Initial Determination of

1 the 1380 investigation, Judge Elliot says, for support,
2 Amazon points to the following equations and tables which
3 show these variables and their bit-depth of 16, i.e.,
4 precision, correct?

5 A. I see that text.

6 Q. Now let's dig into Walker a little bit.

7 In your direct you talked about the Walker
8 reference discussing four different codecs, correct?

9 A. I recall the Walker reference discussing four
10 different specifications for video decoding.

11 Q. And if I understood your presentation correctly,
12 you were suggesting that Walker was limited to those four
13 specifications, correct?

14 A. I don't recall using those words. I recall
15 explaining that Walker's main focus, as I understand it, was
16 on a unified decoding process that applies to each of those
17 four or all of those four specifications that I mentioned.

18 Q. You would agree with me that the Walker reference
19 isn't limited to those four specifications that you talked
20 about in your direct, correct?

21 A. I don't recall whether Walker mentions other
22 specifications, but Walker's unified decoding method is
23 directed to those four specifications. That's my
24 recollection.

25 Q. Mr. Davis, could we bring up the Walker

1 reference? I believe it's JX-0683. And let's look at page
2 17, paragraph 46, please.

3 Dr. Richardson, do you recognize paragraph 46 of
4 the Walker reference?

5 A. I think so, yes.

6 Q. And it begins, at the most prevalent weighted
7 bi-prediction implementations will be discussed, right?

8 A. Yes.

9 Q. And in this paragraph 46 he refers to the MPEG-4
10 standard that you identified, RealVideo 9 that you
11 identified, Windows Media Video 9, and H.264, right?

12 A. Yes.

13 Q. And those are the four you identified in your
14 direct testimony, correct?

15 A. Yes.

16 Q. And at the end of this paragraph, Walker states,
17 as those of ordinary skill in the art can appreciate, other
18 implementations of bidirectional prediction can be
19 accommodated without departing from the spirit or scope of
20 the disclosed methods, correct?

21 A. I see that text.

22 Q. Okay. Mr. Davis, let's bring up Walker at
23 Table 2, and that should be on the exhibit page 19.

24 Dr. Richardson, let's dig into Walker a little
25 bit.

1 Now, there are two variables that you identified
2 in your direct, pred0 and pred1, correct?

3 A. I identified those two variables in my direct
4 testimony today.

5 Q. And pred0 and pred1 are Walker's predictions,
6 fair?

7 A. In my opinion. I think not in Dr. Schonfeld's
8 opinion.

9 Q. You would agree, though, that pred0 and pred1
10 each have 8 bits, correct?

11 A. That's consistent with my recollection of how
12 Walker defines these variables or these -- yes. Sorry.

13 Q. Thank you. And Walker also has two values called
14 w0 and w1, correct?

15 A. In this table, yes.

16 Q. And w0 and w1 refer to weight 0 and weight 1,
17 fair?

18 A. That's broadly my recollection.

19 Q. Well, Mr. Davis, let's go to Table 1, which is on
20 page 18. Thank you.

21 Sir, Table 1 of Walker shows that w0 and w1 are
22 represented by 8 bits, correct?

23 A. Walker chooses to represent these by 8 bits.

24 Q. And you would agree with me that the values w0,
25 w1 are independent of pred0 and pred1, correct?

1 A. In H.264 these are not necessarily independent.
2 The weighting factors w0 and w1 --

3 Q. Sir, my question is about Walker, not H.264.

4 So w0 and w1 are independent of pred0 and pred1
5 in Walker, correct?

6 A. With respect, this is H.264, an implementation of
7 H.264 that Walker is describing in Table 1.

8 Q. So you disagree that w0, w1 is independent of
9 pred1 and pred0 as discussed in Walker, correct?

10 A. Not completely independent. pred0 and pred1 are
11 obtained from a first in reference, second reference
12 picture. w0 and w1 are the weighting factors for that first
13 and second reference picture.

14 Q. Sir, I want you to listen to my question
15 carefully.

16 w0 and w1 are weighting factors applied to but
17 not correlated with the prediction values pred0 and pred1.

18 Do you agree?

19 A. I don't necessarily see why they would be
20 correlated.

21 Q. So they are not correlated, fair?

22 A. They might not be correlated. I haven't actually
23 worked it out.

24 Q. Can we bring up Dr. Richardson's rebuttal report
25 at paragraph 213, please?

1 Sir, in paragraph 213 you state, w_0 and w_0 are
2 weighting factors applied to but not correlated with the
3 prediction values $pred_0$ and $pred_1$, correct?

4 A. I'll take your word for it, yep.

5 Q. Sir, that's your report, correct?

6 A. I'm happy to accept that.

7 Q. You don't recognize the words that are in your
8 report?

9 A. There's a lot of paragraphs, but I can look it
10 up, but I'm happy to take your representation. I'll look it
11 up just to check.

12 Q. Let's go back to Table 2 of the Walker reference,
13 please.

14 Dr. Richardson, Table 2 shows there's an
15 operation 1, correct?

16 A. Yes.

17 Q. And operation 1 of Walker multiplies $pred_0$ times
18 w_0 , correct?

19 A. Or $pred_1$ times w_1 , as I recall.

20 Q. Fair. The result of either of those
21 multiplications, $pred_0$ weight 1 or $pred_1$ weight 1, is stored
22 in a 16-bit result, correct?

23 A. As I recall, Walker chooses to use a 16-bit
24 register to hold those -- either of those two
25 multiplications.

1 Q. Sir, you would agree with me that you can
2 represent more possible values using 16 bits than 8 bits,
3 right?

4 A. Yes.

5 Q. You also agree that multiplying a variable that
6 can take the full range of its possible values by another
7 variable that can take the full range of its possible values
8 can increase the number of possible values for the resulting
9 product, correct?

10 A. If these are variables and not constants, then I
11 agree with you.

12 Q. Now, sir, in your direct you presented an example
13 to illustrate the interpretation of precision.

14 And Mr. Davis, could we bring up CDX-11.37.

15 Sir, this is the demonstrative 37 that you were
16 discussing in your direct, correct?

17 A. This is a demonstrative I discussed in my direct
18 testimony.

19 Q. If we focus on the left side of this, pred0, you
20 have four unique values, correct?

21 A. In that 3x3 illustrated block, yes.

22 Q. And then there's a multiplication by 2 that
23 results in all the values being scaled by 2, correct?

24 A. That's correct.

25 Q. And, in your view, that is not increasing

1 precision, correct?

2 A. Correct.

3 Q. And you're sure about that? Multiplying by 2
4 doesn't increase the precision?

5 A. If 2 is a constant for all of the values in the
6 block, that is correct.

7 Q. You would agree with me, though, that shifting
8 the values to the left of a binary value by 1 bit position
9 is a computationally simple way to multiply the value by 2,
10 correct?

11 A. Generally, yes.

12 Q. So shifting the value of the block to the left by
13 1 bit is a multiplication by 2, correct?

14 A. It can be used to achieve a multiplication by 2.

15 Q. Mr. Davis, can we bring up claim 4 of the '267
16 patent, JX-7, at 27, please.

17 Sir, claim 4 says at the end that the second
18 prediction is obtained by shifting the values of said second
19 reference block to the left, correct?

20 A. You read that correctly.

21 Q. And, sir, you did not consider claim 4 of the
22 '267 patent when you were performing your analysis for this
23 case, correct?

24 A. I don't think that's correct. I recall
25 considering claim 4, talking about claim 4, writing about

1 claim 4, rather, in my rebuttal expert report.

2 Q. Sir, at your deposition you couldn't recall
3 considering claim 4 of the '267 patent when you were
4 performing your analysis for this case, correct?

5 A. I don't recall the context of that.

6 Q. Mr. Davis, can we bring up Dr. Richardson's
7 December 5th deposition at page 252 and span to, say, 253,
8 please, to line 20. Thank you.

9 Sir, at your deposition you were asked:

10 Did you consider claim 4 of the '267 patent when
11 you were performing your analysis for this case?

12 Answer. Not that I recall. My recollection is
13 that it's not asserted in this case.

14 That was your deposition testimony, sir?

15 A. If I didn't remember at that stage, I didn't
16 remember.

17 Q. Now, you've also -- we can take that down.

18 You've also taken the position that a person of
19 ordinary skill would have no motivation to combine Walker
20 and Srinivasan, correct?

21 A. Yes, that's my recollection.

22 Q. You would agree with me that Walker describes the
23 operation of a conventional bi-prediction in the standards,
24 correct?

25 A. Say that again, please?

1 Q. Walker describes the operation of conventional
2 bi-prediction in the various standards and specifications
3 that you mentioned earlier, correct?

4 A. At least the four standards and specifications
5 that I mentioned in my direct testimony when talking about
6 Walker.

7 Q. And conventional bi-prediction standards in
8 Walker support the use of B-frames, correct?

9 A. B-frames, B-pictures, or B-macroblocks generally,
10 at least some of those -- I think at least some of those
11 four methods.

12 Q. Now Srinivasan, sir, also -- Srinivasan describes
13 motion compensation prediction techniques used in
14 conventional video coding systems, correct?

15 A. Walker -- sorry -- Srinivasan, as I recall, is
16 directed to interpolation, I think, in the context of video
17 coding.

18 Q. And Srinivasan, in fact, refers to B-frames for
19 bidirectional prediction, correct?

20 A. I don't recall precisely, but I wouldn't be
21 surprised if it did.

22 Q. Mr. Davis, could we bring up RX-2024, that's
23 Srinivasan, at lines 9, 26-32.

24 Sir, do you recognize this passage from
25 Srinivasan?

1 A. Is it possible to zoom out a little bit? That's
2 really big in my monitor.

3 Q. Sure.

4 Mr. Davis, can we zoom out, please?

5 A. Thank you.

6 Q. Sir, this portion of Srinivasan, it states, a
7 predicted frame, also called P-frame, B-frame, for
8 bi-prediction or inter-coded frame, is represented in terms
9 of prediction or difference from one or more other frames,
10 fair?

11 A. I see that text.

12 Q. Let me shift gears and talk about the '321
13 patent.

14 Sir, the '321 patent, as you mentioned, relates
15 to random access and video coding, correct?

16 A. It does relate to that issue, yes.

17 Q. And it's Nokia's position that H.264's IDR
18 picture is the decoded at least one image frame, correct?

19 A. Could you ask that again, please?

20 Q. It's Nokia's position that the IDR picture in
21 H.264 satisfies the at least one image frame?

22 A. Nokia's position -- that's broadly my
23 recollection. It sounds like something that -- on the
24 infringement side. Would that be correct?

25 Q. Let me move on.

1 And H.264 signals an IDR frame using a NAL unit
2 type, correct?

3 A. So in H.264 a NAL -- a certain NAL unit type
4 indicates to a decoder that the NAL unit contains -- I think
5 it's a slice of an IDR picture.

6 Q. That's right. The NAL unit type is defined or
7 sent in the slice header, correct?

8 A. No, I don't think that's correct.

9 Q. Let me rephrase.

10 The NAL unit type is found, in a slice header, in
11 a slice-related header, correct?

12 A. I don't think it's found in the slice header in
13 H.264. I could be wrong about that. I don't have the
14 standard -- well, I may have the standard in front of me,
15 but that's not my recollection.

16 Q. You would agree it's in a header however? Maybe
17 it's not the slice, but it's in a header, correct?

18 A. Yeah. I would normally go to the standard at
19 this point, but my general recollection is that the NAL unit
20 type is a property of the NAL unit, which is a certain layer
21 of the H.264 syntax.

22 Q. And, in particular, a header?

23 A. It's a certain layer of the syntax, I can't
24 remember if it's described as a header. Yeah, that's my
25 recollection.

1 Q. Now, for invalidity, it's your view that MPEG-1's
2 closed_gop_flag is not an indication of a first image frame,
3 correct?

4 A. In the context of the '321 patent, that's broadly
5 correct.

6 Q. And that's because the closed_gop_flag is present
7 in a structural level of the coded bitstream that relates to
8 an entire group of coded pictures, correct?

9 A. That's part of my reasoning. I wouldn't say
10 that's the whole of it.

11 Q. You agree with me, sir, that the '321 patent
12 explains that indications of image frames may be included in
13 header fields, right?

14 A. I don't recall the precise language, but I recall
15 something along those lines.

16 Q. Now, with respect to a closed GOP, sir, you would
17 agree that the frame immediately following the
18 closed_gop_flag will always be the first frame of the closed
19 GOP, correct?

20 A. Are we talking MPEG-1 now?

21 Q. Yes, sir.

22 A. So if there are no errors, then the -- there will
23 be, following a group of pictures' header, there will be a
24 series of coded pictures, and one of those will be first.

25 Is that what you're asking?

1 Q. Yes. Following the closed_gop_flag the --
2 following that flag will always be the first frame of the
3 closed GOP, correct?

4 A. Following the GOP header, assuming no errors,
5 there will be a series of coded pictures forming a GOP in
6 MPEG-1, and the first one of those will be first.

7 Q. And that's true when the closed_gop_flag is set
8 to 1, correct?

9 A. For closed_gop_flag set to 0 or 1 in MPEG-1,
10 following the GOP header, assuming no errors, will be a
11 series of coded pictures, and one of those will be first.

12 Q. In MPEG-1 the first property for a group of
13 pictures is that, in bitstream order, it would begin with an
14 I-picture, correct?

15 A. My recollection is that in MPEG-1 a property of a
16 group of pictures is that the first of those in decoding
17 order should be an I-picture.

18 Q. And after that I-picture in MPEG-1, there can be
19 any number of I, P, or B-pictures in any order, correct?

20 A. After that, there may be a number of I, P, and/or
21 B-pictures. I don't recall whether there is a limit on
22 that. I recall that it can be quite a large number.

23 Q. But the smallest group of pictures in MPEG-1
24 would be a single I-frame, correct, or single I-picture,
25 correct?

1 A. I think that is -- I think that is compatible
2 with the MPEG-1 specification, I think.

3 Q. Mr. Davis, why don't we bring up the MPEG-1
4 standards, JX-61.085.

5 Sir, we can stay broad to give you some context,
6 but you see here we're talking about the group of pictures
7 in MPEG-1, correct? And that's JX-61.

8 A. So we don't have the heading section before this,
9 but I recall this section. So I think that's correct.

10 Q. And, Mr. Davis, if you could zoom in on Fig. D.17
11 of the MPEG-1 standard.

12 This page illustratable some examples of groups
13 of pictures, correct?

14 A. That's correct.

15 Q. And at the top of this pyramid is a single
16 I-picture, correct?

17 A. At the top of Fig. 2.17 from the MPEG-1 standard,
18 it shows a single I-picture as a group of pictures.

19 Q. So in MPEG-1 a group of pictures with a single
20 I-frame is a -- is syntactically valid, correct?

21 A. That would seem to be correct based on what you
22 just showed me.

23 Q. Now, Mr. Davis, could we bring up
24 Dr. Richardson's demonstrative slides, CDX-11 at 121,
25 please.

1 Now, sir, you remember talking about this on your
2 direct, correct?

3 A. Say that again, please.

4 Q. You remember testifying about CDX-11.121 in your
5 direct, correct?

6 A. Yes, I do.

7 Q. And I wrote down for this slide you were
8 discussing that a closed_gop_flag is not an indication of a
9 first image frame in MPEG-1, correct?

10 A. I think that's what I said, and that's certainly
11 my opinion, yes.

12 Q. And you recall that Nokia made the same argument
13 in the 1380 investigation, correct?

14 A. I wasn't involved in the 1380 investigation, but
15 that's roughly my recollection, that that argument was
16 presented.

17 Q. And you understand that Judge Elliot agreed that
18 the closed GOP in fact met this limitation, correct?

19 A. I don't recall the relevant wording of Judge
20 Elliot's determination as broadly consistent with my
21 understanding and recollection.

22 Q. Mr. Davis, let's go ahead and bring up the 1380
23 initial determination again. That's RX-1945.0057. That's
24 page 50.

25 Sir, in the middle of this page there is a

1 paragraph about Nokia's argument with respect to this
2 limitation. And it ends explaining, from Judge Elliot, that
3 the limitation is met at least some of the time, correct?

4 A. I'm not seeing much context here. I certainly
5 see those words. I'm not quite sure what Judge Elliot is
6 talking about here.

7 Q. Regardless, sir, you didn't discuss Judge
8 Elliot's interpretation of the GOP flag in your direct
9 testimony today, correct?

10 A. What do you mean by "the GOP flag"?

11 Q. The closed GOP flag that we're talking about for
12 MPEG-1 that's the centerpiece of the MPEG-1 invalidity
13 grounds.

14 A. If that's what Judge Elliot is talking about
15 here, then, no, I don't think I discussed that, but I'm not
16 quite sure of the context here.

17 Q. Let's go back to the MPEG-1 reference, again,
18 JX-61, at page 87.

19 Sir, in the middle of this page there is a
20 discussion of the temporal reference, correct?

21 A. Yes.

22 Q. And the temporal reference is a 10-bit number
23 which can be used to define the order in which the pictures
24 must be displayed, correct?

25 A. You read that correctly.

1 Q. And the temporal reference is set to 0 for the
2 first picture for each group of pictures, correct?

3 A. Wait a minute. Say that again?

4 Q. The temporal reference is set to 0 for the first
5 picture in display order for each group of pictures,
6 correct?

7 A. That's correct, yes.

8 Q. But now you disagree that MPEG-1 satisfies the
9 limitation of resetting the value to zero with respect to
10 temporal reference, correct?

11 A. The decoding limitations, I don't agree that
12 MPEG-1 alone satisfies the decoding limitations of the
13 asserted claims of the '321 patent.

14 Q. And for temporal reference, that's because the
15 claims require the decoder to reset the identifier value to
16 zero, correct?

17 A. My recollection is that the claims do require the
18 decoder to set the identifier value to zero.

19 Q. But it's your view that, because the MPEG-1 -- or
20 because in MPEG-1 it's the encoder that assigns the temporal
21 reference value that it doesn't qualify for that limitation,
22 correct?

23 A. Well, MPEG-1, the MPEG-1 standard simply does not
24 disclose a decoder resetting temporal reference to zero.
25 It's just not disclosed. That's why I disagree.

1 Q. Right. But temporal reference is set by the
2 encoder, correct?

3 A. In MPEG-1 temporal reference in a compliant
4 bitstream must be equal to zero for the first picture in
5 display order of a group of pictures.

6 Q. And it's set by the encoder, sir?

7 A. What encoder are you asking?

8 Q. The encoder, the encoder that sends a group of
9 pictures.

10 A. I'm confused now. What are you asking me about?

11 Q. I'll move on.

12 It's your opinion, sir, that a counter does not
13 satisfy the claim's requirement that identifier values be
14 decoded according to a numbering scheme and then reset for
15 the first image frame, correct?

16 A. The counter values in Adolph pointed to by
17 Respondents, I don't agree they satisfy those limitations of
18 the asserted claims.

19 Q. And, in part, because they aren't decoded,
20 correct?

21 A. That was part of my reasoning that I gave in my
22 testimony today.

23 Q. And sticking on Adolph, you agree with me, sir,
24 that it's your opinion that I, P, and B-counters cannot be
25 identifier values that are reset because they are internal

1 counters, correct?

2 A. In my opinion they simply don't satisfy those
3 elements that you mentioned of the asserted claims. There's
4 a number of reasons, which I gave in my direct testimony.

5 Q. And one of them is that they are internal
6 counters.

7 A. In my view they are internal counters as
8 disclosed by Adolph and they are not decoded from the
9 bitstream.

10 Q. Now, sir, you could develop a decoder that
11 practices claim 8 of the '321 patent without using reference
12 picture selection, correct?

13 A. I haven't tried it, but I don't recall the claim
14 itself mentioning the words "reference picture selection."

15 Q. Mr. Davis, could we bring up the March 5th trial
16 testimony at page 308 to 309? I'm sorry. December 5th
17 deposition transcript, please.

18 Just so the record is clear, because I think I
19 botched that in multiple ways, Mr. Davis, we're going to
20 look at Dr. Richardson's deposition testimony from December
21 5th at pages 308 to 309, lines 18 to 15.

22 We'll withdraw the question.

23 Dr. Richardson, you remember being asked
24 questions about Dr. Acton's analysis in your direct
25 examination, correct?

1 A. Yes.

2 Q. You didn't provide any affirmative opinion about
3 the value of the asserted patents, correct?

4 A. I don't believe I've been asked to provide such
5 an opinion, and I don't recall providing such an opinion in
6 this matter.

7 Q. And if I recall your testimony, you testified
8 that the technical value can be evaluated in the
9 standard-settings or specification-setting bodies; is that
10 right?

11 A. I'm not sure I used the words "technical value."
12 I don't actually remember the words I used. But certainly
13 the merit of technical contributions can be evaluated in
14 that situation in a number of ways.

15 Q. Mr. Davis, let's go to, instead, JX-0187, to the
16 first page, please.

17 Sir, you recognize that JX-0187 is Nokia's
18 proposal with respect to the '267 patent, correct?

19 A. It's a proposal by Nokia authors, and my
20 recollection is that this relates to the '267 patent.

21 Q. And you testified about this proposal in your
22 direct examination today, correct?

23 A. I think so, yes. Yes, I did.

24 Q. And this is a proposal that Nokia is making to
25 the standards bodies, correct?

1 A. To the standard what, sir?

2 Q. To the standard body, correct?

3 A. It's a proposal made by one or more Nokia
4 engineers, as I recall, to the -- one of the meetings of the
5 JCT-VC group.

6 Q. And, sir, you would agree with me that, if we go
7 to the conclusion on page 3, that the inventors
8 characterized this as a minor fix on how bidirectional
9 prediction is generated, correct?

10 A. I see the words you're highlighting. I recall
11 reading these words before.

12 Q. And that's with respect to the '267 patent,
13 correct?

14 A. This is with respect to this particular
15 contribution, as I recall.

16 Q. Mr. Davis, could we please bring up JX-0208 at
17 page 1, please?

18 Dr. Richardson, you testified in your direct
19 about the proposals Nokia made with respect to the '321
20 patent, fair?

21 A. Yes, that's correct.

22 Q. And JX-0208 was one of the proposals you
23 identified, correct?

24 A. This appears to be the B041 proposal which I
25 mentioned earlier, yes.

1 Q. And the inventors here characterized their
2 proposal as a simple modification into the header syntax to
3 signal random access positions, correct?

4 A. I see those words that you just read out in the
5 first sentence of this contribution document.

6 I'm sorry. Could I have the question again? I
7 think I answered -- I'm not sure I answered the question you
8 asked.

9 Q. The document is proposing a simple modification
10 into the slice header syntax to signal random access
11 positions, correct?

12 A. That's broadly correct. That's broadly
13 consistent with the language I see here, yes, for this
14 document.

15 MR. WILSON: Your Honor, at this time I need to
16 have co-counsel do the examination for the '714 patent.

17 JUDGE MCNAMARA: Yes. Thank you.

18 MR. HOUMAND: Corey Houmand for Morgan Lewis on
19 behalf of Acer.

20 Your Honor, just as a point of procedure, I've
21 got about 15 to 20 minutes for my exam. I can start now or
22 I can start after our lunch break.

23 JUDGE MCNAMARA: I suspect everybody could use a
24 lunch break at this point, and particularly Dr. Richardson.
25 So I know we said I'd stop promptly, but we're close enough.

1 How about if I see you in an hour?

2 Are we still good on time?

3 MR. HOUMAND: I believe so for Respondents.

4 JUDGE MCNAMARA: Are we okay?

5 MR. VERBONCOEUR: I believe we are for Nokia,
6 Your Honor.

7 MS. DUCCA: Your Honor, by my calculation, we
8 should have two hours and 20 minutes left.

9 JUDGE MCNAMARA: Okay. Thank you. I'll see you
10 in an hour.

11 (Whereupon, the proceedings recessed at 12:52
12 p.m.)

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1 AFTERNOON SESSION

2 (In session at 2:00 p.m.)

3 JUDGE MCNAMARA: Hello, everyone. Thank you.

4 It's snowing.

5 Please be seated.

6 So I guess we've got winter redux here. Here we
7 go again.

8 MR. HOUMAND: Sure seems like it.

9 JUDGE MCNAMARA: It does, doesn't it.

10 MR. HOUMAND: Corey Houmand from Morgan Lewis,
11 Your Honor. May I begin?

12 JUDGE MCNAMARA: Yes, please.

13 MR. HOUMAND: Okay.

14 CROSS-EXAMINATION

15 BY MR. HOUMAND:

16 Q. Good afternoon, Dr. Richardson.

17 A. Good afternoon.

18 Q. My name is Corey Houmand. I represent Acer. I'm
19 going to ask you a few questions about the '714 patent,
20 albeit on a limited schedule. So I just ask that you listen
21 to and answer the questions that I'm asking. Sound fair?

22 A. Of course.

23 Q. Okay. Dr. Richardson, there have been at least
24 three Inter Partes Review proceedings involving the '714
25 patent before the Patent Trial and Appeal Board, correct?

1 A. I can't remember the exact number. I recall I've
2 been involved with at least two, I think.

3 Q. At least two. Two of those IPR proceedings were
4 filed by Amazon in April 2024, right?

5 A. I'm happy to accept that.

6 Q. Okay. The third of those IPR proceedings was
7 filed by ASUS in June 2025, right?

8 A. I'm not sure of the dates.

9 Q. Okay. But you're aware of a currently ongoing
10 Inter Partes Review proceedings filed by ASUS that was
11 instituted, correct?

12 A. I believe there is -- yeah, I'm not sure.
13 There's been so many IPRs, I'm not sure of the details of
14 each one.

15 Q. Well, you recently filed a declaration, signed
16 and filed a declaration in the ASUS IPR proceeding involving
17 the '714 patent just a few days ago, right, sir?

18 A. I recall filing a declaration a few days ago,
19 yes.

20 Q. Okay. Now, and you submitted declarations, not
21 only in the ASUS IPR proceedings, but you did so in the two
22 Amazon IPR proceedings as well, right?

23 A. I think that's correct, yes.

24 Q. Can we have RDX-19.2, please, Mr. Davis?

25 Now, Dr. Richardson, on August 12, 2024, you

1 submitted two declarations in support of Nokia's preliminary
2 response to Amazon's two IPR petitions, correct?

3 A. That fits my recollection.

4 Q. And in those declarations you argued -- well,
5 first off, let me just back up and say, in all the IPR
6 petitions and proceedings that we've been discussing, Amazon
7 and ASUS were arguing that the '714 patent is rendered
8 obvious by Rusert in combination with Karczewicz '721,
9 right?

10 A. I don't recall all the grounds. I believe there
11 were other grounds, but my recollection is that that ground
12 appears in all of these proceedings --

13 Q. Okay.

14 A. -- at least the ones that I've been involved
15 with.

16 Q. And in your declarations that you signed and were
17 submitted on August 12th, 2024, you argued that Rusert and
18 Karczewicz did not render the '714 patent obvious, right?

19 A. That fits my recollection, yes.

20 Q. Let's have RDX-19.3, please.

21 In fact, Dr. Richardson, you specifically argued
22 that Rusert and Karczewicz do not teach, quote, determining
23 a subset of spatial motion vector prediction candidates
24 based on a location of the block associated with the first
25 spatial motion vector prediction candidate, as required by

1 the claims, correct?

2 A. Thank you for reading that correctly. I've
3 noticed a typo. I've read this many times. I didn't see
4 that before. So, yes, that's what I intended to say there.

5 Q. Okay. Thank you.

6 Let's go to RDX-19.4.

7 Now, the PTAB did not agree with the arguments
8 that you presented in your August 2024 declarations,
9 correct?

10 A. My recollection is that both of these proceedings
11 were -- the PTAB granted institution on both of these IPR
12 proceedings.

13 Q. Right. And specifically on November 7th, 2024,
14 that's when the PTAB instituted Inter Partes Review on both
15 of Amazon's IPR petitions, correct?

16 A. That's consistent, I think, with my memory for
17 the two petitions. I can't quite see the numbers, but I'm
18 happy to take your word for it.

19 Q. Okay. Let's have RDX-19.5, please, Mr. Davis.

20 Let's see how the PTAB addressed your arguments
21 regarding the determined a subset limitation.

22 The PTAB ruled that, with respect to Rusert,
23 quote, petitioner is correct that the determined subset does
24 depend on the location of the first selected spatial motion
25 vector prediction candidate.

1 Did I read that correctly?

2 A. Yes.

3 Q. Let's have RDX-19.6.

4 The PTAB went on to conclude that, quote, if the
5 first selected candidate is at the location of block 5, then
6 the subset would be the four members 1, 2, 3, and 4, and if
7 the first selected candidate is at the location of block 3,
8 then the subset would be the two members 1 and 2.

9 Did I read that correctly?

10 A. I believe you did.

11 Q. Let's now have RDX-19.7, please, Mr. Davis.

12 And the PTAB concluded in that same paragraph
13 that, quote, the members of the determined subset depend on
14 the location of the block associated with the first selected
15 spatial motion vector prediction candidate as petitioner
16 contends.

17 Did I read that sentence correctly?

18 A. I believe so, yes.

19 Q. Let's now have Dr. Richardson's slide 70, please,
20 which is CDX-11.70.

21 Now, Dr. Richardson, despite the PTAB's rulings,
22 it's still your position that Rusert and Karczewicz do not
23 determine a subset of spatial motion vector prediction
24 candidates based on the location of the block associated
25 with the first spatial motion vector prediction candidate,

1 correct?

2 A. My opinion is, as I stated earlier today, that
3 the Rusert and Karczewicz reference do not render obvious
4 these limitations. That's still my opinion.

5 Q. That's still your opinion. And you didn't tell
6 the ALJ about any of the PTAB's prior rulings regarding the
7 '714 patent when you were testifying.

8 A. I don't recall mentioning PTAB rulings of any
9 sort while I was testifying today.

10 Q. We can take that down, Mr. Davis.

11 I want to talk about ALJ Elliot's 1380 ID. You
12 mentioned in speaking with my colleague, Mr. Wilson, that
13 you had read portions of it, right?

14 A. Could you explain what an ID is?

15 Q. Initial determination, sir.

16 A. I recall reading at least portions of Judge
17 Elliot's Initial Determination in the 1380 matter or
18 hearing.

19 Q. Did you review the portions relating to the '714
20 patent?

21 A. I think I recall reviewing portions. I'm not
22 sure if they were all the portions. I recall reviewing
23 portions relating to the '714 patent.

24 Q. In fact, in your rebuttal report you said that
25 you agreed with ALJ Elliot's construction of the block in

1 the '714 patent that he rendered in his 1380 Initial
2 Determination, right?

3 A. I don't recall that exact piece of my rebuttal
4 report.

5 Q. Okay. Let's have CX-6465C at paragraph 603,
6 Mr. Davis.

7 And, in particular, directing your attention,
8 Dr. Richardson, to the second-to-last sentence in this
9 paragraph, you wrote, "I agree with ALJ Elliot's
10 construction of the block."

11 Do you see that?

12 A. I see that yes.

13 Q. So you at least reviewed that part of the Initial
14 Determination regarding the '714 patent, correct?

15 A. That's consistent with what I can remember, yes.

16 Q. Let's talk about some of the other portions and
17 see if you reviewed those.

18 Mr. Davis, may we have RX-1945.95, which is
19 page 89 of the 1380 Initial Determination.

20 And if we could enlarge the middle paragraph that
21 begins with "Amazon is correct."

22 Now, I want to talk to you about some of ALJ
23 Elliot's rulings regarding the meaning of the word
24 "determine," sir, okay? And at the start of this paragraph,
25 ALJ Elliot writes, "Amazon is correct in that H.265

1 predefines the subset."

2 Do you see that?

3 A. Yes.

4 Q. Did you review that portion of ALJ Elliot's 1380
5 Initial Determination?

6 A. I might have read it. I don't recall relying on
7 this. It would seem to be infringement related.

8 Q. Okay. And just to be clear, you didn't discuss
9 this during your direct testimony, right?

10 A. I didn't discuss anything relating to
11 infringement or any -- I didn't discuss infringement in my
12 testimony here today.

13 Q. Okay. And let's go to the next sentence. He
14 writes, "Yet the word 'determine' in a computer apparatus
15 claim ordinarily has a broad meaning, and the intrinsic
16 evidence supports a finding that a computer can, quote,
17 'determine a value even when that value is provided to it
18 (e.g., by the bitstream from the encoder).'"

19 Did you review that portion of ALJ Elliot's 1380
20 ID?

21 A. I may well have done it. I don't recall exactly.

22 Q. Either way, you didn't discuss it during your
23 direct testimony, correct?

24 A. I don't recall -- unless it was cited in one of
25 my demonstratives, which it's not my recollection, I don't

1 recall discussing this portion.

2 Q. Let's now move to the next page, .96, and focus
3 in on the final sentence of that paragraph.

4 Here we have another ruling by ALJ Elliot on the
5 meaning of the word "determine." And specifically he says
6 in that sentence that is highlighted now by Mr. Davis:

7 "So, again, the patent seems to use, quote,
8 'determine' even in situations where things are
9 predetermined or instructed."

10 Did I read that correctly, sir?

11 A. I believe so.

12 Q. Did you review this portion of the 1380 Initial
13 Determination in coming to your opinions?

14 A. I may well have reviewed it. I don't recall -- I
15 don't recall relying on this in my opinions that I presented
16 today. If I did, then it's just a memory thing.

17 Q. Okay. Either way, you didn't discuss it during
18 your direct testimony, right?

19 A. I don't recall citing or referring to this
20 language in my direct testimony, no.

21 Q. Okay. We can take that down, Mr. Davis.

22 You talked a lot about prediction units during
23 your testimony, correct?

24 A. I talked about prediction units during my
25 testimony today. I wouldn't necessarily say I talked a lot.

1 Q. Okay. Fair. Let's talk now about what the
2 claims require.

3 Can we have RDX-19.8?

4 Sir, what we're seeing on RDX-19.8 is claim 15 of
5 the '714 patent, correct?

6 A. I believe so.

7 Q. Claim 15 recites a, quote, "prediction unit of
8 the block of pixels," as highlighted, correct?

9 A. Yes.

10 Q. Claim 15 does not recite any particular size or
11 shape of the prediction unit, right?

12 A. Not as far as I recall.

13 Q. And there are dependent claims of the '714 patent
14 that recite examining whether the block of pixels is divided
15 into a first prediction unit or a second prediction unit.

16 Do you recall those?

17 A. Vaguely. I don't recall the exact language in
18 any dependent claims.

19 Q. Okay. Let's have RDX-19.9, please.

20 This is dependent claim 18, correct, sir?

21 A. I believe so.

22 Q. Dependent 18 depends from claim 15, right?

23 A. That's my understanding.

24 Q. And dependent 18 recites, wherein the apparatus
25 is further caused to examine whether the block of pixels is

1 divided into a first prediction unit and a second prediction
2 unit, right?

3 A. I see that language.

4 Q. The asserted claims of the '714 patent in this
5 investigation do not have that requirement, correct?

6 A. My recollection is that claim 18 isn't one of
7 those asserted claims.

8 Q. We can take that down, Mr. Davis, and in its
9 place, can we please have Dr. Richardson's slide CDX-11.80,
10 please.

11 And you gave us some testimony about this slide
12 during your direct testimony, right, Dr. Richardson?

13 A. I did, yes.

14 Q. Now, you have a little line up here where you
15 wrote, "correlation does not equal based on," right?

16 A. I see that.

17 Q. And just to be clear, "based on," as it's recited
18 in the claims, does not mean "exclusively based on," right?

19 A. I don't recall ever saying that.

20 Q. Well, "based on" doesn't mean "exclusively based
21 on" as it's recited in the claims; you agree on that?

22 A. I think "based on" is clear in the claims.

23 Q. Okay.

24 A. Sorry. It's clear in the claims and in my
25 reading of the claims in the context of the patent.

1 Q. Right. And when you were coming to your validity
2 opinions, you didn't apply -- you didn't apply "based on" as
3 having a meaning of "based exclusively on" or "based solely
4 on" or "based only on." You didn't do that type of
5 analysis, right?

6 A. I don't recall providing such opinions.

7 Q. And, in fact, when you were deposed, you gave us
8 an example of how you could make a determination based on
9 something as well as something else, right?

10 A. I don't recall precisely, but I may have done it.
11 I don't recall.

12 Q. I mean, you gave us an example that's really
13 appropriate, given the weather today. You said, I could
14 determine to wear my coat based on the weather forecast and
15 on something else, such as whether it's actually raining
16 right now. So I've made my determination based on the
17 weather forecast, but there was something else involved in
18 that scenario.

19 Do you recall giving us that example?

20 A. I don't recall the exact words, but I'm quite
21 happy to take your representation that I did.

22 Q. And in this example on slide 80, I believe you
23 were making the point that different candidate locations in
24 Rusert can have the same subset. Do I have that right?

25 A. I think I was making the point that the subset

1 isn't based on a candidate, the location of a future
2 candidate location -- sorry.

3 I think I was making the point that the alleged
4 subset in Rusert is not based on the location of a
5 subsequent candidate position.

6 Q. Okay. But here you're illustrating and you're
7 saying, well, Candidate 3 could have the subset of 1 and 2,
8 Candidate 4 could possibly have the subset of 1 and 2,
9 right? That's what your illustrations depict?

10 A. That's my illustration here of what Rusert itself
11 says, yes.

12 Q. Okay. And let's take this slide down and now put
13 up RDX-12.4.

14 We saw this demonstrative during Dr. Moulin's
15 testimony, my questioning of him, right? Do you remember
16 that?

17 A. I'm honestly not entirely sure because there were
18 some points when I had to be outside because of the
19 confidential record. So to the extent that this was up on
20 the screen when I was in the room, then I would have seen
21 this.

22 Q. Okay. And just to be clear, my examination of
23 him was all on the public record. So you would agree in
24 H.265 that both candidate locations A0 and B1 have the same
25 subset of A1, right?

1 A. What are we referring to here?

2 Q. Well, this is a table of candidate locations and
3 the corresponding subset as defined in H.265.

4 A. What do you mean by "as defined in H.265"?

5 Q. Well, are these the subsets in H.265?

6 A. The subsets of what? Could you give me some
7 context, please?

8 Q. Of the candidate locations, sir.

9 A. Which portion of H.265 are we talking about?

10 Q. Section 8.5.3.2.3 of the standard.

11 A. Okay. I don't have that in front of me, so
12 what's the question?

13 Q. Well --

14 A. It's not my slide.

15 Q. If you don't remember, that's okay, sir. Let me
16 move on and ask --

17 A. Excuse me. I don't say I didn't remember. I
18 just said I don't have the standard in front of me. I'm
19 asking for a context, what are the subsets that you're
20 talking about, with regard to which section of the standard?

21 Q. Well, you had a -- well, given that my time is
22 limited, sir, I'm going the move on to another question.

23 So let us now have slide 74, please, from
24 Dr. Richardson's rebuttal demonstratives.

25 Now, on slide 74, this was one of the slides that

1 you had in your direct demonstratives but you didn't show
2 during your direct today, but I want to ask you about it,
3 nonetheless.

4 Now, you would agree with me that block 1
5 corresponds to location B1 in the standard, correct, in the
6 H.265 standard?

7 A. In which section of the H.265 standard?

8 Q. Section 8.5.3.2.3, sir.

9 A. What's the title of that section, please?

10 Q. I don't have the title in front of me. But based
11 on the -- are you able -- without taking the time to pull
12 out the standard, are you able to answer my question as to
13 whether or not block 1 is correlated or the same as the
14 position of block B1 in the H.265 standard?

15 A. I can certainly answer that question, but I think
16 as was discussed yesterday, I would always go to the
17 standard before answering definitively a question about the
18 standard.

19 Q. Okay. Well, my time is limited, sir. I
20 appreciate you answering my questions.

21 A. I'm very happy to answer your questions if I have
22 the full information.

23 MR. HOUMAND: I pass the witness at this time.
24 Thank you.

25 JUDGE MCNAMARA: Thank you very much.

1 Ms. Ducca?

2 EXAMINATION BY COUNSEL FOR ITC STAFF

3 BY MS. DUCCA:

4 Q. Good afternoon, Dr. Richardson.

5 A. Good afternoon.

6 Q. One more time.

7 A. One more time, yes.

8 Q. I want to ask you some questions about
9 interpolation.

10 A. Okay.

11 Q. All right? And so I'm not sure there's a lot in
12 the record of precisely what interpolation is, so I want to
13 make sure that I understand it.

14 Would you agree that at least one definition of
15 interpolation would be the process of calculating
16 intermediate sample values between existing pixels?

17 A. I think as far as interpolation applied to images
18 and certainly in the context of video coding, I think that
19 would be an acceptable way to describe it.

20 Q. Okay. That's great, because I took it from one
21 of your books.

22 All right. So I'll move to the document camera.
23 I want to explore what an interpolation operation might look
24 like.

25 So let's say I have an image -- and I'm going to

1 use your description where you use the different pictures
2 and different colors. So let's say we have three pixels.
3 We have a red pixel, a yellow pixel, and a blue pixel.
4 Okay.

5 So in this situation, I think we said that you
6 would need 2 bits to be able to represent each of these
7 three pixels; is that correct?

8 A. So if you have exactly three colors available,
9 those are the only colors you have available, then I could
10 represent those three colors. I think I need 2 bits. I
11 could apply a 2-bit binary code to each, and then I could
12 distinguish between those three -- those three values.

13 Q. Okay. Let's say that we apply an interpolation
14 operation to these three pixels. See what I'm doing?

15 Would I be correct that we could end up with a
16 green pixel, and let's pretend this is orange. I have the
17 wrong color. Nonetheless, now I have a purple pixel and a
18 green pixel in addition to my red pixel, yellow pixel, and
19 blue pixel, correct?

20 A. I'm not sure that this is entirely consistent
21 with my example, and I apologize if my example has thrown
22 you. I was trying to simplify things, but I wonder if I
23 haven't.

24 Q. Let me just ask you a question. Am I correct
25 that if we apply an interpolation operation to a series of

1 pixels, that we could determine the pixels or the
2 representations between those pixels? Am I correct?

3 A. That's broadly correct. And the thing that I
4 don't want to confuse is that --

5 Q. I'll take it down.

6 A. I'm sorry. I'll be quiet.

7 Q. No, no, no, that's okay. That's okay. I just
8 want to make sure that I'm understanding interpolation
9 correctly. Is my high-level understanding of interpolation
10 correct, it effectively let's us estimate pixel values
11 between the ones that are available?

12 A. Yes. And I would suggest Chapter 6 of my 2024
13 book, I can't remember the figure number, but I've got an
14 example of doing exactly that, taking a lower-resolution
15 picture, in monochrome so we don't have to talk about
16 colors, in monochrome, and I show how interpolation can be
17 used to generate a version that has more sample values but
18 they are not actually -- they are not pixels that existed in
19 the original image. They are kind of what you said, they
20 are estimating the values between neighboring actual pixels.

21 Q. Okay. So we're estimating the values between the
22 pixels, correct?

23 A. I think, yeah, we agreed that that's -- that's
24 one way to talk about interpolation.

25 Q. Okay. Are those estimated pixel values

1 predictions? Aren't we predicting the pixel values between
2 the original ones?

3 A. Okay. In a way, you could say that. They are
4 not the predictions of the claim of the '267 that we're
5 talking about, as I recall.

6 Q. Okay.

7 A. Not -- they could be, but that process of
8 estimation gives you these intermediate values. In terms of
9 the patent I was discussing earlier today, one could create
10 a prediction using or from those interpolated values. So
11 that's a possibility.

12 Q. Okay. Now, interpolation is not a new concept,
13 right?

14 A. Interpolation of signals and samples and indeed
15 images has been known for, yeah, quite some time.

16 Q. How long has it been known to be used in image
17 processing?

18 A. For samples, for instance, any signal, I think
19 many, many decades. For images, it's certainly quite a few
20 decades.

21 Q. So one of ordinary skill in the art would
22 understand what interpolation is, correct?

23 A. In terms of the definition we're using here, I
24 think they would understand what interpolation is, yes.

25 Q. And they would understand how to apply an

1 interpolation operation in a calculation for image
2 processing, correct?

3 A. In general, I think they would understand that
4 concept.

5 Q. Okay. So help me understand your opinion that
6 the interpolation that's disclosed in Srinivasan, because I
7 think we all agree that Srinivasan is about interpolation,
8 does not result in a higher-level precision when applied to
9 Walker.

10 A. I think there were two main things that I tried
11 to explain earlier. Number one is that, in my opinion,
12 Srinivasan doesn't disclose an interpolated value that is
13 actually a higher bit-depth than the original pixel values
14 that I was talking about. That's number one. And I
15 explained the reasons why I believe that earlier.

16 Number two is that I think maybe towards the end
17 of that section, I explained the reasons why, in my opinion,
18 the proposed combination of aspects of Srinivasan with
19 aspects of Walker, that I don't think one would have a
20 reasonable expectation of success without working out a
21 number of other things that I didn't see disclosed in
22 Respondents' proposed combination of the two references.

23 Q. I want to follow up with your first item.

24 A. Sure.

25 Q. So with the understanding that the process of

1 calculating intermediate sample values between existing
2 pixels is what interpolation is, how can an interpolation
3 operation not result in additional essentially bits used,
4 additional points?

5 A. Okay, I think I see the possible confusion.

6 Srinivasan describes a number of intermediate
7 stages in its interpolation process. At the end of all of
8 those stages, Srinivasan outputs 8-bit pixel values. It
9 starts with 8 bits, ends with 8 bits.

10 The intermediate stages are intermediate stages
11 in Srinivasan, and the question for the '267 patent is, are
12 the predictions used in a prediction process at a higher
13 precision. I mean, that's a question that we've been
14 discussing quite a lot.

15 So, yes, there are higher-precision intermediate
16 values, I would say, in Srinivasan, certainly higher
17 bit-depth values. They may well be higher-precision
18 intermediate values, but Srinivasan does not disclose
19 actually reaching an output point that could be used as a
20 prediction or is disclosed to be operable as a prediction
21 that is at a higher precision.

22 Q. Okay. I think I understand better. Thank you,
23 Dr. Richardson. I appreciate your time.

24 A. You're very welcome.

25 MS. DUCCA: I'll pass the witness.

1 JUDGE MCNAMARA: Okay.

2 Mr. Verboncoeur?

3 MR. VERBONCOEUR: Yes, Your Honor, very briefly.

4 JUDGE MCNAMARA: Sure.

5 MR. VERBONCOEUR: May I proceed?

6 JUDGE MCNAMARA: Yes.

7 REDIRECT EXAMINATION

8 BY MR. VERBONCOEUR:

9 Q. Mr. Moreno, can we please have slide CDX-11.6?

10 Dr. Richardson, I want to talk to you about the
11 way the prior art, as described in the '267 patent,
12 interpolation.

13 Can you walk us through what you have on your
14 slide 6 and explain to us where in the process is the
15 subpixel interpolation filter we were discussing?

16 A. There's a subpixel interpolation filter in green
17 at the top left of this diagram and another one in green at
18 the lower left of this diagram. And that's the first stage
19 of a process shown here which produces a prediction P1 or
20 P2.

21 Q. And you were discussing this concept of
22 intermediate values with Ms. Ducca. Where in the '267
23 patent's Fig. 10 describing the prior art would we see those
24 intermediate values?

25 A. Immediately at the output of the N-tap filter.

1 So the output of that filter, which I've shown in green on
2 this slide, my slide 6, goes into two further stages, add
3 rounding offset and shift to input bit-depth.

4 So the output of the green box is an intermediate
5 value, which -- I actually think the '267 patent describes
6 as potentially having a higher precision than the original
7 pixel values.

8 But what's used as a prediction is P1, which has
9 been further operated on to bring it back down, is one way
10 of describing it, to the input pixel bit-depth.

11 Q. In the '267 patent's description of the prior
12 art, what happens between the green box on your slide 6, the
13 interpolation filter, and the point at which we reach P1 or
14 P2?

15 A. There's two stages. There's an addition of a
16 rounding offset, and this is a number to try to correct for
17 rounding error, and then there's a shifting to input
18 bit-depth. And my recollection is that that would be a
19 right-shifting operation.

20 Q. How does what's displayed in the '267 patent's
21 Fig. 10 compare to how interpolation was done in the H.264
22 standard?

23 A. It is pretty much what was done in the H.264
24 standard.

25 Q. Now what I'd like to do is I would like to ask

1 you about Srinivasan. So let's please have slide CDX-11.55.

2 Can you explain with reference to Srinivasan how
3 the interpolation process works?

4 A. So without going into all of the gory details,
5 Srinivasan starts at the top left of its Fig. 8 with input
6 pixels with an 8-bit range, so 8-bit precision. It ends up
7 at the lower right with output pixels also with an 8-bit
8 range or 8-bit precision. In between there are a number of
9 stages, and it's actually a point at the top right of this
10 diagram where the figure itself says that we have y-bit
11 range, intermediate pixel values where y is greater than 8.

12 So that's actually an example of an intermediate
13 step where the range, and I take that to be synonymous with
14 precision at this point, is actually higher than 8 bits.

15 Q. Can we call the intermediate pixel value shown on
16 Fig. 8 of Srinivasan, can we call that the prediction?

17 A. I don't believe we can, no. Srinivasan doesn't
18 call it a prediction, and I don't believe it's consistent
19 with the disclosure of Srinivasan.

20 Q. Can we please have slide CDX-11.6 again.

21 Can you explain how Srinivasan's interpolation
22 process compares to the '267 patent's description of the
23 prior art as referenced in Fig. 10 of that patent?

24 A. If one were to try and overlay one on top of the
25 other, Srinivasan's interpolation process starting with 8

1 bits, ending with 8 bits, you would overlay that on the top
2 or the bottom green and blue boxes, including all those
3 intermediate stages that I talked about.

4 So on the top left would be the input of
5 Srinivasan. P1 would be consistent with the output of
6 Srinivasan.

7 Q. And can we please have slide 56 from
8 Dr. Richardson's demonstratives.

9 Doctor, does your opinion -- is your opinion the
10 same with respect to Srinivasan's x+1 scenario?

11 A. It is as I explained earlier, and in the context
12 of Srinivasan, the x+1 refers to an extra bit at the last
13 but one stage of Srinivasan's process, which Srinivasan
14 describes as effectively being eliminated in that final
15 clipping or clamping process.

16 Q. I apologize for jumping around so much, but let's
17 go back to slide 6, please.

18 Can you tell me whether, based on your
19 understanding of the outputs of Srinivasan's interpolation
20 filters, has Srinivasan solved the rounding error problem
21 described in the '267 patent?

22 A. In my opinion, no. Srinivasan would basically be
23 a substitution for that top branch with the green and the
24 blue boxes. So one could conceivably use Srinivasan to
25 replace or to implement that part of the diagram.

1 Q. Now I'd like to have JX-7.27, please.

2 I want to ask you about claim 4 of the '267
3 patent.

4 First, what claim does 4 depend on?

5 A. Claim 2.

6 Q. And what claim does claim 2 depend on?

7 A. Claim 1.

8 Q. Can you walk us through your understanding of
9 claim 4 -- well, I guess it would be claim 1, then 2, then
10 4.

11 A. So at a high level, claim 1 is one that we've --
12 it covers the concepts that we've talked about at some
13 length, obtaining a first prediction and a second
14 prediction, each of those having a second precision higher
15 than the first prediction, which would be the precision of
16 the input blocks and so on. Obtaining a combined prediction
17 and then doing some more things.

18 So claim 2 is about, if the first motion vector
19 points to a subpixel, the prediction is obtained by
20 interpolation, the first prediction is obtained by
21 interpolation.

22 And claim 4 depends on claim 2 and suggests that,
23 if the second motion vector points to an integer sample, the
24 second prediction, I'm paraphrasing but I believe it's
25 correct, can be obtained by shifting values of said second

1 reference block to the left.

2 So in a situation where you have a subpixel
3 motion vector for one of your reference blocks, an integer
4 motion vector for the other reference block, you can obtain
5 an interpolated prediction from one and you can simplify or
6 you can shortcut that interpolation process for the other
7 one by using a left-shift in some circumstances.

8 Q. In your view, does using a left-shift operation
9 increase the precision of a block of pixels?

10 A. By itself, no.

11 Q. Do you think that claim 4 -- well, let me not ask
12 that question. It's not a clear one.

13 When the claim says said prediction is obtained
14 by shifting values of said reference block to the left, what
15 is your understanding of that phrase?

16 A. Say again?

17 Q. When the claim says said second prediction is
18 obtained by shifting values of said second reference block
19 to the left, what is your understanding of that phrase?

20 A. Just what it is, that you're obtaining a
21 prediction and you are doing it by carrying out a
22 computationally simpler operation than, for example, a long
23 interpolation filter.

24 Q. Let's have CDX-11.121, please.

25 Doctor, do you recall being asked the question

1 about the scenario where in MPEG-1 you may have a group of
2 pictures that consists of a single I-picture?

3 A. Yes.

4 Q. And I think the implication was that we could
5 perhaps draw your dotted box as a smaller box around an
6 I-picture.

7 Does the fact that you can have a single
8 I-picture in a group of pictures change your understanding
9 of whether closed_gop_flag is an indication of the first
10 image frame?

11 A. It does not.

12 Q. Why not?

13 A. Well, the GOP header tells us nothing at all
14 about the size of the group of pictures. It could have one
15 picture, it could have 200 pictures in it. The group of
16 pictures header doesn't tell us about that. It just tells
17 us here's something about the next group of pictures.
18 Whether that group of pictures has one -- group of pictures
19 has one coded picture or 200 coded pictures, we don't
20 actually know. The decoder doesn't know at the point at
21 which it's read and interpreted the GOP header.

22 Q. How would an MPEG-1 compliant decoder figure out
23 how many pictures it was dealing with?

24 A. It would have to decode them one by one, in
25 order.

1 Q. We can take that down, Mr. Moreno.

2 Now I would like to briefly ask you about the
3 '714 patent. You were asked about IPRs that had been filed
4 in the past. Do you recall that?

5 A. Yes.

6 Q. And I believe you said that you had participated
7 in at least some of those?

8 A. In at least?

9 Q. In at least some of those.

10 A. I don't know how many there are. I've
11 participated in more than one IPR relating to this patent.

12 Q. Were you deposed in any of those proceedings?

13 A. I was for at least the -- I think there were two
14 mentioned with number 604 and 605, if I remember correctly.
15 I was deposed in relation to those two IPRs.

16 Q. Was the testimony you gave today consistent with
17 the positions you took in the depositions in those IPRs?

18 A. To the very best of my ability, and I'm not aware
19 of anything that's changed in my testimony.

20 Q. And counsel mentioned rulings by the PTAB. Are
21 you aware of any final written decisions with respect to the
22 '714 patent?

23 A. I haven't been -- I would have to be informed
24 because I don't necessarily follow these things. I'm not
25 aware of any.

1 Q. Thank you.

2 MR. VERBONCOEUR: No further questions.

3 JUDGE MCNAMARA: Thank you, Mr. Verboncoeur.

4 MR. WILSON: Thank you, Your Honor. Jack Wilson
5 for the Respondents. Just briefly.

6 RECROSS-EXAMINATION

7 BY MR. WILSON:

8 Q. Dr. Richardson, do you recall being asked
9 questions about Srinivasan a moment ago?

10 A. Yes.

11 Q. And you testified that the intermediate values
12 had higher precision in the interpolation process of
13 Srinivasan, correct?

14 A. I recall that Srinivasan discloses intermediate
15 values, which can have a higher precision, yes.

16 Q. And, Mr. Davis, I'm sorry, could we bring up
17 slide 6 from Dr. Richardson's demonstratives?

18 And, Dr. Richardson, you on your redirect were
19 mapping Srinivasan to portions of what's shown on Fig. 10 of
20 slide 6, correct?

21 A. I wouldn't necessarily characterize it like that,
22 but I was asked where Srinivasan might fit into such a
23 diagram.

24 Q. And your testimony was that the interpolation
25 process of Srinivasan would cover one set of the green and

1 blue boxes, correct?

2 A. I would say it could. It's not necessarily the
3 same process as these green and blue boxes, but in terms of
4 where would the input be, where would the output be in the
5 context of Fig. 10 of the '267 patent, that's roughly what I
6 said.

7 Q. Fair. So the input would come in from the left,
8 the output would be on the right of Fig. 10 of -- well, the
9 output would be, for example, P1, correct?

10 A. I think that's consistent with what I said and
11 with Srinivasan's disclosure.

12 Q. And Srinivasan discloses that the intermediate
13 values can be extended arbitrarily, correct?

14 A. I think you have to actually bring out the claim
15 language there. There's another part to that sentence which
16 I think is important -- not the claim language, sorry,
17 Srinivasan's language at that point.

18 Q. Mr. Davis, could we bring up Srinivasan, that's
19 RX-2024, on exhibit page 26. That should be at column 20,
20 lines 20 to 32.

21 And, Dr. Richardson, this is the portion of
22 Srinivasan that you're referring to that begins, the second
23 sentence, the specific choice of bit-depth for the input
24 values for the first stage, the output values of the last
25 stage, and the intermediate values can be extended

1 arbitrarily in accordance with the technical specifications
2 of a target architecture or application.

3 Correct?

4 A. That's the entire sentence I believe we're
5 discussing.

6 Q. So it's more than just the intermediate values.
7 Srinivasan also in this passage refers to the input values
8 and the output values, correct?

9 A. And, in my opinion, that's entirely consistent
10 with, for example, a 10-bit implementation rather than an
11 8-bit implementation. And that was known, I think, by the
12 time of Srinivasan, that one could work with 10-bit pixel
13 values from the start and create, for example, 10-bit
14 predictions.

15 So I think that's just consistent with what we're
16 seeing here. And I think Srinivasan actually mentions, as I
17 recall, known standards such as H.264, which contemplate
18 higher bit-depths throughout.

19 Q. Thank you, Dr. Richardson.

20 MR. WILSON: Thank you, Your Honor.

21 A. Thank you.

22 JUDGE MCNAMARA: Thank you.

23 Anything more?

24 MS. DUCCA: Nothing more from Staff, Your Honor.

25 JUDGE MCNAMARA: Okay.

1 MR. VERBONCOEUR: Nothing more from Nokia.

2 JUDGE MCNAMARA: All right.

3 And thank you very much, Dr. Richardson. You may
4 step down.

5 A. Thank you, Your Honor.

6 MR. NEWCOMER: Josh Newcomer for Nokia. ALJ
7 McNamara, I would like to introduce another NEXT Advocate
8 who is going to be presenting our next witness, Kyra Mouser.

9 JUDGE MCNAMARA: Could you provide your last name
10 again?

11 MS. MOUSER: Mouser, M-O-U-S-E-R.

12 JUDGE MCNAMARA: Thank you.

13 MS. MOUSER: Good afternoon, Your Honor.

14 JUDGE MCNAMARA: Good afternoon, Ms. Mouser.

15 MS. MOUSER: At this time Nokia would like to
16 call its next witness, Arthur Levin, to the stand.

17 JUDGE MCNAMARA: Very good. Thank you.

18 MS. MOUSER: And later in the examination we
19 would like to use a physical demonstrative. Is it all right
20 if we set that up now?

21 JUDGE MCNAMARA: Sure. Yes.

22 MS. MOUSER: Thank you.

23 JUDGE MCNAMARA: Good afternoon.

24 A. Good afternoon, Your Honor.

25 JUDGE MCNAMARA: How are you?

1 A. Fine. Thank you.

2 JUDGE MCNAMARA: Could you remain standing and
3 raise your right hand, please.

4 ARTHUR LEVIN,

5 having been first duly sworn or affirmed on
6 their oath, was thereafter examined and testified as
7 follows:

8 JUDGE MCNAMARA: Please state your name.

9 A. Arthur Bennett Levin.

10 JUDGE MCNAMARA: Thank you.

11 MS. MOUSER: Is it all right if the easels go
12 here, or would you like them --

13 JUDGE MCNAMARA: As long as everybody can see
14 them, but I don't think Ms. Ducca can. You can move around.
15 Whatever works that makes it easiest so everybody can see.
16 Anybody should be free to get up and move around if you
17 can't see what is being done. Not everybody may be able to
18 see it well, depending on where it is placed.

19 DIRECT EXAMINATION

20 BY MS. MOUSER:

21 Q. Good afternoon, Mr. Levin. Would you please
22 introduce yourself?

23 A. Yes. MY name is Arthur Bennett Levin.

24 Q. Let's turn to slide 2.

25 Can you please tell us a bit about your

1 background and where you spent most of your career?

2 A. Yes. My education, I received my undergraduate
3 degree from Cornell University, and my law degree from
4 George Washington Law Center here in the District.

5 In the interest of time, I'm going to skip
6 directly to my 18 years of experience at the ITU. I did
7 want to mention that the ITU is an international
8 intergovernmental organization, headquartered in Geneva,
9 Switzerland, founded in 1865. It is an independent
10 organization, but it is also a United Nations specialized
11 agency. So it is quite unique.

12 So I began at the ITU in the legal affairs unit
13 where I was the attorney responsible for all intellectual
14 property matters. During the summers I was an adjunct
15 professor of law, teaching a full course on international
16 telecommunications law at what was then called Franklin
17 Pierce Law Center and is now the University of New Hampshire
18 Law School.

19 Going back to the ITU, I next was nominated to be
20 the chief advisor to the Secretary General. One of my main
21 tasks, among many, during that period, I was the executive
22 director and the lead organizer of the United Nations World
23 Summit on the Information Society.

24 And in my final years at the ITU, I was chief of
25 operations and planning in the Telecommunications

1 Standardization Bureau. Bureau is the ITU word for
2 department. And in that capacity, among other things, I was
3 directly supervising the Staff responsible for the ITU
4 patent statements database.

5 Q. Did you have any involvement with the development
6 of the ITU patent policy?

7 A. Yes. And I would just interject that I will try
8 very hard not to slip into ITU lingo, but a couple of times
9 here I will explain terminology.

10 So in the ITU, the formal word is ITU
11 recommendations. It is the same thing as the standard. So
12 I will use those two words interchangeably.

13 Another terminology is that the ITU consists of
14 members, and by "members" we mean countries, member states.
15 There are 194 member states of the ITU right now, and, in
16 addition, the ITU has over 211 -- over 200 private companies
17 that participate and are called sector members.

18 So I did -- in 1998 the ITU decided that it
19 needed a formal patent policy. At the meeting of the
20 governing body of the members, the standards advisory group,
21 in 1998 they created a nine-person task force to develop the
22 ITU patent policy, the first formal patent policy, and I was
23 one of the nine persons assigned to that task.

24 Q. Turning to slide 3, what is the JVT and how does
25 it relate to the ITU?

1 A. Yes. So I'll walk -- I'll try and walk quickly
2 through this slide.

3 So you see that ITU is part of the United Nations
4 family. The work of developing standards at the ITU is
5 assigned to study groups, in this case study group 16. And
6 when you get to the JVT, the JVT was the Joint Video Team.
7 It was a joint group that was formed to establish H.264.
8 One of its parents' organizations was the ITU. The other
9 parent was ISO and IEC, two other standards bodies.

10 And, secondly, you have the Joint Collaborative
11 Team on Video Coding, which was the follow-up to the JVT and
12 was tasked with developing H.265.

13 I did want to mention that with respect to H.264,
14 this was an achievement of great pride to the ITU. We were
15 awarded the Emmy for technical achievement at a ceremony in
16 Los Angeles, California, and the actual Emmy statue was in a
17 display case right outside my office.

18 Q. Now, Mr. Levin --

19 A. One more point. So there's sometimes confusion.
20 The actual approval of standards or recommendations at the
21 ITU is done by study groups.

22 So the JVT is a subsidiary group that provided
23 input to the study group in the form of their agreed text
24 for H.264, and in the case of JCT, for H.265. But it's
25 actually at the study group level that the final approval is

1 made.

2 Q. Have you analyzed Nokia's submissions and
3 contributions to the ITU, JVT, and JCT?

4 A. Yes, I have.

5 Q. Can you give us a preview of your ultimate
6 conclusion?

7 A. Yes. I have attended more than a hundred
8 meetings of study groups at the ITU. I have also attended
9 all of the senior-level meetings concerning standards.

10 So based on my more than 18 years of experience
11 at the ITU as a senior official, my conclusion and opinion
12 is that Nokia at all times fully complied with the patent
13 disclosure obligations under the ITU patent policy, and
14 under the patent policies of the JVT and the JCT-VC.

15 And maybe to save a little time, I'll just say
16 JCT from now on.

17 MS. MOUSER: At this time, Your Honor, Nokia
18 offers Mr. Arthur Levin as an expert in the ITU patent
19 policies and those of the JVT and the JCT.

20 JUDGE MCNAMARA: Mr. Rizzolo, I see you're in the
21 top seat, we will call it.

22 MR. RIZZOLO: I am, Your Honor, and no
23 objections.

24 JUDGE MCNAMARA: Thank you.

25 Ms. Ducca?

1 MS. DUCCA: No objection from Staff, Your Honor.

2 JUDGE MCNAMARA: Thank you. Then Mr. Levin is
3 accepted as an expert for the topics upon which he has been
4 called to testify without objection.

5 Q. Mr. Levin, let's start by talking about the ITU
6 patent policy, turning to slide 4.

7 What are we looking at here on the left,
8 Mr. Levin?

9 A. So this is the 1999 version of the policy. This
10 was the first formal ITU patent policy. This is the version
11 of the policy that was in effect when H.264 was being
12 developed, and this is the policy that I worked on.

13 Q. This is the policy you helped draft?

14 A. Yes, it is.

15 Q. And what's on the right of this slide?

16 A. So on the right you have the version of the
17 policy, it looks a bit fancier. This is the 2012 version of
18 the policy. This version of the policy was in effect when
19 H.265 was being developed.

20 One wrinkle to note here, as of 2007, this was
21 now a common patent policy. So this is -- as of 2007, this
22 is the common patent policy of ITU, but also ISO and IEC.
23 So this is the patent policy of three major standards
24 organizations fully supported by their members and approved
25 by their members.

1 Q. For the record, those are found at JX-410 and
2 JX-415.

3 Mr. Levin, what was the objective of the ITU's
4 patent policy?

5 A. Yes. The objective as stated directly in the
6 1999 policy, there was one sole objective, and that was to
7 ensure that ITU recommendations were accessible to everyone
8 without undue constraints. And to achieve that, the policy
9 goes on to explain, ITU wanted to ensure that whatever
10 recommendation was adopted would not be hindered or
11 encumbered by a patentholder who was refusing to license
12 their rights. That was the main objective.

13 Q. Can you walk us through the different parts of
14 the policy?

15 A. Yes, I would be glad to.

16 They are quite similar. So in the 1999 version,
17 the policy starts with a set of guidelines. These
18 guidelines are to help clarify and explain and give an
19 understanding of the provisions of the policy.

20 The next part is a series in 1999 of three
21 appendices. In 2012 it's three annexes.

22 So the first -- I'll use the word "annex." The
23 first annex is the actual patent policy. And the next two
24 annexes are two forms. The first is what we call, and I
25 will refer to in this proceeding, as the individual or

1 specific patent disclosure form, and I'll explain a little
2 bit more what that is later on.

3 And then Annex III or Appendix II is a general
4 patent statement and licensing declaration.

5 Q. What does the ITU policy require that a
6 patentholder do to fulfill its disclosure obligations?

7 A. I will address this more as I go along, but
8 there's a very clear distinction in the ITU patent policy
9 between mandatory obligations and nonmandatory obligations.

10 And there are very few mandatory obligations.
11 But one of them is that, when you want to disclose your
12 patent rights and options of your -- your licensing options,
13 you must, you have to use the patent declaration form that
14 is attached to the -- attached here and that you can see is
15 Annex II or Annex III. And there's a reason for that.

16 ITU wanted to ensure that every company was using
17 the same form. They wanted to ensure that these were
18 standardized submissions. All of these patent declaration
19 forms are posted online and are publicly available, and I
20 have to say thanks to my former staff, very readily
21 searchable.

22 These forms and -- we'll see a little bit more of
23 the form later on. These forms have to be signed by an
24 authorized person of the company, they have to be dated, and
25 they have to indicate the licensing intention of the

1 company. If you want to disclose your patent information to
2 the ITU, you must use that form.

3 Q. Turning to slide 5, can you tell us what a
4 general declaration is?

5 A. Yes, I'd be glad to.

6 So this is a general declaration. And a general
7 declaration is a declaration that applies to all
8 recommendations of the ITU, and it has two different
9 licensing options and only two.

10 The first is that the patentholder is willing to
11 license for free, and the second is that the patentholder is
12 willing to license on RAND terms.

13 Q. And what is the document that we see on the
14 screen at JX-179?

15 A. Well, this is an actual General Patent Statement
16 Declaration. This is by Nokia. And you can see on this
17 form that they checked box 2. They were willing to license
18 on RAND terms for any ITU recommendation.

19 Q. When did Nokia submit this form?

20 A. The date is very interesting. They submitted
21 this form in June of 2001. They were one of the first. And
22 that date is about two years before the approval of H.264.
23 And I'll explain a bit more later, but once you file a
24 General Patent Statement Declaration, that remains in effect
25 until you file a specific.

1 So this declaration was in effect during the
2 development of H.264, and then at a certain point they filed
3 a specific. It was also in effect during the development of
4 H.265 until they filed a specific declaration.

5 Q. Do you know if some sector members only file a
6 general declaration?

7 A. Yes, that's very much the case. Approximately 40
8 percent of all sector members, and the number of sector
9 members is somewhere between 200 and 250, about 40 percent
10 only ever file a general declaration.

11 Q. Let's turn to slide 6 and look at specific
12 declarations.

13 How is a specific declaration different from a
14 general declaration?

15 A. Well, it's kind of tiny, but you can see that a
16 specific declaration applies to only one recommendation.
17 And you can see on the right the three licensing options.

18 Q. Can you tell us what those licensing options are?

19 A. I'd be glad to.

20 So the first two are very similar to our general
21 declaration. You're willing to license on a royalty-free
22 basis or, number two, that you're willing to license on RAND
23 terms.

24 Where it differs is in box number 3, and this
25 gets back to the objective of the policy. In the case where

1 the patentholder is unwilling to grant licenses, in that
2 case, and only in that case, the following information must
3 be provided, and that's where you see the requirement to
4 provide specific patent information to the ITU.

5 And I would note a particular bullet point under
6 3, the first one, it says, patent registration/application
7 number. And this is the only place in the policy where this
8 is a specific request for the actual patent or registration
9 number or patent application number.

10 Q. Let's talk a little bit about that.

11 Why does the ITU only require the specific
12 identification of patents if option 3 is selected?

13 A. You've got -- it goes directly back to the
14 objective of the policy. As long as you're willing to
15 license for free or on RAND terms, it's not a problem.

16 If you're not willing to license your rights,
17 then what happens is that the ITU must take -- go back to
18 the group developing the recommendation and say what do we
19 do, we have technology in the recommendation that the
20 patentholder is refusing to license. And in those cases the
21 technical body would either delete that technology or they
22 would modify it or they would otherwise make sure their
23 recommendation was not encumbered.

24 Q. In addition to its general declaration, did Nokia
25 also submit a specific declaration?

1 A. Well, we actually are looking at the Nokia
2 specific declaration. It's in -- this is the one for 264.
3 This declaration was submitted to the ITU by Nokia on
4 October of 2002.

5 Q. For the record, this is JX-184.

6 What option did Nokia select on its H.264
7 specific declaration?

8 A. Well, on this declaration, specific to H.264,
9 they selected box 2, which is agreeing to license on RAND
10 terms, and you'll see throughout my presentation they always
11 picked box 2. They were always willing to license on RAND
12 terms.

13 Q. So was Nokia required to disclose specific patent
14 information on this form?

15 A. Very much in my view and my experience, unless
16 you're refusing to license, you do not have to provide
17 specific information, and that is the sense of box 3.

18 It's also noteworthy that this patent declaration
19 form was filed with the ITU in October of 2002. That is six
20 months before H.264 was even approved. It actually is while
21 JVT was still considering the final text of H.264. The
22 H.264 was finalized by the JVT on December 23rd of 2002.
23 This form had already been submitted to the ITU two months
24 before that.

25 Q. Let's turn to slide 7.

1 Is there any other language on the form that
2 tells us that Nokia was not required to disclose specific
3 patent information?

4 A. Yes. It's quite clear at the top of the form.
5 If you check options 1 and 2, licensing options 1 and 2, and
6 Nokia checked number 2, such information was desired, but it
7 was not required.

8 And, again, in the bottom it says, if you check
9 option 3 refusing to license, then you had to provide
10 additional minimum information. And, again, the information
11 was patent registration and application numbers, but only in
12 that case.

13 Q. Let's now turn to slide 8.

14 Did Nokia submit a specific patent declaration
15 form for H.265?

16 A. Yes, they did. This is a copy of that form.

17 Q. Are the licensing options on this form the same
18 as the options we just saw for H.264?

19 A. Yes. The licensing options haven't changed since
20 the original version of the policy in 1999. And, here
21 again, Nokia checked box 2, indicating their willingness to
22 license on RAND terms.

23 Q. Based on this, in your opinion, did Nokia fully
24 comply with its disclosure obligations under the ITU's
25 patent policy for both H.264 and H.265?

1 A. Yes, they did. They submitted licensing,
2 specific licensing declarations indicating they were willing
3 in both cases to license on RAND terms. This form was
4 submitted to the ITU in June of 2013. This was even before
5 publication of H.265.

6 Q. Now, was Nokia required to submit declaration
7 forms identifying the asserted patents in this
8 investigation?

9 A. Under the policy, since Nokia was willing to
10 license on RAND terms, they did not have to identify
11 specific patents.

12 Q. Turning to slide 9, did Nokia ever identify the
13 asserted patents on an ITU patent declaration form anyway?

14 A. Yes. Nokia went way above and beyond the
15 obligations of the policy and disclosed significant amounts
16 of additional specific information, as we'll see on these
17 forms and later on in my presentation.

18 So these are the declarations that Nokia made
19 that identify specific patents.

20 The one on the left was submitted in 2007. This
21 identifies '321, patent '321, and that applies to H.264.

22 The middle declaration was submitted in June of
23 2013, again, before publication of H.265. And this form
24 identified three different patents, '321, '701, and '714,
25 all for H.265.

1 And then, finally, they submitted a separate form
2 in 2014 identifying patent '267, again, for H.265. And
3 these are all signed and dated by an authorized official of
4 Nokia.

5 Q. Looking now at slide 10, let's turn to the JVT
6 which developed the H.264 standard.

7 Did the JVT create its own patent policy?

8 A. Yes. The JVT and the JCT had to operate in
9 compliance with the overall ITU patent policy, and,
10 additionally, they had to operate in compliance with the
11 work methods of the ITU standardization sector. But the JVT
12 did decide to create its own patent policy, which they did
13 in establishing their terms of reference.

14 Q. Did the JVT create its own patent disclosure
15 form?

16 A. Yes. You can see this on the right. So the
17 purpose of this form is to collect IPR information. And you
18 can see further down that they did create their own form.
19 They required that the form be attached to any contribution.
20 So this was a very clear directive. And it says below that
21 they -- you had to submit a fully filled out JVT patent
22 disclosure if you made a contribution.

23 And they further specified and recognized that
24 the form was not a substitute for submitting the ITU patent
25 declaration form. It did not have to be signed and it had

1 an informal status.

2 Q. Does the JVT patent policy apply to all of the
3 patents asserted in this investigation?

4 A. No. It only has application to patent '321.

5 Q. Let's turn to slide 11.

6 Mr. Levin, can you tell us a bit about the intent
7 of the JVT?

8 A. Yeah. I think there's been some misunderstanding
9 about what is the role of technical groups.

10 So it's very clear and recognized in the terms in
11 reference to the JVT that their mission was to offer the
12 best possible technical performance. They were not to dwell
13 on patent rights or patent issues.

14 And that language is in the ITU patent policy.
15 It applies to all study groups and all work groups including
16 the JVT.

17 In other words, technical bodies were to focus on
18 the best technical solutions and not to be overly concerned
19 with patent rights and patent issues.

20 Q. Let's next go to slide 12.

21 What are we looking at on the screen here,
22 Mr. Levin?

23 A. Well, this has been presented before but in a
24 somewhat different context. So this is a contribution and
25 another term of art. When a company makes a technical

1 proposal to a technical body, it's called a contribution.

2 This is the contribution that JVT made --
3 sorry -- Nokia made to the JVT. It is B041. B means it was
4 the second meeting of the JVT. And this relates to their
5 '321 patent.

6 You can see it says on the JVT disclosure form
7 they were concerned about any patent issues, not
8 particularly identifying specific patents, and that this is
9 not a binding legal document.

10 Q. What licensing option did Nokia select on this
11 form?

12 A. This requires a bit of explanation. Because the
13 JVT form had several options in addition to those you would
14 see on the ITU patent declaration form, and I know we're
15 pressed for time and I will try to be as brief as possible.

16 So in this case JVT selected box 2.2.1. What
17 does that mean? There was an effort by the JVT to establish
18 a royalty-free baseline profile for parts of H.264. But the
19 condition was that all of the companies involved had to
20 agree to that royalty-free baseline profile.

21 So Nokia was very much in support of that effort.
22 And by checking box 2.2.1, they said we will agree to a
23 royalty-free baseline profile but only if all the other
24 patentholders do the same. And this is the same form for
25 every company.

1 What happened at the end is that several
2 companies did not want to agree to that, in which case,
3 according to this form, Nokia's statement became 2.2,
4 agreeing to license on RAND terms.

5 Q. Did Nokia attach a fully filled out JVT
6 disclosure form to this proposal?

7 A. Yes, they did. That's what you see on the
8 screen.

9 Q. It looks like certain information actually wasn't
10 filled out.

11 Can you explain that?

12 A. Yes. This is very similar to the ITU patent
13 form. If you're not willing to license, then you have to
14 provide specific patent information. In this case Nokia was
15 willing to license on RAND terms, so they did not have to
16 fill out this part of the form. It was optional. They
17 could have, but they were not required to do so.

18 Q. Did Nokia comply with its disclosure obligations
19 to the JVT with this contribution?

20 A. Yes.

21 Q. Let's turn now to slide 13.

22 Did the JCT which developed the H.265 standard
23 create its own form like the JVT?

24 A. So the JCT took a little bit different approach.
25 The JCT, these are from the terms of reference, did not

1 establish a separate form. What the JCT said, if you submit
2 a contribution, then simply provide a statement about your
3 licensing intention following the three options on the ITU
4 patent declaration form.

5 So what you see here, again, are Nokia technical
6 contributions to the work of the JCT. The first one on the
7 left is D.3.2.1. So letters reflect the different meetings.
8 This is the fourth meeting of the JCT. And this relates to
9 their patent '267.

10 The one on the right is at a later meeting of the
11 JCT. This relates to their '714 patent. This is a
12 technical contribution. This is G593 and submitted in
13 November of 2011.

14 And you can see in both cases Nokia included at
15 the end of their submission or the contribution their
16 licensing intent, which was to grant license under RAND
17 terms.

18 Q. Mr. Levin, in your opinion, did Nokia fully
19 comply with the JCT's patent policy?

20 A. Yes, they did.

21 MS. MOUSER: So, Your Honor, at this time we
22 would like to set up a physical demonstrative.

23 JUDGE MCNAMARA: Sure.

24 Q. Mr. Levin, we're a little tight on time, but did
25 you review the ITU's declaration database compiling every

1 patent declaration submitted to the ITU for H.264 and H.265?

2 A. Yes, I did.

3 Q. Did you bring charts today with you that describe
4 your analysis?

5 A. Yes, I did.

6 Q. So --

7 A. And they stayed dry despite the snow.

8 Q. Can you just tell us generally what's listed on
9 these charts?

10 A. I'm feeling like this is an eye chart. This is
11 quite a long way away.

12 Q. We can turn to the next slide as well.

13 A. I would be very happy to walk you through the
14 charts, Your Honor.

15 So let me just introduce it by saying these are
16 all the patent declaration forms submitted, on the left, in
17 the H.264, on the right, the H.265.

18 And what this -- thank you. It's on my screen.
19 Very helpful.

20 So these charts really show you we have moved
21 from the academic world to the real world of what actually
22 happens at the ITU. And these charts show you how the
23 private companies, some of the leading technology companies
24 in the world, actually operated and implemented the ITU
25 patent policy.

1 So I'm going to start with the colors. The
2 orange rows are Nokia patent declaration submissions. And
3 you can see there's an awful lot of orange.

4 The blue rows are submissions by other companies
5 that also identified specific patent information. And,
6 again, all this information was not required unless you were
7 refusing to license, which was not the case here.

8 Now, you can see about midway down on the column
9 on the left is, in gray, that is the date when the standard
10 was approved by study group 16, and that date is May of
11 2003.

12 So a couple of observations. Just really some
13 numbers. If you look at all the submissions prior to
14 approval of the standard, there were 39. If you look at all
15 the submissions after approval of the standard, there were
16 88. So the majority of patent submissions under H.264 were
17 made after approval of the standard.

18 And if we take a little closer look at the first
19 39 that were filed before approval, you can see that Nokia
20 was the very first one to submit -- to make a submission
21 that identified specific patents. You can also see that, of
22 the 39, only ten identified specific patents. 29 submitted
23 a patent declaration form, but there was no specific patent
24 information.

25 Q. Let's turn quickly to H.265.

1 A. Well, I just want to say one or two more things
2 about this one.

3 Q. I think we're a little tight on time, Mr. Levin,
4 so we're going to turn to H.265.

5 Can you tell us a little bit about that chart?

6 A. Okay. Here you see a little bit different
7 pattern. Again, Nokia is in orange. The other companies
8 submitting specific information are in blue. And here the
9 line, the gray line, as when the standard was approved has
10 moved up. So why is that?

11 Because only -- there were 79 -- there's 79 total
12 patent declarations on this chart. Only 14 of those were
13 submitted before approval of H.265, only 14, and only one of
14 those identified any specific patent information.

15 So the overwhelming majority of patent
16 declarations under H.265, doing rudimentary math, were 65 of
17 them were submitted after approval of the standard.

18 And if you look at the total amount of patent
19 information that was submitted, in 264, Nokia supplied 68
20 percent, more than two-thirds of all the specific patent
21 information. In the case of 265, Nokia submitted 52 percent
22 of all the specific patent information.

23 Q. Thank you, Mr. Levin. We're going to walk
24 through a few points that we heard from Professor Simcoe
25 yesterday.

1 Looking now at slide 16, Mr. Levin, do disclosure
2 obligations apply to both essential and nonessential claims?

3 A. No. And this has been clear since 1999, the
4 first version of the policy. And this language that you see
5 at the top is from the actual patent declaration form. It
6 says, rights whose use would be required to implement the
7 above ITU recommendation.

8 So that is clearly restricting this form to only
9 essential patents or patent claims.

10 It's also indicated in the guidelines in 1999
11 that they apply for essential patents that fully or partly
12 cover elements of the draft recommendation. So it was
13 recognition that some parts of a patent, only some parts of
14 a patent may be essential.

15 This understanding -- the same language that you
16 see at the top is the same language used in 2012. And this
17 kind of -- this understanding about it has to be -- you have
18 to be filing a patent disclosure form with respect to
19 Essential Patent Claims, this understanding was memorialized
20 by language added to the form. I participated in that
21 effort in 2012.

22 Q. Let's turn now to slide 17.

23 Do you believe that the ITU's patent policy
24 creates a timing requirement for patent disclosure?

25 A. Very much the -- the approach to the timing of

1 when you make a patent disclosure was flexible. So I won't
2 spend the time going through all of the terminology, but
3 what we can see even better on the next slide, that
4 should -- from the outset, which is repeatedly cited by
5 Professor Simcoe, was only one of the timing elements.

6 In fact, the very next sentence says, and here
7 you can see it in yellow, after from the outset, it says,
8 this might not be possible when the first draft text
9 appears.

10 This is because very often experts consider -- I
11 mentioned this in my report -- that disclosures later in the
12 process are more valuable than disclosures early in the
13 process because the recommendation changes.

14 So in terms of the timing elements, both 1999 and
15 2012 recognized you could make patent disclosures before
16 approval and you could make patent disclosures after
17 approval of the standard and provisions to that effect.

18 In the interest of time, I won't explain all
19 three of the provisions. So the timing element is flexible.

20 Q. For the record, we're now on slide 18.

21 So Professor Simcoe told the court that Nokia did
22 not use best efforts to provide its patent information.

23 Do you agree?

24 A. No, I don't. Just to put that whole section in
25 context, we're talking about best efforts if you disclose

1 specific patent information. As I've indicated, under the
2 policy, you did not have to disclose such information.
3 We're talking about your efforts for a voluntary act that
4 goes beyond and above the policy.

5 There's no definition of best efforts except to
6 state that you don't have to conduct patent searches, and
7 this is because ITU understood that there are many
8 organizations that can be a forum for developing standard.
9 And so if you make it too onerous on companies, they are not
10 going to come to the ITU. It's part business. We are an
11 agency, but there is a business aspect to it as well.

12 And then, finally, we've just seen on the charts
13 that Nokia submitted more specific patent information than
14 any other company. They submitted more patent disclosure
15 forms than any other company.

16 So in the absence of a specific definition of
17 best efforts, that, for me, is pretty convincing evidence.

18 Q. Thank you, Mr. Levin.

19 MS. MOUSER: No further questions. I pass the
20 witness, Your Honor.

21 MR. RIZZOLO: Good afternoon, Your Honor. We're
22 passing out some cross binders.

23 JUDGE MCNAMARA: While you're doing that, may I
24 have a set of the deck slides for the direct examination?

25 MR. RIZZOLO: May I proceed, Your Honor?

1 JUDGE MCNAMARA: Yes.

2 CROSS-EXAMINATION

3 BY MR. RIZZOLO:

4 Q. Good to see you again, Mr. Levin.

5 A. Nice to see you again, Counselor. I'm very
6 familiar with your face.

7 Q. Me with you as well.

8 You expressed the opinion that Nokia fully
9 complied with its disclosure obligations under the patent
10 policies at issue here, right?

11 A. Yes.

12 Q. You called it a nonmandatory obligation, correct?

13 A. What I said is that disclosing patent information
14 was always framed in nonmandatory language. It should
15 encourage, desirable.

16 What is mandatory is that, if you discloses such
17 information, then you must use the patent disclosure form.

18 Q. You're not offering any legal opinions here
19 today, correct?

20 A. I certainly am not.

21 Q. You have no opinion on whether the ITU patent
22 policy imposes contractual obligations on Nokia, right?

23 A. My hearing has gotten worse in the year and a
24 half. Would you speak a little bit louder?

25 Q. Absolutely. You have no opinion on whether the

1 ITU patent policy imposes contractual obligations on Nokia?

2 A. No, that is not an issue within my expertise.

3 Q. You have no opinion on whether implementers of
4 ITU standards are third-party beneficiaries of the ITU?

5 A. No, I have no opinion on that matter. I'm aware
6 of some court cases in the United States, but I have no
7 independent opinion on that.

8 Q. You have no opinion on whether Swiss law applies
9 to Nokia's obligations under the policies, do you?

10 A. Well, as I stated in my report, having consulted
11 on that with experts, I do consider that course of
12 performance under Swiss law is relevant.

13 Q. You have no opinion on the definition of best
14 efforts under Swiss law, do you?

15 A. Under Swiss law, no. And under the ITU policy,
16 it is not a defined term.

17 Q. And you have no opinion on whether Nokia has
18 complied with its obligations to license its SEPs on RAND
19 terms, correct?

20 A. I'll be very clear. When you look at the patent
21 disclosure form, it says very clearly that negotiations are
22 between the parties outside the scope of the ITU. And in
23 fact, in the 1999 policy, there's a whole page explaining
24 why ITU does not want to resolve the dispute.

25 So no, I don't have any knowledge of the

1 negotiations in this proceeding, and I am not an expert on
2 RAND.

3 Q. Subsequent to your report and deposition, you are
4 aware that the UK Court found that Nokia breached its
5 obligations to license under the ITU policy, are you?

6 A. I only have a very general awareness of the UK
7 decision.

8 Q. It's fair to say that you didn't consider the UK
9 decision in formulating your opinions?

10 A. Well, I think it's fair to say that I didn't see
11 the need to consider the UK decision because, again, from
12 the little bit I know about it and the excerpts I've read,
13 particularly in some of the filings before this court, it
14 dealt with issues outside the ITU. The nature of the
15 licensing conditions, RAND terms, this is all completely
16 outside the ITU.

17 Q. You and I disagree on a lot of things, but I
18 think we can agree that the numbers of the patents here
19 weren't disclosed to the ITU or the JVT until after the
20 relevant standards were adopted, right?

21 A. I think with respect to the asserted patents,
22 they did disclose a lot of specific patent information in
23 the 264 before approval of the standard. But with respect
24 to the actual four asserted patents, the patents, as I show
25 in my chart, were only identified to the ITU in a form after

1 approval, but, again, they were not required to identify
2 those patents.

3 Q. You testified -- actually, I'll move on from
4 that.

5 Your opinion was that Nokia had no duty
6 whatsoever to disclose any -- the specific identity of any
7 patents to the ITU at any time as long as it agreed to
8 license on RAND terms, right?

9 A. Yes. And I think you can see that as confirmed
10 by the actual practice of participants.

11 I might add, since I did mention it in my report,
12 there's an ad hoc group that advises the ITU on changes to
13 the policy. I was a participant at different times. At
14 present there are fifty to a hundred of the leading patent
15 experts from private companies who come to the ITU.

16 And in 2019, so very recently, they sat and
17 considered should we require and modify the policy to say,
18 if you submit a patent disclosure form, you have to identify
19 at least one patent. But after discussion they said, no,
20 we're not going to do that, which means, in their view as
21 well, the patent disclosure policy of the ITU does not
22 require identification of specific patents unless you're
23 refusing to license.

24 Q. So just so we're clear --

25 A. It took a littler longer. I know your time is

1 short.

2 Q. Thank you. It's a yes or no question.

3 The only thing Nokia ever needed to do to comply
4 with the disclosure requirements under the policy, in your
5 opinion, is to say that it would license its patents on RAND
6 terms?

7 A. Yes. By submitting the patent disclosure form,
8 yes.

9 Q. So, in your expert opinion, you showed some
10 slides during your direct, what was the date at which Nokia
11 became fully compliant with the ITU patent policy? Was it
12 July 2001 when Nokia submitted the general declaration?

13 A. Well, they were compliant when they submitted the
14 general declaration.

15 Q. So in July 2001, once they submitted the general
16 declaration, Nokia was fully compliant with the ITU policy?

17 A. They were compliant, and then they additionally
18 submitted specific patent declarations with respect to the
19 H.264 and H.265.

20 Q. But in your expert opinion, anything -- all of
21 those additional disclosures that have been made, all of
22 those orange boxes that were made over the last 20-plus
23 years, those were all irrelevant, Nokia was already fully in
24 compliance with the policy, yes?

25 A. Well, there are two parts of your question.

1 Q. That's a yes or no question, sir.

2 A. Well, I just don't -- you say irrelevant. This
3 is additional information that the ITU wants to get, but it
4 doesn't require.

5 Q. Okay.

6 A. So it is very useful information. But I would
7 say that the 40 percent of executive members who only file
8 general declarations are compliant with the policy as well.

9 Q. Speaking of the chart, while we're looking at it,
10 on the very left-hand side, I think you mentioned that there
11 was one declaration from Nokia that identified particular
12 patents prior to the H.264 standard being adopted.

13 Do you recall that?

14 A. Yes.

15 Q. And that declaration that identified particular
16 patents, that doesn't identify any of the patents at issue
17 in this case, right?

18 A. No. With respect to the 264, Nokia identified
19 the '321 patent in October 2007.

20 Q. We've talked before about Broadcom or the
21 Qualcomm-Broadcom case. Do you recall that?

22 A. Yes, very much.

23 Q. And I think you've expressed the opinion that the
24 Qualcomm case involved significantly different facts than
25 this case, right?

1 A. I would be happy to explain the difference, if we
2 have time.

3 Q. I'll ask you a few questions about that now. And
4 I agree with you that Qualcomm -- some of Qualcomm's conduct
5 was different than what's at issue in this case.

6 But you would agree with me that the relevant
7 patent policy at issue here is the same, the Qualcomm case
8 involved the ITU and the JVT, yes?

9 A. I would agree with that, yes.

10 Q. And I know the Qualcomm case did not involve the
11 JCT, but you'd agree with me that the JCT also has to
12 operate in compliance with the ITU's policy, yes?

13 A. Yes, as stated in the very terms of reference.

14 Q. And Qualcomm participated in the H.264 standards
15 development process, just like Nokia did, right?

16 A. No. I don't agree.

17 Q. That's your testimony? Qualcomm did not
18 participate in the H.264 standards development process?

19 A. Well, I'll take a minute then to explain. The
20 facts in the Qualcomm case --

21 Q. I'm asking you a yes or no question.

22 A. They did not participate in the same way, no.
23 They didn't make a contribution. They intentionally misled
24 the JVT about their patent rights. In the words of the
25 district court, they engaged in a deadly plan to deceive the

1 JVT. In the words of the court of appeals, it was a
2 deliberate intentional effort to mislead the JVT. None of
3 that applies to Nokia.

4 Q. Okay. So, Mr. Levin, I'm going to ask you some
5 particular questions about Qualcomm, and I would appreciate
6 it if you restricted your answers to my questions.

7 A. I'll do my best.

8 Q. Can we have RDX-18.3, please?

9 And this is where -- you just told me that
10 Qualcomm was not participating in the H.264 standards
11 development process.

12 We see the quote from the Federal Circuit opinion
13 on the bottom there at page 14. The Federal Circuit said,
14 we now know, however, that Qualcomm actually was
15 participating in the JVT prior to the approval of the H.264
16 standard.

17 So they were participating in the JVT, correct?

18 A. I see what you're referring to, but this
19 holding -- again, I'm not here to offer legal opinions, but
20 the holding in the appellate court in California was that
21 JVT had been deceptive about the extent to which they
22 participated. In fact, they lied about their participation
23 in the JVT.

24 Q. But they participated, yes or no?

25 A. My understanding of the facts of that case is

1 that they participated --

2 Q. Sir, it's a yes or no question. We are very
3 short on time.

4 A. Well, how do we define participate? If you're
5 lying about who you are, are you really participating?

6 Q. Do you think the Federal Circuit's statement here
7 is incorrect, that Qualcomm actually was participating in
8 the JVT?

9 A. I'm not going to disagree with the court's
10 statement here, but I'm explaining the factual circumstances
11 around their participation, which was completely deceptive.

12 Q. We'll get to some of those.

13 So you reviewed all of the H.264 and H.265
14 declarations and put them on those charts over there, yes?

15 A. Yes.

16 Q. Is that correct? You reviewed all these?

17 A. Yes.

18 Q. Okay. So you know that one of them, one of them,
19 which is number 52 on the left side here, it's right here,
20 right around the time that several of Nokia's were sent into
21 the ITU, that's a Qualcomm declaration, right?

22 A. I can't see that far away, but I know that
23 Qualcomm did submit patent disclosure forms to the ITU.

24 Q. Could we have the next slide, RDX-18.4?

25 Qualcomm submitted a declaration on May 1st,

1 2006 -- or April 25th, 2006, in which it agreed to license
2 its H.264 essential patents on RAND terms, correct?

3 A. It's correct that there's a signed form from
4 Qualcomm. It's also correct that this proceeding is not
5 involving Qualcomm. It's about Nokia.

6 Q. But the same -- by submitting that, you would
7 agree with me, that the same disclosure obligations applied
8 to Qualcomm as to Nokia, correct?

9 A. I don't have any real opinion on Qualcomm, but
10 given the factual circumstances surrounding their deception
11 of the JVT.

12 Q. But you haven't offered an opinion that there's
13 some different type of ITU disclosure obligations that
14 applied to Qualcomm, right?

15 A. Well, there's no special policy for Qualcomm.
16 But, again, the facts of the participation of Nokia in the
17 JVT were completely dramatically different than those of
18 Qualcomm. And, again, we're not discussing -- Qualcomm is
19 not a party to this proceeding.

20 Q. The Federal Circuit said that the ITU patent
21 policy required standard-setting participants, like Nokia
22 and Qualcomm, to identify patents embodied fully or partly
23 in a standard under consideration, didn't it?

24 A. Well, again, we've discussed this before. They
25 did not say you have to identify specific patents or

1 individual patents.

2 Q. Could we have slide 18.5, please?

3 Do you see the highlighted language where it
4 says, the ITU-T and ISO/IEC patent policy provides that any
5 party participating in the work of the ITU, ISO, or IEC
6 should identify patents embodied fully or partly in a
7 standard under consideration?

8 Sir, did I read that correctly, yes or no?

9 A. You mostly read it correctly, but if you look at
10 that carefully --

11 Q. Sir, sir, again, we're short on time.

12 A. You can see that there are quotes around some of
13 the language and not quotes around other parts of the
14 language.

15 And I would say as well, again, it says identify
16 patents. It doesn't say identify specific patents.

17 Q. So identify patents doesn't mean identify
18 specific patents in your mind? That's your testimony?

19 A. No, and that's consistent with the ITU patent
20 policy.

21 Q. And there it says they had to -- JVT participants
22 had to disclose patents prior to final approval of a
23 standard under the rules of the JVT parent organizations,
24 which includes the ITU, doesn't it?

25 A. That's partly true. There are two different --

1 if you permit me, there were two different references to
2 that disclosure obligation under the JVT policy, correct,
3 that one said had to identify during the approval process,
4 I'm not sure what that meant, but they also -- JVT also says
5 that you should -- you should provide information prior to
6 filing approval.

7 So there's conflicting statements in the JVT
8 policy. The actual ITU policy at that time said that you
9 are requested to provide patent information prior to final
10 approval -- but requested. It didn't say use mandatory
11 language like required.

12 Q. Can we turn to slide 18C.6?

13 Sir, the Federal Circuit in the Qualcomm-Broadcom
14 decision concluded that Qualcomm had a duty to disclose the
15 particular patents asserted against Broadcom to the JVT,
16 didn't it?

17 A. Well, again, the language is patent. It's not
18 specific patents.

19 Q. Okay.

20 A. And there's further language that we're not
21 looking at in the court of appeals which also made rulings
22 on this matter.

23 Q. So in the highlighted language here where it
24 says, Qualcomm had a duty to disclose patents, and where it
25 says, JVT participants had a duty to disclose patents that

1 might reasonably be necessary to practice the H.264
2 standard, that doesn't refer to specific patents in your
3 mind, correct?

4 A. That's the problem. It doesn't refer to specific
5 patents.

6 Q. And could we turn to the next slide, slide 7?

7 In the conclusion at the bottom, it says, based
8 on the foregoing analysis, we agree with the district court
9 that Qualcomm had a duty to disclose the asserted patents to
10 the JVT, and that it breached its disclosure duty.

11 Do you see that?

12 A. Yes, I see that, and I don't think --

13 Q. And these asserted patents were two specific
14 asserted patents, weren't they?

15 A. Well, I think the court there, in my view, and
16 looking also at other parts of the opinion, but I think in
17 the interest of time we won't really go through all that,
18 the court in Qualcomm at the appellate level said that the
19 ITU -- the JVT disclosure policy was -- at one point they
20 said ambiguous. In two other places they said that policy
21 was not unambiguous.

22 Q. Sir, that is not answering my question.

23 A. Well, I think they are referring to -- there were
24 two asserted patents by Qualcomm. And, again, I don't know
25 why we're discussing Qualcomm, but I don't think that

1 specifically says that they had to -- the disclosure
2 obligations of the JVT was to disclose specific patents, if
3 you're refusing to license.

4 Q. And you talked about Qualcomm's misconduct. The
5 Federal Circuit --

6 If we could turn to slide 8.

7 The Federal Circuit's analysis of whether there
8 was a duty to disclose under the ITU and JVT policies didn't
9 involve analyzing Qualcomm's behavior, did it?

10 A. I would refer to the appellate court, which
11 says --

12 Q. This is the appellate court, sir.

13 A. -- legal question with factual underpinnings.
14 And I think that's the analysis.

15 Q. So on the slide, on RDX-18C.8, we have an excerpt
16 from the opinion where the court says, determining whether
17 Qualcomm had a duty to disclose the '104 and '767 patents to
18 the JVT involves two questions.

19 Do you see that?

20 A. Yes. And, again, they clearly recognized the
21 policy is ambiguous.

22 Q. So they said first we must determine whether the
23 written JVT IPR Policies impose any disclosure obligations
24 on participants, right?

25 A. I'm just looking at what you're reading. Yes, I

1 mean, you read it correctly.

2 Q. And then second, to the extent the written JVT
3 IPR policies are ambiguous, we must determine whether the
4 participants understood the policies as imposing such
5 obligations.

6 Do you see that?

7 A. Yes.

8 Q. There's nothing in here about Qualcomm's
9 behavior, true?

10 A. Well, they talk about what JVT participants
11 understood. You also know that in these decisions the court
12 said that this was an exceptional case determination. I
13 actually had to look up that phrase because I had never seen
14 it before in a case. And much of these policies describe
15 the abhorrent conduct of Qualcomm employees in deceiving the
16 JVT.

17 Q. Other than Nokia, are you aware of any party that
18 has pursued injunctive or exclusionary relief for patents
19 that are subject to a ITU FRAND obligation?

20 A. No, I'm not.

21 Q. Other than Nokia, are you aware of any party
22 that's been found by a court to have breached the ITU patent
23 policy?

24 A. Well, Nokia hasn't been found to have breached
25 the ITU patent policy.

1 Q. Could we bring up RDX-18.9? This is an excerpt
2 from the UK Court decision.

3 Do you see the highlighted language that says,
4 overall, insofar as necessary, I find Nokia in breach of
5 their ITU-T commitment?

6 A. Well, again, I don't have any -- I don't have any
7 opinion on the ruling of the court in the UK, because they
8 were dealing with the licensing negotiations that took place
9 outside of the ITU.

10 Q. Fair enough. I do want to go, just before I wrap
11 up, to one thing with the Qualcomm decision.

12 Could we bring up RDX-17 at page 26?

13 Here your position is that Nokia complied with
14 the policy by agreeing to license its patents on RAND terms,
15 right?

16 A. Are you talking about the ITU policy or the JVT
17 policy?

18 Q. The ITU policy.

19 A. My conclusion is very clearly that Nokia fully
20 complied with its disclosure obligations under the ITU
21 patent policy as well as that of JVT.

22 Q. And --

23 A. I mean, Nokia submitted contributions to the JVT.
24 They attached the required patent disclosure form to the
25 JVT. Qualcomm did none of those things.

1 Q. Isn't it true that Qualcomm made essentially the
2 same argument in its case, that Qualcomm said that its
3 failure to disclose the patents didn't cause any harm
4 because it had committed to license the patents?

5 A. Well, honestly, I don't know the exact nature of
6 what Qualcomm argued. I know what the court decided.

7 Q. Okay. So let's show the middle paragraph there,
8 the second sentence of that paragraph. It starts with,
9 "Qualcomm submits."

10 Do you see it says, "Qualcomm submits that there
11 is no harm because," and then it talks about a jury verdict
12 on noninfringement, and then it says, "even if the asserted
13 patents were needed to practice the H.264 standard, Qualcomm
14 would be willing to license them."

15 And as we discussed earlier, Qualcomm submitted a
16 RAND declaration just like Nokia, correct?

17 A. They submitted a declaration. I'm not going to
18 try to infer what the court is saying about that. I don't
19 see -- I'm not quite understanding this language in terms of
20 whether talking about essential patents or not essential
21 patents, but under the ITU policy, any determinations about
22 essentiality are a matter between the parties and
23 ultimately, if necessary, between the courts. ITU takes
24 no -- instructs their study groups not to make any
25 determinations about what is essential.

1 Q. The Federal Circuit said it disagreed with
2 Qualcomm, right? Do you see, "we disagree"?

3 A. I see that. Well, I see it says, "we disagree."

4 Are we looking -- can you please explain to me
5 again what we're looking at here?

6 Q. This is the Qualcomm opinion.

7 A. Which one?

8 Q. It's in your binder. It's RCX-17.

9 A. Which court?

10 Q. The Federal Circuit, sir.

11 A. Okay.

12 Q. And the Federal Circuit said in that last
13 sentence, "forcing a party to accept a license and pay
14 whatever fee the licensor demands, or to undergo the
15 uncertainty and cost of litigation, are significant
16 burdens."

17 Do you see that?

18 A. I'm reading it. Well, again, this is not an
19 opinion written with respect to the conduct of Nokia.

20 Q. But here you understand that Nokia is insisting
21 that Acer and ASUS pay its so-called program rates.

22 A. I can't agree with that only because I have not
23 been asked at all to comment or opine about the licensing
24 negotiations, the terms and conditions. That is completely
25 outside the scope of my report, and, frankly, my area of

1 expertise.

2 Q. Thank you, sir.

3 MR. RIZZOLO: No further questions, Your Honor.

4 JUDGE MCNAMARA: Thank you, Mr. Rizzolo.

5 Ms. Ducca?

6 MS. DUCCA: No questions from Staff, Your Honor.

7 JUDGE MCNAMARA: Ms. Mouser, any redirect?

8 MS. MOUSER: Yes, Your Honor, briefly.

9 REDIRECT EXAMINATION

10 BY MS. MOUSER:

11 Q. Mr. Levin, do you remember that Mr. Rizzolo asked
12 you about the timeline of the Qualcomm disclosures?

13 A. Yes.

14 Q. Mr. Moreno, could you please pull up CDX-2427?

15 Mr. Levin, did Qualcomm file -- did Qualcomm file
16 its disclosure form before or after it had sued Broadcom?

17 A. My recollection is that they filed -- they
18 submitted the forms after they had filed suit.

19 Q. So when Qualcomm sued Broadcom, had they made a
20 RAND commitment yet?

21 A. Well, I don't know. I didn't -- I don't follow
22 RAND issues.

23 Q. Had they submitted a patent disclosure form to
24 the ITU?

25 A. Oh, sorry. I didn't understand your question.

1 Yes, they did, I believe, checked box 2 when they
2 submitted the patent disclosure form to the ITU, but, again,
3 it did come after the litigation had started.

4 MS. MOUSER: Thank you, Your Honor. No further
5 questions.

6 JUDGE MCNAMARA: Thank you, Ms. Mouser.

7 Mr. Rizzolo, anything more?

8 RE CROSS-EXAMINATION

9 BY MR. RIZZOLO:

10 Q. One quick question on that, Mr. Levin.

11 The ITU policy, you said there's no time limit on
12 submitting licensing declarations, correct?

13 A. Yes. It's a flexible policy, and it also
14 recognizes that, for example, H.264 has undergone 14
15 amendments. So it changes. H.265 has undergone at least
16 11 -- ten different versions and amendments. So ITU does
17 not set a deadline for any patent disclosure.

18 Q. And the ITU policy includes nothing in there
19 about whether a declaration can be submitted before or after
20 a litigation is filed. It doesn't get into those issues,
21 correct?

22 A. That's not what I said. I'll take the time,
23 then. In 1999 --

24 Q. Sir, sir, I have --

25 A. My answer is yes, it does. There were clearly

1 provisions about submitting patent disclosure forms after
2 approval of a recommendation both in 1999 and in 2012.

3 Q. And I want to make sure the record is clear. I
4 didn't ask anything about a recommendation; I asked about a
5 litigation.

6 The ITU policy doesn't include anything about
7 whether there are requirements about submitting a patent
8 statement or licensing declaration form before or after a
9 lawsuit is filed. The ITU doesn't --

10 A. You're asking about before or after a lawsuit?

11 Q. Correct.

12 A. That language, I don't think it is specifically
13 addressed in the ITU policy.

14 MR. RIZZOLO: Thank you.

15 JUDGE MCNAMARA: Thank you, Mr. Rizzolo.

16 Again, Ms. Ducca, anything?

17 MS. DUCCA: Nothing from Staff, Your Honor.

18 JUDGE MCNAMARA: Thank you, Mr. Levin. You may
19 step down. Thank you for your testimony.

20 MR. NEWCOMER: This is Josh Newcomer for Nokia.
21 I think we have one witness left, and so it might be a good
22 time for the afternoon break.

23 JUDGE MCNAMARA: All right. I will see you back
24 here in 15 minutes.

25 (Whereupon, the proceedings recessed at 3:44

1 p.m.)

2 (In session at 4:05 p.m.)

3 JUDGE MCNAMARA: Okay. Thank you, everybody.

4 All right. Please be seated.

5 Okay, I think we're on our last witness.

6 MR. CHERN: Thankfully we are, Your Honor. Alex
7 Chern for Nokia, and at this time we call Dr. Akemann back
8 to the stand.

9 JUDGE MCNAMARA: Thank you.

10 MICHAEL AKEMANN,

11 having been previously duly sworn or affirmed
12 on their oath, was thereafter examined and testified further
13 as follows:

14 JUDGE MCNAMARA: Good afternoon, Dr. Akemann.

15 A. Good afternoon, Your Honor.

16 JUDGE MCNAMARA: All right. So you're still
17 under oath. You're fine.

18 A. Thank you.

19 MR. CHERN: Your Honor, I think just out of an
20 abundance of caution because we will be starting to talk
21 about licenses at some point pretty early on, we should
22 probably just go ahead and start on the Nokia confidential
23 record.

24 (Whereupon, the hearing proceeded in confidential
25 session.)

1 O P E N S E S S I O N

2 BY MR. CHERN:

3 Q. Let's talk a little bit about public interest,
4 shifting gears.

5 Remind us of your conclusion about whether an
6 exclusion order would adversely impact the four public
7 interest factors.

8 A. I concluded that it would not.

9 Q. About how much of the total U.S. computer market
10 do Respondents occupy?

11 A. Collectively, as we've seen, around 10 percent
12 over time.

13 Q. Now, did Respondents' expert, Dr. Seth, agree
14 that we should look at the U.S. market holistically?

15 A. At times in her analysis she did. Other times
16 she focuses in on particular subsegments.

17 Q. And do you agree with how Dr. Seth segmented the
18 market when she did?

19 A. No. I think that's ultimately not a helpful
20 approach to analyzing the economic issues here. I think it
21 fails to appreciate both supply side and demand side
22 flexibility that require, in my view, a consideration of the
23 market as a whole.

24 Q. Have you seen any evidence that consumers make
25 choices based on these segments that Dr. Seth sometimes

1 used?

2 A. I mean, they're marketing segments, so obviously
3 companies market in a particular way for reasons. So it's
4 certainly possible that consumers looking for a Chromebook
5 will choose amongst Chromebooks, for example, but there's
6 still a lot of flexibility on both the demand side and the
7 supply side.

8 People are able to switch seamlessly between an
9 education computer and an everyday computer and a business
10 computer. They all provide essentially the same
11 functionality, maybe with different horsepower, different
12 bells and whistles.

13 Q. Mr. Moreno, if we could go to slide CDX-16.8?

14 Can you kind of just give us a real-world example
15 of how Dr. Seth's market segmentation doesn't reflect the
16 realities?

17 A. Well, we heard Dr. Seth explain that she sort of
18 picked her segments based on, I guess, her experience, at
19 least in part, setting aside IDC segment, the data and so
20 forth.

21 And, you know, these price cutoffs, of course,
22 are in some sense quite arbitrary. The \$199 computer, in
23 her world, is going into one bucket, the blue bucket; the
24 \$201 computer is going into the green bucket. But by all
25 indications, these are going to be very similar, if not

1 almost identical products, even though the price might vary
2 by only \$2.

3 Q. And what's the effect of Dr. Seth kind of
4 segmenting the market this way? Why did she do it?

5 A. Well, it seems to be, in my view, arbitrary and
6 to focus on particular cherry-picked subsegments, where the
7 Respondents either collectively or individually have
8 relatively large shares as measured in various ways.

9 Q. Now, did Dr. Seth or Dr. Phiroz conduct any
10 research or market analysis in forming these segments?

11 A. I'm sorry. Could you repeat that?

12 Q. Yeah. Did you see Dr. Seth or Dr. Phiroz conduct
13 any research or market analysis in forming these segments?

14 A. Well, I think Dr. Seth did cite documents and
15 data that suggest segmentation, but I don't think that
16 there's any economic articles or treatises, for example,
17 that support the segments that she focused on as meaningful
18 for competitive analysis.

19 I think everything that you would see in the
20 literature, consistent with some of her other analysis,
21 would suggest that the way to think about the PC market is
22 as a whole, which is why, for example, the old article she
23 cited on computer cross-price elasticities look at the
24 market as a whole. They don't treat education as somehow a
25 distinct subsegment.

1 Q. You mentioned Dr. Seth sometimes using certain
2 data. Where does that data come from?

3 A. She used IDC data for many of her purposes.

4 Q. And do you find IDC data generally reliable?

5 A. I do. I use it routinely in my work.

6 Q. Was there any problem, though, with how Dr. Seth
7 was or wasn't using IDC data at times?

8 A. Well, we heard a lot of talk earlier about sort
9 of the mixing and matching across IDC data and information
10 provided by at least one of the Respondents in this case.

11 And when Dr. Seth was asked about this, the best
12 explanation she seemed to give is that they were measuring
13 different things, but, if so, they shouldn't add them
14 together. It doesn't make any sense to do that if they are
15 measuring different things.

16 So, in my view, you kind of have to pick a lane
17 on this stuff, and the IDC data is certainly a better source
18 for these purposes, I would argue.

19 Q. And was the IDC data on education market shares
20 lower than the data that Dr. Seth provided in court?

21 A. Substantially so, by a factor of 2 or more,
22 almost 3 if you credit the 40 percent figure, which, again,
23 suggests either one or the other is wrong or they are
24 measuring different things, but, in any case, it's not
25 reliable to do them together.

1 Q. Setting aside those critiques, even under
2 Dr. Seth's market segments, would there be a public interest
3 concern from excluding Respondents' computers?

4 A. No, because that segment isn't somehow distinct
5 and isolated from competitive forces. Consumers can and do
6 switch across segments, and if for some reason Acer and ASUS
7 did exit the education segment entirely, all the other large
8 participants and many small participants are already selling
9 in that segment and could easily sell more there over time.

10 Q. Dr. Seth talked a lot about Chromebooks. First,
11 do you agree that Chromebooks is its own separate market
12 segment?

13 A. No. There are obviously some distinguishing
14 features. They do use a different operating system, but
15 there's clearly a lot of switching and competitiveness
16 across Chromebooks and/or typically other lower-priced
17 laptop products.

18 Q. Is there anything unique about Respondents'
19 Chromebooks that would make it difficult for the market to
20 quickly replace them?

21 A. I certainly have not seen Respondents present
22 anything during this investigation, and that doesn't
23 surprise me, because the whole point of a Chromebook
24 essentially is to be hardware agnostic. The operating
25 system and software runs in the cloud. Any Chromebook is

1 supposed to work with any other Chromebook with the
2 operating system and applications that come along with.

3 Q. Dr. Seth also talked about Chromebooks in the
4 education sector. Do you remember that?

5 A. I do.

6 Q. Do you agree with Dr. Seth that schools switching
7 to other Chromebook manufacturers will harm the public
8 interest?

9 A. Not at all. I don't see how it could.

10 Q. And if we could go to the next slide, Mr. Moreno.
11 Is there any evidence that schools are locked
12 into using just Respondents' Chromebooks?

13 A. I've not seen any evidence of lock-in or
14 exclusive contracts.

15 Q. What does the evidence from, you know, two of
16 Dr. Seth's examples actually tell us?

17 A. Well, as Dr. Seth testified earlier today, on the
18 right side, with LA Unified, they are already choosing if
19 anything from other suppliers. I didn't see Acer or ASUS --
20 I do see Acer. No ASUS on that list. And on the left,
21 again, there are competing Chromebook suppliers, Lenovo, for
22 example.

23 Q. And what harm, if any, did Dr. Seth actually
24 quantify as to schools switching costs if they had to
25 replace their Chromebooks with another manufacturer?

1 A. I didn't see any quantification of that.

2 Q. Let's move on to Dr. Seth's consumer surplus
3 model.

4 First, is her consumer surplus model consistent
5 with the rest of her analysis?

6 A. It's not in the sense that it treats the market
7 as, in my view, properly, a whole singular entity, not a
8 subsegment-by-subsegment analysis.

9 Q. Okay. So in her other analysis, she segments the
10 market, but in her consumer surplus analysis, Dr. Seth
11 treats it as a whole?

12 A. That's right. And the starting point of her
13 model is a single computer priced at \$872, or whatever it is
14 precisely.

15 Q. Why would Dr. Seth switch methodologies like
16 that?

17 A. Well, she might do it in part because that's, in
18 some sense, the right way to analyze the computer market, at
19 least that's why I would do it that way if I were to go down
20 that path.

21 Q. Are there problems with Dr. Seth's modeling for
22 her consumer surplus analysis?

23 A. Absolutely. I didn't really have a chance to
24 explain in my direct testimony, but the model that she uses
25 is inherently static. It doesn't really permit new product

1 introduction, new model introduction. I think Dr. Seth even
2 concluded that, at most, she is measuring a temporary
3 effect, and that's the most a static model like that can
4 hope to predict.

5 In a highly competitive market like the U.S.
6 computer industry, you would expect if any market exit
7 occurred, there were fewer products offered in the education
8 segment, other suppliers would expand or offer new models in
9 there very quickly, which would undermine all of the effects
10 that she's estimating under that static approach.

11 Q. And what is Dr. Seth's opinion on how much prices
12 will increase under an exclusion order?

13 A. Even under her static model, she only estimates a
14 price effect of about 1.3 percent, which she herself
15 conceded earlier today was small, and I certainly agree with
16 that, small and insignificant.

17 Q. And just to be clear, do you agree with
18 Dr. Seth's consumer surplus model in any respect?

19 A. I don't think it's useful or well applied here at
20 all.

21 Q. Okay. But even setting that aside, what would it
22 mean practically in dollars and cents based on what Dr. Seth
23 found?

24 A. Well, shown at the bottom of this slide here,
25 that if we start with a \$200 PC and we add about 1.3

1 percent, that computer is going to be priced under her model
2 at \$202.74, so less than a 2 percent price increase.

3 Q. And is this the worse that Dr. Seth says it will
4 be?

5 A. Yeah. In some sense, that's a maximum short-run
6 impact, and I think she conceded earlier today that, if
7 anything, it would be dissipated over time, in my view,
8 almost immediately, if it even occurred in the first
9 instance.

10 Q. So even setting aside the flaws with Dr. Seth's
11 analysis, would a 1.37 percent price increase harm the
12 public interest?

13 A. Not at all. That wouldn't be significant.

14 Q. Dr. Akemann, in sum, do you believe that the
15 evidence shows that Nokia's offers complied with its RAND
16 commitment going back to the beginning?

17 A. Yes, I do.

18 Q. And do you believe that an exclusion order would
19 or would not harm the public interest here?

20 A. It would not harm the public interest, in my
21 view.

22 Q. Thank you, Dr. Akemann.

23 MR. CHERN: I'll pass the witness, Your Honor.

24 JUDGE MCNAMARA: Thank you, Mr. Chern.

25 Mr. Colaianni?

1 MR. COLAIANNI: Yes, Your Honor.

2 I think we should go on to the Nokia confidential
3 record, Your Honor.

4 JUDGE MCNAMARA: Okay.

5 (Whereupon, the hearing proceeded in confidential
6 session.)

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1 O P E N S E S S I O N

2 JUDGE MCNAMARA: Mr. Newcomer?

3 MR. NEWCOMER: That concludes our presentation of
4 our rebuttal case, Your Honor.

5 JUDGE MCNAMARA: Okay. Very good. So there are
6 just several --

7 Thank you, everybody. Boy, what an interesting
8 trial. A lot of good issues.

9 There are some administrative things to take care
10 of, including, of course, the admission into evidence of
11 exhibits.

12 Have you all agreed on a list of exhibits
13 including from the recent testimony?

14 MR. NEWCOMER: I think we're caught up through
15 Mr. Akemann. I guess we need a minute to confer.

16 JUDGE MCNAMARA: Sure. Why don't I step out,
17 give you a few minutes to talk about this, and there's a
18 list. And then I just have a few things I have to walk
19 through. It won't take me very long. So why don't you
20 confer. Knock on the door when you're ready for me.

21 MR. NEWCOMER: That sounds good, Your Honor.
22 I'll give you a heads-up. The parties are going to request
23 an extended page limit that we were thinking of for the
24 post-hearing brief.

25 JUDGE MCNAMARA: Gee, funny thing about that,

1 because I was thinking about that too and I was going to
2 wait for your offer before I make a counteroffer. How is
3 that?

4 MR. NEWCOMER: Okay. Thank you.

5 (Whereupon, the proceedings recessed at 5:17
6 p.m.)

7 (In session at 5:24 p.m.)

8 MR. NEWCOMER: We should be on the public record.

9 JUDGE MCNAMARA: Okay.

10 MR. NEWCOMER: I think Ms. Kinkade was going to
11 take that back to us concluding the presentation.

12 JUDGE MCNAMARA: Okay.

13 MR. NEWCOMER: So we have an agreed exhibit list.
14 It's being printed right now. No objection, I think.

15 MS. ROBERTS: No objections.

16 JUDGE MCNAMARA: Thank you, Ms. Roberts.

17 MS. DUCCA: No objections from Staff, Your Honor.

18 JUDGE MCNAMARA: Very good. Whatever is on the
19 exhibit lists that are going to be handed up to me and to
20 Ms. Kinkade will be accepted into evidence.

21 (Whereupon, the exhibits, as recited and
22 reflected in the index, were received in evidence, without
23 objection.)

24 JUDGE MCNAMARA: So why don't you all be seated.

25 So I understand you have an offer, Mr. Newcomer.

1 MR. NEWCOMER: Yes. The parties have conferred,
2 and we would like to extend the post-hearing brief to 200
3 pages.

4 JUDGE MCNAMARA: I agree. In fact, frankly, we
5 were talking about this earlier today. If you hadn't
6 suggested it, I was, and I would even be willing to go
7 higher. There's a lot of complicated information here, and
8 I suspect that you all are going to use a lot of the visuals
9 from the patents, and they take up a lot of space, as I well
10 know.

11 So I'm even willing to consider additional pages.
12 And you can split them up, again, as I typically allow, you
13 can split them up between the post-hearing brief and the
14 reply brief. If you want to go higher, again, I'm amenable
15 to that.

16 MS. DUCCA: Your Honor, when you say we can split
17 it up, it means we can use 150 for the opening and 50, but
18 it's our choice?

19 JUDGE MCNAMARA: Yes. It's your choice.

20 MR. NEWCOMER: We will counter our own offer and
21 go up to 225 then, Your Honor. Thank you.

22 JUDGE MCNAMARA: Well, you're not bidding against
23 yourself, because I have already upped the ante.

24 Are you good with that, Ms. Roberts?

25 MS. ROBERTS: Yes, Your Honor.

1 JUDGE MCNAMARA: If there's a problem, again, we
2 know there's a difference between space and characters, let
3 me know sooner rather than later and we'll see if we need to
4 adjust. I really want to see really good arguments on this.
5 Thank you.

6 I have a few administrative things to take care
7 of. First of all, I understand that each side has been sent
8 a Box link for exhibits, or everybody has been sent one.

9 Is that understanding correct? And, if so, who
10 are the recipients of the Box links for each side or who
11 will be?

12 MR. NEWCOMER: It should be Josh Newcomer, and I
13 think you have my email, and then Mel Kalka.

14 JUDGE MCNAMARA: For Respondents?

15 MS. ROBERTS: For Respondents you can add me,
16 Stephanie Roberts, and John Lund as well.

17 JUDGE MCNAMARA: Okay. That takes care of that
18 one.

19 Then I wanted to make sure, I understand from
20 Dr. Cheng's testimony that he was staying in D.C., that
21 there were still negotiations occurring. That's what he
22 said on the stand.

23 My question to you all is, are the September
24 offers -- I understood from the earlier testimony last week
25 that a September offer was made by ASUS and that there was a

1 January offer.

2 So are those offers that came in after discovery
3 closed on the exhibit lists?

4 MR. COLAIANNI: Yes, Your Honor. There were
5 several offers that were exchanged post close of fact
6 discovery. There was one in January. There was one in
7 February even. And they are on the exhibit list, as far as
8 I understand.

9 JUDGE MCNAMARA: Good.

10 Mr. Newcomer?

11 MR. NEWCOMER: I believe it's correct, whatever
12 came in through the witnesses and I believe they may have --

13 JUDGE MCNAMARA: Good. I just wanted to be sure
14 because I know they were not all identified, just a couple
15 were.

16 Ms. Ducca, you wanted to say something? All
17 right.

18 So we've taken care of that.

19 The next thing is, again, how you submit and how
20 you name the final exhibit list, what you handed up was fine
21 for interim witness lists, but, again, there's a
22 25-character field after the numbering of the exhibit
23 itself. That should contain alpha characters that describe
24 whether it's the declaration of so and so, whether it is an
25 excerpt from a specification. Just give it a description in

1 alpha characters so that we're just not looking at Exhibit
2 Dr. Akemann, Exhibit Dr. Akemann seriatim. We want
3 descriptions of what the exhibits are. Okay?

4 And, again, there are just a certain number of
5 characters you can use. Please double-check with Dockets,
6 also, about the size of the files, but they are pretty good
7 about giving you their limitations online, and I think it's
8 still 25 MB.

9 Let me see. Oh, yes, let me see. I'm trying to
10 read my handwriting.

11 For any documents that you annotated during the
12 course of the hearing and put on to the screen, please make
13 sure they are identified by date, have your name on them,
14 and they are identified in terms of some sort of a caption.

15 And then, finally, for any documents -- let me
16 think about this. I understand that Ms. Ekweonu, my
17 assistant, handed out a template to everybody of how the
18 exhibits should come in. Please borrow from that. And if
19 you have any questions, get back to Ms. Ekweonu very
20 quickly. She will respond quickly. She is really good at
21 that.

22 Finally, there's an opening for an attorney
23 advisor, an OALJ. So if anybody knows of anybody who is
24 thinking of wanting to come into government service, we do
25 have an opening, so I thought I would let you all know that.

1 So that's it from me.

2 Is there anything more that I can address before
3 we conclude?

4 Ms. Ducca? We're going backwards.

5 MS. DUCCA: I do have a question. This is a
6 little bit selfish for me. With respect to the motions to
7 strike, there's a couple out there that might be filed. I
8 know this morning Your Honor said that they can file it by
9 next week, by the end of next week. To the extent anybody
10 files it earlier, can we file the responses by the end of
11 next week? I know Ground Rule 9.8 says we file it the next
12 day.

13 JUDGE MCNAMARA: And I varied that orally, which
14 I often do, just because people are really pressed. So,
15 yes.

16 MS. DUCCA: Okay. Thank you, Your Honor.

17 JUDGE MCNAMARA: Is that clear for everybody?
18 And let me know -- I'll know by your silence if you're
19 withdrawing -- I'll know by your silence and timing if
20 you're not going to file your motions to strike, but you
21 might want to let us know that for the record. Okay?

22 Is there anything else? I was going around.

23 Mr. Colaianni for Respondents? Or Ms. Roberts?

24 MS. ROBERTS: Ms. Roberts. A couple things. The
25 physical exhibits, what do you want us to do with those?

1 JUDGE MCNAMARA: Wow. You know, a big part of
2 me says why didn't you hang on to them, take screenshots of
3 them. And if we want to use them in any way, we would let
4 you know and we would make sure there was a chain of
5 custody, but I don't think we need them right now.

6 MS. ROBERTS: Understood. And the demonstrative
7 exhibits, we haven't been adding them to the exhibit lists
8 since they are not admitted exhibits, but we were planning
9 to upload them to Box.

10 JUDGE MCNAMARA: Yes, please. And also, again, I
11 think, if you have any question at all, just have your folks
12 contact Ms. Ekweonu. She knows.

13 MS. ROBERTS: Thank you, Your Honor.

14 JUDGE MCNAMARA: You're welcome.

15 Anything more, Mr. Newcomer?

16 MR. NEWCOMER: Just wanted to say thank you, Your
17 Honor, thanks to Ms. Kinkade and your staff, thanks on
18 behalf of Nokia and the McKool Smith team.

19 JUDGE MCNAMARA: You're welcome. Our pleasure, I
20 have to assure you of that.

21 Thank you, everybody. Have a good night. You
22 all have certainly earned it, and I'll see you soon. Take
23 care.

24 (Whereupon, the proceedings concluded at
25 5:33 p.m.)

1 C O N T E N T S

2 INDEX OF WITNESSES

3

	WITNESS	DIRECT	CROSS	RE- DIRECT	RE- CROSS	STAFF
5	PALLAVI SETH.....		1862	1892		
6	IAIN RICHARDSON.....	1895	1978	2029	2037	2023
7			2008			
8	ARTHUR LEVIN.....	2041	2066	2084	2085	
9	MICHAEL AKEMANN.....	2088		2138	2143	

10

11

12

13

14 AFTERNOON SESSION.....2008

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16

17

18

19 CONFIDENTIAL SESSION.....1862- 1894

20 CONFIDENTIAL SESSION.....2088- 2105

21 CONFIDENTIAL SESSION.....2116- 2145

22

23

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25

1 EXHIBIT LISTS SUBMITTED FOR ADMISSION:
2 LIST OF EXHIBITS ADMITTED FOR MARCH 11
3 CX-0633C
4 CX-1661
5 CX-6498C
6 CX-6499C
7 CX-6619C
8 CX-6620C
9 CX-6622C
10 CX-6633C
11 CX-7209
12 CX-7218
13 CX-7219C
14 CX-7220C
15 CX-7225
16 CX-7226
17 CX-7227
18 JX-0039C
19 JX-0040C
20 JX-0041C
21 JX-0042C
22 JX-0054C
23 JX-0073C
24 JX-0076C
25 JX-0085C

1	JX-0086C
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4	JX-0089C
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6	JX-0091C
7	JX-0092C
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9	JX-0094C
10	JX-0095C
11	JX-0179
12	JX-0182C
13	JX-0184
14	JX-0192
15	JX-0203
16	JX-0204
17	JX-0206
18	JX-0208
19	JX-0209
20	JX-0210
21	JX-0212
22	JX-0243C
23	JX-0366C
24	JX-0372C
25	JX-0374

1	JX-0379
2	JX-0381
3	JX-0410
4	JX-0411
5	JX-0412
6	JX-0415
7	JX-0425C
8	JX-0439C
9	JX-0445C
10	JX-0459C
11	JX-0464C
12	JX-0472C
13	JX-0480C
14	JX-0496C
15	JX-0497C
16	JX-0517C
17	JX-0518C
18	JX-0519C
19	JX-0520C
20	JX-0521C
21	JX-0522C
22	JX-0523C
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7	JX-0568C
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9	JX-0570C
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12	JX-0573C
13	JX-0597C
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20	JX-0604C
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24	JX-0608C
25	JX-0613C

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3	JX-0617C
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6	JX-0626C
7	JX-0627C
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9	JX-0629C
10	JX-0630C
11	JX-0631C
12	JX-0632C
13	JX-0633C
14	JX-0699
15	JX-0710C
16	JX-0765
17	RX-0231
18	RX-0259
19	RX-0260
20	RX-0284
21	RX-0293
22	RX-0349
23	RX-0350
24	RX-0428C
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7	RX-0886
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9	RX-0910
10	RX-0911
11	RX-0914
12	RX-0918
13	RX-0923
14	RX-0925
15	RX-0979
16	RX-0980
17	RX-0984
18	RX-1016
19	RX-1017
20	RX-1019
21	RX-1020
22	RX-1021
23	RX-1025
24	RX-1039
25	RX-1041

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2	RX-1045
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13	RX-1289
14	RX-1296
15	RX-1298
16	RX-1320
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5	RX-1489
6	RX-1490
7	RX-1491
8	RX-1492
9	RX-1493
10	RX-1494
11	RX-1496
12	RX-1671
13	RX-1714C
14	RX-1715C
15	RX-1716C
16	RX-1733C
17	RX-1735C
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19	RX-1738C
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6	RX-2221
7	RX-2222
8	RX-2223
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23	RX-3602C
24	RX-3603C
25	RX-3607C

1	RX-3609C
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7	RX-3638C
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14 RX-4067C
15 RX-4068C
16 RX-4069C
17 RX-4073
18 RX-4074
19 RX-4076
20 RX-4077C
21 RX-4078
22 LIST OF EXHIBITS ADMITTED FOR MARCH 12
23 CX-1723
24 CX-1737
25 CX-1767

1	CX-1884
2	CX-1885
3	CX-1888
4	CX-1932
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6	CX-1966
7	CX-1971
8	CX-1972
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12	CX-1977
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22	CX-2017
23	CX-2018
24	CX-2019
25	CX-2020

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22	CX-2092
23	CX-2093
24	CX-2094
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8	CX-6589C
9	CX-6591C
10	CX-6592C
11	CX-6598
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22	CX-7111
23	CX-7112
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8	CX-7167
9	CX-7168
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11	CX-7170
12	CX-7171
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23	CX-7182
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7	CX-7191
8	CX-7222C
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10	JX-0036C
11	JX-0038
12	JX-0048
13	JX-0053C
14	JX-0077C
15	JX-0190
16	JX-0413
17	JX-0433C
18	JX-0697
19	JX-0722
20	JX-1966
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22	RX-0194
23	RX-0196
24	RX-0199
25	RX-0217

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6	RX-0624
7	RX-0625
8	RX-0628
9	RX-0629C
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11	RX-0632
12	RX-0634
13	RX-0635
14	RX-0637
15	RX-0641
16	RX-0643
17	RX-0644
18	RX-0645
19	RX-0648
20	RX-0656
21	RX-0658
22	RX-0659
23	RX-0660
24	RX-0661
25	RX-0663

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2	RX-0665
3	RX-0666
4	RX-0683
5	RX-0687
6	RX-0690
7	RX-0692
8	RX-0694
9	RX-0695
10	RX-0696
11	RX-0705
12	RX-0708
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22	RX-0742
23	RX-0743
24	RX-0751
25	RX-0752

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12	RX-0771
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14	RX-0777
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17	RX-0782
18	RX-0784
19	RX-0785
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22	RX-0795
23	RX-0797
24	RX-0799
25	RX-0800

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8	RX-0821
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12	RX-0830
13	RX-0837
14	RX-0839
15	RX-0840
16	RX-0841
17	RX-0842
18	RX-0843
19	RX-0844
20	RX-0845
21	RX-0846
22	RX-0847
23	RX-0850
24	RX-0851
25	RX-0852

1	RX-0853
2	RX-0853C
3	RX-0856
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6	RX-0865
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10	RX-1019
11	RX-1085
12	RX-1086
13	RX-1098
14	RX-1099
15	RX-1100
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17	RX-1103
18	RX-1105
19	RX-1106
20	RX-1108
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22	RX-1110
23	RX-1111
24	RX-1118
25	RX-1121

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2	RX-1130
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16	RX-1157
17	RX-1158
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19	RX-1160
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21	RX-1166
22	RX-1174
23	RX-1175
24	RX-1177
25	RX-1179

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4	RX-1188
5	RX-1194
6	RX-1234
7	RX-1500
8	RX-1503
9	RX-1505
10	RX-1506
11	RX-1511
12	RX-1512
13	RX-1513
14	RX-1514
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20	RX-1590
21	RX-1610
22	RX-1612
23	RX-1617
24	RX-1618
25	RX-1892

1 RX-1894
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4 RX-1905C
5 RX-1929C
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1 C E R T I F I C A T E

2 TITLE: CERTAIN VIDEO-CAPABLE LAPTOP, DESKTOP COMPUTERS,
3 HANDHELD COMPUTERS, TABLETS, TELEVISIONS, PROJECTORS, AND
4 COMPONENTS AND MODULES THEREOF

5 INVESTIGATION NO.: 337-TA-1448

6 HEARING DATE: March 12, 2026

7 LOCATION: Courtroom A

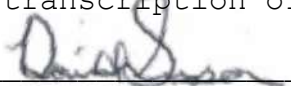
8 NATURE OF HEARING: Evidentiary Hearing

9 I hereby certify that the foregoing/attached
10 transcript is a true, correct and complete record of the
above-referenced proceedings of the U.S. International Trade
Commission. Date 3/12/26

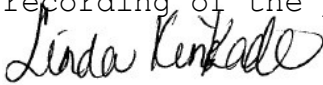
11 Signed: 
12 ss//
Heritage Reporting Corporation
13 1150 Connecticut Avenue, NW, Suite 305
Washington, D.C.

14 Signature of the Contractor or the Authorized Contractor's
15 Representative

16 I hereby certify that I am not the court reporter
and that I have proofread the above-referenced transcript of
17 the proceedings of the U.S. International Trade Commission
against the aforementioned court reporter's notes and
18 recordings for accuracy in transcription in the spelling,
hyphenation, punctuation and speaker identification and did
19 not make any changes of a substantive nature. The
foregoing/attached transcript is a true, correct and
complete transcription of the proceedings.

20 Signed: 
21 ss//

22 I hereby certify that I reported the
above-referenced proceedings of the U.S. International Trade
Commission and caused to be prepared from my record media
23 and notes of the proceedings a true, correct and complete
verbatim recording of the proceedings.

24 Signed: 
25 ss//

1 A P P E A R A N C E S (continued):

2

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9 Investigative Attorney

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11 Supervisory Attorney

12

13 *** Index appears at end of transcript ***

14

15 PLEASE NOTE: Quotations from documents are reflected in the
16 transcript as read and may not constitute a verbatim quote.

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1 P R O C E E D I N G S

2 (In session at 9:00 a.m.)

3 JUDGE MCNAMARA: Good morning, everyone. Please
4 be seated.

5 All right. So we are on the last day. Is there
6 anything that you would like me to address?

7 MR. NEWCOMER: I think a couple of administrative
8 issues, Your Honor.

9 JUDGE MCNAMARA: Sure.

10 MR. NEWCOMER: First, Joseph Micheli is going to
11 handle source code, how to submit it.

12 JUDGE MCNAMARA: Okay. Very good.

13 MR. NEWCOMER: He is one of our NEXT Advocates.

14 JUDGE MCNAMARA: Good. I am glad to hear that.

15 MR. MICHELI: Your Honor, Joseph Micheli for
16 Nokia.

17 JUDGE MCNAMARA: Yes.

18 MR. MICHELI: I wanted to briefly address the
19 source code exhibits. The parties met and conferred, and we
20 wanted to give you the option of either receiving all of the
21 source code or the files to which we cited in
22 demonstratives.

23 JUDGE MCNAMARA: Well, for me, that is an easy
24 choice, just those to which you have cited. And if we need
25 more because we want to see context, we will ask for more,

1 but at this point just what you cited.

2 MR. MICHELI: Understood, Your Honor. Thank you.

3 JUDGE MCNAMARA: Thank you very much.

4 MR. FLEMING: Kyle Fleming for Respondents. Just
5 a quick follow-up on timing. Is that to be submitted today
6 or could the parties have a couple days to --

7 JUDGE MCNAMARA: You have several days to get it
8 in. I will be out next week anyway, so you have some time.

9 MR. FLEMING: Thank you, Your Honor.

10 JUDGE MCNAMARA: And I think you should just look
11 at the scheduling order. You will start to work with
12 Ms. Ekweonu on getting the final exhibit lists in, but I
13 will talk about that later today.

14 MR. FLEMING: Thank you, Your Honor.

15 JUDGE MCNAMARA: Okay.

16 Anything, Ms. Ducca?

17 MS. DUCCA: Nothing from Staff, Your Honor.

18 JUDGE MCNAMARA: Good.

19 Mr. Newcomer?

20 MR. NEWCOMER: Are there still any slide
21 objections or are we good on those?

22 MS. ROBERTS: Yes, I think we have -- we're going
23 to have one of our NEXT Advocates, Ann Le, introduce the
24 exhibits from yesterday, and then there are slide
25 objections.

1 JUDGE MCNAMARA: Okay. From yesterday or today?

2 MS. ROBERTS: The objections are for
3 Dr. Richardson, who is up next.

4 JUDGE MCNAMARA: Yes. Okay.
5 Good morning, Ms. Le.

6 MS. LE: Good morning, Your Honor. We would like
7 to admit the exhibits that were entered into the record
8 yesterday with Dr. Phiroz, Dr. Acton, Dr. Simcoe, and
9 Dr. Lopez.

10 JUDGE MCNAMARA: Okay.
11 Are there any objections from Nokia's side?

12 MR. NEWCOMER: No objections.

13 JUDGE MCNAMARA: All right.

14 Then the list of exhibits that you have
15 identified, Ms. Le, will be admitted into evidence without
16 objection.

17 (Whereupon, the exhibits as recited by counsel
18 and reflected in the attached index were submitted and
19 received in evidence.)

20 JUDGE MCNAMARA: And, Ms. Ducca, I should have
21 asked you, do you have any objections?

22 MS. DUCCA: No objection from Staff, Your Honor.

23 JUDGE MCNAMARA: Okay, good. Then they will be
24 admitted, and presumably you have a list now to hand to me
25 and to Ms. Kinkade?

1 MS. LE: Yes, Your Honor. May I approach?

2 JUDGE MCNAMARA: Yes, please.

3 Thank you.

4 MR. MILLER: Your Honor, Zach Miller for
5 Respondents.

6 JUDGE MCNAMARA: Good morning.

7 MR. MILLER: I don't know if we are on the
8 confidential record or public. We can probably be on the
9 public record, but I see the confidential sign there.

10 JUDGE MCNAMARA: All right.

11 MR. MILLER: There was one objection to three
12 slides by Dr. Richardson.

13 Can we pull up CDX-11.124 and start there?

14 It's the same objection, generally, Your Honor.
15 This is Dr. Richardson's rebuttal to Dr. Hemami's testimony
16 regarding the MPEG-1 alone obviousness combination for the
17 '321 patent.

18 Dr. Richardson identifies Respondents' Step 1,
19 which was that it would be obvious for a decoder to use a
20 closed GOP with no leading B-frames, and then Step 2, which
21 is performing one of two sets of modifications.

22 And then if we look at CDX-11.125 and 126,
23 Dr. Richardson has comments and opinions regarding the two
24 methods as part of Step 2.

25 Your Honor, our objection is that, in his report,

1 Dr. Richardson only commented/criticized Step 1. He didn't
2 provide opinions with respect to Step 2.

3 If we pull up his report, that's CX-6465C, and if
4 we go to paragraph 277, this is where the section starts
5 with him addressing this limitation.

6 And I want to pull up paragraph 282 at the bottom
7 of page 92, and this is where Dr. Richardson identifies that
8 Dr. Hemami's argument is based on the premise that it would
9 have been obvious to a POSITA to create or implement a
10 modified version of MPEG-1 that only permitted the first
11 form of closed GOPs. That's the form without the leading
12 B-frames, and that's what all of his analysis is.

13 Your Honor, I understand that you often -- often
14 your practice on this type of issue is to let it in and then
15 have parties file a motion to strike. And so if that's what
16 you'd prefer, that's fine, but I just wanted to raise the
17 objection.

18 JUDGE MCNAMARA: I appreciate that, Mr. Miller.
19 Ms. Ducca?

20 MS. DUCCA: I was going to propose the same
21 thing. So as I understand it -- I haven't had a chance to
22 dig into the expert report --

23 JUDGE MCNAMARA: Me either.

24 MS. DUCCA: -- but the Respondents say it's not
25 there, the Complainants say it is. So I think the most

1 logical way to go about this is a motion to strike.

2 JUDGE MCNAMARA: That is why I put the ground
3 rule in, because it is very hard sometimes on the fly, when
4 you are not -- when you don't have the entire context and
5 when you don't have the trial transcript in front of you to
6 see what was said and not said to make that decision.

7 So I appreciate your suggestion, and it is kind
8 of nice. It is like you put up the flag before, you know,
9 and gave us the alternative without just the -- and I like
10 that. That is a good --

11 MR. MILLER: Of course, Your Honor. And as far
12 as timing on the motion to strike, is there a specific time
13 you want? I know your ground rules have it, I think, by
14 tomorrow, but --

15 JUDGE MCNAMARA: Yes. No, that is fine. I am
16 going to be out of town. I am going to be taking a week
17 out. So I am going to give you a week. And then you will
18 have -- the Complainants will have time to respond.

19 MR. MILLER: Thank you, Your Honor.

20 JUDGE MCNAMARA: You are welcome.

21 Okay. Is there anything else?

22 MR. NEWCOMER: That's all, Your Honor.

23 JUDGE MCNAMARA: Thank you, Mr. Newcomer.

24 Mr. Lipschitz?

25

1 MR. LIPSCHITZ: Yes.

2 PALLAVI SETH,

3 having been previously duly sworn or affirmed
4 on their oath, was thereafter examined and testified further
5 as follows:

6 JUDGE MCNAMARA: Good morning, Dr. Seth.

7 A. Good morning.

8 JUDGE MCNAMARA: I hope you found it pleasant
9 last night.

10 A. Yes, I got to spend some time with my kids, so
11 that's great.

12 JUDGE MCNAMARA: Oh, that's good. That's good.

13 I have the time. Has everyone agreed on the
14 time?

15 MR. NEWCOMER: I think we're in agreement on the
16 time, Your Honor, and I think, based on both sides' current
17 budget, we'll finish with a little bit of time left at the
18 end of the day, not a lot, just a little bit if Warren
19 sticks to his budget.

20 JUDGE MCNAMARA: Okay, that sounds good.

21 All right. Please, be seated. Thank you.

22 MR. LIPSCHITZ: May I proceed, Your Honor?

23 JUDGE MCNAMARA: Yes, thank you.

24 MR. LIPSCHITZ: Let's go on the Acer confidential
25 record, Your Honor.

1 (Whereupon, the hearing proceeded in confidential
2 session.)
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1 O P E N S E S S I O N

2 MR. VERBONCOEUR: Good morning, Your Honor. For
3 Nokia's first witness in its rebuttal case, it will call
4 Dr. Iain Richardson.

5 JUDGE MCNAMARA: All right. Very good.

6 Good morning, Dr. Richardson.

7 A. Good morning.

8 IAIN RICHARDSON,

9 having been previously duly sworn or affirmed
10 on their oath, was thereafter examined and testified further
11 as follows:

12 JUDGE MCNAMARA: You are still under oath, so you
13 can just sit, make yourself comfortable.

14 MR. VERBONCOEUR: We will begin on the public
15 record. I expect we will remain there.

16 DIRECT EXAMINATION

17 BY MR. VERBONCOEUR:

18 Q. Good morning, Dr. Richardson.

19 A. Good morning.

20 Good morning, Your Honor.

21 Q. Let's jump right in. Did you prepare a set of
22 slides to assist you with your testimony?

23 A. I did.

24 Q. Can you tell us why you're here?

25 A. If we could go to the next slide, please,

1 slide 2.

2 JUDGE MCNAMARA: Can we have those?

3 MR. VERBONCOEUR: Yes, I'm sorry, Your Honor. I
4 apologize, Your Honor. They are coming right up.

5 JUDGE MCNAMARA: Thank you.

6 Q. Dr. Richardson, can you tell us why you're here?

7 A. I'm looking at slide 2. I'm here to talk about
8 validity today, Your Honor, specifically of the '267 patent,
9 the '714 patent, and the '321 patent.

10 Q. Let's have slide 3, please.

11 Before we get into those validity grounds,
12 Doctor, can you remind us what a person of ordinary skill in
13 the art is for the four patents at issue here?

14 A. So a person of ordinary skill in the art, or a
15 POSITA, for all four patents at issue in this hearing would
16 have at least a bachelor's degree in a relevant field with
17 around two years of experience in video decoding or
18 encoding.

19 Q. Did you qualify as a person of ordinary skill in
20 the art as of the time of the inventions in each of the four
21 patents at issue in this case?

22 A. Yes.

23 Q. Let's have slide 4.

24 Doctor, can we get started with the '267 patent?

25 A. Okay.

1 Q. Let's have slide 5.

2 Doctor, can you explain for us what led to the
3 '267 patent?

4 A. So the '267 patent is about technology in video
5 coding called bidirectional prediction. I'm going to talk
6 more about that later, Your Honor, but, very briefly, the
7 '267 patent inventors identified a problem with existing
8 methods of bidirectional prediction, which involved creating
9 a prediction P1 from a first reference frame, creating a
10 picture -- a prediction P2 from a second reference frame,
11 and combining those to make a prediction shown as P on my
12 slide 5, which is Fig. 10 of the '267 patent.

13 And the problem was that in prior art methods at
14 doing this, P1 was created at the input bit-depth, P2 was
15 also created at the input bit-depth, and the combined
16 prediction P was at the same bit-depth, and the inventors
17 recognized that there was a problem, potential problem with
18 the accuracy of resulting prediction.

19 Q. Let's have slide 6, please.

20 And, Doctor, can you explain to us how in the
21 prior art these predictions P1 and P2 were formed?

22 A. So you've heard about interpolation, Your Honor.
23 So the first stage of these predictions, which I've
24 highlighted in green on my slide 6, is a filter, and in each
25 case that's a way of combining integer pixel values to

1 create a combined value, and then in blue I've highlighted a
2 pair of processes in each case that convert that if you like
3 back down to the input bit-depth that I talked about
4 earlier.

5 Q. Were there any prior art attempts to address the
6 rounding error problem?

7 A. So this problem of the accuracy of prediction,
8 which was also known as the rounding error problem, this
9 was -- if you would go to slide 7, please -- this was a
10 known problem.

11 At the time of the invention, the committee, the
12 JCT-VC that was working towards developing the H.265
13 standard, had identified this problem. Various attempts
14 were made to solve it, but it was not resolved by this
15 stage, and the whole draft standard had been split into what
16 they called high efficiency and low complexity parts, partly
17 because of this problem with rounding error and prediction
18 inaccuracies.

19 Q. Let's have slide 8, please.

20 Did Nokia attempt to solve the rounding error
21 problem?

22 A. They did. And this is an extract from a
23 contribution to that standardization committee made by
24 Nokia, on my slide 8, and the proposed Nokia solution is
25 essentially to avoid converting or constructing P1 and P2,

1 those predictions, to avoid constructing them at the input
2 bit-depth, but instead to keep them at a higher precision so
3 that a more accurate prediction could be performed.

4 Q. Let's have slide 9, please.

5 So, Doctor, what happened after Nokia made its
6 contribution?

7 A. So these are extracts from a JCT-VC document, and
8 the proposal was to harmonize the two separate
9 configurations, the high complexity and the low complexity
10 configurations, to keep these prediction signals at a high
11 precision, as I've highlighted at the top of this
12 demonstrative, and the result, which I have extracted at the
13 bottom of this slide 9, is that the proposal was adopted,
14 and the text there says adopted into the HM, and HM was the
15 draft version of the standard which ultimately became the
16 H.265 standard.

17 Q. Let's have slide 10.

18 Now, Doctor, I'd like to turn to the prosecution
19 history of the '267 patent.

20 Was there anything noteworthy in the prosecution
21 history that we ought to consider before diving into the
22 validity grounds at issue here?

23 A. If we go to slide 11, please.

24 So this, Your Honor, is an extract of the file
25 history of the priority application for the '267 patent, and

1 I've highlighted some text here which relates to a reference
2 "Ye" or "Ye," and that reference disclosed a very similar
3 issue to one that we're going to talk about today, which is
4 the concept of scaling prediction blocks, such as P0 and P1,
5 by a weighting factor.

6 And I've highlighted this text: As discussed
7 during the interview, and that's between the applicant and
8 the Examiner, these weighted values do not have increased
9 precision relative to, and these are the original prediction
10 values, P0 and P1, and instead simply serve to change the
11 range of values.

12 And, as a result, the Examiner concluded that the
13 Ye reference fails to teach or suggest any increase in
14 precision from the reference blocks to the first and second
15 predictions.

16 Now, I'm going to explain the context of that
17 shortly, but, in my view, this is the same issue that was
18 one of the grounds brought up by Dr. Schonfeld earlier in
19 this hearing, and so the Examiner had already addressed and
20 the applicant had overcome this issue during prosecution.

21 Q. Let's have slide 12, please.

22 Doctor, what are the invalidity grounds that
23 Respondents advance against the '267 patent?

24 A. If we go to slide 13, there are two grounds.
25 There's a reference called Walker, an obviousness ground,

1 and the second ground is Walker with another reference,
2 Srinivasan, also an obviousness ground.

3 Q. Let's have slide 14, please.

4 What's the Walker reference?

5 A. Walker is directed to something called weighted
6 bidirectional prediction. And, again, I'm going to talk
7 further about that shortly, Your Honor, but Walker's purpose
8 was to construct what Walker describes as a universal
9 formula or a single implementation for decoding four
10 different specifications using one formula or one
11 methodology, and those specifications were the MPEG-4 part 2
12 standard, something called RV9, something called WMV9, and
13 something we are more familiar with, the H.264 standard.

14 Q. Let's have slide 15, please.

15 Doctor, what is weighted bi-prediction?

16 A. Okay. So I've got a video here. I'm going to
17 talk for a moment and then we'll play it again, because you
18 missed that. It's so quick you miss it.

19 So weighted bi-prediction is something that is in
20 the H.264 standard. And it's to do with constructing
21 predictions from two reference frames, and it's particularly
22 relevant or useful when we consider fading. And fading is
23 when one scene fades into another. We see this a lot on TVs
24 and in movies.

25 So I'm about to ask for this video to be played

1 and you're just going to see a few seconds where it's fading
2 from one scene with a crowd of people into another scene
3 with traffic. One more time, please.

4 (Video clip played.)

5 A. I've slowed it down. The whole fade here lasts
6 about two seconds in the original video.

7 If we go to the next slide, please, this is in
8 color, a figure from one of my books, where I used this
9 exact scene to illustrate bi-prediction and weighted
10 bi-prediction.

11 And if we consider the frame in the middle at the
12 top here, I've outlined a white block or macroblock. So
13 consider how we want to predict that block, we have a
14 previous frame with the first scene, a future frame with the
15 second scene.

16 So the weighted prediction is a way of getting an
17 efficient prediction of these kinds of blocks, and, as
18 Walker says, weighting factors, such as the ones I'm going
19 to talk about, can be beneficial when one scene fades into
20 another.

21 So if we go to the next slide, slide 17, so I've
22 now just expanded on this diagram somewhat. So on the left
23 we've got a frame from the crowd scene, on the right we've
24 got a frame from the city scene. And in green I've shown a
25 block in a frame right in the middle.

1 So, for that block we've got 50 percent of the
2 crowd, 50 percent of the city. So it makes sense if we're
3 using bi-prediction to use equal weightings, equal
4 prediction from both of those scenes.

5 The blue block slightly to the left, in that
6 frame we are closer in time to the crowd scene, and there's
7 more of the crowd scene in the fading image. So it makes
8 sense from an encoding perspective to weight the crowd scene
9 more to give it a three-quarters weight, .75, and to give a
10 weighting to the city scene of .25, so that we kind of
11 adjust the prediction depending on which of the reference
12 frames is a better match for the current frame.

13 And, finally, with the red block, we're, again,
14 weighting it the other way around. It's now got more of the
15 city scene. So with weighted bi-prediction, the encoder can
16 weight the contribution of the city scene by three quarters
17 and the crowd scene by one quarter.

18 So this idea of shifting weights between the two
19 frames or increasing one and decreasing the other, this is
20 what we mean by weighted bi-prediction, and this is what
21 Walker is about, it's about a way of implementing this.

22 Q. Let's have slide 18, please.

23 So, Doctor, we're talking about the Walker
24 reference.

25 What in Walker are the predictions you're talking

1 about here?

2 A. So I've shown a figure from Walker. A lot going
3 on here, Your Honor, but if we focus on the yellow
4 highlighting, we have two blocks, 520 and 580. And 520 is
5 what Walker describes as a best matching macroblock for a
6 current macroblock being encoded.

7 So that's, I would say, you would consider an
8 example of a prediction. It's trying to predict that
9 current macroblock. It's trying to estimate that
10 macroblock. So that we can get a good prediction and a good
11 match.

12 And then 580 is the same idea. It's a prediction
13 for the block from a second reference frame. So 520 and
14 580, if you think of those as comparable to those two arrows
15 coming into the predicted block in the previous slide.

16 So these are predictions. And in my view a
17 person of ordinary skill in the art would recognize these as
18 predictions. They are estimating a value that's to be
19 encoded, such as a block, pixels of a block or samples of a
20 block.

21 Q. Let's have slide 19, please.

22 We just spoke about the top part of that Fig. 5
23 from Walker.

24 Would a person of ordinary skill in the art also
25 recognize what the predictions would be on the bottom part?

1 Let's go back to slide 18.

2 So we spoke about the top part of Fig. 5.

3 There's also the bottom part of Fig. 5.

4 Would a person of ordinary skill in the art also
5 understand what the predictions are from the bottom part of
6 Fig. 5?

7 A. Yes. And I haven't highlighted these,
8 Your Honor, but Walker basically puts the encoder on the top
9 line in this middle section of Fig. 5, and the decoder on
10 the bottom line. The decoder, I know that because it's
11 going Q minus 1, that's inverse quantizing or rescaling,
12 inverse transform, and then add the predictions. And the
13 predictions now on the bottom are 565 and 590. And these
14 would be constructed in an identical manner in the encoder
15 and in the decoder.

16 Q. Let's have slide 20, please.

17 Now what I'd like to do is let's walk through
18 what the predictions are in each of Walker's
19 implementations.

20 So what's the prediction, in your view, in the
21 MPEG-4 implementation in Walker?

22 A. So I mentioned that Walker tries to implement
23 four specifications or standards in one design. The first
24 one here is MPEG-4 part 2, and the predictions here are
25 pred1ij and pred2ij, and these are 8-bit samples.

1 Q. Let's have slide 21, please.

2 What does Walker call the predictions in the RV9
3 or RealVideo 9 implementation?

4 A. So this is another specification for video
5 coding, and, again, Walker identifies two prediction
6 signals, pred1ij, pred2ij, and, again, these are 8-bit
7 predictions.

8 And if I could just move forward, Your Honor, if
9 you go to the next slide, slide 22, similarly for the
10 Windows Media Video 9 specification, yet another video
11 coding specification, again, Walker identifies prediction
12 samples predij -- sorry -- pred1ij and pred2ij, and, again,
13 these are 8-bit samples in the prediction.

14 And one more, slide 23, and this is now the more
15 familiar H.264 standard, and, again, Walker identifies two
16 prediction inputs, pred0 and pred1, which, once again, are
17 8-bit prediction blocks of 8-bit prediction samples.

18 Q. Doctor, I want to ask you a question about slide
19 23. You've highlighted pred0 and pred1 as samples from
20 prediction blocks.

21 Now, you understand that the Respondents in this
22 matter allege that the weighted w times pred0, w0 times
23 pred0, is a prediction.

24 Do you have a response to that?

25 A. In my view that is simply not a prediction,

1 Your Honor. A person of ordinary skill in the art, reading
2 Walker, sees throughout Walker a consistent reference to
3 prediction blocks. As we can see, they all have -- all
4 these blocks have pred in the title, they are all 8-bit, all
5 consisting of 8-bit samples.

6 So in my view Respondents are identifying a value
7 that is not a prediction; it's some other value in the
8 process.

9 Q. So now let's turn to slide 24, please.

10 You also mentioned the Srinivasan reference
11 earlier. What is Srinivasan?

12 A. Srinivasan is a patent and it's concerned, not
13 directly with bi-prediction, it's concerned with
14 interpolation, this process of generating interpolated
15 samples between integer or existing pixel values.

16 And I'm just highlighting here, I'll come back to
17 this, but I'm highlighting Fig. 8 of Srinivasan, and the
18 abstract where Srinivasan is concerned with starting with
19 8-bit pixel values at the top left of Fig. 8, carrying out a
20 series of operations, and ending up with 8-bit filter to
21 output values at the lower right of Srinivasan Fig. 8.

22 Q. Let's please have slide 25.

23 Now what I'd like to do is I'd like to turn to
24 Respondents' invalidity theories for the '267 patent.

25 Can you remind us what the two grounds were that

1 Respondents assert?

2 A. If we go to slide 26, please, so Respondents have
3 two main grounds, and, as I understood Dr. Schonfeld's
4 testimony, he splits up ground 1 into three theories, which
5 I have called the bitwidth theory, the variable weight
6 theory, and a theory involving alleged precision from
7 interpolation in the Walker reference itself.

8 And then in ground 2, I'm going to describe his
9 theory as what I believe to be alleged precision from the
10 Srinivasan interpolations.

11 Q. Let's have slide 27, please.

12 Can you tell us what Respondents are pointing to
13 as far as Walker is concerned?

14 A. So in Respondents' analysis of Walker, they point
15 to values of the encoder and decoder. They are actually
16 slightly different in Walker. In the encoder they point to
17 values pred0 times $w0$, and pred1 multiplied by $w1$. And in
18 the decoder they point to a slightly different variant into
19 this.

20 Q. Let's have slide 28.

21 What do Respondents point to in the decoding
22 claims in Walker?

23 A. I got ahead of myself. This is the decoding
24 side. Respondents point specifically to -- I'll try and
25 read it out -- pred0 times weight A or w_a , and then the

1 result of that right-shifted by 6 binary places. And they
2 point to a similar quantity involving pred1 and wb and,
3 again, a right-shift.

4 And Respondents, for the encoding and decoding
5 side, they start by pointing to these values and then
6 identifying these as predictions in Walker.

7 Q. Let's have slide 29.

8 And, Doctor, I'd like to start with what you've
9 called the bitwidth theory from Respondents. But before I
10 do, I want to ask you the broader question.

11 Do you agree with any of Respondents' invalidity
12 grounds?

13 A. I do not with respect to the '267 patent, no.

14 Q. So I'd like to walk through those various
15 theories now.

16 Let's have slide 30.

17 What is your response to the Respondents'
18 bitwidth theory for Walker?

19 A. So, as I understand the theory, to get to the
20 answer that they get to, to get the conclusion Respondents
21 get to, they misidentify elements of Walker as predictions.

22 If we actually look at the bottom of slide 30,
23 I've highlighted in blue one of the Walker equations that
24 Dr. Schonfeld relied on the other day. There are three
25 predictions in that equation. You can actually see them

1 from the variable names, they are described as predictions,
2 pred0, pred1, and the output, which is called final_pred.

3 Instead of considering these to be predictions,
4 Respondents consider, at the top of my slide 30, these
5 quantities I mentioned to be predictions, pred0 times w0,
6 and pred1 times w1.

7 Q. Let's have slide 31, please.

8 Can you explain to us the relationship between
9 what Respondents are calling Walker's predictions and what
10 you've called Walker's predictions?

11 A. To be honest, in my opinion, these are Walker's
12 predictions, but I'll accept your question.

13 I've highlighted Fig. 8 of Walker, part of Fig. 8
14 of Walker, on my slide 31. This is a diagram of Walker's
15 universal decoder that I mentioned.

16 Walker in this diagram has, for example, pred1
17 and pred0, which I've shown highlighted in blue. Walker
18 describes these in the specification as predictions as 8-bit
19 predictions.

20 Respondents for the decoding claims have pointed
21 to this, these arrows that I've highlighted in red. They
22 don't actually have a name in Fig. 8 of Walker. And you'll
23 see they are immediately to the right of Walker's box, units
24 855 and 860 in Fig. 8 of Walker.

25 And in my view this is an arbitrary choice of

1 something that is not described as a prediction in Walker,
2 and a person of ordinary skill would not recognize as a
3 prediction in Walker.

4 Q. Let's go to slide 32, please.

5 We just spoke about Walker's predictions, which
6 you've identified as pred0, pred1. Now what I'd like to do
7 is talk about this concept of a second precision in Walker.

8 Do you agree with Respondents that w times pred
9 has a second precision which is higher than the first
10 precision as claimed in the '267 patent?

11 A. No. In my opinion, even if I were to accept
12 Respondents' identification of what they call predictions,
13 what they identify does not have a higher precision than the
14 input pixel values as required by the claims.

15 Q. Let's have slide 33.

16 Before we jump into that topic, are there any
17 claim construction proposals we should consider?

18 A. Yes. In particular, the parties' proposed
19 constructions of the term "precision" are highly relevant in
20 my -- in forming my opinion.

21 I have formed my opinions and reached my opinions
22 in the light of all three of the proposed construction for
23 precision, and the most important aspect is that all
24 three -- or an important aspect is that all three specify
25 precision as a number of bits needed or required to

1 represent possible values or distinct alternatives. And
2 I've considered all three of these.

3 Q. Doctor, I want to make sure the record is clear
4 on this point.

5 Are you saying that your opinions on the '267
6 patent invalidity grounds are the same across all three
7 proposed constructions?

8 A. With respect to my conclusions that the
9 references do not invalidate the '267 patent, yes.

10 Q. Before we dive in, you mentioned the term
11 "bitwidth." What is bitwidth?

12 A. So if we go to slide 34, this is actually one of
13 Dr. Schonfeld's demonstratives. And at the lower right he
14 has highlighted these -- two of these terms I mentioned,
15 pred0 times w0, pred1 times w1. And I think this is his
16 highlighting. He has also highlighted what Walker described
17 as the bitwidth of an operation result.

18 And so bitwidth is the number of bits that Walker
19 has chosen to store these combined values, pred0 times w0,
20 pred0 times w1.

21 Q. In your view are bitwidth and precision the same
22 concepts?

23 A. They are not. Precision, especially under the
24 three proposed claim constructions, is the number of bits
25 needed or required to represent possible values.

1 Bitwidth is the number of bits used in a
2 particular implementation. I can use more bits than I need
3 to represent a value. And in my view that's exactly what
4 Walker has done here.

5 Q. Now what I'd like to do is discuss that last
6 point you made, the number of bits needed or required to
7 represent possible values or distinct alternatives.

8 Can we turn to slide 35?

9 Can you explain to us what you mean by this
10 distinction between the number of bits needed to represent
11 possible values and bitwidth?

12 A. Your Honor, I think this is a very important
13 point. I think the record may not be entirely clear up to
14 this stage.

15 And so I've moved away from numbers briefly,
16 because I think numbers can actually be a source of
17 potential confusion. The constructions all talk about
18 representing possible values or possible alternatives.

19 On the left of slide 35 I have shown eight
20 colors. Let's say I want to identify any one of those eight
21 colors, how many bits do I need. Maybe I want to paint by
22 numbers. How many bits do I need if I identify each of
23 these values in binary.

24 And the answer is 3 bits, because, with 3 bits, I
25 can represent one color with 000, another one with 001, all

1 the way up to 111. So 3 bits is what I need to represent
2 these 8 possible values.

3 You consider the right of slide 35, I've shown a
4 different collection of colors. Now I've got four possible
5 colors, only four. How many bits do I need to represent
6 this set of four colors, and the answer is 2, 00, 01, 10,
7 11. I could use more, but I only need 2 bits to represent
8 the choice of colors on the right.

9 So hopefully that's a clear illustration of
10 what's actually meant by the number of bits needed to
11 represent possibilities.

12 Q. I want to hone in here on slide 35 and see if we
13 can discuss this in the context of our everyday experiences.

14 How does what you're showing on slide 35 relate
15 to what a user or a viewer would see on their screen when
16 watching video?

17 A. So it's quite analogous in that to show
18 full-color video, we might use, let's say -- let's say we
19 use 256 possible values, and we get 8-bit, let's go, maybe
20 it's black and white, 8-bit black and white or monochrome
21 image. If we increase the number of possibilities,
22 something called high dynamic range, we need more bits per
23 pixel to represent those possibilities.

24 Q. And is a user going to perceive any difference
25 between sort of the fewer possible values and more possible

1 values when watching a video?

2 A. Yes. As we increase the number of possible
3 colors and brightnesses and so on, you see what looks like a
4 more realistic image, as the number of colors and
5 possibilities increases.

6 Q. Let's have slide 36, please.

7 Now what I'd like to talk about is this concept
8 of multiplying a set of possible values by another number.

9 Does scaling increase the number of possible
10 values?

11 A. It does not. And I'm illustrating this on slide
12 36, and I'll put it in context in a moment, but, for the
13 moment, just focus on the four unique values on the left, 4,
14 8, 12 and 16. And now I'm back to numbers. Hopefully the
15 basic concept is in the record.

16 And now four unique values. If I want to
17 represent these in bits, I actually only need 2 bits,
18 because I only have four possibilities.

19 Let's say we ignore the ones on the left and we
20 look at the ones on the right. There are still only four
21 possible values, 8, 16, 24, and 32. I might choose to use
22 more bits, but I only need 2 bits to represent the values on
23 the right. And the relationship, of course, is that I got
24 to the ones on the right by doubling them, doubling the
25 numbers on the left. So that's scaling by a constant.

1 So scaling by a constant by itself does not
2 increase the number of possible values, and, therefore,
3 under all the constructions, does not increase precision.

4 Q. Slide 37. Now I want to ask you that question in
5 the context of the sort of predictions in Walker we're
6 talking about.

7 Does scaling Walker's predictions increase the
8 number of possible values?

9 A. No, it does not. And so this is slide 37. And
10 we're now directly in the territory that there's a dispute
11 about.

12 If I have a very small block, a 3x3 block on the
13 left of slide 37, let's say that is pred0, in that block
14 there are four unique values. If I scale that block by a
15 constant of 2, so every sample within that block is scaled
16 by the same amount, I get a new block on the right. Let's
17 call that pred0 times w0.

18 The numbers are different, but there are still
19 only four unique values. So under all the constructions of
20 precision, the precision has not changed, and hopefully they
21 link to my previous diagram and now it becomes a bit
22 clearer.

23 On the right-hand side of slide 37, I've
24 represented four unique values before scaling, four unique
25 values after scaling. So the scaling itself has not

1 increased the number of possible values. The scaling has
2 not increased precision.

3 Q. Doctor, what can we conclude, then, with respect
4 to the Respondents' bitwidth theory for Walker?

5 A. So Respondents pointed to w_0 times w_0 as one
6 of their alleged predictions. They pointed to the bitwidth
7 that Walker uses for that quantity and used that, as I
8 understand, to say that the precision has increased. But
9 because w_0 is a constant across the block, in my opinion,
10 the precision has not increased. It's still -- if it was 8
11 bits before, it's still 8 bits after scaling.

12 Q. Let's have slide 38, please.

13 Now what I'd like to do is turn to the variable
14 weight theory that you discussed earlier.

15 What is Respondents' variable weight theory for
16 the Walker ground?

17 A. If we go to slide 39, as I understand it, the
18 Respondents' theory here is, roughly speaking, to, if you
19 like, rebut what I just said, and they are pointing to a
20 description in Walker, Table 1, which says that the
21 weighting factor w_0 can range from minus 128 to plus 127.

22 So, as I understand it, the counterargument to
23 me, to my earlier argument, is that Walker's weight 0 can
24 vary, and, therefore, because it can vary, it can increase
25 the number of possible values and therefore the precision.

1 I disagree with that statement.

2 Q. Let's have slide 40.

3 Is it true that Walker's weights for a given
4 block of pixels can have a range of possible values?

5 A. So remember that Walker has four specifications
6 or standards that are being implemented. For the MPEG-4
7 part 2 implementation there is no weighted prediction, so
8 the question is effectively irrelevant.

9 Q. Let's have slide 41.

10 For the Windows Media Video 9 or WMV9
11 implementation, does Respondents' variable weight theory
12 apply?

13 A. It does not apply, because, again, for Windows
14 Media Video 9, the averaging process is the same as MPEG-4
15 part 2. There is no weighted prediction, so it's not a
16 relevant question.

17 Q. Let's have slide 42.

18 What about the H.264 and RealVideo 9
19 implementations?

20 A. So now we need to consider weighted prediction,
21 what it is, what it's doing, and I've already explained
22 that, Your Honor.

23 So Walker itself explains that the weights, when
24 they are in use, are not variable at the block level. And
25 I've shown on my slide 42 an annotated version of Walker

1 Fig. 5.

2 I've highlighted the previous reference frame 510
3 in blue, and the next reference frame or future reference
4 frame 585 in green. And I've highlighted them, the whole
5 frame, in blue or green to emphasize the fact that in H.264,
6 across all the blocks of a frame or slice, the weights are
7 constant. In fact, they are tied to the reference frame.

8 So if my reference frame is frame 10, the
9 weighting across frame 10 or across the blocks of the slice
10 of frame 10 is the same. It's constant across that frame or
11 slice.

12 Q. And I want to make sure we capture this point
13 clearly.

14 Is it the case that in Walker the weights can
15 vary, but only on the reference frame level, not on the
16 block level?

17 A. So for a given frame, if it uses reference frame
18 10, the weights for that reference frame are constant across
19 the frame. I'm going to talk -- I think I'm going to talk
20 about a situation where blocks can use different reference
21 frames, but the weights are constant across the reference
22 frame.

23 Q. Let's have slide 43.

24 I want to ask you about the RealVideo 9
25 implementation, which I don't think we've mentioned yet.

1 Do the weights vary for blocks of pixels in the
2 RealVideo 9 implementation of Walker?

3 A. So in RealVideo 9 the weights are, and the
4 highlighted text on slide 43 is, the weights are computed as
5 relative temporal positions of the B-frame with respect to
6 the two reference frames.

7 So to decode that sentence, if you remember the
8 diagram I had with five frames for my fading sequence, the
9 reference frames were the ones we were predicting from. The
10 temporal position of the B-frame here is the position of the
11 frame in the middle.

12 So the relative temporal positions, that's
13 exactly what I was talking about, as you get closer to a
14 reference frame, the weight increases in RealVideo 9. As
15 you get further away, it decreases. So it's relating to the
16 relative positions of the frames, not the blocks.

17 Q. Let's have slide 17 again just so we can turn
18 back to that point.

19 17, please.

20 Doctor, this is the image you showed us earlier
21 of weighted bi-prediction.

22 Can you explain what you mean when you say that
23 the weights are based on the temporal distance of a frame
24 and its reference frame?

25 A. Yes. So now if we remember that sentence from

1 the RealVideo 9 description, it said something along the
2 lines if the weights depend on the relative temporal
3 distance of the B-frame, so that would be our way in the
4 frame with the blue box, the green box or the red box, and
5 the relative temporal distance to the reference frames,
6 which here are the first and last frames on slide 17.

7 Q. And I want to ask you about something on your
8 slide 17. Let's look at the blue box you have on the
9 left-hand side of the slide.

10 Will the weights that are listed above the blue
11 box, will those change for the blocks of pixels that you've
12 identified?

13 A. Those weights are constant within that blue box
14 for every single sample value.

15 Q. Let's please go to slide 44.

16 So we talked about the MPEG-4, WV9, and
17 RealVideo 9 implementations.

18 What about H.264 implementations in Walker?

19 A. So Dr. Schonfeld was asked about this, and I
20 broadly agree with his answers that he gave earlier in the
21 hearing, which are shown on my -- an excerpt of them are
22 shown on my slide 44.

23 And if I could draw your attention to a couple of
24 questions and answers.

25 Halfway down my slide 44, and in explicit

1 weighting in the H.264 standard weights are transmitted in
2 the slice header, not the block level.

3 Dr. Schonfeld agreed with that statement. I
4 agree with that statement.

5 And then the final question, for implicit
6 weighted bi-prediction, the weights that are used are
7 calculated based on -- and I think there might be a
8 typographical error -- I'll read it as based on the relative
9 temporal positions of the reference frames, not at the
10 individual block level.

11 Dr. Schonfeld agreed with that statement. I
12 agree with that statement with regards to H.264.

13 Q. Let's have slide 45, please.

14 Is there anything in Walker that confirms your
15 understanding of how H.264 weighted bi-prediction would
16 work?

17 A. Yes. Here Walker is talking about direct mode
18 weighting based on temporal distance to past and future
19 frames.

20 Once again, Walker is talking about this concept
21 of depending on your temporal distance to the reference
22 frames, the weights are directly based on that.

23 Q. Now let's have slide 47.

24 Can you walk us through sort of a real example of
25 how Walker would apply its weights to given predictions?

1 A. So this is, if you like, it's an extension of
2 some of these illustrations I've provided already,
3 Your Honor.

4 Slide 47, the top right, I have a block in my
5 current frame 10, call it block A. That block is made up of
6 pixel or sample values. We'll assume Walker's scenario
7 where all of those sample or pixel values are 8 bits and
8 have 256 possible values.

9 Let's say that the encoder has chosen frame 9 as
10 the reference frame for block A. The prediction from frame
11 9 in Walker pred0 is also 8 bits, as I showed you earlier.
12 It also has 256 possible values per sample. And let's
13 assume that the weight is 5. That's a constant of 5.

14 So what happens is that those prediction samples
15 can be 256 possible values, they are all scaled by the same
16 amount, 5, so we have a scaled prediction, or I think
17 Respondents called it a weight -- weighted prediction, w_0
18 times pred0, which, again, has 256 possible values.

19 So the number of possible values has not changed.
20 Just comparing that to the claim language, finally back to
21 the claim, on the left, we're decoding a block of pixels,
22 block A, we're determining a reference block, we are using
23 the reference block to obtain a first prediction, pred0, or
24 even pred0 multiplied by the weight.

25 And the whole point that I'm trying to make here

1 is that first prediction, whether it's pred0 or pred0 times
2 $w0$, does not have a second precision higher than the first
3 precision.

4 In Walker, the number of possible values is still
5 256, the weight is constant, and, therefore, under all three
6 possible claim constructions, the weight, the prediction,
7 does not have a higher precision than the original pixels.

8 Q. Let's have slide 48.

9 Now, Doctor, you understand that you could have,
10 for different blocks of pixels in a frame, different
11 reference frames.

12 Does the fact that you might have a different
13 reference frame for a different block of pixels change your
14 opinions on this question?

15 A. No, it does not. On slide 48, Your Honor, I'm
16 illustrating another block in frame 10 immediately below
17 block A, we'll call it block B. Let's say it uses a
18 different reference frame, frame 8, and let's say that the
19 weight is now 3.

20 But for block B, which is now the current block,
21 the same argument applies. For that current block, the
22 first reference block, the first prediction, either pred0 or
23 pred0 times $w0$, both of those blocks have the same number of
24 possible values and, therefore, the same precision under all
25 three claim constructions, and that precision is not higher

1 than the precision of the pixel values. So the claim is not
2 satisfied for either block in my opinion.

3 Q. Let's have slide 49, please.

4 Doctor, I'd like to now turn to the sort of third
5 theory under the Walker ground.

6 Can you explain to us how Walker does
7 interpolation?

8 A. So if we go to slide 50, this is the whole of
9 Fig. 8 from Walker showing Walker's universal decoder or
10 combined decoder. There's a block 835, which I've
11 highlighted, which is the pixel interpolation stage. That
12 feeds into block 840. And there are two outputs of block
13 840, pred0 and pred1. And as I have explained and as Walker
14 explains, these are both predictions made up of 8-bit
15 samples.

16 So pixel interpolation -- I didn't really answer
17 your question. I apologize. Pixel interpolation, you've
18 heard explained before, Your Honor, it's a process of
19 generating these subpixel predictions, which we use in
20 motion compensated prediction, but the important point here
21 is that Walker's pixel interpolation does not generate
22 anything other than 8-bit prediction values.

23 Q. Let's have slide 51.

24 Is there anything else in Walker that confirms
25 your understanding of how the interpolation process works?

1 A. So Walker talks about pixel interpolation, for
2 example, in paragraph 114, which is on the left of slide 51.
3 But the reason I know that Walker's interpolated predictions
4 are not at a higher precision is that pred0 on Table 4 of
5 Walker, which Respondents point to or rely on, pred0
6 comprises 8-bit values. The output of the whole of this
7 process, that's the combined prediction in Walker, Walker
8 also describes as having 8-bit values.

9 So because pred0 comes from at least indirectly
10 the interpolation block, Walker's interpolated pixel values
11 are not anything greater than 8 bits.

12 Q. Based on your understanding of how Walker's
13 interpolation works, what conclusions can you reach about
14 whether Respondents are correct that Walker's interpolation
15 has a second precision higher than the first precision?

16 A. My conclusion is it does not, and that is
17 entirely supported by Walker's description of the inputs and
18 outputs of each of its stages, as I've explained earlier.

19 Q. Let's have slide 52.

20 What I'd like to do now is turn to ground 2,
21 which is the Walker plus Srinivasan ground.

22 What is your understanding of Respondents'
23 argument for the Walker plus Srinivasan ground?

24 A. So if we go to slide 53, and this is an extract
25 from Dr. Schonfeld's testimony on the left, and the

1 demonstrative on the right that I believe he was describing,
2 his slide 166.

3 And he identifies some extracts from Srinivasan,
4 which is describing interpolation. And he talks about bit
5 values of x or $x+1$. He talks about supposed arbitrary
6 extension of bit-depth and of output values with dynamic
7 ranges of different bit-depth.

8 And I think what he -- the position that he
9 attempts to reach is that Srinivasan can produce higher
10 precision interpolations, and that it would be obvious to
11 somehow insert those higher precision interpolations into
12 the Walker reference to get to this desired outcome of
13 precisions at -- sorry -- predictions at a higher precision.

14 Q. I want to ask you about something on your slide
15 53, which cites to Dr. Schonfeld's slide 166.

16 There's a red underline under "extended
17 arbitrarily." And I think the sentence says, the
18 intermediate values can be extended arbitrarily.

19 What is your understanding of what the
20 intermediate values refers to there?

21 A. So the intermediate values are, in a sort of
22 analogous way to the pred_0 times w_0 values, are what
23 Srinivasan describes as just that, as values that are
24 calculated during the interpolation process, but they are
25 not -- the intermediate values are not the output of the

1 interpolation process.

2 Q. Are the intermediate values inside of an
3 interpolation filter, are those predictions?

4 A. No, they are not.

5 Q. Let's have slide 54.

6 Is there anything in Srinivasan that informs your
7 understanding of whether the outputs of Srinivasan's
8 interpolation filters would have a higher precision?

9 A. So, first of all, if we look at the right of my
10 slide 54, these are three extracts from Srinivasan. In each
11 case Srinivasan consistently describes the final output
12 value as being 8-bit. So that is not at a higher precision
13 than the original pixel values, which were also 8 bits.

14 And there is also reference in Srinivasan to the
15 $x+1$, which Dr. Schonfeld referred to, but that is covered in
16 Srinivasan, for example, in the two excerpts on the left of
17 my slide 54. And that extra bit, which is at the last but
18 one stage in Srinivasan, is there to deal with overflow and
19 underflow, and it's not part of the output, the final
20 interpolated value of Srinivasan.

21 Q. Can you tell us what overflow and underflow
22 refers to here in Srinivasan?

23 A. So at the lower left of my slide 54, Srinivasan
24 explains that in some cases they can reach an almost final
25 value, which is actually out of the required range of 0 to

1 255. It could be negative or slightly larger than 255. So
2 Srinivasan keeps one extra bit and then uses it at the very
3 final stage of what we call clipping or clamping to convert
4 that value to a correct 8-bit value, which can range from 0
5 to 255.

6 Q. Let's have slide 155. Sorry. 55, slide 55.

7 Do you have any additional support for your
8 understanding of Srinivasan's interpolation filters?

9 A. So my slide 55 is Srinivasan's Fig. 8. It has
10 input pixel values at the top left, 8-bit values, and output
11 pixel values at the lower right, also 8-bit pixel values.

12 I'll draw your attention, Your Honor, to the box
13 just before that clamp output value. That's the stage where
14 Srinivasan's method deals with potential overflow and
15 underflow.

16 And so, again, this supports my opinion that,
17 even though intermediate pixel values -- intermediate values
18 could be higher than 8 bits in Srinivasan, the result of
19 interpolation is the original bit-depth, which in this
20 example is 8 bits.

21 Q. Let's have slide 56.

22 What about the $x+1$ that Dr. Schonfeld referred to
23 in his testimony earlier?

24 A. So Srinivasan Fig. 14, which I show on my slide
25 56, has an output value 1436, and my recollection is that

1 this is the value that Srinivasan describes as x or x+1 bit.
2 But reading Srinivasan, it explains that the x+1 there is
3 the extra bit that's used to make sure that the clamping
4 process works correctly and that we don't have an overflow
5 or underflow.

6 Q. Does the extra bit you refer to that ensures the
7 clamping process works correctly, does that add additional
8 possible values to Srinivasan's predictions?

9 A. No. It's really just dealing with a potential,
10 once again, rounding error problem.

11 Q. And let's have slide 57.

12 Do you have any opinions about whether a person
13 of ordinary skill in the art would have been motivated to
14 combine Srinivasan with Walker?

15 A. So my opinion is they wouldn't have been
16 motivated to do so in the way that Dr. Schonfeld and
17 Respondents suggest.

18 And just briefly, I've put up Fig. 8 of Walker
19 again. And I think Dr. Schonfeld's proposal is that
20 Walker's pixel interpolation unit 835 would be, if I
21 understand correctly, replaced with Srinivasan's
22 interpolator.

23 Let's assume for the sake of argument that that
24 produces higher bit-depth output, such as 9-bit output
25 instead of 8 bits, I don't think that's correct, but, if we

1 assume that, we still have to deal with how do we use those
2 9-bit values in the motion compensation, how do we create
3 pred0 and pred1, which Walker says remain at 8 bits, and how
4 do we then carry out Walker's operations thereafter, and how
5 do we do that in such a way that we deal with all the
6 possible integer and subpixel positions that the motion
7 vectors would be pointing to.

8 And Dr. Schonfeld -- I didn't hear Dr. Schonfeld
9 or read Dr. Schonfeld explain at any point how one would
10 actually do that. And, in my view, one would not have a
11 reasonable expectation of success without identifying and
12 solving a number of problems, which I don't know how to
13 solve.

14 Q. Quickly on this point, do the opinions you've
15 expressed as far as motivation to combine Srinivasan with
16 Walker, do they also apply to the sort of Walker-alone
17 obviousness ground?

18 A. They would, because, again, Walker -- with the
19 Walker-alone argument, as I understand it, is to somehow
20 modify pixel interpolation unit 835 and allow it or break it
21 open so that it can produce higher bit-depth outputs, but
22 then the same problems occur of how do you deal with those
23 outputs for pred1, pred0, and the combinations in Walker,
24 and how do you deal with all the possible integer and
25 subpixel motion vector locations.

1 Q. Let's have slide 58, please.

2 Can we turn to the '714 patent now?

3 A. Sure.

4 Q. Let's have slide 59.

5 Doctor, please remind us what led to the '714
6 patent.

7 A. So there was a known issue, if you like, in the
8 motion compensation process in the draft H.265 standard at
9 this point where we had this idea of predicting a current
10 block and choosing one of a number of candidate blocks and
11 inheriting or using motion information from those blocks.

12 So the process of identifying candidates
13 involved, in the prior art, an exhaustive comparison between
14 what is shown here as 5 candidate positions. So all the
15 vectors of -- motion vectors of those positions had to be
16 compared each with each other, and that was considered to be
17 a problem, because of the computation required to do that,
18 and because of the fact it could be done in parallel.

19 So Nokia made a proposal to the joint -- to the
20 JCT-VC committee, and their proposal resulted in decreased
21 computational complexity by reducing the number of candidate
22 duplication checks from 10 to 5, in the worst case, in such
23 a way that these values could be computed in parallel.

24 Q. Let's have slide 60, please.

25 And, Professor, can you remind us what happened

1 with Nokia's contribution?

2 A. So it was tested in what they called a core
3 experiment in the committee, and the decision was to adopt
4 both aspects of the proposal, and I've shown that in the
5 highlighted extract on my slide 60 of the JCT-VC meeting
6 minutes shown at the top left.

7 Q. Let's have slide 61.

8 What is Acer's invalidity ground with respect to
9 the '714 patent?

10 A. It's based on a combination of two references, a
11 reference called Rusert and a reference called Karczewicz
12 '721 patent.

13 Q. Let's have slide 62.

14 Can you tell us about the Rusert reference?

15 A. So Dr. Hemami described this reference in some
16 detail, Your Honor. So just briefly, the Rusert reference
17 talks about a current block position, which on slide 62 is
18 shown in red in the center of that diagram.

19 And Rusert describes a process of stepping
20 through a number of neighboring locations in a scan order,
21 and there's numerical order here, 1, 2, 3, 4, 5 and so on.
22 And at some point at the end of that process Rusert ends up
23 with a set of motion vector prediction candidates.

24 Q. Is Rusert a parallel or sequential process?

25 A. In my opinion Rusert is a sequential process.

1 Rusert describes, still on slide 62, considering candidate
2 location 1, then considering candidate location 2, and then
3 3, and 4, and so on.

4 Q. Let's have slide 63.

5 What was the state of the art prior to the '714
6 patent?

7 A. So on the left of slide 63, I've shown an excerpt
8 from Dr. Hemami's demonstratives, her slide 19. And she
9 described the state of the art prior to the '712 patent and
10 contribution as a situation where, and this is her color
11 coding and illustration, when considering a current block,
12 all five of these neighboring candidates were exhaustively
13 compared. And Dr. Hemami demonstrated that with this
14 checkbox illustration where each of the candidates on the
15 left is compared with each of the possible candidates at the
16 top of her illustration.

17 So everything is compared with everything else,
18 and so you end up, in the worst case, with 10 comparisons
19 for 5 candidate neighbor positions.

20 Q. Let's have slide 64.

21 How does the prior art that we just discussed
22 compare to the Rusert reference?

23 A. So, in my opinion, it works in the same way with
24 respect to exhaustively comparing candidates. And I will
25 come back to this later, but, just briefly, if we consider

1 Rusert's first 5 positions, 1, 2, 3, 4, 5, as I'll explain,
2 as Rusert steps through those positions, every possible
3 candidate, if available, is compared with every other
4 possible candidate, if available.

5 And so, essentially, if one were to redraw
6 Dr. Hemami's checkbox table, all of the same boxes would be
7 checked. And I'll explain that further and demonstrate that
8 shortly.

9 Q. Let's have slide 65.

10 We talked about Rusert. What is Karczewicz?

11 A. The Karczewicz '721 reference is -- discloses
12 coding units, coding trees, and prediction units. And these
13 are basically data structures that were part of what I think
14 at that time was the early draft of the H.265 standard. It
15 wasn't the standard yet, but the same concepts end up in the
16 standard, and the concepts are these variable-sized and
17 shaped coding blocks and prediction blocks.

18 Q. Let's turn to slide 66.

19 Which claims did you consider for your analysis
20 of the Rusert and Karczewicz ground?

21 A. I considered the two decoding claims and the two
22 encoding claims, which I understand to be asserted in this
23 investigation. And for the decoders, as I've shown on slide
24 66, that's claims 9 and claim 23.

25 Q. And then let's have slide 67.

1 Are these the encoding claims you considered?

2 A. Yes, the encoding claims 1 and 15 of the '714
3 patent.

4 Q. Let's have slide 68.

5 Are there any proposed constructions relevant to
6 the '714 patent?

7 A. There is a claim term "first spatial motion
8 vector prediction candidate," and all three parties have
9 proposed a construction of this claim term.

10 Q. Let's have slide 69.

11 I want to ask you about Respondents' proposed
12 construction.

13 Does Rusert combined with Karczewicz render the
14 claims of the '714 patent obvious under Respondents'
15 proposed construction?

16 A. No.

17 Q. Why not?

18 A. Because under Respondents' proposed construction
19 the candidate for processing in Rusert is always candidate
20 1, if it's available. So whatever that first -- if it's
21 candidate 1, whatever that first candidate is, it's not
22 compared with anything in Rusert. So it couldn't satisfy
23 the asserted claims.

24 Q. Let's have slide 70.

25 Now I'd like to turn to claim limitation [C] from

1 claims 1, 9, 15 and 23.

2 In your opinion, does the Rusert and Karczewicz
3 combination disclose limitation [C]?

4 A. No. And that opinion holds across each of these
5 four claims 1, 9, 15, and 23. And -- sorry -- this
6 limitation is -- I'll probably call it the determining a
7 subset limitation.

8 Q. Let's have slide 71.

9 What does Acer call the subset for purposes of
10 the determine a subset limitation?

11 A. So when considering the Rusert reference, Acer
12 points to something in Rusert that is called PMV_CANDS, and
13 that PMV_CANDS is a list of candidates that Rusert has
14 developed.

15 Acer points to that as the alleged subset of
16 motion vector prediction candidates from the '714 patent
17 claims.

18 Q. Do you agree with that position?

19 A. Well, if that is the subset, it is also the set
20 in Rusert, because, in my view, that PMV_CANDS list, at any
21 point in Rusert's proces, PMV_CANDS contains all of the
22 possible or available candidates for comparison.

23 Q. I want to ask you about your slide 71, which
24 cites to Dr. Hemami's slide 24.

25 We see on these slides that there is a candidate

1 6 in blue.

2 At the time Rusert is considering candidate 6,
3 does it know anything about whether there are candidates
4 beyond that point?

5 A. It does not. And I'll explain further in a
6 moment, Your Honor, what becomes important there is what
7 Rusert calls availability.

8 Rusert does not know whether any of those further
9 candidates, 7, 8, 9, up to f, are actually even available
10 let alone potential candidates.

11 Q. And we'll turn back to the availability point,
12 but first let's go to slide 72.

13 What is Acer's argument for why any determined
14 subset is based on the location of the block associated with
15 the first spatial motion vector prediction candidate?

16 A. So on slide 72 I've shown an excerpt from
17 Dr. Hemami's testimony. Her slide 80, I believe.

18 And as I understand it, Acer's argument or
19 Respondents' argument is that, when Rusert is considering
20 Candidate 4, assuming that candidates 1, 2, and 3 are
21 PMV_CANDS, that the chosen subset, that's 1, 2, and 3, is
22 somehow dependent on where block 4 is positioned.

23 In my view, that subset is not dependent on the
24 position of block 4 or the location of block 4.

25 Q. Let's have slide 78.

1 Can you walk us through how the PMV_CANDS list
2 that Acer calls the determined subset is built?

3 A. So we start on the left of my slide 78,
4 Your Honor. Let's say we are considering Rusert's candidate
5 location 1. There is no subset at this point or alleged
6 subset. There is no PMV_CANDS. Rusert says that, if
7 location 1 is available, then that location goes into
8 PMV_CANDS.

9 So once we've done that, we now have PMV_CANDS,
10 contains a 1. We don't know the next candidate location,
11 and I'll explain that further a little bit later. But then
12 assuming they are all available, let's go to location 2,
13 which is the next column.

14 Our subset was 1 previously. If 2 is available,
15 and if it's not the same as 1, it's compared with 1, and
16 then added to PMV_CANDS. So now we have the subset 1, 2.
17 Alleged subset, sorry. PMV_CANDS is now 1, 2. We don't
18 know the next location.

19 In the middle, Rusert goes to location 3, if it's
20 available, it gets considered, and this carries on. And on
21 the right I've shown Rusert considering candidate location
22 5.

23 If we assume that PMV_CANDS contains all the --
24 well, it does contain all of the available nonidentical
25 candidates up to that stage, if we assume that they are 1,

1 2, 3, and 4, 5 is compared with each of those, if it's
2 different to all of them, it's added to PMV_CANDS and the
3 alleged subset.

4 Q. And I want to ask you about your slide 78. You
5 have a question mark where it says PMV candidate location
6 and resulting PMV_CANDS in each of your charts on your
7 slide.

8 Why do you put a question mark there?

9 A. Because in Rusert's method, let's say we process
10 candidate locations 1 and 2, we don't know the location at
11 that point in Rusert of the next candidate.

12 Q. Your slide 78 says PMV Candidate Location.

13 Is candidate the same thing as a location?

14 A. No. These are Rusert's locations. And the
15 location is a relative position. The location may or may
16 not have motion information in it, and that's the heart of
17 what Rusert describes as availability.

18 Q. And what specifically is a spatial motion vector
19 prediction candidate?

20 A. A spatial motion vector prediction candidate in
21 the claims is a -- the candidate is the motion information
22 associated with a block neighboring the current block that
23 has previously been coded.

24 Q. Earlier you mentioned that a candidate, this
25 motion information, may or may not be available at a given

1 location.

2 Can we have slide 79, please?

3 What do you mean by availability here?

4 A. So this slide, Your Honor, this is a screenshot
5 from a video sequence. I've used an analyzer software
6 program to superimpose colors that show the types of blocks
7 in the frame. And I've zoomed in on some of those blocks on
8 the right of my slide 79.

9 Near the center of that zoomed-in portion there
10 is a current block with a white border highlighting it. And
11 then there are a number of neighboring and further away
12 blocks. Red in this diagram means that the neighboring
13 block is intra-coded or does not have an associated motion
14 vector. In Rusert's terms, that would be an unavailable
15 neighbor.

16 Blue means, in this example, that the block has
17 -- the neighboring block has a motion vector and is not
18 intra-coded. So in Rusert's terms that would be an
19 available neighbor.

20 And just briefly, looking at the image on the
21 left, Your Honor, you'll see that this is a very typical
22 video frame. Many of the blocks have unavailable neighbors,
23 some have available neighbors.

24 Q. Let's have slide 80.

25 Earlier you testified that you disagree that in

1 Rusert a subset is determined based on the location of the
2 block associated with the first spatial motion vector
3 prediction candidate.

4 Can you walk us through why?

5 A. So here, again, back to Rusert, back to Rusert's
6 locations 1 and 2, so let's assume on the left that we've
7 processed 1 and 2 and PMV_CANDS contains the alleged subset
8 of 1 and 2.

9 What comes next in Rusert? What comes next
10 depends on availability. If location 3 is available, so if
11 it's inter-coded and has a motion vector, then Rusert says
12 it's available, and it's the next candidate to be evaluated.

13 If location 3 is not available, then location 4
14 would be the next candidate to be evaluated.

15 So we have a single subset here, which is -- or
16 alleged subset, which is 1 and 2, but we have two possible
17 next candidate or alleged first spatial motion vector
18 candidate locations shown.

19 So, in my opinion, this illustrates that the
20 subset does not and cannot depend on the location of the
21 first spatial motion vector prediction candidate in Rusert,
22 because, one, we don't know that location when the subset
23 is -- alleged subset is finalized, and, two, that location
24 changes depending on availability.

25 Q. And, Doctor, I want to follow up with something

1 on your slide 80. This might be a potential source of
2 confusion.

3 The numbers on your slide 80, they refer to
4 locations around what you have as sort of a green or teal
5 dot in the center of each of your plots, right?

6 A. That's correct. And these are the locations
7 marked out by Rusert in that figure from Rusert that we've
8 seen many times. So these are locations.

9 Q. And you've also referred to candidates by number.
10 So next candidate is 3 or next candidate is 4.

11 Can you explain how we differentiate between a
12 block location and a candidate?

13 A. Okay. Maybe I've been a little bit compact with
14 my terminology here.

15 When I say in this demonstrative slide next
16 candidate is 3, I mean that the next candidate in Rusert is
17 going to be the motion vector prediction information which
18 exists at location 3. And, similarly, when I say next
19 candidate is 4, I mean that the motion vector information
20 that exists at location 4.

21 Q. Let's have slide 81.

22 Doctor, does your position or your understanding
23 of how the PMV_CANDS process works with respect to the '714
24 patent claims, does that opinion apply to all of the
25 positions in Rusert?

1 A. Yes. Yes, it does. And what I've illustrated on
2 slide 81 are the two examples I just took you through and a
3 new one. All of these are what I called iteration 2, so I'm
4 assuming that Rusert has processed locations 1 and 2, put
5 the motion information into PMV_CANDS, so we have the same
6 subset at all three, and depending on availability, the next
7 position that Rusert evaluates could be 3, could be 4, it
8 could be 8, it could be f, depending on which of the
9 intervening blocks are available, which are not available.

10 Q. So we spoke about different PMV_CANDS sets at
11 different positions in Rusert's scan order.

12 Can the same position have different PMV_CANDS
13 lists depending on availability?

14 A. It can. I've illustrated that in slide 82.

15 So now I'm just -- these are all examples
16 compatible with Rusert's disclosure. I'm sort of flipping
17 it now and thinking, well, let's say that in Rusert, Rusert
18 is evaluating position 4. What is the content of PMV_CANDS?
19 What could it be?

20 It could actually be empty at this point or it
21 could be the candidates at positions 1, 2, and 3. That's
22 the example on the left. If 3 is unavailable, it could be
23 the position, the candidates or positions 1 and 2. If 4
24 is -- sorry. If 3 and 2 are unavailable, it could be just
25 the single candidate at position 1. And actually we've got

1 more possible combinations than this.

2 So not only does the subset not depend on the
3 location, the location doesn't depend on the subset. So the
4 two are, if you like, not -- can't be based on each other.

5 MR. VERBONCOEUR: Your Honor, I'm mindful that
6 it's now 11:00 in the morning. If you would like to take
7 the morning break, I'm happy to, but I'm also happy to
8 proceed.

9 JUDGE MCNAMARA: It might be a good time to take
10 a break. I see some nods. So I'll see you back here in 15
11 minutes.

12 (Whereupon, the proceedings recessed at 11:02
13 a.m.)

14 (In session at 11:20 a.m.)

15 JUDGE MCNAMARA: All right. Thank you, everyone.
16 Please be seated.

17 MR. VERBONCOEUR: Mitch Verboncoeur for Nokia.

18 JUDGE MCNAMARA: Yes, thank you.

19 MR. VERBONCOEUR: May I proceed, Your Honor?

20 JUDGE MCNAMARA: Yes.

21 MR. VERBONCOEUR: Thank you.

22 Q. Can we have slide 83, please.

23 Doctor, I'd like to turn to limitation [D] in
24 claims 1, 9, 15, and 23. I'll call this the comparing
25 limitation.

1 What does Acer identify as the set of spatial
2 motion vector prediction candidates for purposes of this
3 limitation?

4 A. If we go to slide 84, please.

5 SO on slide 84, I've shown an excerpt from
6 Dr. Hemami's demonstratives. This is her slide 86, I
7 believe. And Acer and Dr. Hemami identify all of the
8 positions in Rusert Fig. 3n as candidates in the set, the
9 set of spatial motion vector prediction candidates.

10 Q. Let's have slide 86.

11 And how does Rusert build PMV_CANDS?

12 A. So, again, on slide 86, this is an excerpt from
13 Dr. Hemami's demonstratives, her slide 59.

14 And as Dr. Hemami describes it, showing in the
15 figure on the right here, I think she showed an animation
16 where Rusert evaluates each of the available candidates in a
17 sequential order, and she -- Dr. Hemami, rather, illustrated
18 that with a spiral shown on this demonstrative.

19 Q. Mr. Moreno, can we please have slide 87.

20 Are you able to show us that spiral animation?

21 A. So this is Dr. Hemami's slide, which I gather
22 Respondents have kindly provided. And if we could play the
23 animation, if that's possible. So Rusert begins with
24 position 1, if available.

25 Okay, I can just talk through it. But my

1 recollection, Your Honor, was that as the spiral progresses,
2 Dr. Hemami's animation highlighted position 1 in yellow, and
3 then position 2 in yellow, and then position 3, 4, 5, 6, and
4 so on in this spiral order, spiraling out from the central
5 position.

6 Q. And can you explain to us how that progressive
7 spiraling relates to whether Rusert knows if a candidate
8 exists at a given position?

9 A. So I explained earlier, Your Honor, about
10 availability in Rusert, and, as I explained several times
11 now, when Rusert is evaluating a particular position, let's
12 say, the candidate at position 5, it does not know whether
13 the candidates at further positions in Fig. 3n are going to
14 be available or not. It doesn't know whether 6 is available
15 or 7. It specifically describes completing the processing
16 of location 5 before considering the next candidate with the
17 next location.

18 Q. Let's go back to slide 86, please.

19 Based on your understanding of how the PMV_CANDS
20 scan order works in Rusert, what should we call Rusert's set
21 of spatial motion vector prediction candidates?

22 A. In my view, if one were to try and label a set of
23 or find a set of spatial motion vector candidates, when
24 considering Rusert's method, the entire set would be all of
25 the candidates that had been evaluated and placed in

1 PMV_CANDS before the current neighboring location that
2 Rusert is considering.

3 Q. Now could we please have slide 90.

4 Now I want to talk about how comparisons work in
5 Rusert. Can you walk us through that?

6 A. Certainly. So I've talked about this briefly
7 before, Your Honor, so I'm on slide 90 now.

8 And Rusert points out that when each of its
9 neighboring locations is evaluated, it compares the new
10 vector that's in this example, that would be the vector in
11 location 4, with the candidates already in the list. And if
12 all of 1, 2, and 3 were available, if they were all
13 different from each other, then the list at this point,
14 PMV_CANDS would contain 1, 2, and 3.

15 And Rusert says that the new vector or the new
16 candidate at position 4 is compared with all of the
17 candidates that are already in the list. So 4 is compared
18 with 1, 4 is compared with 2, 4 is compared with 3.

19 So taking it a step further, if one were to
20 consider all four of these potential candidate locations, 1,
21 2, 3, 4, at location 2, 2 is compared with 1, so the
22 comparison is 2 with 1. At location 3, 3 is compared with
23 1, 3 is compared with 2. And at location 4, 4 is compared
24 with 1, and with 2, and with 3.

25 So if you keep going here, you can see that each

1 new candidate is compared with every previously considered
2 and stored candidate. So this is an exhaustive comparison
3 process.

4 Q. In your opinion, does Rusert disclose without
5 making a comparison of each candidate pair -- of each
6 possible candidate pair from the set of spatial motion
7 vector prediction candidates?

8 A. No, it doesn't, in my view, because, as I've
9 illustrated in this example, all of the possible candidates,
10 by the time Rusert gets to location 4 and processes
11 location 4, all of the possible candidate pairs between 1,
12 2, 3, and 4 have been compared with each other.

13 So there is no -- there is a comparison of each
14 possible candidate pair from the set, alleged set of spatial
15 motion vector prediction candidates in Rusert, so that claim
16 15 -- so the claim elements [D] I've shown on slide 90 are
17 not satisfied.

18 Q. And let's have slide 92, please.

19 I'd like to shift topics a bit into whether a
20 person of skill in the art would have been motivated to
21 combine Rusert and Karczewicz.

22 Do you have any opinions on that?

23 A. In my view, a person of ordinary skill in the art
24 would not be motivated to combine these two references in
25 the way that Respondents propose.

1 Q. Let's have slide 93.

2 What is Respondents' position as far as the
3 combination of Karczewicz and Rusert?

4 A. So my recollection is that Respondents point out
5 that Rusert, I think, came after H.264, that H.264 included
6 the concept of -- or a concept of blocks or macroblocks
7 being divided into various size and shape partitions.

8 Karczewicz '721, I've shown an excerpt on the
9 right of slide 93, showing that the coding unit in
10 Karczewicz's system does not have the same limitations as
11 the macroblocks of H.264, and what's actually happening in
12 Karczewicz is that you can have many possible combinations
13 of neighboring prediction block sizes.

14 Q. Let's have slide 94.

15 Do you have a response to Respondents' contention
16 regarding a motivation to combine Karczewicz with Rusert?

17 A. So on the left of my slide 94, I've shown Rusert
18 Fig. 3n, which we have seen many times, and that shows
19 Rusert's scan order.

20 On the right of slide 94, I've shown a figure I
21 adapted from one of my books showing a current block in
22 light blue. And I've shown 1, 2, 3, 4, 5 neighboring
23 blocks.

24 And this is quite a typical or perfectly feasible
25 way blocks could be split up in Karczewicz's system with

1 variable-sized prediction units or prediction blocks. And
2 it's also perfectly feasible in the context of, for example,
3 the H.265 standard.

4 So, for example, the current block is a
5 horizontal rectangle, and I'll draw your attention, Your
6 Honor, to the two blocks immediately above the current
7 block. So Rusert's scan order, Fig. 3n, says that
8 position 1 is immediately above the current block. But
9 there's no guidance in Rusert as to how you deal with this
10 situation on the right, where that vertical neighbor is
11 split into two, which one do you choose as your candidate.

12 And another problem is illustrated on the left of
13 the current block, where, in my example, the left-hand block
14 is twice as tall in the vertical direction. Rusert Fig. 3n
15 says you should consider candidates at locations 2 to the
16 left of the current block, and 5 to the lower left of the
17 current block, but in Karczewicz's partitions, these could
18 both be in the same block.

19 So how do you deal with that? Again, Rusert is
20 silent about that. Karczewicz is silent about that. So
21 this is one reason why, in my view, one would not have a
22 reasonable expectation of success combining these two
23 references in the way that Respondents suggest.

24 Q. Let's have slide 95, please.

25 What was Acer's explanation as far as why a

1 person of skill in the art would be able to make that
2 combination with the different block sizes you described?

3 A. So Dr. Hemami pointed out on the right here in
4 her, part of her slide 65, pointed out correctly that Rusert
5 does talk about potential embodiments with different
6 partition sizes, and I think that's consistent with these
7 larger and smaller block sizes I just talked about.

8 But what I'm highlighting in green on the right,
9 so I've added the green highlighting, Rusert says that, if
10 you have different partition sizes, motion vectors with more
11 weight are placed further in the beginning of a PMV_CANDS
12 list.

13 So what Rusert is saying is that, if you have
14 variable partition sizes, you modify the processing order
15 and the order of candidates in PMV_CANDS. And Dr. Hemami
16 and Respondents haven't given any guidance as to how one
17 deals with that.

18 And, you know, to summarize, it is my opinion
19 that Rusert's further embodiments with variable-size
20 partitions would not be compatible with the scan order of
21 Rusert 3n as described by and as relied on by Respondents.

22 Q. Let's have slide 96 now.

23 Doctor, can we turn to the '321 patent?

24 A. Of course.

25 Q. And let's have slide 97.

1 What was the problem that was addressed by the
2 '321 patent?

3 A. So I mentioned this a week ago, Your Honor. It
4 seems like a long ago. The '321 patent was trying to
5 address a problem particularly with what was called
6 reference picture selection, which was a flexible method of
7 picking reference pictures for prediction, which was
8 considered as part of the H.264 standard development.

9 And the problem was to deal with situations such
10 as the one on the right, where the end user might wish to
11 start browsing a video file from the middle, this random
12 access challenge.

13 Q. How were reference pictures handled in the prior
14 art?

15 A. If we go to slide 98, and this is similar to
16 diagrams we've seen before, Your Honor. This is what I've
17 called here the classic group of pictures prediction
18 structure, and this would be -- was in existence in
19 standards such as MPEG-1 and MPEG-2, which we've heard
20 about, and in this I would say well-defined and somewhat
21 constrained structure, we know that the prediction of any
22 current frame is going to be from a frame that's nearby.
23 For a B picture, it's going to be an immediately or a very
24 close neighbor I or P picture, for example.

25 Q. Let's have slide 99.

1 How did reference picture selection change the
2 classic group of picture structure?

3 A. So in H.264, the possibilities for predicting a
4 current block have increased dramatically. And, for
5 example, here I'm illustrating that in the current picture
6 shown on the right, I can have predictions from the past,
7 predictions from the future, but these could be from a whole
8 range of different frames.

9 And these can include what H.264 calls long-term
10 references. And I've shown one there with lots of dots on
11 the left-hand side. And these could be tens or hundreds of
12 frames in the past.

13 So there's no longer this well-described
14 contained prediction structure to rely on, and so you have a
15 potential problem when you want to join a video sequence
16 partway through and it's referring to a picture that might
17 be hundreds of frames in the past.

18 Q. Let's have slide 100.

19 How did the '321 patent solve the issue in the
20 art with random access in reference picture selection?

21 A. And, again, as I summarized last week, Your
22 Honor, the proposal of the '321 patent, or the invention of
23 the '321 patent is about identifying a new type of picture
24 called an IDR picture, an instantaneous decoder refresh
25 picture.

1 And the decoder can find that picture, the number
2 of the initiation images is set to zero, and from that point
3 the decoder can start decoding without reference to any of
4 these older reference pictures that I mentioned.

5 Q. Let's have slide 101.

6 Professor, I believe you talked to us about it
7 last week, but was there a contribution made by Nokia
8 relating to this patent?

9 A. There was, as I recall, a series of
10 contributions. So this slide 101 shows an excerpt from the
11 first of those, JVT-B041, where Nokia proposed this concept
12 of starting an independently decodable sequence and
13 resetting a picture number to zero.

14 Q. Let's have slide 102.

15 You mentioned there was a series of
16 contributions. What was the next one in sequence after
17 B041?

18 A. So this is another contribution at the same
19 meeting, and so I should have said this was at the joint
20 video team meetings that led to the publication of H.264.

21 And so this JVT-B109, which I'm excerpting on my
22 slide 102, talks about the, again, the concept proposed by
23 Nokia, the start of a group of pictures indication,
24 instantaneous decoder refresh, and this is where we start to
25 see the IDR, instantaneous decoder refresh, terminology.

1 Q. Let's have slide 103.

2 Did Nokia submit any subsequent contributions
3 after the JVT's B meeting?

4 A. Yes. So this is the next meeting of the JVT, the
5 joint video team, in May 2002. And as the excerpt on the
6 lower left says, this contribution recaps the main points of
7 those two earlier contributions.

8 And, again, at the top right it talks about the
9 two aspects, identifying random access positions, now this
10 is done with a specific network abstraction layer packet
11 type and a picture number update rule, and that's the
12 resetting that we've heard a lot about.

13 Q. Let's have slide 104.

14 Was Nokia's contribution adopted?

15 A. Yes. All these aspects were proposed and
16 adopted. So this was the point where the joint video team
17 at their May 2002 meeting decided to adopt this and put it
18 into what became the H.264 standard.

19 Q. Let's have slide 105.

20 What are Respondents' invalidity grounds against
21 the '321 patent?

22 A. If we go to the next slide, slide 106, there are
23 three grounds, as I understand.

24 Number 1 is a modified version of the MPEG-1
25 standard, that's an obviousness ground; ground number 2 is

1 MPEG-1 combined with a reference called Adolph, that's an
2 obviousness ground; and number 3 is a software program
3 called VLC version 0.7.2, and that is an anticipation
4 ground.

5 Q. Let's have slide 107.

6 Let's start with MPEG-1. What is MPEG-1?

7 A. MPEG-1 is a standard. We've heard a lot about
8 standards. This one was first published in 1993 by the
9 ISO/IEC standardization body, and it's about video coding.

10 Q. What are the parts of MPEG-1 that are relevant to
11 Respondents' invalidity theories here?

12 A. Three concepts in particular. The concept of a
13 temporal reference, the concept of closed and open groups of
14 pictures, or GOPs, and the concept of neighboring reference
15 pictures.

16 Q. You mentioned that Respondents had a modified
17 MPEG-1 ground. Let's have slide 108.

18 How do Respondents propose modifying MPEG-1?

19 A. So there's two steps, as I understand. The first
20 one is to propose a decoder that only decodes closed GOPs
21 with no leading B frames. And I think you heard the details
22 of that from Dr. Hemami a few days ago.

23 And then there's a Step 2, as I understand it,
24 where this decoder has to do one of two things. The method
25 on the left, Method (i), as I described it -- no, sorry,

1 this is from Dr. Hemami's description.

2 So this is Dr. Hemami's description. And Method
3 (i), the, decoder decodes something called a
4 closed_gop_flag, ignores or skips a decoding process, sets a
5 temporal reference to 0, and decodes following temporal
6 reference values. And Dr. Hemami also described Method
7 (ii), with the difference that the temporal reference is
8 decoded, and then reset, and then further frames are
9 decoded.

10 Q. Let's turn to slide 109.

11 There was also the Adolph reference. What's
12 that?

13 A. So this is a patent application publication, and
14 the concepts in here that I think are particularly relevant
15 are Adolph's internal frame counter variable or variables,
16 Adolph's handling of certain display order problems in
17 sequences such as MPEG-1 or MPEG-2 video sequences, and
18 Adolph's usage of headers in MPEG-1 or MPEG-2.

19 Q. Let's have slide 110.

20 How do Respondents propose to combine the
21 MPEG-1 -- or, sorry, how do Respondents propose to combine
22 MPEG-1 and Adolph?

23 A. They propose, first of all, to have a closed GOP
24 set to restrict the MPEG-1 syntax. That's a definition in
25 the standard of a video sequence restricted to only closed

1 groups of pictures.

2 They -- Dr. Hemami rather, or Respondents,
3 propose to use closed_gop_flag equal to 1 as an indication
4 of a first frame. Respondents propose to use either
5 temporal reference or IP counter values as identifier
6 values. And they propose that Adolph -- they propose --
7 sorry -- they suggest that Adolph -- I'm sorry.

8 Respondents suggest that Adolph discloses
9 resetting of IP counter values by its decoder.

10 Q. Doctor, I didn't ask this, but do you agree with
11 Respondents' modified MPEG-1 theory?

12 A. So this -- could you actually go back a slide,
13 please?

14 Q. Yes.

15 A. And one more slide.

16 So I disagree with both step 1 of Respondents'
17 proposed MPEG-1 modification and also step 2 in either
18 Method (i) or Method (ii).

19 Q. For the record, we're on slide 108.

20 Now I'd like to turn back to slide 110.

21 Do you agree with the proposed MPEG-1 and Adolph
22 combination?

23 A. I do not, no.

24 Q. Let's have slide 111.

25 You reference the Adolph -- you reference

1 Adolph's IP counter. What's that?

2 A. So Adolph generally describes a device that
3 carries out standards-compliant video decoding, and I think
4 Adolph mentions one or both of MPEG-1 and MPEG-2 video.

5 And it describes what I understand to be a method
6 on top of that, so not something that's specified in either
7 standard, which includes counting I, P, and B-pictures. And
8 the way Adolph proposes to do that is sort of a tally count.

9 So every time the device receives an I-picture or
10 a P-picture, it increments a counter called the IP counter.

11 Every time the device receives a B-picture, it
12 increments another counter called the B-counter.

13 Q. You used the term "tally counter" to describe the
14 IP counter. What do you mean by tally counter?

15 A. This would be analogous, if you go to the theater
16 and there is somebody at the door and they are clicking a
17 counter to count up the number of people coming in, and so
18 it's a count of how many I and/or P-frames have, if you
19 like, come into the decoder.

20 What it's not doing is identifying any particular
21 frames. For example, if you look at the numbers in the
22 highlighted row of this figure from Adolph on my slide 111,
23 you'll see that the IP tally counter with IP counter goes 1
24 and then 2, 2, 2, and so the counter is remaining at 2 even
25 though several frames have been received.

1 And then it gets to 3, and so by the time it's
2 reached 3, we know that three I and/or P-frames have been
3 received, but we don't know what they are or what numbers
4 they have from this counter.

5 Q. Let's turn to slide 112.

6 What is the relevance of Adolph's IP counter to
7 Respondents' MPEG-1 and Adolph combination?

8 A. My recollection is that the Respondents are
9 identifying -- or pointing to Adolph's IP counter, and the
10 fact that it's incremented when certain pictures are
11 identified, and the fact that Adolph describes it as being
12 reset after a GOP header, and so my recollection is that
13 Respondents propose that that satisfies certain elements of
14 the asserted claims.

15 Q. Do you agree with Respondents on this point?

16 A. No.

17 Q. And we'll turn back to your disagreement, but,
18 first, let's have slide 113.

19 Tell us what the VLC ground is.

20 A. So this is a ground that I understand to be -- to
21 rely on software which is VLC version 0.7.2, which
22 Respondents identify as being available at least as of
23 May 21st, 2004.

24 Q. Do you agree that VLC version 0.7.2 is prior art
25 to the '321 patent?

1 A. No.

2 Q. Let's have slide 114.

3 What claims did you analyze for purposes of your
4 validity analysis?

5 A. Claims 8 and 10 of the '321 patent.

6 Q. Are there any claim constructions to consider
7 here?

8 A. Yes. If we go to slide 115, there are two claim
9 terms that are relevant. There's the "identifier value," is
10 one claim term, and "reset" or "resetting" is another claim
11 term. And in each case all three parties have proposed
12 constructions of these terms.

13 Q. Did you consider the grounds at issue here for
14 the '321 patent under Staff and Nokia's proposed
15 constructions?

16 A. I did.

17 Q. Let's have slide 116.

18 Can we start with the modified MPEG-1 ground?

19 A. Okay.

20 Q. Which limitation shall we discuss from claims 8
21 and 10 of the '321 patent with respect to the modified
22 MPEG-1 ground?

23 A. If we go to slide 117, I'd like to focus on
24 limitations 8[A], 10[A], 8[D], and 10[D]. So these are --
25 8[A] and 10[A] are the decoding and indication limitations,

1 and 8[D] and 10[D] are the resetting identifier value
2 limitations.

3 And, I'm sorry, I would like to point out in case
4 I forget later, Your Honor, these are all claims relating to
5 decoding.

6 Q. Let's have slide 119.

7 What do Respondents point to for the decoding
8 indication of a first image frame limitation, which I
9 believe you've labeled as 8[A]/10[A]?

10 A. So I've shown on my slide 119 one of Dr. Hemami's
11 demonstrative slides, her slide 129. And Respondents
12 identify a flag in the MPEG-1 group of pictures header.

13 And that flag is closed_gop, and they
14 specifically identify that flag when it is set to 1 and
15 decoded with a value of 1 as the claimed indication.

16 Q. For the record, I realize that Dr. Richardson's
17 slides label the decoding and indication limitations as 8[A]
18 and 10[A], and I see that Dr. Hemami's slides label that
19 same limitation as 8[B] and 10[B]. So I just want to put
20 that in the record.

21 Let's have slide 120.

22 Doctor, do you agree with Respondents' position
23 that the closed_gop_flag is an indication of the first image
24 frame as claimed?

25 A. I don't agree. The closed_gop_flag in MPEG-1 is,

1 at most, information about a group of pictures, not about
2 any one picture.

3 Q. Let's have slide 121.

4 Where does closed_gop_flag fit into MPEG-1's
5 syntax structure?

6 A. So slide 121 is two illustrations that I created.

7 At the top, I've shown graphically an MPEG-1
8 bitstream, and I've tried to illustrate that there's a group
9 of pictures header, which is shown as a black box, followed
10 by in bitstream order a group of pictures. Within that
11 group of pictures are a number of coded pictures, which can
12 be of types I, P, and B, as you've heard at some length.
13 And the closed_gop_flag, in my opinion, says something about
14 the entire GOP. So at the most, one could say that it
15 indicates the entire group of pictures.

16 It doesn't do what the claim requires, which I've
17 highlighted in blue, which is to indicate a particular image
18 frame.

19 Q. Let's have slide 122.

20 Does MPEG-1 have other indications for image
21 frames that Respondents haven't identified here?

22 A. There is information about an image frame in
23 MPEG-1, and each image frame has an associated picture layer
24 header, and I've highlighted that in a light green color on
25 my slide 122. I've highlighted some of the syntax of that

1 on the left of the slide. And highlighted its position in
2 the syntax on the right-hand side of the slide. Both of
3 these are extracts from MPEG-1.

4 There's a different layer of the syntax called a
5 group of pictures layer, as I mentioned, and I've
6 highlighted that in blue.

7 Q. I want to ask a follow-up question about
8 closed_gop_flag. If the decoder receives a closed_gop_flag,
9 does it know about the existence of any particular image
10 frame?

11 A. No, it does not. It just knows something about
12 the GOP that it expects to follow the current GOP header.
13 And there are many situations where there could be all sorts
14 of things happening, such as errors during transmission or
15 reading errors if this is a stored media. And so those
16 pictures might not even exist.

17 Q. Let's have slide 123.

18 I'd like to turn now to what I'll call the reset
19 limitation.

20 What's your understanding of how Respondents
21 address the reset limitation for the modified MPEG-1 ground?

22 A. So if we go to slide 124, and this is the reset
23 limitation, which, again, has to happen in a decoder.
24 That's my understanding. It has to happen in a decoder.
25 And so my understanding, as I've already said, is that

1 Respondents address this by creating a modified decoder,
2 which only decodes closed GOPs with no leading B frames, and
3 which carries out decoding in two particular ways, which I
4 mentioned earlier, which Dr. Hemami describes as Method (i)
5 or Method (ii).

6 Q. Let's have slide 125.

7 What do you think of Respondents' modified
8 MPEG-1?

9 A. So this is Dr. Hemami's Method (i). So assuming
10 this method, I simply don't think it makes sense to make all
11 of these modifications from -- I certainly don't think it
12 would be obvious, for a number of reasons, including the
13 reasons I've listed on the right.

14 First of all, Dr. Hemami's modified decoder still
15 has to parse or read the bits of the temporal reference
16 syntax element or value. And this is a 10-bit value in the
17 bitstream. It's always 10 bits. The decoder has to read
18 those 10 bits, and it seems to me that Dr. Hemami is
19 proposing to read those bits and then not look at them in
20 the decoder, ignore -- don't look at what they might be.

21 Which doesn't make sense, I think, given that the
22 information is there.

23 Also, as a result of that, in my view, this
24 modification -- or that particular modification would mean
25 that the decoder no longer could identify or handle certain

1 bitstream errors. What if there's been an error, some
2 frames are missing, and the next temporal reference is
3 actually not zero.

4 And this happens all the time in decoding video.
5 You get glitches, freeze-frames, and so on.

6 In Dr. Hemami's method, we don't know that that
7 error has occurred because she has ignored -- in her method,
8 Dr. Hemami has ignored that value that would tell us what
9 the temporal reference is of the next frame.

10 It would no longer be possible to decode that
11 initial I-picture without a GOP header, as I understand it,
12 because Dr. Hemami says do not decode the temporal reference
13 value. I cannot decode that I-picture successfully without
14 that value.

15 In my view, Dr. Hemami's rewriting what's
16 disclosed in MPEG-1 using what she is looking for in the
17 '321 patent as a roadmap.

18 And then, finally, at least on this list, what
19 has been described in Dr. Hemami's Method (i) is no longer
20 an MPEG-1 decoder. It's a nonstandard decoder. It doesn't
21 follow the standard. It's departed significantly from the
22 standard for no obvious reason that I can see.

23 Q. So slide 126, what's your response to sort of the
24 other potential modification of MPEG-1?

25 A. So, once again, in my view, the series of steps

1 in Dr. Hemami's Method (i) would not be obvious -- they just
2 don't make sense to me, at least for the reasons on the
3 right, most which are the same, but now Dr. Hemami says to
4 decode the temporal reference and then ignore it or discard
5 it and reset it, even if it's 0 to reset it, which I don't
6 understand why one would do that.

7 I think it still has the problem of not handling
8 bitstream errors, because if the temporal reference was
9 anything other than 0, I think Dr. Hemami is saying reset it
10 to 0 even if it's 32 or 200. I don't understand that.

11 And then the final point on the right, I won't
12 read out the ones I've already read out, it's not an MPEG-1
13 decoder, and now it's first decoding a reference value, or
14 some sort of an indication value, and then it's resetting.
15 And that's nowhere in MPEG-1. That's nowhere in the '321
16 patent or any of the standards we've been discussing.

17 So I just don't understand where this comes from,
18 apart from rewriting what's disclosed in MPEG-1.

19 Q. Let's go back to slide 124, please.

20 Doctor, I have a quick follow-up question here.
21 What are -- at the top of your slide 124 there's a reference
22 to leading B-frames.

23 What are those?

24 A. So I think Dr. Hemami actually described this in
25 some detail earlier in the week. And it's a little bit

1 difficult to explain with no diagram, but, just briefly, in
2 MPEG-1, in display order, a GOP can start with an I-picture
3 or it can start with one or more B-pictures, and these are
4 known as leading B-pictures or leading B-frames.

5 Q. What do you think about the Respondents'
6 contention that it would have been obvious for a decoder to
7 use a closed GOP with no leading B-frames?

8 A. I don't agree with that. As I understand
9 Dr. Hemami's and Respondents' proposal, they are proposing a
10 decoder that simply cannot decode anything other than a
11 closed GOP with no leading B-frames. That's no longer an
12 MPEG-1 decoder.

13 I don't -- I genuinely don't understand why one
14 would limit the decoder in such a way, because if you don't
15 want to use leading B-frames, you can just control the
16 encoder to not put them in the bitstream. There's no need
17 to rewrite or redesign a decoder so that it's not
18 standard-compliant. I genuinely don't understand why one
19 would do this.

20 Q. Let's have slide 127, please.

21 And let's turn to the MPEG-1 and Adolph ground.

22 Let's have slide 128.

23 What do Respondents point to for the indication
24 of the first image frame in the MPEG-1 and Adolph ground?

25 A. Once again, Respondents point to closed_gop_flag

1 in the group of pictures layer, particularly when it's set
2 to 1.

3 Q. Do you have the same response as to the
4 closed_gop_flag in MPEG-1 that you did in the modified
5 MPEG-1 ground?

6 A. Yes. I disagree that this would be an indication
7 of the first image frame as claimed for the same reasons.

8 Q. And let's have slide 129.

9 Earlier we were talking about Adolph's IP
10 counter. You called it a tally counter. Where does the IP
11 counter fit in?

12 A. In my view, the IP counter disclosed in Adolph is
13 not a decoded value. It's not decoded at all. In my
14 opinion, based on my reading of the reference, it is an
15 internal counting variable that's not part of the MPEG-1 or
16 MPEG-2 decoding process.

17 Q. Let's have slide 130.

18 Does Adolph's IP counter identify an image frame?

19 A. In my opinion, it does not. And I actually
20 previewed some of this earlier.

21 If one were to look at the IP counter that's part
22 of one of the highlighted rows on my slide 130, there's a,
23 if you like, a weak correlation with frames, but one cannot
24 work backwards from the IP counter and identify a specific
25 image frame. For example, for the IP values of 2, IP

1 counter is 2 for a series of image frames. It doesn't
2 identify any individual image frame for that value.

3 Q. Let's have slide 132, please.

4 Doctor, in your view, does Adolph teach the
5 resetting limitations of claims 8 and 10 of the '321 patent?

6 A. In my view, no, because the IP counter disclosed
7 in the reference, the reference says this counter is reset
8 after a GOP header has been correctly found.

9 So this is different from resetting for an image
10 frame. This is resetting after something has happened with
11 a header, and this doesn't meet the limitation for similar
12 reasons to the ones I described earlier. A GOP header does
13 not -- isn't related to a specific image frame.

14 Q. Let's have slide 133.

15 Do the Respondents have any alternative theories
16 with respect to what they label as identifier values?

17 A. Yes. As I mentioned earlier, I understand
18 Respondents to propose two alternatives, identifier values
19 being IP counter values or identifier values being
20 temporal_reference values.

21 Q. Let's have slide 134.

22 What are your opinions about the sort of proposed
23 alternative theories for the MPEG-1 and Adolph ground?

24 A. So I've mentioned already that for the Adolph
25 ground, or Adolph ground, the IP counters, in my view, don't

1 identify frames. They are not reset for an indicated first
2 image frame. They simply count a tally of how many frames
3 of a certain type have been received.

4 And also they are not decoded. They are not part
5 of the coded bitstream. They are not part of the decoding
6 process specified in MPEG-1. And in the MPEG -- in the
7 alternative, temporal reference and MPEG-1 does say
8 something about the display order of frames, but the decoder
9 doesn't reset temporal_reference. And it's about the
10 display order rather than the bitstream order.

11 Q. Let's have slide 135.

12 I want to quickly turn to the last ground, VLC
13 version 0.7.2. Remind us, is VLC prior art to the '321
14 patent?

15 A. Not in my opinion.

16 Q. Can we have slide 136?

17 Can you give us a timeline of VLC with respect to
18 the '321 patent here?

19 A. So I explained last week, Your Honor, why, in my
20 view, the '321 patent is entitled to a priority date of the
21 23rd of January 2002.

22 A little over a year later, H.264 was published
23 for the first time in May 2003. In May 2004, specifically
24 21st of May, 2004, this version of VLC was published for the
25 first time.

1 Q. And, Doctor, does VLC version 0.7.2 include
2 Nokia's contributions to the H.264 standard?

3 A. I believe it does because it includes an
4 implementation of H.264 video encoder and actually also, as
5 I recall, includes an implementation of an H.264 video
6 decoder. And H.264, in my view, includes the contribution
7 and invention of the '321 patent.

8 Q. Let's have slide 137.

9 Can you remind us -- I believe it was the
10 resetting limitation that Respondents challenged for the
11 '321 patent's priority date. Can you remind us where you
12 found that in the Finnish Patent Application?

13 A. So last week, Your Honor, I pointed you to
14 paragraph 49 of the Finnish Patent Application for the '321
15 patent, which I've shown at the left of slide 137.

16 And, particularly, the language decoder sets the
17 identifier of the first image frame, preferably an I-frame,
18 of the independently decodable sub-sequence at zero.

19 And in my opinion, from the perspective of a
20 person of ordinary skill in the art, that is the decoder
21 resetting that identifier.

22 Q. There's also an excerpt from JVT-B041 on the
23 right-hand side of slide 137. What are you showing us
24 there?

25 A. So I mentioned this document earlier, Your Honor.

1 This is an extract from the JVT-B041 standards contribution
2 that Nokia made after the -- on the same day, actually, as
3 the filing date of the Finnish application. And I've
4 highlighted text in this proposal: We propose that the
5 picture number shall be reset to zero in the first picture
6 of an independently decodable GOP.

7 And my recollection is that that is done in the
8 decoder in that proposal.

9 Q. Doctor, do you think a person of ordinary skill
10 in the art would perceive any material difference between
11 the language, the decoder preferably sets the identifier at
12 zero and the picture number shall be reset to zero?

13 A. In my view, no, particularly from the perspective
14 of a POSITA. We learn about resetting at quite an early
15 stage in engineering education, and these two are, in my
16 opinion, entirely consistent.

17 Q. Let's have slide 138.

18 What was Respondents' rebuttal to your position
19 on priority date for the '321 patent?

20 A. On my slide 138, I've included Dr. Hemami's slide
21 164. And my recollection is that Respondents' position at
22 this point was to look at -- or to identify an extract from
23 the '321 patent itself, I think, that talks about an
24 encoding process, and that identifier values for pictures
25 are encoded and the indicated first picture of an

1 independent sequence is reset.

2 Q. Does Respondents' citation here on your slide 138
3 change your opinion about the priority date of the '321
4 patent?

5 A. It doesn't, firstly, for the reasons I've already
6 explained, and, secondly, this is -- this part of the '321
7 patent is talking about the encoder doing something, the
8 encoder resetting a value.

9 Q. And, Mr. Moreno, we can take the slides down.
10 Dr. Richardson, I just have a few follow-up
11 questions.

12 Were you in the courtroom when Dr. Scott Acton
13 was testifying about sort of the value -- or the coverage, I
14 think I should say coverage of Nokia's patents vis-à-vis
15 patent pool patents?

16 A. I was.

17 Q. What did you think of that testimony?

18 A. Generally, I didn't agree that the conclusions
19 Dr. Acton reached were supported by the evidence that he
20 gave in the hearing yesterday.

21 Q. If one wanted to determine whether a certain
22 concept or idea in the field of video coding was more
23 meritorious or valuable than another idea, how would a
24 person of skill in the art go about that process?

25 A. So, for example, during the development of the

1 standards, including H.264 and H.265, a lot of technical
2 ideas and contributions are evaluated, they are compared,
3 and they are done using certain well-defined and well-known
4 objective mechanisms and metrics.

5 Q. And you mentioned H.264. I think it was the
6 joint video team that developed the H.264?

7 A. Yes.

8 Q. And H.265 was a joint collaborative team on video
9 coding?

10 A. Yes.

11 Q. What are some objective metrics that the joint
12 video team and joint collaborative team on video coding
13 might use to evaluate the merits or value of a proposal?

14 A. So it could be quite a lot of them, but they
15 include, off the top of my head, picture quality, well-known
16 ways of measuring decoded picture quality. They include the
17 bitrate, so that's how much the video has been compressed
18 by.

19 They can and did and have included computation,
20 and that might include processing speed, memory usage, and
21 also the concepts such as the ability to parallelize the
22 concept.

23 They might also include usability issues. So,
24 for example, there's a whole field of research into quality
25 of experience, and one can measure things like how does the

1 decoder handle errors and recover from errors and what's the
2 effect from the user's perspective.

3 Q. Did contributions to the joint video team or
4 joint collaborative team on video coding include any
5 empirical testing?

6 A. Yes. So, generally, yeah, in general, if one
7 were to submit a contribution for a, potentially,
8 modification to the draft standard, one would, in my
9 experience, include test data to support that contribution,
10 and that would actually follow agreed processes, agreed
11 video sequences, agreed measures of quality, agreed measures
12 of bitrate and so on.

13 Q. I want to quickly touch on another topic.

14 Are you familiar with the H.264 and H.265
15 standards?

16 A. Yes, very familiar.

17 Q. What is a subclause in the context of the H.264
18 and H.265 standards?

19 A. So I think Dr. Acton pointed out that these are
20 very big documents, many, many pages. You've probably seen
21 printouts of them, Your Honor. And in that document there
22 are sections, numbered sections, and there are subsections
23 and sub-subsections.

24 So, for example, I might have section 3,
25 subclause 7.3, subclause of that is 7.3.1, 7.3.2, and there

1 are many of these particularly in some parts of the
2 standard, some sections of the standard.

3 Q. Are subclauses like 7.3.2.2 interchangeable with
4 other subclauses like 7.3.2.1?

5 A. No, they are not. Generally each subclause is
6 describing a distinct part of the decoding process or the
7 syntax or whatever it's describing.

8 MR. VERBONCOEUR: Your Honor, I pass the witness.

9 JUDGE MCNAMARA: Thank you, Mr. Verboncoeur.

10 CROSS-EXAMINATION

11 BY MR. WILSON:

12 Q. May I proceed, Your Honor?

13 JUDGE MCNAMARA: Yes, Mr. Wilson.

14 Q. Jack Wilson on behalf of the Respondents, ASUS.
15 Dr. Richardson, good to see you again this
16 morning.

17 A. Likewise, good afternoon, or -- it's just
18 afternoon.

19 Q. I'm hoping we can start by having you clear
20 something up that we've talked about in the hearing.

21 There's been some discussions about what a video
22 codec is, right?

23 A. Yes.

24 Q. And you were here when Dr. Moulin testified that
25 a video codec is hardware, correct?

1 A. I believe so. I would just point out that for
2 some of the portions of testimony I had to leave the room,
3 but -- could you ask the question again? Sorry.

4 Q. You were here when Dr. Moulin testified that a
5 video codec is hardware, correct?

6 A. I remember him talking about software and
7 hardware in relation to video coding.

8 Q. Mr. Davis, could we bring up the trial transcript
9 from March 5th at pages 358 at lines 13-22?

10 Dr. Richardson, you were here -- this is
11 Dr. Moulin's testimony -- and he was talking about the
12 codec, the extension that he downloaded, and at lines 13 he
13 was asked: Okay. And that extension could be an AV1 codec,
14 browser, extension or media player?

15 His response: No, no, no, the codecs is
16 hardware. And he continues.

17 You were here for that testimony, sir?

18 A. I'm honestly not sure because -- yeah, I'm
19 honestly not sure.

20 Q. You were here when Dr. Chrissan testified about
21 what a video codec is, correct?

22 A. Again, I was here for at least portions of
23 Dr. Chrissan or Chrissan's -- I think it's Chrissan --
24 testimony, but only portions. I'm sorry to interrupt.

25 Q. Do you understand that Dr. Chrissan testified

1 that video codecs are hardware only, correct?

2 A. I don't recall that specific testimony.

3 Q. Mr. Davis, can we bring up the March 5th trial
4 testimony again at page 458 at lines 13-18?

5 This was Dr. Chrissan testifying.

6 Question. Do you recall being asked on direct
7 whether you agreed with Dr. Moulin that video codecs are
8 hardware only?

9 Answer. Yes.

10 And you testified that you agreed with him,
11 correct?

12 Yes.

13 Were you here for that testimony, sir?

14 A. Again, I'm really not sure because it would
15 depend on whether the confidential record sign was up.

16 Q. But, sir, you would agree with me that a video
17 codec can be software, correct?

18 A. A video codec can be software, Your Honor, yes.

19 Q. So when Dr. Moulin and Dr. Chrissan testified
20 that it's hardware, they are incorrect, fair?

21 A. I genuinely don't know the context or remember
22 the context of those discussions. Personally I would, as I
23 think I explained in the opening, my opening portion, Your
24 Honor, it's my experience that video coding can be done in
25 software only, it is often done in consumer devices using a

1 combination of software and hardware. And in the early part
2 of my career, Your Honor, I worked with video codecs that
3 were hardware only.

4 Q. Respectfully, Dr. Richardson, I have a little bit
5 of a time budget, so I'm going to ask you to focus on my
6 question. I want to talk about the '267 patent.

7 You were here -- were you here when Dr. Moulin
8 testified that when pixel values are interpolated, the
9 result is a prediction at a higher second precision?

10 A. In the -- that could have been in the context of
11 the '267 patent. I think in the context of the '267 patent,
12 predictions are at a higher precision. I'm not sure if that
13 was the context of that testimony.

14 Q. In particular, he pointed to interpolation as
15 resulting in the higher precision prediction, correct?

16 A. I don't recall precisely that testimony.

17 Q. Do you recall having your deposition taken in
18 this case?

19 A. I do.

20 Q. And you agreed that, in deposition, that
21 interpolation is one way to increase precision, correct?

22 A. So interpolation can increase precision. I agree
23 with that.

24 Q. Right. It's one way. There are multiple ways.
25 But interpolation is one way, correct?

1 A. I'm pretty sure we had that discussion, yeah. I
2 think I would -- I think I would still agree with that.

3 Q. Now, in your direct you testified that weighted
4 prediction, on the other hand, doesn't provide any
5 additional precision, correct?

6 A. In the context of the Walker reference, in the
7 context of H.264, weighted prediction, and in the context of
8 a particular step in that, which is applying a multiplier,
9 such as w_0 or w_1 , to a prediction value, that does not
10 increase precision.

11 Q. And then in the opening counsel for Nokia
12 explained that when the prediction $pred_0$ has 256 potential
13 values, and when we multiple by weight w_0 , we still have 256
14 potential values, we're not getting any precision here,
15 we're not getting any additional information, we're just
16 scaling.

17 Do you agree with that, sir?

18 A. If the multiplication is simply a scaling and if
19 it's done specifically with the same multiplication factor
20 for all pixels or samples of a current block, then the
21 precision is not increased under any of the three claim
22 constructions.

23 Q. And you would agree that you're not getting any
24 new additional information by doing that weighted scaling,
25 correct?

1 A. I would put it in the way I just put it. I'm not
2 going to introduce new words such as "information."

3 Q. Now, Dr. Richardson, you've read the 1380 Initial
4 Determination, correct?

5 A. I believe I recall reading at least parts of it.
6 I'm not sure that I've read all of it, yeah.

7 Q. You cited the 1380 Initial Determination as part
8 of your analysis for this case, correct?

9 A. I recall citing it at least in my -- in one or
10 more of my expert reports.

11 Q. And you were present when Dr. Schonfeld testified
12 in this case, correct?

13 A. Yes. Again, I was present except for certain
14 points. If he was on the confidential record for source
15 code, third-party source code, then I would not have been
16 present.

17 Q. You were here when Dr. Schonfeld discussed the
18 1380 Initial Determination in the context of Walker, right?

19 A. I remember quite a lot of discussion in
20 Dr. Schonfeld's testimony of the 1380 hearing determination
21 with respect to the Walker reference.

22 Q. And in your direct testimony today you didn't
23 discuss the 1380 investigation, correct?

24 A. I don't recall citing it in my direct testimony
25 today.

1 Q. And, sir, you didn't attempt to reconcile the
2 positions you're taking in this case with the Initial
3 Determination in the 1380 investigation, correct?

4 A. I don't recall discussing that in my testimony
5 today.

6 Q. You're aware, sir, that Judge Elliot found that
7 the Walker reference invalidated claims of the '267 patent
8 as he wrote in the 1380 Initial Determination, correct?

9 A. That's roughly my recollection. I don't recall
10 the details of which claims and which claim elements.

11 Q. But there were claims of the '267 that Judge
12 Elliot concluded were invalid in view of the Walker
13 reference in the 1380 investigation, correct?

14 A. That's broadly consistent with my recollection.

15 Q. And, in particular, Judge Elliot found that
16 Walker's equations show variables and then a bit-depth of
17 16, i.e., precision, correct?

18 A. That's -- I broadly recall something similar to
19 that. I don't recall the exact wording.

20 Q. Mr. Davis, could we bring up Judge Elliot's
21 initial determination, at RX-1945, and specifically page
22 141.

23 Let's just zoom in on that top paragraph before
24 that figure.

25 Dr. Richardson, in the Initial Determination of

1 the 1380 investigation, Judge Elliot says, for support,
2 Amazon points to the following equations and tables which
3 show these variables and their bit-depth of 16, i.e.,
4 precision, correct?

5 A. I see that text.

6 Q. Now let's dig into Walker a little bit.

7 In your direct you talked about the Walker
8 reference discussing four different codecs, correct?

9 A. I recall the Walker reference discussing four
10 different specifications for video decoding.

11 Q. And if I understood your presentation correctly,
12 you were suggesting that Walker was limited to those four
13 specifications, correct?

14 A. I don't recall using those words. I recall
15 explaining that Walker's main focus, as I understand it, was
16 on a unified decoding process that applies to each of those
17 four or all of those four specifications that I mentioned.

18 Q. You would agree with me that the Walker reference
19 isn't limited to those four specifications that you talked
20 about in your direct, correct?

21 A. I don't recall whether Walker mentions other
22 specifications, but Walker's unified decoding method is
23 directed to those four specifications. That's my
24 recollection.

25 Q. Mr. Davis, could we bring up the Walker

1 reference? I believe it's JX-0683. And let's look at page
2 17, paragraph 46, please.

3 Dr. Richardson, do you recognize paragraph 46 of
4 the Walker reference?

5 A. I think so, yes.

6 Q. And it begins, at the most prevalent weighted
7 bi-prediction implementations will be discussed, right?

8 A. Yes.

9 Q. And in this paragraph 46 he refers to the MPEG-4
10 standard that you identified, RealVideo 9 that you
11 identified, Windows Media Video 9, and H.264, right?

12 A. Yes.

13 Q. And those are the four you identified in your
14 direct testimony, correct?

15 A. Yes.

16 Q. And at the end of this paragraph, Walker states,
17 as those of ordinary skill in the art can appreciate, other
18 implementations of bidirectional prediction can be
19 accommodated without departing from the spirit or scope of
20 the disclosed methods, correct?

21 A. I see that text.

22 Q. Okay. Mr. Davis, let's bring up Walker at
23 Table 2, and that should be on the exhibit page 19.

24 Dr. Richardson, let's dig into Walker a little
25 bit.

1 Now, there are two variables that you identified
2 in your direct, pred0 and pred1, correct?

3 A. I identified those two variables in my direct
4 testimony today.

5 Q. And pred0 and pred1 are Walker's predictions,
6 fair?

7 A. In my opinion. I think not in Dr. Schonfeld's
8 opinion.

9 Q. You would agree, though, that pred0 and pred1
10 each have 8 bits, correct?

11 A. That's consistent with my recollection of how
12 Walker defines these variables or these -- yes. Sorry.

13 Q. Thank you. And Walker also has two values called
14 w0 and w1, correct?

15 A. In this table, yes.

16 Q. And w0 and w1 refer to weight 0 and weight 1,
17 fair?

18 A. That's broadly my recollection.

19 Q. Well, Mr. Davis, let's go to Table 1, which is on
20 page 18. Thank you.

21 Sir, Table 1 of Walker shows that w0 and w1 are
22 represented by 8 bits, correct?

23 A. Walker chooses to represent these by 8 bits.

24 Q. And you would agree with me that the values w0,
25 w1 are independent of pred0 and pred1, correct?

1 A. In H.264 these are not necessarily independent.
2 The weighting factors w0 and w1 --

3 Q. Sir, my question is about Walker, not H.264.

4 So w0 and w1 are independent of pred0 and pred1
5 in Walker, correct?

6 A. With respect, this is H.264, an implementation of
7 H.264 that Walker is describing in Table 1.

8 Q. So you disagree that w0, w1 is independent of
9 pred1 and pred0 as discussed in Walker, correct?

10 A. Not completely independent. pred0 and pred1 are
11 obtained from a first in reference, second reference
12 picture. w0 and w1 are the weighting factors for that first
13 and second reference picture.

14 Q. Sir, I want you to listen to my question
15 carefully.

16 w0 and w1 are weighting factors applied to but
17 not correlated with the prediction values pred0 and pred1.

18 Do you agree?

19 A. I don't necessarily see why they would be
20 correlated.

21 Q. So they are not correlated, fair?

22 A. They might not be correlated. I haven't actually
23 worked it out.

24 Q. Can we bring up Dr. Richardson's rebuttal report
25 at paragraph 213, please?

1 Sir, in paragraph 213 you state, w_0 and w_0 are
2 weighting factors applied to but not correlated with the
3 prediction values $pred_0$ and $pred_1$, correct?

4 A. I'll take your word for it, yep.

5 Q. Sir, that's your report, correct?

6 A. I'm happy to accept that.

7 Q. You don't recognize the words that are in your
8 report?

9 A. There's a lot of paragraphs, but I can look it
10 up, but I'm happy to take your representation. I'll look it
11 up just to check.

12 Q. Let's go back to Table 2 of the Walker reference,
13 please.

14 Dr. Richardson, Table 2 shows there's an
15 operation 1, correct?

16 A. Yes.

17 Q. And operation 1 of Walker multiplies $pred_0$ times
18 w_0 , correct?

19 A. Or $pred_1$ times w_1 , as I recall.

20 Q. Fair. The result of either of those
21 multiplications, $pred_0$ weight 1 or $pred_1$ weight 1, is stored
22 in a 16-bit result, correct?

23 A. As I recall, Walker chooses to use a 16-bit
24 register to hold those -- either of those two
25 multiplications.

1 Q. Sir, you would agree with me that you can
2 represent more possible values using 16 bits than 8 bits,
3 right?

4 A. Yes.

5 Q. You also agree that multiplying a variable that
6 can take the full range of its possible values by another
7 variable that can take the full range of its possible values
8 can increase the number of possible values for the resulting
9 product, correct?

10 A. If these are variables and not constants, then I
11 agree with you.

12 Q. Now, sir, in your direct you presented an example
13 to illustrate the interpretation of precision.

14 And Mr. Davis, could we bring up CDX-11.37.

15 Sir, this is the demonstrative 37 that you were
16 discussing in your direct, correct?

17 A. This is a demonstrative I discussed in my direct
18 testimony.

19 Q. If we focus on the left side of this, pred0, you
20 have four unique values, correct?

21 A. In that 3x3 illustrated block, yes.

22 Q. And then there's a multiplication by 2 that
23 results in all the values being scaled by 2, correct?

24 A. That's correct.

25 Q. And, in your view, that is not increasing

1 precision, correct?

2 A. Correct.

3 Q. And you're sure about that? Multiplying by 2
4 doesn't increase the precision?

5 A. If 2 is a constant for all of the values in the
6 block, that is correct.

7 Q. You would agree with me, though, that shifting
8 the values to the left of a binary value by 1 bit position
9 is a computationally simple way to multiply the value by 2,
10 correct?

11 A. Generally, yes.

12 Q. So shifting the value of the block to the left by
13 1 bit is a multiplication by 2, correct?

14 A. It can be used to achieve a multiplication by 2.

15 Q. Mr. Davis, can we bring up claim 4 of the '267
16 patent, JX-7, at 27, please.

17 Sir, claim 4 says at the end that the second
18 prediction is obtained by shifting the values of said second
19 reference block to the left, correct?

20 A. You read that correctly.

21 Q. And, sir, you did not consider claim 4 of the
22 '267 patent when you were performing your analysis for this
23 case, correct?

24 A. I don't think that's correct. I recall
25 considering claim 4, talking about claim 4, writing about

1 claim 4, rather, in my rebuttal expert report.

2 Q. Sir, at your deposition you couldn't recall
3 considering claim 4 of the '267 patent when you were
4 performing your analysis for this case, correct?

5 A. I don't recall the context of that.

6 Q. Mr. Davis, can we bring up Dr. Richardson's
7 December 5th deposition at page 252 and span to, say, 253,
8 please, to line 20. Thank you.

9 Sir, at your deposition you were asked:

10 Did you consider claim 4 of the '267 patent when
11 you were performing your analysis for this case?

12 Answer. Not that I recall. My recollection is
13 that it's not asserted in this case.

14 That was your deposition testimony, sir?

15 A. If I didn't remember at that stage, I didn't
16 remember.

17 Q. Now, you've also -- we can take that down.

18 You've also taken the position that a person of
19 ordinary skill would have no motivation to combine Walker
20 and Srinivasan, correct?

21 A. Yes, that's my recollection.

22 Q. You would agree with me that Walker describes the
23 operation of a conventional bi-prediction in the standards,
24 correct?

25 A. Say that again, please?

1 Q. Walker describes the operation of conventional
2 bi-prediction in the various standards and specifications
3 that you mentioned earlier, correct?

4 A. At least the four standards and specifications
5 that I mentioned in my direct testimony when talking about
6 Walker.

7 Q. And conventional bi-prediction standards in
8 Walker support the use of B-frames, correct?

9 A. B-frames, B-pictures, or B-macroblocks generally,
10 at least some of those -- I think at least some of those
11 four methods.

12 Q. Now Srinivasan, sir, also -- Srinivasan describes
13 motion compensation prediction techniques used in
14 conventional video coding systems, correct?

15 A. Walker -- sorry -- Srinivasan, as I recall, is
16 directed to interpolation, I think, in the context of video
17 coding.

18 Q. And Srinivasan, in fact, refers to B-frames for
19 bidirectional prediction, correct?

20 A. I don't recall precisely, but I wouldn't be
21 surprised if it did.

22 Q. Mr. Davis, could we bring up RX-2024, that's
23 Srinivasan, at lines 9, 26-32.

24 Sir, do you recognize this passage from
25 Srinivasan?

1 A. Is it possible to zoom out a little bit? That's
2 really big in my monitor.

3 Q. Sure.

4 Mr. Davis, can we zoom out, please?

5 A. Thank you.

6 Q. Sir, this portion of Srinivasan, it states, a
7 predicted frame, also called P-frame, B-frame, for
8 bi-prediction or inter-coded frame, is represented in terms
9 of prediction or difference from one or more other frames,
10 fair?

11 A. I see that text.

12 Q. Let me shift gears and talk about the '321
13 patent.

14 Sir, the '321 patent, as you mentioned, relates
15 to random access and video coding, correct?

16 A. It does relate to that issue, yes.

17 Q. And it's Nokia's position that H.264's IDR
18 picture is the decoded at least one image frame, correct?

19 A. Could you ask that again, please?

20 Q. It's Nokia's position that the IDR picture in
21 H.264 satisfies the at least one image frame?

22 A. Nokia's position -- that's broadly my
23 recollection. It sounds like something that -- on the
24 infringement side. Would that be correct?

25 Q. Let me move on.

1 And H.264 signals an IDR frame using a NAL unit
2 type, correct?

3 A. So in H.264 a NAL -- a certain NAL unit type
4 indicates to a decoder that the NAL unit contains -- I think
5 it's a slice of an IDR picture.

6 Q. That's right. The NAL unit type is defined or
7 sent in the slice header, correct?

8 A. No, I don't think that's correct.

9 Q. Let me rephrase.

10 The NAL unit type is found, in a slice header, in
11 a slice-related header, correct?

12 A. I don't think it's found in the slice header in
13 H.264. I could be wrong about that. I don't have the
14 standard -- well, I may have the standard in front of me,
15 but that's not my recollection.

16 Q. You would agree it's in a header however? Maybe
17 it's not the slice, but it's in a header, correct?

18 A. Yeah. I would normally go to the standard at
19 this point, but my general recollection is that the NAL unit
20 type is a property of the NAL unit, which is a certain layer
21 of the H.264 syntax.

22 Q. And, in particular, a header?

23 A. It's a certain layer of the syntax, I can't
24 remember if it's described as a header. Yeah, that's my
25 recollection.

1 Q. Now, for invalidity, it's your view that MPEG-1's
2 closed_gop_flag is not an indication of a first image frame,
3 correct?

4 A. In the context of the '321 patent, that's broadly
5 correct.

6 Q. And that's because the closed_gop_flag is present
7 in a structural level of the coded bitstream that relates to
8 an entire group of coded pictures, correct?

9 A. That's part of my reasoning. I wouldn't say
10 that's the whole of it.

11 Q. You agree with me, sir, that the '321 patent
12 explains that indications of image frames may be included in
13 header fields, right?

14 A. I don't recall the precise language, but I recall
15 something along those lines.

16 Q. Now, with respect to a closed GOP, sir, you would
17 agree that the frame immediately following the
18 closed_gop_flag will always be the first frame of the closed
19 GOP, correct?

20 A. Are we talking MPEG-1 now?

21 Q. Yes, sir.

22 A. So if there are no errors, then the -- there will
23 be, following a group of pictures' header, there will be a
24 series of coded pictures, and one of those will be first.

25 Is that what you're asking?

1 Q. Yes. Following the closed_gop_flag the --
2 following that flag will always be the first frame of the
3 closed GOP, correct?

4 A. Following the GOP header, assuming no errors,
5 there will be a series of coded pictures forming a GOP in
6 MPEG-1, and the first one of those will be first.

7 Q. And that's true when the closed_gop_flag is set
8 to 1, correct?

9 A. For closed_gop_flag set to 0 or 1 in MPEG-1,
10 following the GOP header, assuming no errors, will be a
11 series of coded pictures, and one of those will be first.

12 Q. In MPEG-1 the first property for a group of
13 pictures is that, in bitstream order, it would begin with an
14 I-picture, correct?

15 A. My recollection is that in MPEG-1 a property of a
16 group of pictures is that the first of those in decoding
17 order should be an I-picture.

18 Q. And after that I-picture in MPEG-1, there can be
19 any number of I, P, or B-pictures in any order, correct?

20 A. After that, there may be a number of I, P, and/or
21 B-pictures. I don't recall whether there is a limit on
22 that. I recall that it can be quite a large number.

23 Q. But the smallest group of pictures in MPEG-1
24 would be a single I-frame, correct, or single I-picture,
25 correct?

1 A. I think that is -- I think that is compatible
2 with the MPEG-1 specification, I think.

3 Q. Mr. Davis, why don't we bring up the MPEG-1
4 standards, JX-61.085.

5 Sir, we can stay broad to give you some context,
6 but you see here we're talking about the group of pictures
7 in MPEG-1, correct? And that's JX-61.

8 A. So we don't have the heading section before this,
9 but I recall this section. So I think that's correct.

10 Q. And, Mr. Davis, if you could zoom in on Fig. D.17
11 of the MPEG-1 standard.

12 This page illustratable some examples of groups
13 of pictures, correct?

14 A. That's correct.

15 Q. And at the top of this pyramid is a single
16 I-picture, correct?

17 A. At the top of Fig. 2.17 from the MPEG-1 standard,
18 it shows a single I-picture as a group of pictures.

19 Q. So in MPEG-1 a group of pictures with a single
20 I-frame is a -- is syntactically valid, correct?

21 A. That would seem to be correct based on what you
22 just showed me.

23 Q. Now, Mr. Davis, could we bring up
24 Dr. Richardson's demonstrative slides, CDX-11 at 121,
25 please.

1 Now, sir, you remember talking about this on your
2 direct, correct?

3 A. Say that again, please.

4 Q. You remember testifying about CDX-11.121 in your
5 direct, correct?

6 A. Yes, I do.

7 Q. And I wrote down for this slide you were
8 discussing that a closed_gop_flag is not an indication of a
9 first image frame in MPEG-1, correct?

10 A. I think that's what I said, and that's certainly
11 my opinion, yes.

12 Q. And you recall that Nokia made the same argument
13 in the 1380 investigation, correct?

14 A. I wasn't involved in the 1380 investigation, but
15 that's roughly my recollection, that that argument was
16 presented.

17 Q. And you understand that Judge Elliot agreed that
18 the closed GOP in fact met this limitation, correct?

19 A. I don't recall the relevant wording of Judge
20 Elliot's determination as broadly consistent with my
21 understanding and recollection.

22 Q. Mr. Davis, let's go ahead and bring up the 1380
23 initial determination again. That's RX-1945.0057. That's
24 page 50.

25 Sir, in the middle of this page there is a

1 paragraph about Nokia's argument with respect to this
2 limitation. And it ends explaining, from Judge Elliot, that
3 the limitation is met at least some of the time, correct?

4 A. I'm not seeing much context here. I certainly
5 see those words. I'm not quite sure what Judge Elliot is
6 talking about here.

7 Q. Regardless, sir, you didn't discuss Judge
8 Elliot's interpretation of the GOP flag in your direct
9 testimony today, correct?

10 A. What do you mean by "the GOP flag"?

11 Q. The closed GOP flag that we're talking about for
12 MPEG-1 that's the centerpiece of the MPEG-1 invalidity
13 grounds.

14 A. If that's what Judge Elliot is talking about
15 here, then, no, I don't think I discussed that, but I'm not
16 quite sure of the context here.

17 Q. Let's go back to the MPEG-1 reference, again,
18 JX-61, at page 87.

19 Sir, in the middle of this page there is a
20 discussion of the temporal reference, correct?

21 A. Yes.

22 Q. And the temporal reference is a 10-bit number
23 which can be used to define the order in which the pictures
24 must be displayed, correct?

25 A. You read that correctly.

1 Q. And the temporal reference is set to 0 for the
2 first picture for each group of pictures, correct?

3 A. Wait a minute. Say that again?

4 Q. The temporal reference is set to 0 for the first
5 picture in display order for each group of pictures,
6 correct?

7 A. That's correct, yes.

8 Q. But now you disagree that MPEG-1 satisfies the
9 limitation of resetting the value to zero with respect to
10 temporal reference, correct?

11 A. The decoding limitations, I don't agree that
12 MPEG-1 alone satisfies the decoding limitations of the
13 asserted claims of the '321 patent.

14 Q. And for temporal reference, that's because the
15 claims require the decoder to reset the identifier value to
16 zero, correct?

17 A. My recollection is that the claims do require the
18 decoder to set the identifier value to zero.

19 Q. But it's your view that, because the MPEG-1 -- or
20 because in MPEG-1 it's the encoder that assigns the temporal
21 reference value that it doesn't qualify for that limitation,
22 correct?

23 A. Well, MPEG-1, the MPEG-1 standard simply does not
24 disclose a decoder resetting temporal reference to zero.
25 It's just not disclosed. That's why I disagree.

1 Q. Right. But temporal reference is set by the
2 encoder, correct?

3 A. In MPEG-1 temporal reference in a compliant
4 bitstream must be equal to zero for the first picture in
5 display order of a group of pictures.

6 Q. And it's set by the encoder, sir?

7 A. What encoder are you asking?

8 Q. The encoder, the encoder that sends a group of
9 pictures.

10 A. I'm confused now. What are you asking me about?

11 Q. I'll move on.

12 It's your opinion, sir, that a counter does not
13 satisfy the claim's requirement that identifier values be
14 decoded according to a numbering scheme and then reset for
15 the first image frame, correct?

16 A. The counter values in Adolph pointed to by
17 Respondents, I don't agree they satisfy those limitations of
18 the asserted claims.

19 Q. And, in part, because they aren't decoded,
20 correct?

21 A. That was part of my reasoning that I gave in my
22 testimony today.

23 Q. And sticking on Adolph, you agree with me, sir,
24 that it's your opinion that I, P, and B-counters cannot be
25 identifier values that are reset because they are internal

1 counters, correct?

2 A. In my opinion they simply don't satisfy those
3 elements that you mentioned of the asserted claims. There's
4 a number of reasons, which I gave in my direct testimony.

5 Q. And one of them is that they are internal
6 counters.

7 A. In my view they are internal counters as
8 disclosed by Adolph and they are not decoded from the
9 bitstream.

10 Q. Now, sir, you could develop a decoder that
11 practices claim 8 of the '321 patent without using reference
12 picture selection, correct?

13 A. I haven't tried it, but I don't recall the claim
14 itself mentioning the words "reference picture selection."

15 Q. Mr. Davis, could we bring up the March 5th trial
16 testimony at page 308 to 309? I'm sorry. December 5th
17 deposition transcript, please.

18 Just so the record is clear, because I think I
19 botched that in multiple ways, Mr. Davis, we're going to
20 look at Dr. Richardson's deposition testimony from December
21 5th at pages 308 to 309, lines 18 to 15.

22 We'll withdraw the question.

23 Dr. Richardson, you remember being asked
24 questions about Dr. Acton's analysis in your direct
25 examination, correct?

1 A. Yes.

2 Q. You didn't provide any affirmative opinion about
3 the value of the asserted patents, correct?

4 A. I don't believe I've been asked to provide such
5 an opinion, and I don't recall providing such an opinion in
6 this matter.

7 Q. And if I recall your testimony, you testified
8 that the technical value can be evaluated in the
9 standard-settings or specification-setting bodies; is that
10 right?

11 A. I'm not sure I used the words "technical value."
12 I don't actually remember the words I used. But certainly
13 the merit of technical contributions can be evaluated in
14 that situation in a number of ways.

15 Q. Mr. Davis, let's go to, instead, JX-0187, to the
16 first page, please.

17 Sir, you recognize that JX-0187 is Nokia's
18 proposal with respect to the '267 patent, correct?

19 A. It's a proposal by Nokia authors, and my
20 recollection is that this relates to the '267 patent.

21 Q. And you testified about this proposal in your
22 direct examination today, correct?

23 A. I think so, yes. Yes, I did.

24 Q. And this is a proposal that Nokia is making to
25 the standards bodies, correct?

1 A. To the standard what, sir?

2 Q. To the standard body, correct?

3 A. It's a proposal made by one or more Nokia
4 engineers, as I recall, to the -- one of the meetings of the
5 JCT-VC group.

6 Q. And, sir, you would agree with me that, if we go
7 to the conclusion on page 3, that the inventors
8 characterized this as a minor fix on how bidirectional
9 prediction is generated, correct?

10 A. I see the words you're highlighting. I recall
11 reading these words before.

12 Q. And that's with respect to the '267 patent,
13 correct?

14 A. This is with respect to this particular
15 contribution, as I recall.

16 Q. Mr. Davis, could we please bring up JX-0208 at
17 page 1, please?

18 Dr. Richardson, you testified in your direct
19 about the proposals Nokia made with respect to the '321
20 patent, fair?

21 A. Yes, that's correct.

22 Q. And JX-0208 was one of the proposals you
23 identified, correct?

24 A. This appears to be the B041 proposal which I
25 mentioned earlier, yes.

1 Q. And the inventors here characterized their
2 proposal as a simple modification into the header syntax to
3 signal random access positions, correct?

4 A. I see those words that you just read out in the
5 first sentence of this contribution document.

6 I'm sorry. Could I have the question again? I
7 think I answered -- I'm not sure I answered the question you
8 asked.

9 Q. The document is proposing a simple modification
10 into the slice header syntax to signal random access
11 positions, correct?

12 A. That's broadly correct. That's broadly
13 consistent with the language I see here, yes, for this
14 document.

15 MR. WILSON: Your Honor, at this time I need to
16 have co-counsel do the examination for the '714 patent.

17 JUDGE MCNAMARA: Yes. Thank you.

18 MR. HOUMAND: Corey Houmand for Morgan Lewis on
19 behalf of Acer.

20 Your Honor, just as a point of procedure, I've
21 got about 15 to 20 minutes for my exam. I can start now or
22 I can start after our lunch break.

23 JUDGE MCNAMARA: I suspect everybody could use a
24 lunch break at this point, and particularly Dr. Richardson.
25 So I know we said I'd stop promptly, but we're close enough.

1 How about if I see you in an hour?

2 Are we still good on time?

3 MR. HOUMAND: I believe so for Respondents.

4 JUDGE MCNAMARA: Are we okay?

5 MR. VERBONCOEUR: I believe we are for Nokia,
6 Your Honor.

7 MS. DUCCA: Your Honor, by my calculation, we
8 should have two hours and 20 minutes left.

9 JUDGE MCNAMARA: Okay. Thank you. I'll see you
10 in an hour.

11 (Whereupon, the proceedings recessed at 12:52
12 p.m.)

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1 AFTERNOON SESSION

2 (In session at 2:00 p.m.)

3 JUDGE MCNAMARA: Hello, everyone. Thank you.

4 It's snowing.

5 Please be seated.

6 So I guess we've got winter redux here. Here we
7 go again.

8 MR. HOUMAND: Sure seems like it.

9 JUDGE MCNAMARA: It does, doesn't it.

10 MR. HOUMAND: Corey Houmand from Morgan Lewis,
11 Your Honor. May I begin?

12 JUDGE MCNAMARA: Yes, please.

13 MR. HOUMAND: Okay.

14 CROSS-EXAMINATION

15 BY MR. HOUMAND:

16 Q. Good afternoon, Dr. Richardson.

17 A. Good afternoon.

18 Q. My name is Corey Houmand. I represent Acer. I'm
19 going to ask you a few questions about the '714 patent,
20 albeit on a limited schedule. So I just ask that you listen
21 to and answer the questions that I'm asking. Sound fair?

22 A. Of course.

23 Q. Okay. Dr. Richardson, there have been at least
24 three Inter Partes Review proceedings involving the '714
25 patent before the Patent Trial and Appeal Board, correct?

1 A. I can't remember the exact number. I recall I've
2 been involved with at least two, I think.

3 Q. At least two. Two of those IPR proceedings were
4 filed by Amazon in April 2024, right?

5 A. I'm happy to accept that.

6 Q. Okay. The third of those IPR proceedings was
7 filed by ASUS in June 2025, right?

8 A. I'm not sure of the dates.

9 Q. Okay. But you're aware of a currently ongoing
10 Inter Partes Review proceedings filed by ASUS that was
11 instituted, correct?

12 A. I believe there is -- yeah, I'm not sure.
13 There's been so many IPRs, I'm not sure of the details of
14 each one.

15 Q. Well, you recently filed a declaration, signed
16 and filed a declaration in the ASUS IPR proceeding involving
17 the '714 patent just a few days ago, right, sir?

18 A. I recall filing a declaration a few days ago,
19 yes.

20 Q. Okay. Now, and you submitted declarations, not
21 only in the ASUS IPR proceedings, but you did so in the two
22 Amazon IPR proceedings as well, right?

23 A. I think that's correct, yes.

24 Q. Can we have RDX-19.2, please, Mr. Davis?

25 Now, Dr. Richardson, on August 12, 2024, you

1 submitted two declarations in support of Nokia's preliminary
2 response to Amazon's two IPR petitions, correct?

3 A. That fits my recollection.

4 Q. And in those declarations you argued -- well,
5 first off, let me just back up and say, in all the IPR
6 petitions and proceedings that we've been discussing, Amazon
7 and ASUS were arguing that the '714 patent is rendered
8 obvious by Rusert in combination with Karczewicz '721,
9 right?

10 A. I don't recall all the grounds. I believe there
11 were other grounds, but my recollection is that that ground
12 appears in all of these proceedings --

13 Q. Okay.

14 A. -- at least the ones that I've been involved
15 with.

16 Q. And in your declarations that you signed and were
17 submitted on August 12th, 2024, you argued that Rusert and
18 Karczewicz did not render the '714 patent obvious, right?

19 A. That fits my recollection, yes.

20 Q. Let's have RDX-19.3, please.

21 In fact, Dr. Richardson, you specifically argued
22 that Rusert and Karczewicz do not teach, quote, determining
23 a subset of spatial motion vector prediction candidates
24 based on a location of the block associated with the first
25 spatial motion vector prediction candidate, as required by

1 the claims, correct?

2 A. Thank you for reading that correctly. I've
3 noticed a typo. I've read this many times. I didn't see
4 that before. So, yes, that's what I intended to say there.

5 Q. Okay. Thank you.

6 Let's go to RDX-19.4.

7 Now, the PTAB did not agree with the arguments
8 that you presented in your August 2024 declarations,
9 correct?

10 A. My recollection is that both of these proceedings
11 were -- the PTAB granted institution on both of these IPR
12 proceedings.

13 Q. Right. And specifically on November 7th, 2024,
14 that's when the PTAB instituted Inter Partes Review on both
15 of Amazon's IPR petitions, correct?

16 A. That's consistent, I think, with my memory for
17 the two petitions. I can't quite see the numbers, but I'm
18 happy to take your word for it.

19 Q. Okay. Let's have RDX-19.5, please, Mr. Davis.

20 Let's see how the PTAB addressed your arguments
21 regarding the determined a subset limitation.

22 The PTAB ruled that, with respect to Rusert,
23 quote, petitioner is correct that the determined subset does
24 depend on the location of the first selected spatial motion
25 vector prediction candidate.

1 Did I read that correctly?

2 A. Yes.

3 Q. Let's have RDX-19.6.

4 The PTAB went on to conclude that, quote, if the
5 first selected candidate is at the location of block 5, then
6 the subset would be the four members 1, 2, 3, and 4, and if
7 the first selected candidate is at the location of block 3,
8 then the subset would be the two members 1 and 2.

9 Did I read that correctly?

10 A. I believe you did.

11 Q. Let's now have RDX-19.7, please, Mr. Davis.

12 And the PTAB concluded in that same paragraph
13 that, quote, the members of the determined subset depend on
14 the location of the block associated with the first selected
15 spatial motion vector prediction candidate as petitioner
16 contends.

17 Did I read that sentence correctly?

18 A. I believe so, yes.

19 Q. Let's now have Dr. Richardson's slide 70, please,
20 which is CDX-11.70.

21 Now, Dr. Richardson, despite the PTAB's rulings,
22 it's still your position that Rusert and Karczewicz do not
23 determine a subset of spatial motion vector prediction
24 candidates based on the location of the block associated
25 with the first spatial motion vector prediction candidate,

1 correct?

2 A. My opinion is, as I stated earlier today, that
3 the Rusert and Karczewicz reference do not render obvious
4 these limitations. That's still my opinion.

5 Q. That's still your opinion. And you didn't tell
6 the ALJ about any of the PTAB's prior rulings regarding the
7 '714 patent when you were testifying.

8 A. I don't recall mentioning PTAB rulings of any
9 sort while I was testifying today.

10 Q. We can take that down, Mr. Davis.

11 I want to talk about ALJ Elliot's 1380 ID. You
12 mentioned in speaking with my colleague, Mr. Wilson, that
13 you had read portions of it, right?

14 A. Could you explain what an ID is?

15 Q. Initial determination, sir.

16 A. I recall reading at least portions of Judge
17 Elliot's Initial Determination in the 1380 matter or
18 hearing.

19 Q. Did you review the portions relating to the '714
20 patent?

21 A. I think I recall reviewing portions. I'm not
22 sure if they were all the portions. I recall reviewing
23 portions relating to the '714 patent.

24 Q. In fact, in your rebuttal report you said that
25 you agreed with ALJ Elliot's construction of the block in

1 the '714 patent that he rendered in his 1380 Initial
2 Determination, right?

3 A. I don't recall that exact piece of my rebuttal
4 report.

5 Q. Okay. Let's have CX-6465C at paragraph 603,
6 Mr. Davis.

7 And, in particular, directing your attention,
8 Dr. Richardson, to the second-to-last sentence in this
9 paragraph, you wrote, "I agree with ALJ Elliot's
10 construction of the block."

11 Do you see that?

12 A. I see that yes.

13 Q. So you at least reviewed that part of the Initial
14 Determination regarding the '714 patent, correct?

15 A. That's consistent with what I can remember, yes.

16 Q. Let's talk about some of the other portions and
17 see if you reviewed those.

18 Mr. Davis, may we have RX-1945.95, which is
19 page 89 of the 1380 Initial Determination.

20 And if we could enlarge the middle paragraph that
21 begins with "Amazon is correct."

22 Now, I want to talk to you about some of ALJ
23 Elliot's rulings regarding the meaning of the word
24 "determine," sir, okay? And at the start of this paragraph,
25 ALJ Elliot writes, "Amazon is correct in that H.265

1 predefines the subset."

2 Do you see that?

3 A. Yes.

4 Q. Did you review that portion of ALJ Elliot's 1380
5 Initial Determination?

6 A. I might have read it. I don't recall relying on
7 this. It would seem to be infringement related.

8 Q. Okay. And just to be clear, you didn't discuss
9 this during your direct testimony, right?

10 A. I didn't discuss anything relating to
11 infringement or any -- I didn't discuss infringement in my
12 testimony here today.

13 Q. Okay. And let's go to the next sentence. He
14 writes, "Yet the word 'determine' in a computer apparatus
15 claim ordinarily has a broad meaning, and the intrinsic
16 evidence supports a finding that a computer can, quote,
17 'determine a value even when that value is provided to it
18 (e.g., by the bitstream from the encoder).'"

19 Did you review that portion of ALJ Elliot's 1380
20 ID?

21 A. I may well have done it. I don't recall exactly.

22 Q. Either way, you didn't discuss it during your
23 direct testimony, correct?

24 A. I don't recall -- unless it was cited in one of
25 my demonstratives, which it's not my recollection, I don't

1 recall discussing this portion.

2 Q. Let's now move to the next page, .96, and focus
3 in on the final sentence of that paragraph.

4 Here we have another ruling by ALJ Elliot on the
5 meaning of the word "determine." And specifically he says
6 in that sentence that is highlighted now by Mr. Davis:

7 "So, again, the patent seems to use, quote,
8 'determine' even in situations where things are
9 predetermined or instructed."

10 Did I read that correctly, sir?

11 A. I believe so.

12 Q. Did you review this portion of the 1380 Initial
13 Determination in coming to your opinions?

14 A. I may well have reviewed it. I don't recall -- I
15 don't recall relying on this in my opinions that I presented
16 today. If I did, then it's just a memory thing.

17 Q. Okay. Either way, you didn't discuss it during
18 your direct testimony, right?

19 A. I don't recall citing or referring to this
20 language in my direct testimony, no.

21 Q. Okay. We can take that down, Mr. Davis.

22 You talked a lot about prediction units during
23 your testimony, correct?

24 A. I talked about prediction units during my
25 testimony today. I wouldn't necessarily say I talked a lot.

1 Q. Okay. Fair. Let's talk now about what the
2 claims require.

3 Can we have RDX-19.8?

4 Sir, what we're seeing on RDX-19.8 is claim 15 of
5 the '714 patent, correct?

6 A. I believe so.

7 Q. Claim 15 recites a, quote, "prediction unit of
8 the block of pixels," as highlighted, correct?

9 A. Yes.

10 Q. Claim 15 does not recite any particular size or
11 shape of the prediction unit, right?

12 A. Not as far as I recall.

13 Q. And there are dependent claims of the '714 patent
14 that recite examining whether the block of pixels is divided
15 into a first prediction unit or a second prediction unit.

16 Do you recall those?

17 A. Vaguely. I don't recall the exact language in
18 any dependent claims.

19 Q. Okay. Let's have RDX-19.9, please.

20 This is dependent claim 18, correct, sir?

21 A. I believe so.

22 Q. Dependent 18 depends from claim 15, right?

23 A. That's my understanding.

24 Q. And dependent 18 recites, wherein the apparatus
25 is further caused to examine whether the block of pixels is

1 divided into a first prediction unit and a second prediction
2 unit, right?

3 A. I see that language.

4 Q. The asserted claims of the '714 patent in this
5 investigation do not have that requirement, correct?

6 A. My recollection is that claim 18 isn't one of
7 those asserted claims.

8 Q. We can take that down, Mr. Davis, and in its
9 place, can we please have Dr. Richardson's slide CDX-11.80,
10 please.

11 And you gave us some testimony about this slide
12 during your direct testimony, right, Dr. Richardson?

13 A. I did, yes.

14 Q. Now, you have a little line up here where you
15 wrote, "correlation does not equal based on," right?

16 A. I see that.

17 Q. And just to be clear, "based on," as it's recited
18 in the claims, does not mean "exclusively based on," right?

19 A. I don't recall ever saying that.

20 Q. Well, "based on" doesn't mean "exclusively based
21 on" as it's recited in the claims; you agree on that?

22 A. I think "based on" is clear in the claims.

23 Q. Okay.

24 A. Sorry. It's clear in the claims and in my
25 reading of the claims in the context of the patent.

1 Q. Right. And when you were coming to your validity
2 opinions, you didn't apply -- you didn't apply "based on" as
3 having a meaning of "based exclusively on" or "based solely
4 on" or "based only on." You didn't do that type of
5 analysis, right?

6 A. I don't recall providing such opinions.

7 Q. And, in fact, when you were deposed, you gave us
8 an example of how you could make a determination based on
9 something as well as something else, right?

10 A. I don't recall precisely, but I may have done it.
11 I don't recall.

12 Q. I mean, you gave us an example that's really
13 appropriate, given the weather today. You said, I could
14 determine to wear my coat based on the weather forecast and
15 on something else, such as whether it's actually raining
16 right now. So I've made my determination based on the
17 weather forecast, but there was something else involved in
18 that scenario.

19 Do you recall giving us that example?

20 A. I don't recall the exact words, but I'm quite
21 happy to take your representation that I did.

22 Q. And in this example on slide 80, I believe you
23 were making the point that different candidate locations in
24 Rusert can have the same subset. Do I have that right?

25 A. I think I was making the point that the subset

1 isn't based on a candidate, the location of a future
2 candidate location -- sorry.

3 I think I was making the point that the alleged
4 subset in Rusert is not based on the location of a
5 subsequent candidate position.

6 Q. Okay. But here you're illustrating and you're
7 saying, well, Candidate 3 could have the subset of 1 and 2,
8 Candidate 4 could possibly have the subset of 1 and 2,
9 right? That's what your illustrations depict?

10 A. That's my illustration here of what Rusert itself
11 says, yes.

12 Q. Okay. And let's take this slide down and now put
13 up RDX-12.4.

14 We saw this demonstrative during Dr. Moulin's
15 testimony, my questioning of him, right? Do you remember
16 that?

17 A. I'm honestly not entirely sure because there were
18 some points when I had to be outside because of the
19 confidential record. So to the extent that this was up on
20 the screen when I was in the room, then I would have seen
21 this.

22 Q. Okay. And just to be clear, my examination of
23 him was all on the public record. So you would agree in
24 H.265 that both candidate locations A0 and B1 have the same
25 subset of A1, right?

1 A. What are we referring to here?

2 Q. Well, this is a table of candidate locations and
3 the corresponding subset as defined in H.265.

4 A. What do you mean by "as defined in H.265"?

5 Q. Well, are these the subsets in H.265?

6 A. The subsets of what? Could you give me some
7 context, please?

8 Q. Of the candidate locations, sir.

9 A. Which portion of H.265 are we talking about?

10 Q. Section 8.5.3.2.3 of the standard.

11 A. Okay. I don't have that in front of me, so
12 what's the question?

13 Q. Well --

14 A. It's not my slide.

15 Q. If you don't remember, that's okay, sir. Let me
16 move on and ask --

17 A. Excuse me. I don't say I didn't remember. I
18 just said I don't have the standard in front of me. I'm
19 asking for a context, what are the subsets that you're
20 talking about, with regard to which section of the standard?

21 Q. Well, you had a -- well, given that my time is
22 limited, sir, I'm going the move on to another question.

23 So let us now have slide 74, please, from
24 Dr. Richardson's rebuttal demonstratives.

25 Now, on slide 74, this was one of the slides that

1 you had in your direct demonstratives but you didn't show
2 during your direct today, but I want to ask you about it,
3 nonetheless.

4 Now, you would agree with me that block 1
5 corresponds to location B1 in the standard, correct, in the
6 H.265 standard?

7 A. In which section of the H.265 standard?

8 Q. Section 8.5.3.2.3, sir.

9 A. What's the title of that section, please?

10 Q. I don't have the title in front of me. But based
11 on the -- are you able -- without taking the time to pull
12 out the standard, are you able to answer my question as to
13 whether or not block 1 is correlated or the same as the
14 position of block B1 in the H.265 standard?

15 A. I can certainly answer that question, but I think
16 as was discussed yesterday, I would always go to the
17 standard before answering definitively a question about the
18 standard.

19 Q. Okay. Well, my time is limited, sir. I
20 appreciate you answering my questions.

21 A. I'm very happy to answer your questions if I have
22 the full information.

23 MR. HOUMAND: I pass the witness at this time.
24 Thank you.

25 JUDGE MCNAMARA: Thank you very much.

1 Ms. Ducca?

2 EXAMINATION BY COUNSEL FOR ITC STAFF

3 BY MS. DUCCA:

4 Q. Good afternoon, Dr. Richardson.

5 A. Good afternoon.

6 Q. One more time.

7 A. One more time, yes.

8 Q. I want to ask you some questions about
9 interpolation.

10 A. Okay.

11 Q. All right? And so I'm not sure there's a lot in
12 the record of precisely what interpolation is, so I want to
13 make sure that I understand it.

14 Would you agree that at least one definition of
15 interpolation would be the process of calculating
16 intermediate sample values between existing pixels?

17 A. I think as far as interpolation applied to images
18 and certainly in the context of video coding, I think that
19 would be an acceptable way to describe it.

20 Q. Okay. That's great, because I took it from one
21 of your books.

22 All right. So I'll move to the document camera.
23 I want to explore what an interpolation operation might look
24 like.

25 So let's say I have an image -- and I'm going to

1 use your description where you use the different pictures
2 and different colors. So let's say we have three pixels.
3 We have a red pixel, a yellow pixel, and a blue pixel.
4 Okay.

5 So in this situation, I think we said that you
6 would need 2 bits to be able to represent each of these
7 three pixels; is that correct?

8 A. So if you have exactly three colors available,
9 those are the only colors you have available, then I could
10 represent those three colors. I think I need 2 bits. I
11 could apply a 2-bit binary code to each, and then I could
12 distinguish between those three -- those three values.

13 Q. Okay. Let's say that we apply an interpolation
14 operation to these three pixels. See what I'm doing?

15 Would I be correct that we could end up with a
16 green pixel, and let's pretend this is orange. I have the
17 wrong color. Nonetheless, now I have a purple pixel and a
18 green pixel in addition to my red pixel, yellow pixel, and
19 blue pixel, correct?

20 A. I'm not sure that this is entirely consistent
21 with my example, and I apologize if my example has thrown
22 you. I was trying to simplify things, but I wonder if I
23 haven't.

24 Q. Let me just ask you a question. Am I correct
25 that if we apply an interpolation operation to a series of

1 pixels, that we could determine the pixels or the
2 representations between those pixels? Am I correct?

3 A. That's broadly correct. And the thing that I
4 don't want to confuse is that --

5 Q. I'll take it down.

6 A. I'm sorry. I'll be quiet.

7 Q. No, no, no, that's okay. That's okay. I just
8 want to make sure that I'm understanding interpolation
9 correctly. Is my high-level understanding of interpolation
10 correct, it effectively let's us estimate pixel values
11 between the ones that are available?

12 A. Yes. And I would suggest Chapter 6 of my 2024
13 book, I can't remember the figure number, but I've got an
14 example of doing exactly that, taking a lower-resolution
15 picture, in monochrome so we don't have to talk about
16 colors, in monochrome, and I show how interpolation can be
17 used to generate a version that has more sample values but
18 they are not actually -- they are not pixels that existed in
19 the original image. They are kind of what you said, they
20 are estimating the values between neighboring actual pixels.

21 Q. Okay. So we're estimating the values between the
22 pixels, correct?

23 A. I think, yeah, we agreed that that's -- that's
24 one way to talk about interpolation.

25 Q. Okay. Are those estimated pixel values

1 predictions? Aren't we predicting the pixel values between
2 the original ones?

3 A. Okay. In a way, you could say that. They are
4 not the predictions of the claim of the '267 that we're
5 talking about, as I recall.

6 Q. Okay.

7 A. Not -- they could be, but that process of
8 estimation gives you these intermediate values. In terms of
9 the patent I was discussing earlier today, one could create
10 a prediction using or from those interpolated values. So
11 that's a possibility.

12 Q. Okay. Now, interpolation is not a new concept,
13 right?

14 A. Interpolation of signals and samples and indeed
15 images has been known for, yeah, quite some time.

16 Q. How long has it been known to be used in image
17 processing?

18 A. For samples, for instance, any signal, I think
19 many, many decades. For images, it's certainly quite a few
20 decades.

21 Q. So one of ordinary skill in the art would
22 understand what interpolation is, correct?

23 A. In terms of the definition we're using here, I
24 think they would understand what interpolation is, yes.

25 Q. And they would understand how to apply an

1 interpolation operation in a calculation for image
2 processing, correct?

3 A. In general, I think they would understand that
4 concept.

5 Q. Okay. So help me understand your opinion that
6 the interpolation that's disclosed in Srinivasan, because I
7 think we all agree that Srinivasan is about interpolation,
8 does not result in a higher-level precision when applied to
9 Walker.

10 A. I think there were two main things that I tried
11 to explain earlier. Number one is that, in my opinion,
12 Srinivasan doesn't disclose an interpolated value that is
13 actually a higher bit-depth than the original pixel values
14 that I was talking about. That's number one. And I
15 explained the reasons why I believe that earlier.

16 Number two is that I think maybe towards the end
17 of that section, I explained the reasons why, in my opinion,
18 the proposed combination of aspects of Srinivasan with
19 aspects of Walker, that I don't think one would have a
20 reasonable expectation of success without working out a
21 number of other things that I didn't see disclosed in
22 Respondents' proposed combination of the two references.

23 Q. I want to follow up with your first item.

24 A. Sure.

25 Q. So with the understanding that the process of

1 calculating intermediate sample values between existing
2 pixels is what interpolation is, how can an interpolation
3 operation not result in additional essentially bits used,
4 additional points?

5 A. Okay, I think I see the possible confusion.

6 Srinivasan describes a number of intermediate
7 stages in its interpolation process. At the end of all of
8 those stages, Srinivasan outputs 8-bit pixel values. It
9 starts with 8 bits, ends with 8 bits.

10 The intermediate stages are intermediate stages
11 in Srinivasan, and the question for the '267 patent is, are
12 the predictions used in a prediction process at a higher
13 precision. I mean, that's a question that we've been
14 discussing quite a lot.

15 So, yes, there are higher-precision intermediate
16 values, I would say, in Srinivasan, certainly higher
17 bit-depth values. They may well be higher-precision
18 intermediate values, but Srinivasan does not disclose
19 actually reaching an output point that could be used as a
20 prediction or is disclosed to be operable as a prediction
21 that is at a higher precision.

22 Q. Okay. I think I understand better. Thank you,
23 Dr. Richardson. I appreciate your time.

24 A. You're very welcome.

25 MS. DUCCA: I'll pass the witness.

1 JUDGE MCNAMARA: Okay.

2 Mr. Verboncoeur?

3 MR. VERBONCOEUR: Yes, Your Honor, very briefly.

4 JUDGE MCNAMARA: Sure.

5 MR. VERBONCOEUR: May I proceed?

6 JUDGE MCNAMARA: Yes.

7 REDIRECT EXAMINATION

8 BY MR. VERBONCOEUR:

9 Q. Mr. Moreno, can we please have slide CDX-11.6?

10 Dr. Richardson, I want to talk to you about the
11 way the prior art, as described in the '267 patent,
12 interpolation.

13 Can you walk us through what you have on your
14 slide 6 and explain to us where in the process is the
15 subpixel interpolation filter we were discussing?

16 A. There's a subpixel interpolation filter in green
17 at the top left of this diagram and another one in green at
18 the lower left of this diagram. And that's the first stage
19 of a process shown here which produces a prediction P1 or
20 P2.

21 Q. And you were discussing this concept of
22 intermediate values with Ms. Ducca. Where in the '267
23 patent's Fig. 10 describing the prior art would we see those
24 intermediate values?

25 A. Immediately at the output of the N-tap filter.

1 So the output of that filter, which I've shown in green on
2 this slide, my slide 6, goes into two further stages, add
3 rounding offset and shift to input bit-depth.

4 So the output of the green box is an intermediate
5 value, which -- I actually think the '267 patent describes
6 as potentially having a higher precision than the original
7 pixel values.

8 But what's used as a prediction is P1, which has
9 been further operated on to bring it back down, is one way
10 of describing it, to the input pixel bit-depth.

11 Q. In the '267 patent's description of the prior
12 art, what happens between the green box on your slide 6, the
13 interpolation filter, and the point at which we reach P1 or
14 P2?

15 A. There's two stages. There's an addition of a
16 rounding offset, and this is a number to try to correct for
17 rounding error, and then there's a shifting to input
18 bit-depth. And my recollection is that that would be a
19 right-shifting operation.

20 Q. How does what's displayed in the '267 patent's
21 Fig. 10 compare to how interpolation was done in the H.264
22 standard?

23 A. It is pretty much what was done in the H.264
24 standard.

25 Q. Now what I'd like to do is I would like to ask

1 you about Srinivasan. So let's please have slide CDX-11.55.

2 Can you explain with reference to Srinivasan how
3 the interpolation process works?

4 A. So without going into all of the gory details,
5 Srinivasan starts at the top left of its Fig. 8 with input
6 pixels with an 8-bit range, so 8-bit precision. It ends up
7 at the lower right with output pixels also with an 8-bit
8 range or 8-bit precision. In between there are a number of
9 stages, and it's actually a point at the top right of this
10 diagram where the figure itself says that we have y-bit
11 range, intermediate pixel values where y is greater than 8.

12 So that's actually an example of an intermediate
13 step where the range, and I take that to be synonymous with
14 precision at this point, is actually higher than 8 bits.

15 Q. Can we call the intermediate pixel value shown on
16 Fig. 8 of Srinivasan, can we call that the prediction?

17 A. I don't believe we can, no. Srinivasan doesn't
18 call it a prediction, and I don't believe it's consistent
19 with the disclosure of Srinivasan.

20 Q. Can we please have slide CDX-11.6 again.

21 Can you explain how Srinivasan's interpolation
22 process compares to the '267 patent's description of the
23 prior art as referenced in Fig. 10 of that patent?

24 A. If one were to try and overlay one on top of the
25 other, Srinivasan's interpolation process starting with 8

1 bits, ending with 8 bits, you would overlay that on the top
2 or the bottom green and blue boxes, including all those
3 intermediate stages that I talked about.

4 So on the top left would be the input of
5 Srinivasan. P1 would be consistent with the output of
6 Srinivasan.

7 Q. And can we please have slide 56 from
8 Dr. Richardson's demonstratives.

9 Doctor, does your opinion -- is your opinion the
10 same with respect to Srinivasan's x+1 scenario?

11 A. It is as I explained earlier, and in the context
12 of Srinivasan, the x+1 refers to an extra bit at the last
13 but one stage of Srinivasan's process, which Srinivasan
14 describes as effectively being eliminated in that final
15 clipping or clamping process.

16 Q. I apologize for jumping around so much, but let's
17 go back to slide 6, please.

18 Can you tell me whether, based on your
19 understanding of the outputs of Srinivasan's interpolation
20 filters, has Srinivasan solved the rounding error problem
21 described in the '267 patent?

22 A. In my opinion, no. Srinivasan would basically be
23 a substitution for that top branch with the green and the
24 blue boxes. So one could conceivably use Srinivasan to
25 replace or to implement that part of the diagram.

1 Q. Now I'd like to have JX-7.27, please.

2 I want to ask you about claim 4 of the '267
3 patent.

4 First, what claim does 4 depend on?

5 A. Claim 2.

6 Q. And what claim does claim 2 depend on?

7 A. Claim 1.

8 Q. Can you walk us through your understanding of
9 claim 4 -- well, I guess it would be claim 1, then 2, then
10 4.

11 A. So at a high level, claim 1 is one that we've --
12 it covers the concepts that we've talked about at some
13 length, obtaining a first prediction and a second
14 prediction, each of those having a second precision higher
15 than the first prediction, which would be the precision of
16 the input blocks and so on. Obtaining a combined prediction
17 and then doing some more things.

18 So claim 2 is about, if the first motion vector
19 points to a subpixel, the prediction is obtained by
20 interpolation, the first prediction is obtained by
21 interpolation.

22 And claim 4 depends on claim 2 and suggests that,
23 if the second motion vector points to an integer sample, the
24 second prediction, I'm paraphrasing but I believe it's
25 correct, can be obtained by shifting values of said second

1 reference block to the left.

2 So in a situation where you have a subpixel
3 motion vector for one of your reference blocks, an integer
4 motion vector for the other reference block, you can obtain
5 an interpolated prediction from one and you can simplify or
6 you can shortcut that interpolation process for the other
7 one by using a left-shift in some circumstances.

8 Q. In your view, does using a left-shift operation
9 increase the precision of a block of pixels?

10 A. By itself, no.

11 Q. Do you think that claim 4 -- well, let me not ask
12 that question. It's not a clear one.

13 When the claim says said prediction is obtained
14 by shifting values of said reference block to the left, what
15 is your understanding of that phrase?

16 A. Say again?

17 Q. When the claim says said second prediction is
18 obtained by shifting values of said second reference block
19 to the left, what is your understanding of that phrase?

20 A. Just what it is, that you're obtaining a
21 prediction and you are doing it by carrying out a
22 computationally simpler operation than, for example, a long
23 interpolation filter.

24 Q. Let's have CDX-11.121, please.

25 Doctor, do you recall being asked the question

1 about the scenario where in MPEG-1 you may have a group of
2 pictures that consists of a single I-picture?

3 A. Yes.

4 Q. And I think the implication was that we could
5 perhaps draw your dotted box as a smaller box around an
6 I-picture.

7 Does the fact that you can have a single
8 I-picture in a group of pictures change your understanding
9 of whether closed_gop_flag is an indication of the first
10 image frame?

11 A. It does not.

12 Q. Why not?

13 A. Well, the GOP header tells us nothing at all
14 about the size of the group of pictures. It could have one
15 picture, it could have 200 pictures in it. The group of
16 pictures header doesn't tell us about that. It just tells
17 us here's something about the next group of pictures.
18 Whether that group of pictures has one -- group of pictures
19 has one coded picture or 200 coded pictures, we don't
20 actually know. The decoder doesn't know at the point at
21 which it's read and interpreted the GOP header.

22 Q. How would an MPEG-1 compliant decoder figure out
23 how many pictures it was dealing with?

24 A. It would have to decode them one by one, in
25 order.

1 Q. We can take that down, Mr. Moreno.

2 Now I would like to briefly ask you about the
3 '714 patent. You were asked about IPRs that had been filed
4 in the past. Do you recall that?

5 A. Yes.

6 Q. And I believe you said that you had participated
7 in at least some of those?

8 A. In at least?

9 Q. In at least some of those.

10 A. I don't know how many there are. I've
11 participated in more than one IPR relating to this patent.

12 Q. Were you deposed in any of those proceedings?

13 A. I was for at least the -- I think there were two
14 mentioned with number 604 and 605, if I remember correctly.
15 I was deposed in relation to those two IPRs.

16 Q. Was the testimony you gave today consistent with
17 the positions you took in the depositions in those IPRs?

18 A. To the very best of my ability, and I'm not aware
19 of anything that's changed in my testimony.

20 Q. And counsel mentioned rulings by the PTAB. Are
21 you aware of any final written decisions with respect to the
22 '714 patent?

23 A. I haven't been -- I would have to be informed
24 because I don't necessarily follow these things. I'm not
25 aware of any.

1 Q. Thank you.

2 MR. VERBONCOEUR: No further questions.

3 JUDGE MCNAMARA: Thank you, Mr. Verboncoeur.

4 MR. WILSON: Thank you, Your Honor. Jack Wilson
5 for the Respondents. Just briefly.

6 RECROSS-EXAMINATION

7 BY MR. WILSON:

8 Q. Dr. Richardson, do you recall being asked
9 questions about Srinivasan a moment ago?

10 A. Yes.

11 Q. And you testified that the intermediate values
12 had higher precision in the interpolation process of
13 Srinivasan, correct?

14 A. I recall that Srinivasan discloses intermediate
15 values, which can have a higher precision, yes.

16 Q. And, Mr. Davis, I'm sorry, could we bring up
17 slide 6 from Dr. Richardson's demonstratives?

18 And, Dr. Richardson, you on your redirect were
19 mapping Srinivasan to portions of what's shown on Fig. 10 of
20 slide 6, correct?

21 A. I wouldn't necessarily characterize it like that,
22 but I was asked where Srinivasan might fit into such a
23 diagram.

24 Q. And your testimony was that the interpolation
25 process of Srinivasan would cover one set of the green and

1 blue boxes, correct?

2 A. I would say it could. It's not necessarily the
3 same process as these green and blue boxes, but in terms of
4 where would the input be, where would the output be in the
5 context of Fig. 10 of the '267 patent, that's roughly what I
6 said.

7 Q. Fair. So the input would come in from the left,
8 the output would be on the right of Fig. 10 of -- well, the
9 output would be, for example, P1, correct?

10 A. I think that's consistent with what I said and
11 with Srinivasan's disclosure.

12 Q. And Srinivasan discloses that the intermediate
13 values can be extended arbitrarily, correct?

14 A. I think you have to actually bring out the claim
15 language there. There's another part to that sentence which
16 I think is important -- not the claim language, sorry,
17 Srinivasan's language at that point.

18 Q. Mr. Davis, could we bring up Srinivasan, that's
19 RX-2024, on exhibit page 26. That should be at column 20,
20 lines 20 to 32.

21 And, Dr. Richardson, this is the portion of
22 Srinivasan that you're referring to that begins, the second
23 sentence, the specific choice of bit-depth for the input
24 values for the first stage, the output values of the last
25 stage, and the intermediate values can be extended

1 arbitrarily in accordance with the technical specifications
2 of a target architecture or application.

3 Correct?

4 A. That's the entire sentence I believe we're
5 discussing.

6 Q. So it's more than just the intermediate values.
7 Srinivasan also in this passage refers to the input values
8 and the output values, correct?

9 A. And, in my opinion, that's entirely consistent
10 with, for example, a 10-bit implementation rather than an
11 8-bit implementation. And that was known, I think, by the
12 time of Srinivasan, that one could work with 10-bit pixel
13 values from the start and create, for example, 10-bit
14 predictions.

15 So I think that's just consistent with what we're
16 seeing here. And I think Srinivasan actually mentions, as I
17 recall, known standards such as H.264, which contemplate
18 higher bit-depths throughout.

19 Q. Thank you, Dr. Richardson.

20 MR. WILSON: Thank you, Your Honor.

21 A. Thank you.

22 JUDGE MCNAMARA: Thank you.

23 Anything more?

24 MS. DUCCA: Nothing more from Staff, Your Honor.

25 JUDGE MCNAMARA: Okay.

1 MR. VERBONCOEUR: Nothing more from Nokia.

2 JUDGE MCNAMARA: All right.

3 And thank you very much, Dr. Richardson. You may
4 step down.

5 A. Thank you, Your Honor.

6 MR. NEWCOMER: Josh Newcomer for Nokia. ALJ
7 McNamara, I would like to introduce another NEXT Advocate
8 who is going to be presenting our next witness, Kyra Mouser.

9 JUDGE MCNAMARA: Could you provide your last name
10 again?

11 MS. MOUSER: Mouser, M-O-U-S-E-R.

12 JUDGE MCNAMARA: Thank you.

13 MS. MOUSER: Good afternoon, Your Honor.

14 JUDGE MCNAMARA: Good afternoon, Ms. Mouser.

15 MS. MOUSER: At this time Nokia would like to
16 call its next witness, Arthur Levin, to the stand.

17 JUDGE MCNAMARA: Very good. Thank you.

18 MS. MOUSER: And later in the examination we
19 would like to use a physical demonstrative. Is it all right
20 if we set that up now?

21 JUDGE MCNAMARA: Sure. Yes.

22 MS. MOUSER: Thank you.

23 JUDGE MCNAMARA: Good afternoon.

24 A. Good afternoon, Your Honor.

25 JUDGE MCNAMARA: How are you?

1 A. Fine. Thank you.

2 JUDGE MCNAMARA: Could you remain standing and
3 raise your right hand, please.

4 ARTHUR LEVIN,

5 having been first duly sworn or affirmed on
6 their oath, was thereafter examined and testified as
7 follows:

8 JUDGE MCNAMARA: Please state your name.

9 A. Arthur Bennett Levin.

10 JUDGE MCNAMARA: Thank you.

11 MS. MOUSER: Is it all right if the easels go
12 here, or would you like them --

13 JUDGE MCNAMARA: As long as everybody can see
14 them, but I don't think Ms. Ducca can. You can move around.
15 Whatever works that makes it easiest so everybody can see.
16 Anybody should be free to get up and move around if you
17 can't see what is being done. Not everybody may be able to
18 see it well, depending on where it is placed.

19 DIRECT EXAMINATION

20 BY MS. MOUSER:

21 Q. Good afternoon, Mr. Levin. Would you please
22 introduce yourself?

23 A. Yes. MY name is Arthur Bennett Levin.

24 Q. Let's turn to slide 2.

25 Can you please tell us a bit about your

1 background and where you spent most of your career?

2 A. Yes. My education, I received my undergraduate
3 degree from Cornell University, and my law degree from
4 George Washington Law Center here in the District.

5 In the interest of time, I'm going to skip
6 directly to my 18 years of experience at the ITU. I did
7 want to mention that the ITU is an international
8 intergovernmental organization, headquartered in Geneva,
9 Switzerland, founded in 1865. It is an independent
10 organization, but it is also a United Nations specialized
11 agency. So it is quite unique.

12 So I began at the ITU in the legal affairs unit
13 where I was the attorney responsible for all intellectual
14 property matters. During the summers I was an adjunct
15 professor of law, teaching a full course on international
16 telecommunications law at what was then called Franklin
17 Pierce Law Center and is now the University of New Hampshire
18 Law School.

19 Going back to the ITU, I next was nominated to be
20 the chief advisor to the Secretary General. One of my main
21 tasks, among many, during that period, I was the executive
22 director and the lead organizer of the United Nations World
23 Summit on the Information Society.

24 And in my final years at the ITU, I was chief of
25 operations and planning in the Telecommunications

1 Standardization Bureau. Bureau is the ITU word for
2 department. And in that capacity, among other things, I was
3 directly supervising the Staff responsible for the ITU
4 patent statements database.

5 Q. Did you have any involvement with the development
6 of the ITU patent policy?

7 A. Yes. And I would just interject that I will try
8 very hard not to slip into ITU lingo, but a couple of times
9 here I will explain terminology.

10 So in the ITU, the formal word is ITU
11 recommendations. It is the same thing as the standard. So
12 I will use those two words interchangeably.

13 Another terminology is that the ITU consists of
14 members, and by "members" we mean countries, member states.
15 There are 194 member states of the ITU right now, and, in
16 addition, the ITU has over 211 -- over 200 private companies
17 that participate and are called sector members.

18 So I did -- in 1998 the ITU decided that it
19 needed a formal patent policy. At the meeting of the
20 governing body of the members, the standards advisory group,
21 in 1998 they created a nine-person task force to develop the
22 ITU patent policy, the first formal patent policy, and I was
23 one of the nine persons assigned to that task.

24 Q. Turning to slide 3, what is the JVT and how does
25 it relate to the ITU?

1 A. Yes. So I'll walk -- I'll try and walk quickly
2 through this slide.

3 So you see that ITU is part of the United Nations
4 family. The work of developing standards at the ITU is
5 assigned to study groups, in this case study group 16. And
6 when you get to the JVT, the JVT was the Joint Video Team.
7 It was a joint group that was formed to establish H.264.
8 One of its parents' organizations was the ITU. The other
9 parent was ISO and IEC, two other standards bodies.

10 And, secondly, you have the Joint Collaborative
11 Team on Video Coding, which was the follow-up to the JVT and
12 was tasked with developing H.265.

13 I did want to mention that with respect to H.264,
14 this was an achievement of great pride to the ITU. We were
15 awarded the Emmy for technical achievement at a ceremony in
16 Los Angeles, California, and the actual Emmy statue was in a
17 display case right outside my office.

18 Q. Now, Mr. Levin --

19 A. One more point. So there's sometimes confusion.
20 The actual approval of standards or recommendations at the
21 ITU is done by study groups.

22 So the JVT is a subsidiary group that provided
23 input to the study group in the form of their agreed text
24 for H.264, and in the case of JCT, for H.265. But it's
25 actually at the study group level that the final approval is

1 made.

2 Q. Have you analyzed Nokia's submissions and
3 contributions to the ITU, JVT, and JCT?

4 A. Yes, I have.

5 Q. Can you give us a preview of your ultimate
6 conclusion?

7 A. Yes. I have attended more than a hundred
8 meetings of study groups at the ITU. I have also attended
9 all of the senior-level meetings concerning standards.

10 So based on my more than 18 years of experience
11 at the ITU as a senior official, my conclusion and opinion
12 is that Nokia at all times fully complied with the patent
13 disclosure obligations under the ITU patent policy, and
14 under the patent policies of the JVT and the JCT-VC.

15 And maybe to save a little time, I'll just say
16 JCT from now on.

17 MS. MOUSER: At this time, Your Honor, Nokia
18 offers Mr. Arthur Levin as an expert in the ITU patent
19 policies and those of the JVT and the JCT.

20 JUDGE MCNAMARA: Mr. Rizzolo, I see you're in the
21 top seat, we will call it.

22 MR. RIZZOLO: I am, Your Honor, and no
23 objections.

24 JUDGE MCNAMARA: Thank you.

25 Ms. Ducca?

1 MS. DUCCA: No objection from Staff, Your Honor.

2 JUDGE MCNAMARA: Thank you. Then Mr. Levin is
3 accepted as an expert for the topics upon which he has been
4 called to testify without objection.

5 Q. Mr. Levin, let's start by talking about the ITU
6 patent policy, turning to slide 4.

7 What are we looking at here on the left,
8 Mr. Levin?

9 A. So this is the 1999 version of the policy. This
10 was the first formal ITU patent policy. This is the version
11 of the policy that was in effect when H.264 was being
12 developed, and this is the policy that I worked on.

13 Q. This is the policy you helped draft?

14 A. Yes, it is.

15 Q. And what's on the right of this slide?

16 A. So on the right you have the version of the
17 policy, it looks a bit fancier. This is the 2012 version of
18 the policy. This version of the policy was in effect when
19 H.265 was being developed.

20 One wrinkle to note here, as of 2007, this was
21 now a common patent policy. So this is -- as of 2007, this
22 is the common patent policy of ITU, but also ISO and IEC.
23 So this is the patent policy of three major standards
24 organizations fully supported by their members and approved
25 by their members.

1 Q. For the record, those are found at JX-410 and
2 JX-415.

3 Mr. Levin, what was the objective of the ITU's
4 patent policy?

5 A. Yes. The objective as stated directly in the
6 1999 policy, there was one sole objective, and that was to
7 ensure that ITU recommendations were accessible to everyone
8 without undue constraints. And to achieve that, the policy
9 goes on to explain, ITU wanted to ensure that whatever
10 recommendation was adopted would not be hindered or
11 encumbered by a patentholder who was refusing to license
12 their rights. That was the main objective.

13 Q. Can you walk us through the different parts of
14 the policy?

15 A. Yes, I would be glad to.

16 They are quite similar. So in the 1999 version,
17 the policy starts with a set of guidelines. These
18 guidelines are to help clarify and explain and give an
19 understanding of the provisions of the policy.

20 The next part is a series in 1999 of three
21 appendices. In 2012 it's three annexes.

22 So the first -- I'll use the word "annex." The
23 first annex is the actual patent policy. And the next two
24 annexes are two forms. The first is what we call, and I
25 will refer to in this proceeding, as the individual or

1 specific patent disclosure form, and I'll explain a little
2 bit more what that is later on.

3 And then Annex III or Appendix II is a general
4 patent statement and licensing declaration.

5 Q. What does the ITU policy require that a
6 patentholder do to fulfill its disclosure obligations?

7 A. I will address this more as I go along, but
8 there's a very clear distinction in the ITU patent policy
9 between mandatory obligations and nonmandatory obligations.

10 And there are very few mandatory obligations.
11 But one of them is that, when you want to disclose your
12 patent rights and options of your -- your licensing options,
13 you must, you have to use the patent declaration form that
14 is attached to the -- attached here and that you can see is
15 Annex II or Annex III. And there's a reason for that.

16 ITU wanted to ensure that every company was using
17 the same form. They wanted to ensure that these were
18 standardized submissions. All of these patent declaration
19 forms are posted online and are publicly available, and I
20 have to say thanks to my former staff, very readily
21 searchable.

22 These forms and -- we'll see a little bit more of
23 the form later on. These forms have to be signed by an
24 authorized person of the company, they have to be dated, and
25 they have to indicate the licensing intention of the

1 company. If you want to disclose your patent information to
2 the ITU, you must use that form.

3 Q. Turning to slide 5, can you tell us what a
4 general declaration is?

5 A. Yes, I'd be glad to.

6 So this is a general declaration. And a general
7 declaration is a declaration that applies to all
8 recommendations of the ITU, and it has two different
9 licensing options and only two.

10 The first is that the patentholder is willing to
11 license for free, and the second is that the patentholder is
12 willing to license on RAND terms.

13 Q. And what is the document that we see on the
14 screen at JX-179?

15 A. Well, this is an actual General Patent Statement
16 Declaration. This is by Nokia. And you can see on this
17 form that they checked box 2. They were willing to license
18 on RAND terms for any ITU recommendation.

19 Q. When did Nokia submit this form?

20 A. The date is very interesting. They submitted
21 this form in June of 2001. They were one of the first. And
22 that date is about two years before the approval of H.264.
23 And I'll explain a bit more later, but once you file a
24 General Patent Statement Declaration, that remains in effect
25 until you file a specific.

1 So this declaration was in effect during the
2 development of H.264, and then at a certain point they filed
3 a specific. It was also in effect during the development of
4 H.265 until they filed a specific declaration.

5 Q. Do you know if some sector members only file a
6 general declaration?

7 A. Yes, that's very much the case. Approximately 40
8 percent of all sector members, and the number of sector
9 members is somewhere between 200 and 250, about 40 percent
10 only ever file a general declaration.

11 Q. Let's turn to slide 6 and look at specific
12 declarations.

13 How is a specific declaration different from a
14 general declaration?

15 A. Well, it's kind of tiny, but you can see that a
16 specific declaration applies to only one recommendation.
17 And you can see on the right the three licensing options.

18 Q. Can you tell us what those licensing options are?

19 A. I'd be glad to.

20 So the first two are very similar to our general
21 declaration. You're willing to license on a royalty-free
22 basis or, number two, that you're willing to license on RAND
23 terms.

24 Where it differs is in box number 3, and this
25 gets back to the objective of the policy. In the case where

1 the patentholder is unwilling to grant licenses, in that
2 case, and only in that case, the following information must
3 be provided, and that's where you see the requirement to
4 provide specific patent information to the ITU.

5 And I would note a particular bullet point under
6 3, the first one, it says, patent registration/application
7 number. And this is the only place in the policy where this
8 is a specific request for the actual patent or registration
9 number or patent application number.

10 Q. Let's talk a little bit about that.

11 Why does the ITU only require the specific
12 identification of patents if option 3 is selected?

13 A. You've got -- it goes directly back to the
14 objective of the policy. As long as you're willing to
15 license for free or on RAND terms, it's not a problem.

16 If you're not willing to license your rights,
17 then what happens is that the ITU must take -- go back to
18 the group developing the recommendation and say what do we
19 do, we have technology in the recommendation that the
20 patentholder is refusing to license. And in those cases the
21 technical body would either delete that technology or they
22 would modify it or they would otherwise make sure their
23 recommendation was not encumbered.

24 Q. In addition to its general declaration, did Nokia
25 also submit a specific declaration?

1 A. Well, we actually are looking at the Nokia
2 specific declaration. It's in -- this is the one for 264.
3 This declaration was submitted to the ITU by Nokia on
4 October of 2002.

5 Q. For the record, this is JX-184.

6 What option did Nokia select on its H.264
7 specific declaration?

8 A. Well, on this declaration, specific to H.264,
9 they selected box 2, which is agreeing to license on RAND
10 terms, and you'll see throughout my presentation they always
11 picked box 2. They were always willing to license on RAND
12 terms.

13 Q. So was Nokia required to disclose specific patent
14 information on this form?

15 A. Very much in my view and my experience, unless
16 you're refusing to license, you do not have to provide
17 specific information, and that is the sense of box 3.

18 It's also noteworthy that this patent declaration
19 form was filed with the ITU in October of 2002. That is six
20 months before H.264 was even approved. It actually is while
21 JVT was still considering the final text of H.264. The
22 H.264 was finalized by the JVT on December 23rd of 2002.
23 This form had already been submitted to the ITU two months
24 before that.

25 Q. Let's turn to slide 7.

1 Is there any other language on the form that
2 tells us that Nokia was not required to disclose specific
3 patent information?

4 A. Yes. It's quite clear at the top of the form.
5 If you check options 1 and 2, licensing options 1 and 2, and
6 Nokia checked number 2, such information was desired, but it
7 was not required.

8 And, again, in the bottom it says, if you check
9 option 3 refusing to license, then you had to provide
10 additional minimum information. And, again, the information
11 was patent registration and application numbers, but only in
12 that case.

13 Q. Let's now turn to slide 8.

14 Did Nokia submit a specific patent declaration
15 form for H.265?

16 A. Yes, they did. This is a copy of that form.

17 Q. Are the licensing options on this form the same
18 as the options we just saw for H.264?

19 A. Yes. The licensing options haven't changed since
20 the original version of the policy in 1999. And, here
21 again, Nokia checked box 2, indicating their willingness to
22 license on RAND terms.

23 Q. Based on this, in your opinion, did Nokia fully
24 comply with its disclosure obligations under the ITU's
25 patent policy for both H.264 and H.265?

1 A. Yes, they did. They submitted licensing,
2 specific licensing declarations indicating they were willing
3 in both cases to license on RAND terms. This form was
4 submitted to the ITU in June of 2013. This was even before
5 publication of H.265.

6 Q. Now, was Nokia required to submit declaration
7 forms identifying the asserted patents in this
8 investigation?

9 A. Under the policy, since Nokia was willing to
10 license on RAND terms, they did not have to identify
11 specific patents.

12 Q. Turning to slide 9, did Nokia ever identify the
13 asserted patents on an ITU patent declaration form anyway?

14 A. Yes. Nokia went way above and beyond the
15 obligations of the policy and disclosed significant amounts
16 of additional specific information, as we'll see on these
17 forms and later on in my presentation.

18 So these are the declarations that Nokia made
19 that identify specific patents.

20 The one on the left was submitted in 2007. This
21 identifies '321, patent '321, and that applies to H.264.

22 The middle declaration was submitted in June of
23 2013, again, before publication of H.265. And this form
24 identified three different patents, '321, '701, and '714,
25 all for H.265.

1 And then, finally, they submitted a separate form
2 in 2014 identifying patent '267, again, for H.265. And
3 these are all signed and dated by an authorized official of
4 Nokia.

5 Q. Looking now at slide 10, let's turn to the JVT
6 which developed the H.264 standard.

7 Did the JVT create its own patent policy?

8 A. Yes. The JVT and the JCT had to operate in
9 compliance with the overall ITU patent policy, and,
10 additionally, they had to operate in compliance with the
11 work methods of the ITU standardization sector. But the JVT
12 did decide to create its own patent policy, which they did
13 in establishing their terms of reference.

14 Q. Did the JVT create its own patent disclosure
15 form?

16 A. Yes. You can see this on the right. So the
17 purpose of this form is to collect IPR information. And you
18 can see further down that they did create their own form.
19 They required that the form be attached to any contribution.
20 So this was a very clear directive. And it says below that
21 they -- you had to submit a fully filled out JVT patent
22 disclosure if you made a contribution.

23 And they further specified and recognized that
24 the form was not a substitute for submitting the ITU patent
25 declaration form. It did not have to be signed and it had

1 an informal status.

2 Q. Does the JVT patent policy apply to all of the
3 patents asserted in this investigation?

4 A. No. It only has application to patent '321.

5 Q. Let's turn to slide 11.

6 Mr. Levin, can you tell us a bit about the intent
7 of the JVT?

8 A. Yeah. I think there's been some misunderstanding
9 about what is the role of technical groups.

10 So it's very clear and recognized in the terms in
11 reference to the JVT that their mission was to offer the
12 best possible technical performance. They were not to dwell
13 on patent rights or patent issues.

14 And that language is in the ITU patent policy.
15 It applies to all study groups and all work groups including
16 the JVT.

17 In other words, technical bodies were to focus on
18 the best technical solutions and not to be overly concerned
19 with patent rights and patent issues.

20 Q. Let's next go to slide 12.

21 What are we looking at on the screen here,
22 Mr. Levin?

23 A. Well, this has been presented before but in a
24 somewhat different context. So this is a contribution and
25 another term of art. When a company makes a technical

1 proposal to a technical body, it's called a contribution.

2 This is the contribution that JVT made --
3 sorry -- Nokia made to the JVT. It is B041. B means it was
4 the second meeting of the JVT. And this relates to their
5 '321 patent.

6 You can see it says on the JVT disclosure form
7 they were concerned about any patent issues, not
8 particularly identifying specific patents, and that this is
9 not a binding legal document.

10 Q. What licensing option did Nokia select on this
11 form?

12 A. This requires a bit of explanation. Because the
13 JVT form had several options in addition to those you would
14 see on the ITU patent declaration form, and I know we're
15 pressed for time and I will try to be as brief as possible.

16 So in this case JVT selected box 2.2.1. What
17 does that mean? There was an effort by the JVT to establish
18 a royalty-free baseline profile for parts of H.264. But the
19 condition was that all of the companies involved had to
20 agree to that royalty-free baseline profile.

21 So Nokia was very much in support of that effort.
22 And by checking box 2.2.1, they said we will agree to a
23 royalty-free baseline profile but only if all the other
24 patentholders do the same. And this is the same form for
25 every company.

1 What happened at the end is that several
2 companies did not want to agree to that, in which case,
3 according to this form, Nokia's statement became 2.2,
4 agreeing to license on RAND terms.

5 Q. Did Nokia attach a fully filled out JVT
6 disclosure form to this proposal?

7 A. Yes, they did. That's what you see on the
8 screen.

9 Q. It looks like certain information actually wasn't
10 filled out.

11 Can you explain that?

12 A. Yes. This is very similar to the ITU patent
13 form. If you're not willing to license, then you have to
14 provide specific patent information. In this case Nokia was
15 willing to license on RAND terms, so they did not have to
16 fill out this part of the form. It was optional. They
17 could have, but they were not required to do so.

18 Q. Did Nokia comply with its disclosure obligations
19 to the JVT with this contribution?

20 A. Yes.

21 Q. Let's turn now to slide 13.

22 Did the JCT which developed the H.265 standard
23 create its own form like the JVT?

24 A. So the JCT took a little bit different approach.
25 The JCT, these are from the terms of reference, did not

1 establish a separate form. What the JCT said, if you submit
2 a contribution, then simply provide a statement about your
3 licensing intention following the three options on the ITU
4 patent declaration form.

5 So what you see here, again, are Nokia technical
6 contributions to the work of the JCT. The first one on the
7 left is D.3.2.1. So letters reflect the different meetings.
8 This is the fourth meeting of the JCT. And this relates to
9 their patent '267.

10 The one on the right is at a later meeting of the
11 JCT. This relates to their '714 patent. This is a
12 technical contribution. This is G593 and submitted in
13 November of 2011.

14 And you can see in both cases Nokia included at
15 the end of their submission or the contribution their
16 licensing intent, which was to grant license under RAND
17 terms.

18 Q. Mr. Levin, in your opinion, did Nokia fully
19 comply with the JCT's patent policy?

20 A. Yes, they did.

21 MS. MOUSER: So, Your Honor, at this time we
22 would like to set up a physical demonstrative.

23 JUDGE MCNAMARA: Sure.

24 Q. Mr. Levin, we're a little tight on time, but did
25 you review the ITU's declaration database compiling every

1 patent declaration submitted to the ITU for H.264 and H.265?

2 A. Yes, I did.

3 Q. Did you bring charts today with you that describe
4 your analysis?

5 A. Yes, I did.

6 Q. So --

7 A. And they stayed dry despite the snow.

8 Q. Can you just tell us generally what's listed on
9 these charts?

10 A. I'm feeling like this is an eye chart. This is
11 quite a long way away.

12 Q. We can turn to the next slide as well.

13 A. I would be very happy to walk you through the
14 charts, Your Honor.

15 So let me just introduce it by saying these are
16 all the patent declaration forms submitted, on the left, in
17 the H.264, on the right, the H.265.

18 And what this -- thank you. It's on my screen.
19 Very helpful.

20 So these charts really show you we have moved
21 from the academic world to the real world of what actually
22 happens at the ITU. And these charts show you how the
23 private companies, some of the leading technology companies
24 in the world, actually operated and implemented the ITU
25 patent policy.

1 So I'm going to start with the colors. The
2 orange rows are Nokia patent declaration submissions. And
3 you can see there's an awful lot of orange.

4 The blue rows are submissions by other companies
5 that also identified specific patent information. And,
6 again, all this information was not required unless you were
7 refusing to license, which was not the case here.

8 Now, you can see about midway down on the column
9 on the left is, in gray, that is the date when the standard
10 was approved by study group 16, and that date is May of
11 2003.

12 So a couple of observations. Just really some
13 numbers. If you look at all the submissions prior to
14 approval of the standard, there were 39. If you look at all
15 the submissions after approval of the standard, there were
16 88. So the majority of patent submissions under H.264 were
17 made after approval of the standard.

18 And if we take a little closer look at the first
19 39 that were filed before approval, you can see that Nokia
20 was the very first one to submit -- to make a submission
21 that identified specific patents. You can also see that, of
22 the 39, only ten identified specific patents. 29 submitted
23 a patent declaration form, but there was no specific patent
24 information.

25 Q. Let's turn quickly to H.265.

1 A. Well, I just want to say one or two more things
2 about this one.

3 Q. I think we're a little tight on time, Mr. Levin,
4 so we're going to turn to H.265.

5 Can you tell us a little bit about that chart?

6 A. Okay. Here you see a little bit different
7 pattern. Again, Nokia is in orange. The other companies
8 submitting specific information are in blue. And here the
9 line, the gray line, as when the standard was approved has
10 moved up. So why is that?

11 Because only -- there were 79 -- there's 79 total
12 patent declarations on this chart. Only 14 of those were
13 submitted before approval of H.265, only 14, and only one of
14 those identified any specific patent information.

15 So the overwhelming majority of patent
16 declarations under H.265, doing rudimentary math, were 65 of
17 them were submitted after approval of the standard.

18 And if you look at the total amount of patent
19 information that was submitted, in 264, Nokia supplied 68
20 percent, more than two-thirds of all the specific patent
21 information. In the case of 265, Nokia submitted 52 percent
22 of all the specific patent information.

23 Q. Thank you, Mr. Levin. We're going to walk
24 through a few points that we heard from Professor Simcoe
25 yesterday.

1 Looking now at slide 16, Mr. Levin, do disclosure
2 obligations apply to both essential and nonessential claims?

3 A. No. And this has been clear since 1999, the
4 first version of the policy. And this language that you see
5 at the top is from the actual patent declaration form. It
6 says, rights whose use would be required to implement the
7 above ITU recommendation.

8 So that is clearly restricting this form to only
9 essential patents or patent claims.

10 It's also indicated in the guidelines in 1999
11 that they apply for essential patents that fully or partly
12 cover elements of the draft recommendation. So it was
13 recognition that some parts of a patent, only some parts of
14 a patent may be essential.

15 This understanding -- the same language that you
16 see at the top is the same language used in 2012. And this
17 kind of -- this understanding about it has to be -- you have
18 to be filing a patent disclosure form with respect to
19 Essential Patent Claims, this understanding was memorialized
20 by language added to the form. I participated in that
21 effort in 2012.

22 Q. Let's turn now to slide 17.

23 Do you believe that the ITU's patent policy
24 creates a timing requirement for patent disclosure?

25 A. Very much the -- the approach to the timing of

1 when you make a patent disclosure was flexible. So I won't
2 spend the time going through all of the terminology, but
3 what we can see even better on the next slide, that
4 should -- from the outset, which is repeatedly cited by
5 Professor Simcoe, was only one of the timing elements.

6 In fact, the very next sentence says, and here
7 you can see it in yellow, after from the outset, it says,
8 this might not be possible when the first draft text
9 appears.

10 This is because very often experts consider -- I
11 mentioned this in my report -- that disclosures later in the
12 process are more valuable than disclosures early in the
13 process because the recommendation changes.

14 So in terms of the timing elements, both 1999 and
15 2012 recognized you could make patent disclosures before
16 approval and you could make patent disclosures after
17 approval of the standard and provisions to that effect.

18 In the interest of time, I won't explain all
19 three of the provisions. So the timing element is flexible.

20 Q. For the record, we're now on slide 18.

21 So Professor Simcoe told the court that Nokia did
22 not use best efforts to provide its patent information.

23 Do you agree?

24 A. No, I don't. Just to put that whole section in
25 context, we're talking about best efforts if you disclose

1 specific patent information. As I've indicated, under the
2 policy, you did not have to disclose such information.
3 We're talking about your efforts for a voluntary act that
4 goes beyond and above the policy.

5 There's no definition of best efforts except to
6 state that you don't have to conduct patent searches, and
7 this is because ITU understood that there are many
8 organizations that can be a forum for developing standard.
9 And so if you make it too onerous on companies, they are not
10 going to come to the ITU. It's part business. We are an
11 agency, but there is a business aspect to it as well.

12 And then, finally, we've just seen on the charts
13 that Nokia submitted more specific patent information than
14 any other company. They submitted more patent disclosure
15 forms than any other company.

16 So in the absence of a specific definition of
17 best efforts, that, for me, is pretty convincing evidence.

18 Q. Thank you, Mr. Levin.

19 MS. MOUSER: No further questions. I pass the
20 witness, Your Honor.

21 MR. RIZZOLO: Good afternoon, Your Honor. We're
22 passing out some cross binders.

23 JUDGE MCNAMARA: While you're doing that, may I
24 have a set of the deck slides for the direct examination?

25 MR. RIZZOLO: May I proceed, Your Honor?

1 JUDGE MCNAMARA: Yes.

2 CROSS-EXAMINATION

3 BY MR. RIZZOLO:

4 Q. Good to see you again, Mr. Levin.

5 A. Nice to see you again, Counselor. I'm very
6 familiar with your face.

7 Q. Me with you as well.

8 You expressed the opinion that Nokia fully
9 complied with its disclosure obligations under the patent
10 policies at issue here, right?

11 A. Yes.

12 Q. You called it a nonmandatory obligation, correct?

13 A. What I said is that disclosing patent information
14 was always framed in nonmandatory language. It should
15 encourage, desirable.

16 What is mandatory is that, if you discloses such
17 information, then you must use the patent disclosure form.

18 Q. You're not offering any legal opinions here
19 today, correct?

20 A. I certainly am not.

21 Q. You have no opinion on whether the ITU patent
22 policy imposes contractual obligations on Nokia, right?

23 A. My hearing has gotten worse in the year and a
24 half. Would you speak a little bit louder?

25 Q. Absolutely. You have no opinion on whether the

1 ITU patent policy imposes contractual obligations on Nokia?

2 A. No, that is not an issue within my expertise.

3 Q. You have no opinion on whether implementers of
4 ITU standards are third-party beneficiaries of the ITU?

5 A. No, I have no opinion on that matter. I'm aware
6 of some court cases in the United States, but I have no
7 independent opinion on that.

8 Q. You have no opinion on whether Swiss law applies
9 to Nokia's obligations under the policies, do you?

10 A. Well, as I stated in my report, having consulted
11 on that with experts, I do consider that course of
12 performance under Swiss law is relevant.

13 Q. You have no opinion on the definition of best
14 efforts under Swiss law, do you?

15 A. Under Swiss law, no. And under the ITU policy,
16 it is not a defined term.

17 Q. And you have no opinion on whether Nokia has
18 complied with its obligations to license its SEPs on RAND
19 terms, correct?

20 A. I'll be very clear. When you look at the patent
21 disclosure form, it says very clearly that negotiations are
22 between the parties outside the scope of the ITU. And in
23 fact, in the 1999 policy, there's a whole page explaining
24 why ITU does not want to resolve the dispute.

25 So no, I don't have any knowledge of the

1 negotiations in this proceeding, and I am not an expert on
2 RAND.

3 Q. Subsequent to your report and deposition, you are
4 aware that the UK Court found that Nokia breached its
5 obligations to license under the ITU policy, are you?

6 A. I only have a very general awareness of the UK
7 decision.

8 Q. It's fair to say that you didn't consider the UK
9 decision in formulating your opinions?

10 A. Well, I think it's fair to say that I didn't see
11 the need to consider the UK decision because, again, from
12 the little bit I know about it and the excerpts I've read,
13 particularly in some of the filings before this court, it
14 dealt with issues outside the ITU. The nature of the
15 licensing conditions, RAND terms, this is all completely
16 outside the ITU.

17 Q. You and I disagree on a lot of things, but I
18 think we can agree that the numbers of the patents here
19 weren't disclosed to the ITU or the JVT until after the
20 relevant standards were adopted, right?

21 A. I think with respect to the asserted patents,
22 they did disclose a lot of specific patent information in
23 the 264 before approval of the standard. But with respect
24 to the actual four asserted patents, the patents, as I show
25 in my chart, were only identified to the ITU in a form after

1 approval, but, again, they were not required to identify
2 those patents.

3 Q. You testified -- actually, I'll move on from
4 that.

5 Your opinion was that Nokia had no duty
6 whatsoever to disclose any -- the specific identity of any
7 patents to the ITU at any time as long as it agreed to
8 license on RAND terms, right?

9 A. Yes. And I think you can see that as confirmed
10 by the actual practice of participants.

11 I might add, since I did mention it in my report,
12 there's an ad hoc group that advises the ITU on changes to
13 the policy. I was a participant at different times. At
14 present there are fifty to a hundred of the leading patent
15 experts from private companies who come to the ITU.

16 And in 2019, so very recently, they sat and
17 considered should we require and modify the policy to say,
18 if you submit a patent disclosure form, you have to identify
19 at least one patent. But after discussion they said, no,
20 we're not going to do that, which means, in their view as
21 well, the patent disclosure policy of the ITU does not
22 require identification of specific patents unless you're
23 refusing to license.

24 Q. So just so we're clear --

25 A. It took a littler longer. I know your time is

1 short.

2 Q. Thank you. It's a yes or no question.

3 The only thing Nokia ever needed to do to comply
4 with the disclosure requirements under the policy, in your
5 opinion, is to say that it would license its patents on RAND
6 terms?

7 A. Yes. By submitting the patent disclosure form,
8 yes.

9 Q. So, in your expert opinion, you showed some
10 slides during your direct, what was the date at which Nokia
11 became fully compliant with the ITU patent policy? Was it
12 July 2001 when Nokia submitted the general declaration?

13 A. Well, they were compliant when they submitted the
14 general declaration.

15 Q. So in July 2001, once they submitted the general
16 declaration, Nokia was fully compliant with the ITU policy?

17 A. They were compliant, and then they additionally
18 submitted specific patent declarations with respect to the
19 H.264 and H.265.

20 Q. But in your expert opinion, anything -- all of
21 those additional disclosures that have been made, all of
22 those orange boxes that were made over the last 20-plus
23 years, those were all irrelevant, Nokia was already fully in
24 compliance with the policy, yes?

25 A. Well, there are two parts of your question.

1 Q. That's a yes or no question, sir.

2 A. Well, I just don't -- you say irrelevant. This
3 is additional information that the ITU wants to get, but it
4 doesn't require.

5 Q. Okay.

6 A. So it is very useful information. But I would
7 say that the 40 percent of executive members who only file
8 general declarations are compliant with the policy as well.

9 Q. Speaking of the chart, while we're looking at it,
10 on the very left-hand side, I think you mentioned that there
11 was one declaration from Nokia that identified particular
12 patents prior to the H.264 standard being adopted.

13 Do you recall that?

14 A. Yes.

15 Q. And that declaration that identified particular
16 patents, that doesn't identify any of the patents at issue
17 in this case, right?

18 A. No. With respect to the 264, Nokia identified
19 the '321 patent in October 2007.

20 Q. We've talked before about Broadcom or the
21 Qualcomm-Broadcom case. Do you recall that?

22 A. Yes, very much.

23 Q. And I think you've expressed the opinion that the
24 Qualcomm case involved significantly different facts than
25 this case, right?

1 A. I would be happy to explain the difference, if we
2 have time.

3 Q. I'll ask you a few questions about that now. And
4 I agree with you that Qualcomm -- some of Qualcomm's conduct
5 was different than what's at issue in this case.

6 But you would agree with me that the relevant
7 patent policy at issue here is the same, the Qualcomm case
8 involved the ITU and the JVT, yes?

9 A. I would agree with that, yes.

10 Q. And I know the Qualcomm case did not involve the
11 JCT, but you'd agree with me that the JCT also has to
12 operate in compliance with the ITU's policy, yes?

13 A. Yes, as stated in the very terms of reference.

14 Q. And Qualcomm participated in the H.264 standards
15 development process, just like Nokia did, right?

16 A. No. I don't agree.

17 Q. That's your testimony? Qualcomm did not
18 participate in the H.264 standards development process?

19 A. Well, I'll take a minute then to explain. The
20 facts in the Qualcomm case --

21 Q. I'm asking you a yes or no question.

22 A. They did not participate in the same way, no.
23 They didn't make a contribution. They intentionally misled
24 the JVT about their patent rights. In the words of the
25 district court, they engaged in a deadly plan to deceive the

1 JVT. In the words of the court of appeals, it was a
2 deliberate intentional effort to mislead the JVT. None of
3 that applies to Nokia.

4 Q. Okay. So, Mr. Levin, I'm going to ask you some
5 particular questions about Qualcomm, and I would appreciate
6 it if you restricted your answers to my questions.

7 A. I'll do my best.

8 Q. Can we have RDX-18.3, please?

9 And this is where -- you just told me that
10 Qualcomm was not participating in the H.264 standards
11 development process.

12 We see the quote from the Federal Circuit opinion
13 on the bottom there at page 14. The Federal Circuit said,
14 we now know, however, that Qualcomm actually was
15 participating in the JVT prior to the approval of the H.264
16 standard.

17 So they were participating in the JVT, correct?

18 A. I see what you're referring to, but this
19 holding -- again, I'm not here to offer legal opinions, but
20 the holding in the appellate court in California was that
21 JVT had been deceptive about the extent to which they
22 participated. In fact, they lied about their participation
23 in the JVT.

24 Q. But they participated, yes or no?

25 A. My understanding of the facts of that case is

1 that they participated --

2 Q. Sir, it's a yes or no question. We are very
3 short on time.

4 A. Well, how do we define participate? If you're
5 lying about who you are, are you really participating?

6 Q. Do you think the Federal Circuit's statement here
7 is incorrect, that Qualcomm actually was participating in
8 the JVT?

9 A. I'm not going to disagree with the court's
10 statement here, but I'm explaining the factual circumstances
11 around their participation, which was completely deceptive.

12 Q. We'll get to some of those.

13 So you reviewed all of the H.264 and H.265
14 declarations and put them on those charts over there, yes?

15 A. Yes.

16 Q. Is that correct? You reviewed all these?

17 A. Yes.

18 Q. Okay. So you know that one of them, one of them,
19 which is number 52 on the left side here, it's right here,
20 right around the time that several of Nokia's were sent into
21 the ITU, that's a Qualcomm declaration, right?

22 A. I can't see that far away, but I know that
23 Qualcomm did submit patent disclosure forms to the ITU.

24 Q. Could we have the next slide, RDX-18.4?

25 Qualcomm submitted a declaration on May 1st,

1 2006 -- or April 25th, 2006, in which it agreed to license
2 its H.264 essential patents on RAND terms, correct?

3 A. It's correct that there's a signed form from
4 Qualcomm. It's also correct that this proceeding is not
5 involving Qualcomm. It's about Nokia.

6 Q. But the same -- by submitting that, you would
7 agree with me, that the same disclosure obligations applied
8 to Qualcomm as to Nokia, correct?

9 A. I don't have any real opinion on Qualcomm, but
10 given the factual circumstances surrounding their deception
11 of the JVT.

12 Q. But you haven't offered an opinion that there's
13 some different type of ITU disclosure obligations that
14 applied to Qualcomm, right?

15 A. Well, there's no special policy for Qualcomm.
16 But, again, the facts of the participation of Nokia in the
17 JVT were completely dramatically different than those of
18 Qualcomm. And, again, we're not discussing -- Qualcomm is
19 not a party to this proceeding.

20 Q. The Federal Circuit said that the ITU patent
21 policy required standard-setting participants, like Nokia
22 and Qualcomm, to identify patents embodied fully or partly
23 in a standard under consideration, didn't it?

24 A. Well, again, we've discussed this before. They
25 did not say you have to identify specific patents or

1 individual patents.

2 Q. Could we have slide 18.5, please?

3 Do you see the highlighted language where it
4 says, the ITU-T and ISO/IEC patent policy provides that any
5 party participating in the work of the ITU, ISO, or IEC
6 should identify patents embodied fully or partly in a
7 standard under consideration?

8 Sir, did I read that correctly, yes or no?

9 A. You mostly read it correctly, but if you look at
10 that carefully --

11 Q. Sir, sir, again, we're short on time.

12 A. You can see that there are quotes around some of
13 the language and not quotes around other parts of the
14 language.

15 And I would say as well, again, it says identify
16 patents. It doesn't say identify specific patents.

17 Q. So identify patents doesn't mean identify
18 specific patents in your mind? That's your testimony?

19 A. No, and that's consistent with the ITU patent
20 policy.

21 Q. And there it says they had to -- JVT participants
22 had to disclose patents prior to final approval of a
23 standard under the rules of the JVT parent organizations,
24 which includes the ITU, doesn't it?

25 A. That's partly true. There are two different --

1 if you permit me, there were two different references to
2 that disclosure obligation under the JVT policy, correct,
3 that one said had to identify during the approval process,
4 I'm not sure what that meant, but they also -- JVT also says
5 that you should -- you should provide information prior to
6 filing approval.

7 So there's conflicting statements in the JVT
8 policy. The actual ITU policy at that time said that you
9 are requested to provide patent information prior to final
10 approval -- but requested. It didn't say use mandatory
11 language like required.

12 Q. Can we turn to slide 18C.6?

13 Sir, the Federal Circuit in the Qualcomm-Broadcom
14 decision concluded that Qualcomm had a duty to disclose the
15 particular patents asserted against Broadcom to the JVT,
16 didn't it?

17 A. Well, again, the language is patent. It's not
18 specific patents.

19 Q. Okay.

20 A. And there's further language that we're not
21 looking at in the court of appeals which also made rulings
22 on this matter.

23 Q. So in the highlighted language here where it
24 says, Qualcomm had a duty to disclose patents, and where it
25 says, JVT participants had a duty to disclose patents that

1 might reasonably be necessary to practice the H.264
2 standard, that doesn't refer to specific patents in your
3 mind, correct?

4 A. That's the problem. It doesn't refer to specific
5 patents.

6 Q. And could we turn to the next slide, slide 7?

7 In the conclusion at the bottom, it says, based
8 on the foregoing analysis, we agree with the district court
9 that Qualcomm had a duty to disclose the asserted patents to
10 the JVT, and that it breached its disclosure duty.

11 Do you see that?

12 A. Yes, I see that, and I don't think --

13 Q. And these asserted patents were two specific
14 asserted patents, weren't they?

15 A. Well, I think the court there, in my view, and
16 looking also at other parts of the opinion, but I think in
17 the interest of time we won't really go through all that,
18 the court in Qualcomm at the appellate level said that the
19 ITU -- the JVT disclosure policy was -- at one point they
20 said ambiguous. In two other places they said that policy
21 was not unambiguous.

22 Q. Sir, that is not answering my question.

23 A. Well, I think they are referring to -- there were
24 two asserted patents by Qualcomm. And, again, I don't know
25 why we're discussing Qualcomm, but I don't think that

1 specifically says that they had to -- the disclosure
2 obligations of the JVT was to disclose specific patents, if
3 you're refusing to license.

4 Q. And you talked about Qualcomm's misconduct. The
5 Federal Circuit --

6 If we could turn to slide 8.

7 The Federal Circuit's analysis of whether there
8 was a duty to disclose under the ITU and JVT policies didn't
9 involve analyzing Qualcomm's behavior, did it?

10 A. I would refer to the appellate court, which
11 says --

12 Q. This is the appellate court, sir.

13 A. -- legal question with factual underpinnings.
14 And I think that's the analysis.

15 Q. So on the slide, on RDX-18C.8, we have an excerpt
16 from the opinion where the court says, determining whether
17 Qualcomm had a duty to disclose the '104 and '767 patents to
18 the JVT involves two questions.

19 Do you see that?

20 A. Yes. And, again, they clearly recognized the
21 policy is ambiguous.

22 Q. So they said first we must determine whether the
23 written JVT IPR Policies impose any disclosure obligations
24 on participants, right?

25 A. I'm just looking at what you're reading. Yes, I

1 mean, you read it correctly.

2 Q. And then second, to the extent the written JVT
3 IPR policies are ambiguous, we must determine whether the
4 participants understood the policies as imposing such
5 obligations.

6 Do you see that?

7 A. Yes.

8 Q. There's nothing in here about Qualcomm's
9 behavior, true?

10 A. Well, they talk about what JVT participants
11 understood. You also know that in these decisions the court
12 said that this was an exceptional case determination. I
13 actually had to look up that phrase because I had never seen
14 it before in a case. And much of these policies describe
15 the abhorrent conduct of Qualcomm employees in deceiving the
16 JVT.

17 Q. Other than Nokia, are you aware of any party that
18 has pursued injunctive or exclusionary relief for patents
19 that are subject to a ITU FRAND obligation?

20 A. No, I'm not.

21 Q. Other than Nokia, are you aware of any party
22 that's been found by a court to have breached the ITU patent
23 policy?

24 A. Well, Nokia hasn't been found to have breached
25 the ITU patent policy.

1 Q. Could we bring up RDX-18.9? This is an excerpt
2 from the UK Court decision.

3 Do you see the highlighted language that says,
4 overall, insofar as necessary, I find Nokia in breach of
5 their ITU-T commitment?

6 A. Well, again, I don't have any -- I don't have any
7 opinion on the ruling of the court in the UK, because they
8 were dealing with the licensing negotiations that took place
9 outside of the ITU.

10 Q. Fair enough. I do want to go, just before I wrap
11 up, to one thing with the Qualcomm decision.

12 Could we bring up RDX-17 at page 26?

13 Here your position is that Nokia complied with
14 the policy by agreeing to license its patents on RAND terms,
15 right?

16 A. Are you talking about the ITU policy or the JVT
17 policy?

18 Q. The ITU policy.

19 A. My conclusion is very clearly that Nokia fully
20 complied with its disclosure obligations under the ITU
21 patent policy as well as that of JVT.

22 Q. And --

23 A. I mean, Nokia submitted contributions to the JVT.
24 They attached the required patent disclosure form to the
25 JVT. Qualcomm did none of those things.

1 Q. Isn't it true that Qualcomm made essentially the
2 same argument in its case, that Qualcomm said that its
3 failure to disclose the patents didn't cause any harm
4 because it had committed to license the patents?

5 A. Well, honestly, I don't know the exact nature of
6 what Qualcomm argued. I know what the court decided.

7 Q. Okay. So let's show the middle paragraph there,
8 the second sentence of that paragraph. It starts with,
9 "Qualcomm submits."

10 Do you see it says, "Qualcomm submits that there
11 is no harm because," and then it talks about a jury verdict
12 on noninfringement, and then it says, "even if the asserted
13 patents were needed to practice the H.264 standard, Qualcomm
14 would be willing to license them."

15 And as we discussed earlier, Qualcomm submitted a
16 RAND declaration just like Nokia, correct?

17 A. They submitted a declaration. I'm not going to
18 try to infer what the court is saying about that. I don't
19 see -- I'm not quite understanding this language in terms of
20 whether talking about essential patents or not essential
21 patents, but under the ITU policy, any determinations about
22 essentiality are a matter between the parties and
23 ultimately, if necessary, between the courts. ITU takes
24 no -- instructs their study groups not to make any
25 determinations about what is essential.

1 Q. The Federal Circuit said it disagreed with
2 Qualcomm, right? Do you see, "we disagree"?

3 A. I see that. Well, I see it says, "we disagree."

4 Are we looking -- can you please explain to me
5 again what we're looking at here?

6 Q. This is the Qualcomm opinion.

7 A. Which one?

8 Q. It's in your binder. It's RCX-17.

9 A. Which court?

10 Q. The Federal Circuit, sir.

11 A. Okay.

12 Q. And the Federal Circuit said in that last
13 sentence, "forcing a party to accept a license and pay
14 whatever fee the licensor demands, or to undergo the
15 uncertainty and cost of litigation, are significant
16 burdens."

17 Do you see that?

18 A. I'm reading it. Well, again, this is not an
19 opinion written with respect to the conduct of Nokia.

20 Q. But here you understand that Nokia is insisting
21 that Acer and ASUS pay its so-called program rates.

22 A. I can't agree with that only because I have not
23 been asked at all to comment or opine about the licensing
24 negotiations, the terms and conditions. That is completely
25 outside the scope of my report, and, frankly, my area of

1 expertise.

2 Q. Thank you, sir.

3 MR. RIZZOLO: No further questions, Your Honor.

4 JUDGE MCNAMARA: Thank you, Mr. Rizzolo.

5 Ms. Ducca?

6 MS. DUCCA: No questions from Staff, Your Honor.

7 JUDGE MCNAMARA: Ms. Mouser, any redirect?

8 MS. MOUSER: Yes, Your Honor, briefly.

9 REDIRECT EXAMINATION

10 BY MS. MOUSER:

11 Q. Mr. Levin, do you remember that Mr. Rizzolo asked
12 you about the timeline of the Qualcomm disclosures?

13 A. Yes.

14 Q. Mr. Moreno, could you please pull up CDX-2427?

15 Mr. Levin, did Qualcomm file -- did Qualcomm file
16 its disclosure form before or after it had sued Broadcom?

17 A. My recollection is that they filed -- they
18 submitted the forms after they had filed suit.

19 Q. So when Qualcomm sued Broadcom, had they made a
20 RAND commitment yet?

21 A. Well, I don't know. I didn't -- I don't follow
22 RAND issues.

23 Q. Had they submitted a patent disclosure form to
24 the ITU?

25 A. Oh, sorry. I didn't understand your question.

1 Yes, they did, I believe, checked box 2 when they
2 submitted the patent disclosure form to the ITU, but, again,
3 it did come after the litigation had started.

4 MS. MOUSER: Thank you, Your Honor. No further
5 questions.

6 JUDGE MCNAMARA: Thank you, Ms. Mouser.

7 Mr. Rizzolo, anything more?

8 RE CROSS-EXAMINATION

9 BY MR. RIZZOLO:

10 Q. One quick question on that, Mr. Levin.

11 The ITU policy, you said there's no time limit on
12 submitting licensing declarations, correct?

13 A. Yes. It's a flexible policy, and it also
14 recognizes that, for example, H.264 has undergone 14
15 amendments. So it changes. H.265 has undergone at least
16 11 -- ten different versions and amendments. So ITU does
17 not set a deadline for any patent disclosure.

18 Q. And the ITU policy includes nothing in there
19 about whether a declaration can be submitted before or after
20 a litigation is filed. It doesn't get into those issues,
21 correct?

22 A. That's not what I said. I'll take the time,
23 then. In 1999 --

24 Q. Sir, sir, I have --

25 A. My answer is yes, it does. There were clearly

1 provisions about submitting patent disclosure forms after
2 approval of a recommendation both in 1999 and in 2012.

3 Q. And I want to make sure the record is clear. I
4 didn't ask anything about a recommendation; I asked about a
5 litigation.

6 The ITU policy doesn't include anything about
7 whether there are requirements about submitting a patent
8 statement or licensing declaration form before or after a
9 lawsuit is filed. The ITU doesn't --

10 A. You're asking about before or after a lawsuit?

11 Q. Correct.

12 A. That language, I don't think it is specifically
13 addressed in the ITU policy.

14 MR. RIZZOLO: Thank you.

15 JUDGE MCNAMARA: Thank you, Mr. Rizzolo.

16 Again, Ms. Ducca, anything?

17 MS. DUCCA: Nothing from Staff, Your Honor.

18 JUDGE MCNAMARA: Thank you, Mr. Levin. You may
19 step down. Thank you for your testimony.

20 MR. NEWCOMER: This is Josh Newcomer for Nokia.
21 I think we have one witness left, and so it might be a good
22 time for the afternoon break.

23 JUDGE MCNAMARA: All right. I will see you back
24 here in 15 minutes.

25 (Whereupon, the proceedings recessed at 3:44

1 p.m.)

2 (In session at 4:05 p.m.)

3 JUDGE MCNAMARA: Okay. Thank you, everybody.

4 All right. Please be seated.

5 Okay, I think we're on our last witness.

6 MR. CHERN: Thankfully we are, Your Honor. Alex
7 Chern for Nokia, and at this time we call Dr. Akemann back
8 to the stand.

9 JUDGE MCNAMARA: Thank you.

10 MICHAEL AKEMANN,

11 having been previously duly sworn or affirmed
12 on their oath, was thereafter examined and testified further
13 as follows:

14 JUDGE MCNAMARA: Good afternoon, Dr. Akemann.

15 A. Good afternoon, Your Honor.

16 JUDGE MCNAMARA: All right. So you're still
17 under oath. You're fine.

18 A. Thank you.

19 MR. CHERN: Your Honor, I think just out of an
20 abundance of caution because we will be starting to talk
21 about licenses at some point pretty early on, we should
22 probably just go ahead and start on the Nokia confidential
23 record.

24 (Whereupon, the hearing proceeded in confidential
25 session.)

1 O P E N S E S S I O N

2 BY MR. CHERN:

3 Q. Let's talk a little bit about public interest,
4 shifting gears.

5 Remind us of your conclusion about whether an
6 exclusion order would adversely impact the four public
7 interest factors.

8 A. I concluded that it would not.

9 Q. About how much of the total U.S. computer market
10 do Respondents occupy?

11 A. Collectively, as we've seen, around 10 percent
12 over time.

13 Q. Now, did Respondents' expert, Dr. Seth, agree
14 that we should look at the U.S. market holistically?

15 A. At times in her analysis she did. Other times
16 she focuses in on particular subsegments.

17 Q. And do you agree with how Dr. Seth segmented the
18 market when she did?

19 A. No. I think that's ultimately not a helpful
20 approach to analyzing the economic issues here. I think it
21 fails to appreciate both supply side and demand side
22 flexibility that require, in my view, a consideration of the
23 market as a whole.

24 Q. Have you seen any evidence that consumers make
25 choices based on these segments that Dr. Seth sometimes

1 used?

2 A. I mean, they're marketing segments, so obviously
3 companies market in a particular way for reasons. So it's
4 certainly possible that consumers looking for a Chromebook
5 will choose amongst Chromebooks, for example, but there's
6 still a lot of flexibility on both the demand side and the
7 supply side.

8 People are able to switch seamlessly between an
9 education computer and an everyday computer and a business
10 computer. They all provide essentially the same
11 functionality, maybe with different horsepower, different
12 bells and whistles.

13 Q. Mr. Moreno, if we could go to slide CDX-16.8?

14 Can you kind of just give us a real-world example
15 of how Dr. Seth's market segmentation doesn't reflect the
16 realities?

17 A. Well, we heard Dr. Seth explain that she sort of
18 picked her segments based on, I guess, her experience, at
19 least in part, setting aside IDC segment, the data and so
20 forth.

21 And, you know, these price cutoffs, of course,
22 are in some sense quite arbitrary. The \$199 computer, in
23 her world, is going into one bucket, the blue bucket; the
24 \$201 computer is going into the green bucket. But by all
25 indications, these are going to be very similar, if not

1 almost identical products, even though the price might vary
2 by only \$2.

3 Q. And what's the effect of Dr. Seth kind of
4 segmenting the market this way? Why did she do it?

5 A. Well, it seems to be, in my view, arbitrary and
6 to focus on particular cherry-picked subsegments, where the
7 Respondents either collectively or individually have
8 relatively large shares as measured in various ways.

9 Q. Now, did Dr. Seth or Dr. Phiroz conduct any
10 research or market analysis in forming these segments?

11 A. I'm sorry. Could you repeat that?

12 Q. Yeah. Did you see Dr. Seth or Dr. Phiroz conduct
13 any research or market analysis in forming these segments?

14 A. Well, I think Dr. Seth did cite documents and
15 data that suggest segmentation, but I don't think that
16 there's any economic articles or treatises, for example,
17 that support the segments that she focused on as meaningful
18 for competitive analysis.

19 I think everything that you would see in the
20 literature, consistent with some of her other analysis,
21 would suggest that the way to think about the PC market is
22 as a whole, which is why, for example, the old article she
23 cited on computer cross-price elasticities look at the
24 market as a whole. They don't treat education as somehow a
25 distinct subsegment.

1 Q. You mentioned Dr. Seth sometimes using certain
2 data. Where does that data come from?

3 A. She used IDC data for many of her purposes.

4 Q. And do you find IDC data generally reliable?

5 A. I do. I use it routinely in my work.

6 Q. Was there any problem, though, with how Dr. Seth
7 was or wasn't using IDC data at times?

8 A. Well, we heard a lot of talk earlier about sort
9 of the mixing and matching across IDC data and information
10 provided by at least one of the Respondents in this case.

11 And when Dr. Seth was asked about this, the best
12 explanation she seemed to give is that they were measuring
13 different things, but, if so, they shouldn't add them
14 together. It doesn't make any sense to do that if they are
15 measuring different things.

16 So, in my view, you kind of have to pick a lane
17 on this stuff, and the IDC data is certainly a better source
18 for these purposes, I would argue.

19 Q. And was the IDC data on education market shares
20 lower than the data that Dr. Seth provided in court?

21 A. Substantially so, by a factor of 2 or more,
22 almost 3 if you credit the 40 percent figure, which, again,
23 suggests either one or the other is wrong or they are
24 measuring different things, but, in any case, it's not
25 reliable to do them together.

1 Q. Setting aside those critiques, even under
2 Dr. Seth's market segments, would there be a public interest
3 concern from excluding Respondents' computers?

4 A. No, because that segment isn't somehow distinct
5 and isolated from competitive forces. Consumers can and do
6 switch across segments, and if for some reason Acer and ASUS
7 did exit the education segment entirely, all the other large
8 participants and many small participants are already selling
9 in that segment and could easily sell more there over time.

10 Q. Dr. Seth talked a lot about Chromebooks. First,
11 do you agree that Chromebooks is its own separate market
12 segment?

13 A. No. There are obviously some distinguishing
14 features. They do use a different operating system, but
15 there's clearly a lot of switching and competitiveness
16 across Chromebooks and/or typically other lower-priced
17 laptop products.

18 Q. Is there anything unique about Respondents'
19 Chromebooks that would make it difficult for the market to
20 quickly replace them?

21 A. I certainly have not seen Respondents present
22 anything during this investigation, and that doesn't
23 surprise me, because the whole point of a Chromebook
24 essentially is to be hardware agnostic. The operating
25 system and software runs in the cloud. Any Chromebook is

1 supposed to work with any other Chromebook with the
2 operating system and applications that come along with.

3 Q. Dr. Seth also talked about Chromebooks in the
4 education sector. Do you remember that?

5 A. I do.

6 Q. Do you agree with Dr. Seth that schools switching
7 to other Chromebook manufacturers will harm the public
8 interest?

9 A. Not at all. I don't see how it could.

10 Q. And if we could go to the next slide, Mr. Moreno.
11 Is there any evidence that schools are locked
12 into using just Respondents' Chromebooks?

13 A. I've not seen any evidence of lock-in or
14 exclusive contracts.

15 Q. What does the evidence from, you know, two of
16 Dr. Seth's examples actually tell us?

17 A. Well, as Dr. Seth testified earlier today, on the
18 right side, with LA Unified, they are already choosing if
19 anything from other suppliers. I didn't see Acer or ASUS --
20 I do see Acer. No ASUS on that list. And on the left,
21 again, there are competing Chromebook suppliers, Lenovo, for
22 example.

23 Q. And what harm, if any, did Dr. Seth actually
24 quantify as to schools switching costs if they had to
25 replace their Chromebooks with another manufacturer?

1 A. I didn't see any quantification of that.

2 Q. Let's move on to Dr. Seth's consumer surplus
3 model.

4 First, is her consumer surplus model consistent
5 with the rest of her analysis?

6 A. It's not in the sense that it treats the market
7 as, in my view, properly, a whole singular entity, not a
8 subsegment-by-subsegment analysis.

9 Q. Okay. So in her other analysis, she segments the
10 market, but in her consumer surplus analysis, Dr. Seth
11 treats it as a whole?

12 A. That's right. And the starting point of her
13 model is a single computer priced at \$872, or whatever it is
14 precisely.

15 Q. Why would Dr. Seth switch methodologies like
16 that?

17 A. Well, she might do it in part because that's, in
18 some sense, the right way to analyze the computer market, at
19 least that's why I would do it that way if I were to go down
20 that path.

21 Q. Are there problems with Dr. Seth's modeling for
22 her consumer surplus analysis?

23 A. Absolutely. I didn't really have a chance to
24 explain in my direct testimony, but the model that she uses
25 is inherently static. It doesn't really permit new product

1 introduction, new model introduction. I think Dr. Seth even
2 concluded that, at most, she is measuring a temporary
3 effect, and that's the most a static model like that can
4 hope to predict.

5 In a highly competitive market like the U.S.
6 computer industry, you would expect if any market exit
7 occurred, there were fewer products offered in the education
8 segment, other suppliers would expand or offer new models in
9 there very quickly, which would undermine all of the effects
10 that she's estimating under that static approach.

11 Q. And what is Dr. Seth's opinion on how much prices
12 will increase under an exclusion order?

13 A. Even under her static model, she only estimates a
14 price effect of about 1.3 percent, which she herself
15 conceded earlier today was small, and I certainly agree with
16 that, small and insignificant.

17 Q. And just to be clear, do you agree with
18 Dr. Seth's consumer surplus model in any respect?

19 A. I don't think it's useful or well applied here at
20 all.

21 Q. Okay. But even setting that aside, what would it
22 mean practically in dollars and cents based on what Dr. Seth
23 found?

24 A. Well, shown at the bottom of this slide here,
25 that if we start with a \$200 PC and we add about 1.3

1 percent, that computer is going to be priced under her model
2 at \$202.74, so less than a 2 percent price increase.

3 Q. And is this the worse that Dr. Seth says it will
4 be?

5 A. Yeah. In some sense, that's a maximum short-run
6 impact, and I think she conceded earlier today that, if
7 anything, it would be dissipated over time, in my view,
8 almost immediately, if it even occurred in the first
9 instance.

10 Q. So even setting aside the flaws with Dr. Seth's
11 analysis, would a 1.37 percent price increase harm the
12 public interest?

13 A. Not at all. That wouldn't be significant.

14 Q. Dr. Akemann, in sum, do you believe that the
15 evidence shows that Nokia's offers complied with its RAND
16 commitment going back to the beginning?

17 A. Yes, I do.

18 Q. And do you believe that an exclusion order would
19 or would not harm the public interest here?

20 A. It would not harm the public interest, in my
21 view.

22 Q. Thank you, Dr. Akemann.

23 MR. CHERN: I'll pass the witness, Your Honor.

24 JUDGE MCNAMARA: Thank you, Mr. Chern.

25 Mr. Colaianni?

1 MR. COLAIANNI: Yes, Your Honor.

2 I think we should go on to the Nokia confidential
3 record, Your Honor.

4 JUDGE MCNAMARA: Okay.

5 (Whereupon, the hearing proceeded in confidential
6 session.)

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1 O P E N S E S S I O N

2 JUDGE MCNAMARA: Mr. Newcomer?

3 MR. NEWCOMER: That concludes our presentation of
4 our rebuttal case, Your Honor.

5 JUDGE MCNAMARA: Okay. Very good. So there are
6 just several --

7 Thank you, everybody. Boy, what an interesting
8 trial. A lot of good issues.

9 There are some administrative things to take care
10 of, including, of course, the admission into evidence of
11 exhibits.

12 Have you all agreed on a list of exhibits
13 including from the recent testimony?

14 MR. NEWCOMER: I think we're caught up through
15 Mr. Akemann. I guess we need a minute to confer.

16 JUDGE MCNAMARA: Sure. Why don't I step out,
17 give you a few minutes to talk about this, and there's a
18 list. And then I just have a few things I have to walk
19 through. It won't take me very long. So why don't you
20 confer. Knock on the door when you're ready for me.

21 MR. NEWCOMER: That sounds good, Your Honor.
22 I'll give you a heads-up. The parties are going to request
23 an extended page limit that we were thinking of for the
24 post-hearing brief.

25 JUDGE MCNAMARA: Gee, funny thing about that,

1 because I was thinking about that too and I was going to
2 wait for your offer before I make a counteroffer. How is
3 that?

4 MR. NEWCOMER: Okay. Thank you.

5 (Whereupon, the proceedings recessed at 5:17
6 p.m.)

7 (In session at 5:24 p.m.)

8 MR. NEWCOMER: We should be on the public record.

9 JUDGE MCNAMARA: Okay.

10 MR. NEWCOMER: I think Ms. Kinkade was going to
11 take that back to us concluding the presentation.

12 JUDGE MCNAMARA: Okay.

13 MR. NEWCOMER: So we have an agreed exhibit list.
14 It's being printed right now. No objection, I think.

15 MS. ROBERTS: No objections.

16 JUDGE MCNAMARA: Thank you, Ms. Roberts.

17 MS. DUCCA: No objections from Staff, Your Honor.

18 JUDGE MCNAMARA: Very good. Whatever is on the
19 exhibit lists that are going to be handed up to me and to
20 Ms. Kinkade will be accepted into evidence.

21 (Whereupon, the exhibits, as recited and
22 reflected in the index, were received in evidence, without
23 objection.)

24 JUDGE MCNAMARA: So why don't you all be seated.

25 So I understand you have an offer, Mr. Newcomer.

1 MR. NEWCOMER: Yes. The parties have conferred,
2 and we would like to extend the post-hearing brief to 200
3 pages.

4 JUDGE MCNAMARA: I agree. In fact, frankly, we
5 were talking about this earlier today. If you hadn't
6 suggested it, I was, and I would even be willing to go
7 higher. There's a lot of complicated information here, and
8 I suspect that you all are going to use a lot of the visuals
9 from the patents, and they take up a lot of space, as I well
10 know.

11 So I'm even willing to consider additional pages.
12 And you can split them up, again, as I typically allow, you
13 can split them up between the post-hearing brief and the
14 reply brief. If you want to go higher, again, I'm amenable
15 to that.

16 MS. DUCCA: Your Honor, when you say we can split
17 it up, it means we can use 150 for the opening and 50, but
18 it's our choice?

19 JUDGE MCNAMARA: Yes. It's your choice.

20 MR. NEWCOMER: We will counter our own offer and
21 go up to 225 then, Your Honor. Thank you.

22 JUDGE MCNAMARA: Well, you're not bidding against
23 yourself, because I have already upped the ante.

24 Are you good with that, Ms. Roberts?

25 MS. ROBERTS: Yes, Your Honor.

1 JUDGE MCNAMARA: If there's a problem, again, we
2 know there's a difference between space and characters, let
3 me know sooner rather than later and we'll see if we need to
4 adjust. I really want to see really good arguments on this.
5 Thank you.

6 I have a few administrative things to take care
7 of. First of all, I understand that each side has been sent
8 a Box link for exhibits, or everybody has been sent one.

9 Is that understanding correct? And, if so, who
10 are the recipients of the Box links for each side or who
11 will be?

12 MR. NEWCOMER: It should be Josh Newcomer, and I
13 think you have my email, and then Mel Kalka.

14 JUDGE MCNAMARA: For Respondents?

15 MS. ROBERTS: For Respondents you can add me,
16 Stephanie Roberts, and John Lund as well.

17 JUDGE MCNAMARA: Okay. That takes care of that
18 one.

19 Then I wanted to make sure, I understand from
20 Dr. Cheng's testimony that he was staying in D.C., that
21 there were still negotiations occurring. That's what he
22 said on the stand.

23 My question to you all is, are the September
24 offers -- I understood from the earlier testimony last week
25 that a September offer was made by ASUS and that there was a

1 January offer.

2 So are those offers that came in after discovery
3 closed on the exhibit lists?

4 MR. COLAIANNI: Yes, Your Honor. There were
5 several offers that were exchanged post close of fact
6 discovery. There was one in January. There was one in
7 February even. And they are on the exhibit list, as far as
8 I understand.

9 JUDGE MCNAMARA: Good.

10 Mr. Newcomer?

11 MR. NEWCOMER: I believe it's correct, whatever
12 came in through the witnesses and I believe they may have --

13 JUDGE MCNAMARA: Good. I just wanted to be sure
14 because I know they were not all identified, just a couple
15 were.

16 Ms. Ducca, you wanted to say something? All
17 right.

18 So we've taken care of that.

19 The next thing is, again, how you submit and how
20 you name the final exhibit list, what you handed up was fine
21 for interim witness lists, but, again, there's a
22 25-character field after the numbering of the exhibit
23 itself. That should contain alpha characters that describe
24 whether it's the declaration of so and so, whether it is an
25 excerpt from a specification. Just give it a description in

1 alpha characters so that we're just not looking at Exhibit
2 Dr. Akemann, Exhibit Dr. Akemann seriatim. We want
3 descriptions of what the exhibits are. Okay?

4 And, again, there are just a certain number of
5 characters you can use. Please double-check with Dockets,
6 also, about the size of the files, but they are pretty good
7 about giving you their limitations online, and I think it's
8 still 25 MB.

9 Let me see. Oh, yes, let me see. I'm trying to
10 read my handwriting.

11 For any documents that you annotated during the
12 course of the hearing and put on to the screen, please make
13 sure they are identified by date, have your name on them,
14 and they are identified in terms of some sort of a caption.

15 And then, finally, for any documents -- let me
16 think about this. I understand that Ms. Ekweonu, my
17 assistant, handed out a template to everybody of how the
18 exhibits should come in. Please borrow from that. And if
19 you have any questions, get back to Ms. Ekweonu very
20 quickly. She will respond quickly. She is really good at
21 that.

22 Finally, there's an opening for an attorney
23 advisor, an OALJ. So if anybody knows of anybody who is
24 thinking of wanting to come into government service, we do
25 have an opening, so I thought I would let you all know that.

1 So that's it from me.

2 Is there anything more that I can address before
3 we conclude?

4 Ms. Ducca? We're going backwards.

5 MS. DUCCA: I do have a question. This is a
6 little bit selfish for me. With respect to the motions to
7 strike, there's a couple out there that might be filed. I
8 know this morning Your Honor said that they can file it by
9 next week, by the end of next week. To the extent anybody
10 files it earlier, can we file the responses by the end of
11 next week? I know Ground Rule 9.8 says we file it the next
12 day.

13 JUDGE MCNAMARA: And I varied that orally, which
14 I often do, just because people are really pressed. So,
15 yes.

16 MS. DUCCA: Okay. Thank you, Your Honor.

17 JUDGE MCNAMARA: Is that clear for everybody?
18 And let me know -- I'll know by your silence if you're
19 withdrawing -- I'll know by your silence and timing if
20 you're not going to file your motions to strike, but you
21 might want to let us know that for the record. Okay?

22 Is there anything else? I was going around.

23 Mr. Colaianni for Respondents? Or Ms. Roberts?

24 MS. ROBERTS: Ms. Roberts. A couple things. The
25 physical exhibits, what do you want us to do with those?

1 JUDGE MCNAMARA: Wow. You know, a big part of
2 me says why didn't you hang on to them, take screenshots of
3 them. And if we want to use them in any way, we would let
4 you know and we would make sure there was a chain of
5 custody, but I don't think we need them right now.

6 MS. ROBERTS: Understood. And the demonstrative
7 exhibits, we haven't been adding them to the exhibit lists
8 since they are not admitted exhibits, but we were planning
9 to upload them to Box.

10 JUDGE MCNAMARA: Yes, please. And also, again, I
11 think, if you have any question at all, just have your folks
12 contact Ms. Ekweonu. She knows.

13 MS. ROBERTS: Thank you, Your Honor.

14 JUDGE MCNAMARA: You're welcome.

15 Anything more, Mr. Newcomer?

16 MR. NEWCOMER: Just wanted to say thank you, Your
17 Honor, thanks to Ms. Kinkade and your staff, thanks on
18 behalf of Nokia and the McKool Smith team.

19 JUDGE MCNAMARA: You're welcome. Our pleasure, I
20 have to assure you of that.

21 Thank you, everybody. Have a good night. You
22 all have certainly earned it, and I'll see you soon. Take
23 care.

24 (Whereupon, the proceedings concluded at
25 5:33 p.m.)

1 C O N T E N T S

2 INDEX OF WITNESSES

3

	WITNESS	DIRECT	CROSS	RE- DIRECT	RE- CROSS	STAFF
5	PALLAVI SETH.....		1862	1892		
6	IAIN RICHARDSON.....	1895	1978	2029	2037	2023
7			2008			
8	ARTHUR LEVIN.....	2041	2066	2084	2085	
9	MICHAEL AKEMANN.....	2088		2138	2143	

10

11

12

13

14 AFTERNOON SESSION.....2008

15

16

17

18

19 CONFIDENTIAL SESSION.....1862- 1894

20 CONFIDENTIAL SESSION.....2088- 2105

21 CONFIDENTIAL SESSION.....2116- 2145

22

23

24

25

1 EXHIBIT LISTS SUBMITTED FOR ADMISSION:
2 LIST OF EXHIBITS ADMITTED FOR MARCH 11
3 CX-0633C
4 CX-1661
5 CX-6498C
6 CX-6499C
7 CX-6619C
8 CX-6620C
9 CX-6622C
10 CX-6633C
11 CX-7209
12 CX-7218
13 CX-7219C
14 CX-7220C
15 CX-7225
16 CX-7226
17 CX-7227
18 JX-0039C
19 JX-0040C
20 JX-0041C
21 JX-0042C
22 JX-0054C
23 JX-0073C
24 JX-0076C
25 JX-0085C

1	JX-0086C
2	JX-0087C
3	JX-0088C
4	JX-0089C
5	JX-0090C
6	JX-0091C
7	JX-0092C
8	JX-0093C
9	JX-0094C
10	JX-0095C
11	JX-0179
12	JX-0182C
13	JX-0184
14	JX-0192
15	JX-0203
16	JX-0204
17	JX-0206
18	JX-0208
19	JX-0209
20	JX-0210
21	JX-0212
22	JX-0243C
23	JX-0366C
24	JX-0372C
25	JX-0374

1	JX-0379
2	JX-0381
3	JX-0410
4	JX-0411
5	JX-0412
6	JX-0415
7	JX-0425C
8	JX-0439C
9	JX-0445C
10	JX-0459C
11	JX-0464C
12	JX-0472C
13	JX-0480C
14	JX-0496C
15	JX-0497C
16	JX-0517C
17	JX-0518C
18	JX-0519C
19	JX-0520C
20	JX-0521C
21	JX-0522C
22	JX-0523C
23	JX-0535C
24	JX-0536C
25	JX-0537C

1	JX-0538C
2	JX-0539C
3	JX-0540C
4	JX-0541C
5	JX-0566C
6	JX-0567C
7	JX-0568C
8	JX-0569C
9	JX-0570C
10	JX-0571C
11	JX-0572C
12	JX-0573C
13	JX-0597C
14	JX-0598C
15	JX-0599C
16	JX-0600C
17	JX-0601C
18	JX-0602C
19	JX-0603C
20	JX-0604C
21	JX-0605C
22	JX-0606C
23	JX-0607C
24	JX-0608C
25	JX-0613C

1	JX-0615C
2	JX-0616C
3	JX-0617C
4	JX-0624C
5	JX-0625C
6	JX-0626C
7	JX-0627C
8	JX-0628C
9	JX-0629C
10	JX-0630C
11	JX-0631C
12	JX-0632C
13	JX-0633C
14	JX-0699
15	JX-0710C
16	JX-0765
17	RX-0231
18	RX-0259
19	RX-0260
20	RX-0284
21	RX-0293
22	RX-0349
23	RX-0350
24	RX-0428C
25	RX-0429C

1	RX-0429C
2	RX-0430C
3	RX-0430C
4	RX-0431C
5	RX-0460
6	RX-0884
7	RX-0886
8	RX-0909
9	RX-0910
10	RX-0911
11	RX-0914
12	RX-0918
13	RX-0923
14	RX-0925
15	RX-0979
16	RX-0980
17	RX-0984
18	RX-1016
19	RX-1017
20	RX-1019
21	RX-1020
22	RX-1021
23	RX-1025
24	RX-1039
25	RX-1041

1	RX-1044
2	RX-1045
3	RX-1046
4	RX-1047
5	RX-1048
6	RX-1053
7	RX-1228
8	RX-1235
9	RX-1239
10	RX-1253
11	RX-1264
12	RX-1274
13	RX-1289
14	RX-1296
15	RX-1298
16	RX-1320
17	RX-1357
18	RX-1358
19	RX-1359
20	RX-1360
21	RX-1362
22	RX-1363
23	RX-1378
24	RX-1413
25	RX-1414

1	RX-1415
2	RX-1468
3	RX-1474
4	RX-1486
5	RX-1489
6	RX-1490
7	RX-1491
8	RX-1492
9	RX-1493
10	RX-1494
11	RX-1496
12	RX-1671
13	RX-1714C
14	RX-1715C
15	RX-1716C
16	RX-1733C
17	RX-1735C
18	RX-1736C
19	RX-1738C
20	RX-1740C
21	RX-1750C
22	RX-1751C
23	RX-1752C
24	RX-1753C
25	RX-1754C

1	RX-1755C
2	RX-1832C
3	RX-1835C
4	RX-1837C
5	RX-1839C
6	RX-1840C
7	RX-1841C
8	RX-1842C
9	RX-1843C
10	RX-1857C
11	RX-1860C
12	RX-1861C
13	RX-1875C
14	RX-1876C
15	RX-1877C
16	RX-1878C
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21	RX-1883C
22	RX-1884C
23	RX-1885C
24	RX-1886C
25	RX-1887C

1	RX-1907C
2	RX-1945
3	RX-2080C
4	RX-2121C
5	RX-2123C
6	RX-2155C
7	RX-2164C
8	RX-2165C
9	RX-2166C
10	RX-2167C
11	RX-2168C
12	RX-2169C
13	RX-2170C
14	RX-2171C
15	RX-2172C
16	RX-2173C
17	RX-2174C
18	RX-2175C
19	RX-2176C
20	RX-2181C
21	RX-2186C
22	RX-2188C
23	RX-2189C
24	RX-2191C
25	RX-2193C

1	RX-2195C
2	RX-2200C
3	RX-2201C
4	RX-2219C
5	RX-2220
6	RX-2221
7	RX-2222
8	RX-2223
9	RX-2224
10	RX-2225
11	RX-2317C
12	RX-2331C
13	RX-2332C
14	RX-2333C
15	RX-2334C
16	RX-2335C
17	RX-2336C
18	RX-2337C
19	RX-2338C
20	RX-2353C
21	RX-2354C
22	RX-2355C
23	RX-2357C
24	RX-2358C
25	RX-2359C

1	RX-2360C
2	RX-2361C
3	RX-2362C
4	RX-2363C
5	RX-2364C
6	RX-2365C
7	RX-2367C
8	RX-2369C
9	RX-2370C
10	RX-2371C
11	RX-2372C
12	RX-2373C
13	RX-2374C
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23	CX-2018
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1 C E R T I F I C A T E

2 TITLE: CERTAIN VIDEO-CAPABLE LAPTOP, DESKTOP COMPUTERS,
3 HANDHELD COMPUTERS, TABLETS, TELEVISIONS, PROJECTORS, AND
4 COMPONENTS AND MODULES THEREOF

5 INVESTIGATION NO.: 337-TA-1448

6 HEARING DATE: March 12, 2026

7 LOCATION: Courtroom A

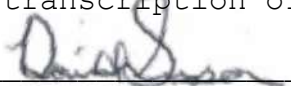
8 NATURE OF HEARING: Evidentiary Hearing

9 I hereby certify that the foregoing/attached
10 transcript is a true, correct and complete record of the
above-referenced proceedings of the U.S. International Trade
Commission. Date 3/12/26

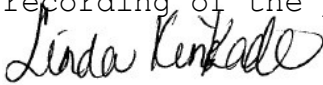
11 Signed: 
12 ss//
Heritage Reporting Corporation
13 1150 Connecticut Avenue, NW, Suite 305
Washington, D.C.

14 Signature of the Contractor or the Authorized Contractor's
15 Representative

16 I hereby certify that I am not the court reporter
and that I have proofread the above-referenced transcript of
17 the proceedings of the U.S. International Trade Commission
against the aforementioned court reporter's notes and
18 recordings for accuracy in transcription in the spelling,
hyphenation, punctuation and speaker identification and did
19 not make any changes of a substantive nature. The
foregoing/attached transcript is a true, correct and
complete transcription of the proceedings.

20 Signed: 
21 ss//

22 I hereby certify that I reported the
above-referenced proceedings of the U.S. International Trade
Commission and caused to be prepared from my record media
23 and notes of the proceedings a true, correct and complete
verbatim recording of the proceedings.

24 Signed: 
25 ss//