

UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

FORD MOTOR COMPANY,

Petitioner,

v.

NEO WIRELESS LLC,

Patent Owner

IPR2023-00763

Patent 10,447,450 B2

VIDEOCONFERENCE DEPOSITION OF

TODOR COOKLEV, Ph.D.

TAKEN ON DECEMBER 3, 2024

REPORTED BY:

PATRICIA L. HUBBARD, CSR #3400

Page 2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 REMOTE VIDEOCONFERENCE DEPOSITION OF TODOR COOKLEV, Ph.D., who is at the time of this proceeding located in Fort Wayne, Indiana, taken on behalf of the Patent Owner, commencing at 8:07 A.M. (Pacific Time) on December 3, 2024, before PATRICIA L. HUBBARD, CSR #3400, a Certified Shorthand Reporter in and for the State of California, pursuant to Notice.	Page 3 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 APPEARANCES OF COUNSEL: For the Patent Owner: LOWENSTEIN & WEATHERWAX, LLP BY: PARHAM HENDIFAR, ESQ. 1016 Pico Boulevard Santa Monica, California 90405 310.307.4514 hendifar@lowensteinweatherwax.com (Present via videoconference) For the Petitioner: BROOKS KUSHMAN BY: KYLE KONZ, ESQ. JOHN LeROY, ESQ. 150 West Second Street Suite 400N Royal Oak, Michigan 48067 248.226.2928 kkonz@brookskushman.com jleroy@brookskushman.com (Present via videoconference) Also Present: Abigail Neufeld
Page 4 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 INDEX WITNESSPAGE TODOR COOKLEV, Ph.D. (By Mr. Hendifar)7, 159 (By Mr. LeRoy)164 EXHIBITS PAGE PATENT OWNER'S DESCRIPTION REFERENCED Exhibit 2025 "Wireless Communication Standards by Todor Cooklev38 Exhibit 2027 "Capacity Analysis Considering Channel Resource Overhead for Mobile Internet Access (WiBro)105 Exhibit 2033 Defendant's Motion for Summary Judgment137	Page 5 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 INDEX (Continued) INFORMATION REQUESTED: (NONE) WITNESS INSTRUCTED NOT TO ANSWER: Page 165, Line 25

1 DECEMBER 3, 2024
2 8:07 A.M. (PACIFIC TIME)
3 * * *

4
5 THE REPORTER: Dr. Cooklev, can you tell
6 me the city and state you are currently located in.

7 THE WITNESS: Fort Wayne, Indiana.

8 THE REPORTER: Okay. I am not at the
9 same location as the witness.

10 Does anyone have any objection to my
11 administering the oath to the witness remotely?

12 MR. HENDIFAR: Not from Patent Owner.

13 MR. LeROY: And not from Ford.

14 THE REPORTER: Okay. Would you please
15 raise your right hand, Doctor.

16 Do you solemnly swear that the testimony
17 you are about to give in this deposition will be the
18 truth, the whole truth, and nothing but the truth
19 under penalty of perjury?

20 THE WITNESS: I do.

21 THE REPORTER: Counsel, would you make
22 your appearances for the record, please.

23 MR. HENDIFAR: Parham Hendifar for
24 Patent Owner Neo Wireless LLC.

25 MR. LeROY: And John LeRoy for Ford

1 Motor Company.

2 THE REPORTER: And you have another
3 associate with you, Mr. LeRoy?

4 MR. LeROY: That is correct. With me
5 here today is Kyle Konz, also counsel for Ford.

6 THE REPORTER: Okay, Counsel. You're
7 good to go.

8
9 TODOR COOKLEV, Ph.D.
10 called as a witness, having been
11 sworn, was examined and testified
12 as follows:

EXAMINATION

13
14 BY MR. HENDIFAR:

15 Q. Good morning, Dr. Cooklev.

16 A. Good morning.

17 Q. Very nice to see you.

18 I believe you have been deposed a number
19 of times before. So, I won't take much of your time
20 going through the basics.

21 Any questions about the procedure for
22 the deposition today?

23 A. I don't think I have questions.

24 Q. Is there any reason why you may not be
25

1 able to provide your best truthful testimony today?

2 A. I'm not aware of any reason.

3 Q. You are aware that for an IPR deposition
4 you are not permitted by the rules to speak with
5 your attorney during the course of my examination,
6 including the breaks, regarding any issues related
7 to the substance of this deposition other than
8 privilege.

9 Do you understand that?

10 A. I do.

11 Q. And your counsel will make short
12 non-speaking objections such as objection ton form
13 or scope. But he won't be able to provide you --
14 unless we ask -- detailed explanation.

15 So if you have any concerns or
16 ambiguities about a question I ask, I ask that you
17 would please let me know and I would be happy to
18 provide additional information or rephrase the
19 question.

20 But if you answer a question that I ask,
21 I will assume that you understood my question.

22 Is that fair?

23 A. Yes.

24 Q. Okay. Do you have any current or past
25 associations with Ford Motor Company other than

1 engagement as an expert in this IPR?

2 A. I do not.

3 Q. What did you do to prepare for today's
4 deposition?

5 A. Well, I think essentially two things. I
6 went over the documents that have been submitted as
7 part of the IPR, and I met a few times with counsel,
8 with Ford, Ford's counsel.

9 Q. Thank you.

10 Other than the documents that have been
11 filed as a part of this IPR, did you review any
12 other documents in preparation for today's
13 deposition?

14 A. I don't recall at the moment reviewing
15 any other documents.

16 Q. Have you reviewed any filings from other
17 IPR proceedings regarding the '450 Patent?

18 A. Maybe -- and maybe I'll -- if I may,
19 I'll return to the last question of -- subject to
20 obviously there are a number of documents, and it's
21 hard to remember everything.

22 But one document that I took a look at
23 is the claim construction memorandum and order from
24 the District Court, which you said which seems to me
25 separate from the documents filed in this IPR. I

1 looked at that.

2 Q. Thank you very much.

3 Have you looked at any documents from
4 IPR2021-01486, which was a petition filed by Dell
5 against the same '450 Patent a few years back?

6 A. You know, I think I may have. I may
7 have looked at something like this last month.

8 So, I think that's the best that I
9 can -- that I can say.

10 Q. Same question for IPR2022-01567, which
11 was a petition filed by Volkswagen against the same
12 patent.

13 Have you looked at any documents from
14 that proceeding?

15 A. Maybe not in considerable detail, even
16 if I did.

17 Q. Are you aware that a few months back the
18 Board issued a non-institution decision of
19 IPR2023-00797 on the basis that Petitioner in that
20 case had not shown a mobile user in the 802.16
21 standard?

22 A. I don't remember the IPR number.

23 So, generally, yes, I am aware that
24 there was something like that. But, again, I --
25 which IPR was it I am not sure.

1 account. And I aim for and I think I am providing
2 testimony that is consistent.

3 Q. Thank you.

4 You also mentioned you met a few times
5 with counsel.

6 Approximately how many hours would you I
7 say you met with counsel in preparation for today's
8 deposition?

9 A. Total about -- about four hours, I'd
10 say.

11 Q. And approximately how many hours did you
12 spend preparing on your own for today's deposition
13 other than meeting counsel?

14 A. It was obviously more time. Now, first
15 of last -- last month or when counsel called me
16 that -- for this deposition I admit I had forgotten
17 about this IPR and about the material. So it took
18 me some time to, again, familiarize myself with the
19 '450 Patent, with the institution decision, the --
20 and even, I admit, with the declaration that I had
21 submitted.

22 So it took me some time to review these
23 documents.

24 So maybe overall I've -- I've spent
25 about a week, something like that, preparing for the

1 Q. And what is the basis of your knowledge
2 about that other IPR which the number you're not
3 sure?

4 How did you learn -- let me rephrase the
5 question. I didn't mean to --

6 A. I may have -- just may have looked at
7 the institution decision.

8 Q. In connection either with preparation
9 for today's deposition or your original declaration
10 filed in this matter, did you review any of your
11 prior publications?

12 A. I mean I review them from time to time
13 overall, but I don't recall reviewing them
14 particularly in connection with this work.

15 Q. Did you consider whether opinions in
16 this IPR are consistent with your opinions as stated
17 in your prior publications?

18 A. Well, normally I would -- normally I
19 would consider that. And obviously to the extent
20 that I recall.

21 Now, in -- and I don't think there is --
22 I don't think there is a conflict of -- obviously
23 what is in the context in a -- in a publication is
24 possibly different.

25 But, yes, generally I do take this into

1 deposition.

2 Q. 40 hours, you would think?

3 A. I haven't -- I haven't done a
4 calculation. I would say yes, something like that.

5 Q. When, if you recall -- I know it was a
6 long time ago, when were you first contacted about
7 this case?

8 A. I was contacted in -- again, to the
9 extent that I remember, it was early 2023, maybe --
10 I don't remember. It could have been January. So,
11 between December 2022 and February or early March
12 2023 was when I was contacted for the first time.

13 And I was contacted by, I think, a Ford
14 different counsel back then.

15 (A clarification was requested by
16 the reporter.)

17 THE WITNESS: I was contacted by a
18 different counsel which represented Ford at that
19 time.

20 BY MR. HENDIFAR:

21 Q. How many hours, if you recall,
22 approximately did you spend prior to signing your
23 declaration in connection with your declaration?

24 A. Maybe a little bit more than a week.

25 Q. You have an amazing memory. I'm

1 impressed.

2 A. I'm just giving my best -- obviously
3 best answers.

4 Q. I appreciate that.

5 Have any of your opinions expressed in
6 your declaration changed since signing your
7 declaration?

8 A. No.

9 Q. Did you draft your declaration that was
10 submitted in connection with this IPR?

11 A. I think we -- we had some discussions
12 with counsel at Latham and Watkins at that time.
13 And I think I did not prepare the draft myself.

14 Again, since I'm a little bit -- my
15 memory's a little bit fuzzy on this. Maybe I
16 didn't.

17 Q. Now, the ground that you present in your
18 declaration is based on a combination of a reference
19 called Park and IEEE 802.16-2004 standard, correct?

20 A. Yes.

21 Q. Did you find the reference Park as a
22 basis of your opinions?

23 A. I think you mean did I -- did I identify
24 Park?

25 Q. Sure, yes.

1 A. I do not recall.

2 Q. Did you identify the 802.16-2004
3 standard as a basis of your opinions?

4 A. Yeah. I -- I don't recall specifically,
5 but I think when one reads the '450 Patent, that the
6 '450 Patent almost suggests that to identify an
7 802.16 standard.

8 Q. Did you identify any references as
9 potentially invalidating the claims of the
10 '450 Patent that are not reflected in your
11 declaration?

12 A. I -- I would say possibly. Possibly I
13 did to solve -- firstly, it depends what time frame.
14 Are we talking about back then when the declaration
15 was submitted? Soon after it was submitted?

16 I think Park is enough. I think just --
17 just basically put here so much and I would rather
18 be concise, if you will, and rely on -- on that.
19 But I think there are some -- I did not make a
20 complete and formal analysis of other -- using other
21 publications. But -- but generally maybe there
22 are -- I think that there possibly are some other
23 publications like that.

24 But to me, Park is -- is a concise
25 reference that is sufficient.

1 Q. Do you have a copy of your declaration
2 that you submitted in this matter?

3 A. I do.

4 Q. May --

5 A. I have an electronic copy. I do not
6 have any hard copies.

7 Q. However you're comfortable. Electronic
8 copy, hard copy, whatever --

9 A. The electronic copy I do have, yes.

10 Q. In the course of the examination you
11 should feel free to consult any of the exhibits in
12 this matter. As long as you tell me what you're
13 looking at and it's a clean copy I have no objection
14 or problem.

15 A. Yeah. All of the -- everything that I
16 have, all of the copies are clean copies. They -- I
17 don't have any markings on them.

18 Q. Wonderful.

19 May I please refer you to paragraph 75
20 of your declaration, Exhibit 1003.

21 (Whereupon the document previously
22 marked as Exhibit 1003 was
23 referenced and is attached
24 hereto.)

25 THE WITNESS: Paragraph?

1 BY MR. HENDIFAR:

2 Q. 75.

3 A. 75. Yes. I am there.

4 Q. The last sentence in that paragraph
5 reads,

6 "Opposer would have found it
7 obvious to implement Park using the
8 802.16-2004 standard to reach
9 Park's specifically direct
10 opposer."

11 Do you see that?

12 A. I do.

13 Q. The combination you present in your
14 declaration is exclusively Park in view -- alone or
15 in view of the 802.16-2004 standard, correct?

16 A. I mean as I've just said, I think -- I
17 think you are correct. I will nevertheless take a
18 look. But this paragraph 75 is part of section 11
19 which is ground one, Park in view of 802.16-2004.

20 But I think -- I mean I think basically
21 even just Park is -- is -- is sufficient.

22 Q. Now, you mentioned the title of the
23 section ground one.

24 Was there a ground two in your
25 declaration that you deleted?

1 A. Yeah. I am -- there is no ground two.

2 Q. I understand.

3 So my question is was there a ground two
4 that you deleted?

5 A. Oh, I see. I do not recall that there
6 was ground two.

7 Q. So, going back to my original question,
8 then, the only ground presented in your declaration
9 is Park either alone or in view of 802.16-2004,
10 correct?

11 A. I think generally that's a fair way.
12 I -- the way here is stated Park in view of
13 802.16-2004. That to me this means the Park
14 combined with 802.16-2004.

15 But the way you phrased it --

16 Q. I'll rephrase it. I don't want to be --
17 it's not meant to be a trick question. I'll
18 rephrase my question.

19 Is it fair to say that the only ground
20 you present in your declaration is Park combined
21 with IEEE 802.16-2004?

22 A. I think yes.

23 Q. In your declaration you also discuss a
24 different -- well, an amendment to the standard
25 called 802.16(e), parentheses E, close parentheses,

1 correct?

2 A. I mention that, yes.

3 Q. You also explain that you were involved
4 in the 802.16 standard, that ratification, correct?

5 A. Yes. I can -- maybe I can explain.

6 But, yes, precisely around that time I attended
7 several meetings of 802.16.

8 I attended meetings just -- most of the
9 time I was in another working group 802.11, but
10 whenever I had time I went also to 802.16 as being
11 interested.

12 Also there was a -- there was a group --
13 my memory is vague, but there was a liaison between
14 802.11 between WiFi and 802.16 and I was part of --
15 and maybe I was the liaison. And I submitted some
16 letters for that to the working group.

17 And in addition to that, I voted on the
18 802.16 -- I voted on several of the 802.16 standards
19 and amendments since then.

20 Q. Thank you.

21 Around September of -- let me step back.

22 The 802.16 amendment (e) was published
23 around -- or was ratified, rather, around December
24 of 2005, based on your declaration, correct?

25 A. Yes, that's correct.

1 Q. Were draft amendments available prior to
2 December 2005 for the (e) amendment?

3 A. Well, of course. It doesn't -- it
4 doesn't appear all of a sudden.

5 I think there were -- and I'll give
6 maybe a more complete answer to your question.

7 In September of 2000 and -- we are
8 talking September 2005. In September of 2005
9 802.16(e) was almost complete. So there were --
10 there were about 12 drafts before it was ratified.

11 What -- what was finally approved in
12 December, as we said, was either draft 11 or draft
13 12, maybe draft 11 became draft 12, and then it was
14 approved, or draft 12 was approved.

15 But draft 10 was available in August of
16 2005.

17 So, and draft 11 was available in -- in
18 October of 2005.

19 So that's -- that's all within a couple
20 of weeks after the -- after September of '05.

21 So almost -- draft 10 I mean is -- just
22 as the number suggests, is very close to the final
23 draft 12. That is what was known about 802.16(e).

24 Q. Thank you very much.

25 And did you look at something to come up

1 with these dates or are you just speaking from
2 memory?

3 A. No. I did -- I did check. At some
4 point I checked, Counsel. I looked at the history
5 of 802.16(e).

6 Q. But right now you are speaking from
7 memory?

8 A. Right now I am speaking from memory.

9 Q. Thank you so much.

10 And when you say draft 10 was available
11 in August 2005, how was it made available? Was it
12 posted on a website? Was it distributed to members?
13 Was it by request only?

14 A. It's -- drafts are all on website, but
15 they are on a website that requires a password. So
16 I believe that drafts are available only to voting
17 members.

18 So, one had to be a voting member of
19 802.16 to get the draft.

20 Q. Understood.

21 How does one become a voting member of
22 802.16 at the time?

23 A. By attending two consecutive meetings,
24 registering and even -- even attending meetings,
25 being there all the time. So there is a -- strict

1 attendance is taken.

2 And at the beginning of the third
3 meeting you are considered a voting member. You are
4 part of the voting members and you get the password
5 to access everything that is for voting members
6 only.

7 Because the reason is that only voting
8 members of 802.16, they vote on individual drafts.

9 And so I said earlier that I voted. So
10 the way -- the way these standards are being
11 developed is after 802.16 is done, basically after
12 they came up with -- they came up with 802.16 or any
13 of the amendments.

14 So after they're done, then other people
15 vote. So there's another round. There is another
16 round of voting. And I was part of that round.

17 I was not a voting member of 802.16
18 because I was a voting member of 802.11. And you
19 can't be in more than one place at any one time. I
20 think that is -- we have not figured that out yet.
21 And I couldn't do it.

22 So I was -- most of the time I was in
23 802.11. But that was after the 802.16 group was
24 done, then there is a group by invitation, it's
25 usually formed by invitation of the 802.16 group

1 chair. And I was part of that group. And then I
2 would review the -- I would review the draft,
3 provide comments if I -- if I had any comments.
4 That was how the work was done.

5 Q. So just so I'm clear, when you say you
6 reviewed the draft after it was introduced by the
7 voting members, was it for each draft, for example,
8 draft 9, 10 and 11, or was it the final draft, and
9 after that you would be involved?

10 A. A good question.

11 If I said draft, that -- I was not --
12 that is not accurate. No, I did not vote on the --
13 on each individual draft. That is -- that is for
14 the -- within the working group.

15 I -- I voted on an amendment. And
16 sometimes they are called draft amendments or
17 something. So there is -- the language sometimes is
18 not just -- I'm not that accurate. So I voted on
19 complete amendments.

20 Q. Do you recall when you voted on the
21 802.16(e) amendment approximately?

22 A. No, I don't recall that. But it's, I
23 guess, sometime soon after they were done.
24 That's -- they were done by December of '05. So
25 sometime in '06 probably I did. But I don't recall.

1 Q. Is it fair to say that you were given a
2 copy of the 802.16(e) amendment after it was
3 approved by the voting members in December 2005?

4 A. Yes.

5 Q. And you had not seen a copy of it before
6 then?

7 A. I described the process. Probably not.

8 Q. Now, you mentioned that in 2005 a person
9 could become a voting member of the 802.16 standard
10 by attending two consecutive meetings and then
11 registering.

12 Do you recall that?

13 A. I do.

14 Q. Are there any educational or experience
15 requirements or were there in 2005 in order to
16 become a voting member of the 802.16 group?

17 A. I can't say that there was a formal
18 educational requirement. But I don't think that
19 they were checking educational background.

20 Obviously one needed also to request --
21 I mean maybe formally you need to request to become
22 a voting member, but that's a formality.

23 I don't think there was an educational
24 requirement, but many, many voting members had Ph.D.
25 degrees. I think almost all of them has Ph.D.

1 degrees or master's degrees.

2 Q. Approximately how many voting members of
3 the 802.16 were there in September of 2005?

4 A. There's -- there's a little bit of a --
5 obviously I need to make a little bit of a guess
6 here.

7 The number of voting members, you know,
8 there are -- there are swings in that number.
9 Sometimes when -- in the -- when there is
10 considerable interest, broad interest in what is
11 being developed, the nature of major amendments,
12 there are more voting members as more people attend.
13 And sometimes not as many.

14 I think around that time, relatively
15 speaking, there were many voting members. I would
16 expect the number to be around 300. And all this --
17 give or take 40, 50 members. It's -- again, it's --
18 to some extent it's a guess.

19 But it wasn't any -- the technology area
20 was being in a state of active development --
21 (inaudible comment) -- amendment.

22 Q. We got disconnected. Your last
23 sentence?

24 A. I apologize. Maybe now it's better, but
25 it's something with the connection.

1 So, 802.16(e) was a major amendment.
2 And, yeah, I -- at the time -- I mean the business
3 case was -- there were questions about the
4 technology, but some were very enthusiastic about
5 the technology. I -- as I said, I would expect
6 around 300 voting members at that time.

7 Q. I appreciate your attempt to provide a
8 complete answer. I really do.

9 Why was 802.16(e) considered a major
10 amendment in 2005?

11 A. Well, it includes the performance of
12 the -- all the previous amendments, I mean grouped
13 under this 802.16-2004 title.

14 So, 16(e) improves their performance
15 when there's mobility.

16 And 802.16 even for a while had -- was
17 trying to make 802.16 the standard for fourth
18 generation cellular telephony. These ideas did
19 exist at the time.

20 And so this is an additional reason why
21 it was a major -- major amendment.

22 Q. Thank you.

23 You mentioned you transmitted letters to
24 the 802.16 committee.

25 Did I understand you correctly?

1 A. Yes.

2 Q. How many letters approximately did you
3 send?

4 A. I said I was fuzzy. Two, maybe three.
5 Not that many.

6 Q. Do you recall the time frame when you
7 sent these letters?

8 A. It might have been earlier than 2004. I
9 do not recall the time frame. But between 2001 and
10 2003 would be my guess.

11 Q. And what was the context which prompted
12 you to send these two or three letters?

13 A. I don't recall.

14 Q. Do you recall what was said in those
15 letters?

16 A. You know, I -- I really do not --
17 possibly -- possibly some issues of interference.
18 Possibly, you know, something to do with that.

19 Q. Are these letters, to your knowledge,
20 publicly available?

21 A. I don't know.

22 Q. If you were to search for these letters
23 on the internet, where would you start?

24 A. Well, there's only -- I think each
25 working group has -- has a repository of documents.

1 So that would be, as you said, where one would
2 start.

3 I am not sure that they are there.

4 Q. Understood.

5 A. I have my personal repository. Maybe I
6 can check. I haven't checked there to find
7 something from that time.

8 Q. You mentioned that after the 802.16(e)
9 amendment was ratified by the approximately
10 300-plus/minus 40 or 50 people voting members in
11 December of 2005 and you were invited as a part of
12 the group to vote on that amendment, as well.

13 Did I understand you correctly?

14 A. You understood me correctly, yes.

15 Q. And what was the criteria for the
16 invitation for the voting after the ratification of
17 the amendment?

18 Or what about -- who were the people who
19 were invited? What was the criteria for the
20 invitation?

21 A. So, generally the criteria is that this
22 group -- some diversity is required in this group.

23 Diversity meaning people that -- well,
24 now, they -- some could have been part of 802.16,
25 but I think most were not part of 802.16. So they

1 were not -- they were not part of the core group
2 that developed that.

3 Diversity meaning that some of them
4 was -- it is desirable to be from -- possibly some
5 of them having academic background, some of them
6 having industry background, maybe some of them from
7 research institutes.

8 And 802.16 like all of the 802 is a
9 national standard. So I think some international
10 participation is also required.

11 So, in the sense diversity is required.

12 And it's not only by invitation. I
13 think one could -- one expresses a volunteer
14 interest as part of their profile.

15 The formal requirement is that those
16 that voted had to be members of the IEEE Standards
17 Association. That's a formal requirement.

18 And there is then profile I think one
19 can express an interest in voting.

20 And that's how they could become part of
21 this -- of this group, if they indicate in voting in
22 precisely these types of -- these types of
23 standards.

24 So that's generally how this group was
25 formed.

1 Q. Thank you very much.

2 Do you know approximately how many
3 people were invited with you to vote on the
4 802.16(e) amendment after it was ratified in
5 December of 2005?

6 A. I don't. I don't know how many were
7 invited.

8 Q. So do you have an estimate, rough
9 estimate?

10 A. And also there's a difference between
11 those that were invited and those that actually
12 submitted -- reviewed the document. It takes a long
13 time to review a document like that and to submit a
14 vote.

15 I would say that -- I'm not sure. The
16 number of people that voted maybe is between --
17 between 30 and 50. Again, it's -- it is some guess.

18 Q. So a relatively smaller number than the
19 number that originally voted on the amendment in
20 December of 2005?

21 A. Yes.

22 Q. Are you familiar with Mr. Bill Alberth,
23 who submitted -- who submitted declarations on
24 behalf of the Patent Owner in other IPR's
25 challenging the '450 Patent?

1 A. No, I was not familiar. And I'm not
2 familiar.

3 Q. Okay. Did you personally work on any
4 aspect of the 802.16 standard relating to mobility?

5 A. That is a very specific question. I
6 can't say that I did.

7 Q. Have you used any products that use --
8 or that comply with the 802.16 standard?

9 A. No, I haven't.

10 Q. Have you seen any products that comply
11 with the 802.16 standard?

12 A. To some extent, yes. I'm not sure how
13 complete were they. So that's why I'm saying to --
14 to some extent.

15 Q. Would you please elaborate what were the
16 products and to what extent you believe they were
17 complete and the time frame?

18 A. 802.16 I think it would -- it's correct
19 to say -- and I'm trying to be careful here, but I
20 think it's correct to say that the market for 802.16
21 in the United States did not succeed. There were
22 some expectations that it would succeed, but I think
23 it did not.

24 The -- there was only one major U.S.
25 service provider who did some sort of a trial on a

1 trial basis to provide 802.16 service. And I think
2 that was Sprint. Around 2005 or 2006 they did on a
3 trial basis.

4 There was a company called -- there was
5 a company called WiMAX.com. And WiMAX is -- is an
6 industry organization that was certifying products
7 as compliant.

8 So it wasn't part of 802.16. It's
9 separate. But they were using the 802.16 standard
10 as the basis for their compliance testing.

11 But this -- this is separate. This
12 company was WiMAX.com.

13 I mean I -- there's some vague
14 recollection. I think they were based on the campus
15 of the University of Texas at Austin in one of the
16 buildings in Austin. And once they invited me to
17 teach a short course on 802.16.

18 So I visited in fact I think only once,
19 but it might have been twice. I might have given
20 two short courses organized by WiMAX.com in Austin.
21 And I think there was something there.

22 But that was -- as far as -- as you
23 said, seeing equipment -- right? -- I haven't used
24 it, didn't operate it, but there was something
25 there, I think.

1 Q. "There," you mean at WiMAX?

2 A. At WiMAX.com in Austin, Texas.

3 Q. And the time frame when you saw for the
4 first time a product that complied with 802.16 was
5 roughly 2005 or 2006, you said?

6 Or when was it? I'm sorry.

7 A. 2006/2007.

8 Q. Thank you.

9 And in the literature I've seen the
10 nomenclature "fixed WiMAX" and "mobile WiMAX."

11 Are you familiar with that terminology?

12 A. I think generally I am familiar with
13 that terminology, yes.

14 Q. Were there two separate WiMAX
15 certifications, one for fixed and one for mobile
16 devices?

17 A. That's something that sounds about
18 right.

19 Q. I read a White Paper that described how
20 as of September 2005, Samsung had not succeeded in
21 making a chip that implemented 802.16 that would fit
22 on a mobile device.

23 Are you familiar with any such efforts?

24 MR. LeROY: Objection. Beyond the
25 scope.

1 THE WITNESS: I have some general
2 familiarity, yes, with -- with such efforts. Not
3 in -- not in details what Samsung had achieved, but
4 generally I am familiar, yes.

5 And probably that was -- as you said,
6 probably that was in connection with the WiBro
7 development.

8 (A clarification was requested by
9 the reporter.)

10 THE WITNESS: Yes. WiBro, W -- capital
11 W-i capital B-r-o.

12 BY MR. HENDIFAR:

13 Q. And what is the extent of your
14 familiarity about the effort to make hardware that
15 would implement 802.16 on a mobile device?

16 A. Well, maybe I can begin with WiBro.

17 I said that at the time 802.16 and all
18 of the -- all of the amendments, which there were
19 numerous -- but all of the amendments were in a
20 state of pediatric development. So all the work was
21 done.

22 And also developing a standard or an
23 amendment by technically .16 is an amendment, so it
24 inherits a lot of things from the base standard but
25 enhances the base standard, which is the 2004 in

1 this case.

2 So an amendment is -- it's a lot of work
3 to develop the amendments. And it just -- it just
4 takes time.

5 It's -- although the process is fairly
6 efficient, but it does take time. And sometimes
7 companies, they -- I should say even not sometimes,
8 but almost always companies begin their product
9 development before the standard is done. Companies
10 do not wait to -- once the standard is done and
11 everybody votes on it and then they do sit down and
12 implement that. It doesn't work like that. And if
13 it -- if it did, it's going to take them a long time
14 to do it.

15 No. Companies, they do their
16 development in parallel with the development of the
17 standard. So much so that sometimes they would like
18 to be done even almost -- almost like be done even
19 before the amendment is formally voted.

20 But somehow I think that that -- that
21 has been and probably still is desirable.

22 And not only that, but by being done
23 with the product, that means, well, you have to have
24 even certification testing so you have -- the
25 product has to be tested. And it's -- so companies

1 want -- wanted to move fast.

2 And so what happened is that WiBro, they
3 said -- I think WiBro took draft two of 802.16(e).
4 They said -- they said we are okay basically with
5 the second draft.

6 And a short while ago you asked me about
7 the tenth -- draft 10, which was in August 2005.
8 But WiBro, they're based on draft two. I'm not sure
9 when was that, but it's obviously earlier than draft
10 ten.

11 So WiBro, they said, "well, we'll take
12 draft two of 802.16(e), and that will be the
13 foundation of the WiBro technology."

14 And I think WiBro can be -- can be
15 considered as -- as a -- somewhere there's a
16 question is it a standard.

17 I think it can be considered as a
18 standard. It's essentially, as I said, based on
19 draft two.

20 So they took that draft two and then
21 they said "if there are any inconsistencies in that
22 draft two, we'll figure them out."

23 So as a standard, one can say that's
24 what WiBro is. It's also a technology. Also a
25 service. I think it can be -- all of these things

1 can be called to WiBro.

2 And Samsung wanted to have proper
3 development for WiBro.

4 Probably as far as performance, power
5 consum- -- all of the -- all of the things that you
6 need to have for a mobile device, probably it took
7 them a little bit more time than September of 2005.

8 Q. Are you aware of any other company that
9 was able to manufacture a mobile device implementing
10 WiBro as of September 2005?

11 A. I'm not aware of any other company.

12 Q. I think we've been going for an hour.

13 Is it a good time for a break?

14 A. That would be fine.

15 Q. Is ten minutes okay for you?

16 A. How about 12 minutes to make it more
17 accurate so we can start in -- what? In 25 after
18 the hour.

19 MR. HENDIFAR: You are the boss. See
20 everybody at 25 minutes past the hour.

21 (Brief recess.)

22 BY MR. HENDIFAR:

23 Q. Okay. Dr. Cooklev, welcome back.

24 During the break did you speak with
25 anybody about this deposition?

1 A. No, I didn't.
 2 Q. We put a document in the chat box which
 3 we will mark as Exhibit 2025. It is a book titled
 4 "Wireless Communication Standards" by Todor Cooklev.
 5 (Whereupon the document referred
 6 to was marked Exhibit 2025 and is
 7 attached hereto.)
 8 BY MR. HENDIFAR:
 9 Q. Do you see that?
 10 A. I do.
 11 Q. Is this a book you authored?
 12 A. Yes.
 13 Q. Okay. On the second page of the pdf
 14 document it says "Published August 2004."
 15 Do you see that?
 16 A. Yes.
 17 Q. On page roman numeral xii, if you can
 18 just go there.
 19 A. X -- yes.
 20 Q. Last paragraph it reads,
 21 "I have made an effort within the
 22 text to reflect not only the state
 23 of the wireless standards at
 24 publication time (2004), but to
 25 provide guidance as to what

1 developments might happen in the
 2 future."
 3 Do you see that?
 4 A. Yes, I do.
 5 Q. Is it fair to say that your discretion
 6 of the 802.16 standard in your book applies to
 7 802.16-2004 version standard, as well?
 8 A. I think so.
 9 Q. May I just refer to page 32 of this
 10 book, Exhibit 2025.
 11 A. It's not of the pdf or --
 12 Q. I'm sorry. I will be referring only to
 13 the native page numbers.
 14 A. Okay.
 15 Q. Page 32, native page number of
 16 Exhibit 2025?
 17 A. I am there.
 18 Q. First paragraph reads, quote,
 19 "However, when using high-speed
 20 wireless data communication
 21 products, users require limited
 22 mobility. As a result, it is both
 23 convenient and realistic to assume
 24 that the channel characteristics do
 25 not change within a packet, only

1 from packet to packet."
 2 Do you see this sentence?
 3 A. Oh, yes.
 4 Q. Thank you.
 5 What types of speeds were you referring
 6 to in this text when you refer to "high-speed
 7 wireless data communication products"?
 8 A. So, here the sentence -- the terms
 9 "high-speed wireless data communication products,"
 10 the "high-speed" is not a measure of speed.
 11 "High-speed wireless data communication" refers to
 12 high data rate.
 13 Q. No. I understand.
 14 What data rate -- I started -- my
 15 question was not clear. I'll rephrase my question.
 16 What types of data rates were you
 17 referring to on page 32 of your book when you said
 18 "high-speed wireless data"?
 19 A. Well, the -- so, so I understand the
 20 question is what did I mean by "high-speed" in 2004.
 21 Q. What types of data rates, correct?
 22 A. What types of data rate would qualify as
 23 high speed?
 24 Q. Right.
 25 A. Well, clearly the answer is relative,

1 meaning that the time is -- is important. So
 2 obviously what -- what was high speed in 2004 is not
 3 high speed today.
 4 And I even -- I mean I will answer -- I
 5 will give you an answer.
 6 To the extent that I recall, obviously,
 7 and -- you know, even though that it's my book, I
 8 can say some things I don't necessarily remember or
 9 recall.
 10 So, but the answer I think should be
 11 approached so the -- as far as requirements towards
 12 mobile communications and wireless communications,
 13 the international telecommunications union is known
 14 to -- has published a major set of requirements.
 15 They publish requirements for third generation
 16 mobile telephony and later publish requirements for
 17 fourth generation mobile telephony.
 18 And they say they -- I think this is an
 19 answer to your question, basically, it's what is
 20 according to them at the time high speed.
 21 So, for -- just to the extent that I
 22 recall, for third generation mobile telephony the --
 23 it's on the order of one to two megabits per second
 24 in a fixed lo- -- while stationary.
 25 So, while the device is moving as far as

1 third generation technology, that was considered
2 high speed.

3 Q. Between one to two megabits per second?

4 A. That was even -- that was even while the
5 device is stationary. It's not -- not even moving
6 at 60 miles an hour. It's more like zero to five
7 miles an hour.

8 And moving at 60 miles an hour, I forgot
9 what the -- I'm sorry. I forgot. But it's -- it's
10 quite a bit less. It's on the order of -- it might
11 have been 144. I don't know. This number somehow
12 pops up. But on the order of 100 to 200 kilobits
13 per second at the time when the device was moving.

14 Q. So you said your response is based on
15 some publication by somebody. I missed the name of
16 the organization that you referred to.

17 A. International Telecommunications Union.

18 Q. And what is that?

19 A. There are requirements -- I think the
20 requirements are called IMT -- IMT-2000 and there's
21 IMT-2020.

22 Q. I-N, as in November?

23 A. No. M, as in mobile. IMT-2000.

24 So maybe at the time we can look at what
25 IMT 2000 -- again, you ask some things that I'm just

1 answering based on my memory. So sometimes I could
2 be -- I could be a little bit off my answer. But
3 that's what I recall.

4 Q. So, on page 32 of your book Exhibit 2025
5 when you "high speed," you are referring to
6 something on the order of one to two megabits per
7 second?

8 A. I mean I am -- I'm using this term
9 somewhat loosely here in this sentence. I can't say
10 that I had in mind like one to two megabits per
11 second.

12 Q. Okay. What did you have in mind?

13 A. Not sure that I can -- I'm not sure that
14 it's a specific number.

15 I think both 802.11 and 802.16 at the
16 time, which -- which I am discussing in this book, I
17 think both at the time could be referred to as high
18 speed.

19 So I think -- and so even if I -- if I
20 look at the entire sentence, what I think is the --
21 the context is that the users at the time did not
22 browse the internet while in -- generally while in a
23 high-speed vehicle; that much of the time while we
24 browse the internet, maybe in a vehicle users are --
25 in a vehicle users are interested in telephony and,

1 therefore, voice.

2 That's not a -- that doesn't require
3 very high data rate.

4 Q. Now, why was it that when using
5 high-speed wireless data communication products the
6 users require limited mobility?

7 A. We don't use laptops in vehicles.

8 Q. I'm sorry. I'm not sure I understood
9 your response.

10 A. I think because we don't use laptops
11 while we are in vehicles.

12 Q. So in your book you mention that when
13 using high-speed wireless data communication
14 products, users require limited mobility, correct?

15 A. Yes, I think that's what it says.

16 Q. Okay. So, doesn't that mean that when
17 using high --

18 Well, here are you talking about the
19 desires of users or the limitation of technology?

20 A. I was more talking about the behavior of
21 users.

22 Q. Okay. In the subsequent sentence in
23 this book you state in that same paragraph, quote,
24 "In the case of a laptop computer
25 with a wireless network interface

1 card, the LOS path can be shadowed
2 by people moving in the vicinity of
3 the laptop."

4 Do you see that?

5 A. Yes.

6 Q. "LOS" refers to the line of sight,
7 correct?

8 A. Yes.

9 Q. What is -- what are you trying to convey
10 in this sentence in your book?

11 A. That there is additional attenuation due
12 to people moving in the vicinity of the laptop.

13 Q. Why is that an issue?

14 A. Well, attenuation is an issue because
15 of -- it needs to be taken into account. It will
16 limit the data rate that can be achieved or it will
17 require transmission at the high power.

18 Q. May I please refer you to page 37 of
19 your book, again native page number.

20 A. Yes. I'm looking at it.

21 Q. So, the first paragraph towards the end
22 of the book reads as follows, quote,

23 "Because communication systems must
24 support not only internet access
25 but also voice and video, both

1 traffic types must be handled.
2 This requirement makes the design
3 of a Mac a difficult task."

4 Do you see that?

5 A. I do.

6 Q. Why does the requirement to support both
7 internet and voice and video traffic make the design
8 of the MAC a difficult task?

9 A. Because I think if we look at the first
10 sentence on this page, it says,

11 "Traffic can be classified in two
12 groups: Periodic and bursty."

13 So, voice and video are in the category
14 of periodic traffic. Data is in the category of a
15 bursty traffic.

16 And so if the MAC is based on the
17 principle of time division, that's good for periodic
18 traffic but not good for bursty traffic,
19 inefficient. It will still work, but not as
20 efficiently.

21 And if the MAC is based on getting a
22 sense multiple access, we have the -- the opposite
23 problem that that's good for bursty traffic such as
24 data, but not as efficient for periodic traffic such
25 as voice and video.

1 Q. Now, why is TDMA not efficient for
2 bursty traffic?

3 A. I can explain.

4 So to some extent the answer is on page
5 38 in the middle of -- it says,

6 "In slotted systems such as TDMA,
7 all users are effectively
8 synchronized and have different
9 time slots of certain duration
10 assigned to them in periodic
11 fashion."

12 So if I skip -- if -- I'm skipping some
13 sentences, but for bursty traffic channel capacity
14 then is wasted because the station will have a time
15 slot assigned, even if it doesn't have anything to
16 transmit.

17 And another problem is selecting the
18 time slot duration and packet size.

19 So, due to these -- at the high level,
20 due to these problems, TDMA is not efficient for
21 bursty traffic.

22 Q. Got it.

23 Now, did you -- I think I heard you
24 correctly that for bursty traffic, carriers sense
25 multiple access is more efficient.

1 Did I hear that correctly?

2 A. Yes.

3 Q. And that's abbreviated as CSMA, correct?

4 A. Yes.

5 Q. What does "CSMA" mean?

6 A. Carrier-sense multiple access.

7 Q. And how does that differ from TDMA?

8 A. Carrier-sense multiple access is also
9 known as just basically transmit when -- whenever
10 you have data. I mean that's the first idea. So --
11 it's also called listen, but listen before talk.

12 So you are listening to the medium. And
13 if the medium is available, and obviously if you
14 have data to transmit, go ahead and send your data.
15 That's basically the idea.

16 Q. Is there -- can CSMA data be transmitted
17 through different methods such as TDMA or OFDMA, or
18 is it limited to just a specific type of modulation?

19 A. No. It's not limited to a specific type
20 of modulation. OFDM will work.

21 Q. Now, why is CSMA not efficient for
22 periodic data?

23 A. CSMA is -- and actually there is --
24 maybe there's a high level discussion in the book,
25 but it's not efficient because gaining access to the

1 medium may take -- may take time. There's no
2 guarantee -- even if you have data to transmit,
3 there's no guarantee that you will get access to the
4 medium, get a chance to transmit in a timely
5 fashion.

6 Q. Thank you very much.

7 Now may I please refer you a couple
8 pages down on page 39 of Exhibit 2025.

9 A. Which page?

10 Q. 39.

11 A. I am there.

12 Q. The paragraph towards the bottom of the
13 page reads, quote,

14 "Wireless communication protocols
15 are affected by the mobility of
16 stations. There are two types of
17 stations to distinguish between;
18 portable and mobile stations. A
19 portable station is one that can be
20 moved from one place to another
21 place, but normally participates in
22 a wireless network when it is in a
23 fixed location. Fixed or slowly
24 moving stations can be considered
25 portable. Mobile stations can

1 participate in a network while in
2 motion."

3 Do you see that?

4 A. I do.

5 Q. What did you mean by "slowly moving" in
6 this sentence?

7 A. Generally slowly moving stations are
8 stations moving at pedestrian speed.

9 Q. Now, you mentioned mobile stations can
10 participate in a network while in motion.

11 Do you see that?

12 A. Yes.

13 Q. Then later you say,

14 "The basic requirements of the MAC
15 are the MAC must handle mobile
16 users."

17 Do you also see that?

18 A. Yes.

19 Q. What do you mean by the MAC being able
20 to handle mobile users?

21 A. Here I first mean this is a high-level
22 description here.

23 So, there are several here requirements
24 for the MAC that arise from this. The first
25 requirement is that stations join and leave the

1 network freely.

2 So, a base station or even an access
3 point, I mean, it doesn't know of the -- of the
4 existence even of a simple subscriber station, that
5 you can't assume that that subscriber station is
6 always connected to the base station or to the
7 access point. It may come and may leave.

8 And so the protocol needs to take this
9 into account.

10 And so that's -- that is -- that's the
11 first thing.

12 And the second thing is that the -- the
13 way a station gets access to the medium, that also
14 needs to -- that also needs to take into account
15 that -- it has to be efficient, because the station
16 is -- is mobile.

17 Q. Would the MAC in a mobile wireless
18 network need to be able to handle hand-overs?

19 A. In a general sense, yes.

20 Q. What is a hand-over?

21 A. The transfer of -- again I'm not
22 giving -- I'm not writing a dictionary here or
23 providing a formal definition for a hand-over, but
24 it is the -- as a general idea, it is the transfer
25 of an active connection from one base station or

1 access point to another.

2 Q. Now, how would the MAC be different in a
3 system where users cannot be assumed to always be
4 connected from one where users can be assumed to
5 always be connected, the first difference you were
6 explaining about MAC?

7 A. Well, one aspect of that is --

8 I can start -- you asked about
9 hand-over. And if the stations are assumed to
10 always be connected to one access point or base
11 station, there's no need for a hand-over.

12 And the other is, as I said, the
13 stations do not need to -- there's no need to listen
14 for beacons and -- because if the station is known
15 to be all -- to be there, and obviously the access
16 points of base stations, they are known to be there,
17 so that -- that simplifies -- that simplifies a
18 number of things.

19 Q. And I'm sure you did an amazing job of
20 expanding it. I don't have a background in this
21 technology.

22 I don't think I understood the last
23 aspect of what you just explained, which was about
24 after a hand-over you explained how the MAC may be
25 give in a system where the users cannot be assumed

1 to always be connected. I don't believe I
2 understood that.

3 Would you be kind enough maybe to try a
4 different way of explaining it?

5 A. Yeah. I can -- I can try.

6 So, that's a separate aspect from the
7 hand-over aspect.

8 I said that users can join the network
9 and leave the network at any time. And so as a
10 consequence of that, the MAC needs to adapt to be
11 able to serve a varying number of stations.

12 So it's in essence what -- I mean I can
13 give an example of what is not -- what would not be
14 desirable is if the base station services -- maybe
15 it services 50 stations. But when the 51st station
16 comes -- right? -- that then the 51st station cannot
17 do anything or, even worse, it will present as an
18 interference to the others.

19 So, that would not be -- that would not
20 be a -- a good outcome.

21 It would be outcome -- a good outcome
22 would be when the 51st station comes, the MAC adapts
23 and provides a -- provides or makes assignment of a
24 time frequency resource for the 51st station to
25 transmit and receive.

1 Q. Understood.

2 In other words it is flexible in terms
3 of the number of users it can handle?

4 A. I think that that's a -- that's a good
5 way to say it.

6 Q. Understood. Thank you very much for
7 that explanation.

8 May I please refer you to native page
9 number 226 on Exhibit 2025.

10 A. 226?

11 Q. Yes.

12 A. I am there.

13 Q. Second paragraph second sentence reads
14 as follows, quote,

15 "Fixed broadband wireless access
16 systems typically include at least
17 one base station and a number of
18 subscriber stations (SS)."

19 Do you see that?

20 A. Yes.

21 Q. In this sentence by base station -- I'm
22 sorry. Strike that.

23 In this sentence by subscriber stations
24 you mean stationary or fixed subscribers, correct?

25 A. In this sentence, yes.

1 Q. May I please refer to you page 331 of
2 Exhibit 2025, again native page number.

3 A. Oh, 331?

4 Q. I assure you I read all the titles in
5 between.

6 A. Okay. Which is good. I haven't done
7 that recently, but --

8 Q. Please let me know when you're there.

9 A. 331. Okay. I'm there.

10 Q. First paragraph towards the middle reads
11 as follows, quote,

12 "Another initiative within IEEE
13 802.16 is to support mobility.
14 Task group 802" -- "802.16(e) was
15 established to support this
16 technology. The solution that will
17 be developed by 802.16(e) will
18 likely be devoting one part of the
19 superframe for fixed stations and
20 one part for mobile stations."

21 Do you see that?

22 A. Yes.

23 Q. What is a superframe?

24 A. It's how -- it's how transmissions are
25 organized --

1 Q. I can rephrase my question.

2 How does a frame compare to a superframe
3 in 802.16?

4 A. So, I think that even this sentence that
5 we are looking at gives the answer of that a
6 superframe is a collection of frames of different
7 types.

8 Again, not as a -- not as a definition,
9 but as an understanding of what superframe is.

10 So here we have this -- one part of the
11 superframe is for fixed stations. And it has
12 frames. So there -- there are frames for the -- for
13 the fixed stations.

14 There is another part for mobile
15 stations. And that part is -- there's a number of
16 frames there, but only for mobile stations.

17 And the boundary between these two
18 parts -- that's -- that's a -- that's a part of the
19 superframe.

20 Q. Why was it necessary to divide the
21 superframe into one portion just for a fixed station
22 and to another portion just for mobile stations?

23 A. Because this is a way to support -- to
24 better support mobile stations and achieve backwards
25 compatibility with the previous version.

1 So that the stations that comply with
2 the previous version of the technology can use the
3 part of the superframe that's for fixed -- that in
4 this context, I should say, this context, is for
5 fixed stations.

6 Q. Did 802.16-2004 also use superframes?

7 A. You know, I --

8 Q. And you more than welcome to look at the
9 standard. I'd be happy to -- it's an exhibit. I'm
10 more than happy to put it in the chat.

11 A. I would like to look at the standard
12 too.

13 Q. It's Exhibit --

14 A. Yeah. I can -- I can find it.

15 Q. Sure.

16 A. It's Exhibit 1006?

17 Q. Yes. And if you don't have it, I'll be
18 happy to put it --

19 A. I have it.

20 It does talk about superframe in one
21 place in connection with advanced antenna systems.

22 Q. Where are you looking now?

23 A. I mean for example I'm looking at
24 802.16-2004. That's at the bottom it's page 574.

25 Q. And I'm sorry. Where does it say

1 superframe?

2 Oh, I'm sorry. Line number three.

3 What is AAS?

4 A. Advanced antenna systems.

5 Q. Is that for beam forming?

6 A. Yes.

7 Q. And is it necessary to use superframes
8 with AAS?

9 A. So your question is to support
10 subscriber stations that -- that have AAS? That --
11 in other words --

12 Q. Maybe I should have been more clear and
13 lay the foundation. I apologize.

14 AAS is antenna configuration for the
15 base station.

16 Am I mistaken?

17 A. Not necessarily. I mean even -- even in
18 the paragraph right here there's the term "AAS
19 enabled subscriber station."

20 So, an AAS enabled subscriber station is
21 a subscriber station that can transmit using an AAS.

22 Q. It doesn't mean a subscriber that can
23 receive. It means a subscriber that can transmit
24 using AAS?

25 A. That's correct.

1 Q. That requires a subscriber to have
2 multiple antennas, correct?

3 A. Yes.

4 Q. Did mobile devices in 2005 typically
5 have multiple antennas?

6 A. No.

7 Q. In that same page 574 of Exhibit 1006,
8 the paragraph towards the middle reads, quote,

9 "While the base station does not
10 have any subscriber stations
11 registered that are not capable of
12 using the adjacent subcarrier
13 permutation selected by the base
14 station, the base station may
15 employ the AAS superframe
16 structure. Otherwise, it shall
17 always return to the distributed
18 subcarrier permutation at the end
19 of each frame and provision
20 broadcast traffic at the start of
21 each frame."

22 Do you see that?

23 A. Yes.

24 Q. Am I understanding this correctly that
25 if there is any subscriber that is not capable of

1 supporting adjacent subcarrier permutation, then the
2 base station cannot use the AAS superframe
3 structure?

4 A. Could you please repeat?

5 Q. Of course.

6 Do I understand this portion of the
7 standard correctly that if there is any base -- any
8 subscriber station that cannot support adjacent
9 subcarrier permutation, then the base station cannot
10 employ the AAS superframe structure?

11 A. But I don't -- I mean this sentence --
12 at the beginning of this paragraph there is a --
13 there is a double negative.

14 Q. I can rephrase my question.

15 A. And the way I can answer right now, and
16 you can -- but I'm thinking that the answer to your
17 question seems to be no.

18 Because it says "while the base station
19 does not have." So if it does have subscriber
20 stations, that -- that are not capable of using the
21 adjacent subcarrier permutation, then it may not
22 use --

23 Oh, yes, I think -- I think that's
24 right. It may not use the AAS superframe.

25 Q. I'll rephrase question so the record is

1 clear to avoid the double negative.

2 Is it correct that in the standard
3 Exhibit 1006 the base station may only use the AAS
4 superframe structure when all the subscriber
5 stations are capable of using the adjacent
6 subcarrier permutation?

7 A. I think that's correct.

8 Q. Now, technologically why is it the case
9 that you need adjacent subcarrier permutation to be
10 able to use the AAS frame -- superframe structure?

11 A. Because -- just with -- with beam
12 forming, the adjacent subcarrier permutation will
13 operate -- will lead to high performance.

14 The distributed subcarrier permutation
15 is less suitable when there's beam forming.

16 Q. Now going back to what we were
17 discussing on page 321 of your book, back to
18 Exhibit 2025, and in the book we were discussing the
19 sentence that said,

20 "The solution that will be
21 developed by 802.16(e) will likely
22 be devoting one part of the
23 superframe for fixed stations and
24 one part for mobile stations."

25 Do you remember -- do you recall that

1 discussion?

2 A. Yes.

3 Q. Does 802.16-2004 divide a superframe
4 between fixed and mobile stations?

5 A. No, I -- I don't think the 2004 version
6 of the standard has the superframe -- this type of a
7 superframe. It was brought by 16(e).

8 Q. Now, how would the two categories of
9 frames be different and the solution you believe
10 would have been implemented in the (e) amendment
11 between mobile and fixed stations?

12 A. Excuse me. I didn't --

13 Q. I apologize.

14 You mentioned that the solution you
15 believed was likely to be implemented by the (e)
16 amendment was to divide the superframe between fixed
17 stations and mobile stations.

18 And then you explained that one category
19 of frames in the superframe would be for fixed
20 stations and then one category of frames would be
21 for mobile stations.

22 Did I understand you correctly?

23 A. I think that's -- that's right, yes.

24 Q. Now, how would the frames used for fixed
25 stations be different from the frames used for

1 mobile stations?

2 A. I -- I think as a general idea the
3 assignments -- so, in these -- within the superframe
4 the assignments of time frequency resources would
5 be -- would be different.

6 But to give a better answer, I would
7 have to look at the standard.

8 Q. Okay. Which standard would you need to
9 look at?

10 A. Well, now I think we need to look at
11 16(e), since that's what I think we started.

12 But -- but actually -- you know, let
13 me -- and if I may, I'll take a look at -- I have
14 here that's Exhibit 2005, which is Park.

15 Q. Just to be, sure, you're looking at Park
16 and you're waiting to review something? Is that
17 correct?

18 A. And for the record, yes. Thanks.

19 I'm looking at the same time for Park, I
20 returned back to Exhibit 2025, which is this book of
21 mine.

22 So, for example, Park Figure 1, Park
23 says that Figure 1 is -- shows a frame structure.
24 And I think this -- this is -- I think this is a
25 superframe, though a superframe is shown in -- in

1 Figure 1 of -- of Park.

2 We don't -- we don't need -- and this
3 superframe is for mobile devices. So we don't need
4 .16(e).

5 So, if Park paragraph seven says use a
6 frame structure of a WiBro, here WiBro stands for
7 wireless broadband, that's what -- that's what the
8 acronym WiBro stands for -- or enable 208.16 system
9 applied to an OFDM system.

10 Maybe -- maybe because this is
11 translation from Korean.

12 And I do note that there is -- another
13 exhibit is just basically a translation from Korean
14 of Park.

15 But this is a superframe for mobile
16 devices. And WiBro is -- is a system that is --
17 that was at that time intended, and a standard
18 intended to provide service for Bro -- for mobile
19 devices.

20 Q. So, on Park can you look at paragraph
21 five of Park, the same Exhibit --

22 A. Yes. Yes, I'm looking at paragraph
23 five.

24 Q. It starts with,
25 "Next generation mobile

1 communication systems."

2 Do you see that?

3 A. Yes.

4 Q. At the time of Park the current 802.16
5 draft was the 2004 draft, correct?

6 A. That's not completely accurate in the
7 sense that -- better was WiBro. And that is
8 important for Park.

9 And I said that WiBro is based on draft
10 two. Essentially draft two. I'm not sure that
11 there was another dot there technically, but around
12 draft of two of 802.16(e). And Park is in the
13 context of both -- 802.16, yes, but it's in the
14 context of WiBro.

15 So even -- even figure 1 of Park is a
16 superframe. So this is what you have to have
17 essentially to support mobility. So you have your
18 Figure 1.

19 And Park says Figure 1 even for Park --
20 for Park it is prior art.

21 Q. Very good.

22 Does Park's Figure 1 appear in the
23 802.16-2004 standard?

24 A. Well, let me -- for the record, I'm
25 looking at my declaration.

Page 66 1 Yes. 2 Q. Okay. Which figure in the 802-2000 -- 3 I'm sorry. 4 Where in 802.16-2004 does Park's 5 Figure 1 appear? 6 A. Well, I state in my -- I will look at 7 that -- I'll look at the 2004 standard. But in 8 my -- in paragraph 112 of my declaration I state 9 that this is in Figure 218 on page 500. 10 Q. I understood your declaration to refer 11 to the picture of the OFDMA frame shown in 12 paragraph 112 of your declaration, not Figure 1 of 13 Park. 14 A. Let me -- and maybe -- maybe I'm getting 15 a little bit tired, if I may. So I will answer the 16 question and I would like to ask for a -- 17 Q. Of course. Of course. And if you need 18 a lunch break, whatever you need, I'm sorry that I 19 didn't offer that. 20 A. Yeah. No problem. I would like to get 21 lunch. 22 Q. I'm fine with us having the question 23 pending. Because I want to have your best accurate 24 answer about where does Park's Figure 1 come from. 25 A. Okay.	Page 67 1 Q. Of course you understand you're not 2 allowed to speak to anyone during the break about 3 the contents of the deposition, including this 4 question. 5 I have no problem with you reviewing 6 Park or the 802.16 standard during the break. Be my 7 guest. 8 But my goal is not to trick you. I want 9 an accurate solid answer. 10 So, lunch break, is that what you'd 11 like? 12 A. I would like a lunch break. I'm not 13 sure how much time I'll have to review Park or the 14 standard, but at least, yes, I would like to get 15 lunch. 16 How about if we break until 2:30 17 Eastern? 18 Q. So, a 45-minute break. It's fine with 19 us, with the small caveat that we are on Pacific 20 Time, so we may need a half hour second lunch break 21 at some point. 22 A. That will be my coffee break. I'm fine. 23 MR. HENDIFAR: Okay. Counsel, is that 24 okay for you? 25 MR. LeROY: Yeah. That's fine.
Page 68 1 MR. HENDIFAR: Court Reporter, are we 2 good? 3 THE REPORTER: Sure. 4 MR. HENDIFAR: Okay. We will come back 5 at 30 minutes past the hour. 6 THE WITNESS: Okay. 7 8 (Whereupon at 10:43 A.M. a lunch 9 recess was taken.) 10 * * * 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25	Page 69 1 DECEMBER 3, 2024 2 11:34 A.M. (PACIFIC TIME) 3 * * * 4 5 (Whereupon at 11:34 A.M. the 6 deposition proceedings were 7 resumed.) 8 9 EXAMINATION (Resumed) 10 11 (Whereupon at 10:43 A.M. a lunch 12 recess was taken.) 13 * * * 14 15 16 17 18 19 20 21 22 23 24 25

18 (Pages 66 to 69)

1 DECEMBER 3, 2024
2 11:34 P.M. (PACIFIC TIME)
3 * * *

4
5 (Whereupon at 11:34 P.M. the
6 deposition proceedings were
7 resumed.)

8
9 EXAMINATION (Resumed)

10 BY MR. HENDIFAR:

11 Q. Welcome back, Dr. Cooklev.

12 Are we back on the record?

13 A. Thank you.

14 Q. During the break did you speak with
15 anybody about the deposition?

16 A. No, I did not.

17 Q. Going back to Exhibit 2025, your book
18 page 331.

19 A. 331, yes.

20 Q. Okay. So the sentence was, quote,
21 "The solution that will be
22 developed by 802.16(e) will likely
23 be devoting one part of the
24 superframe for fixed stations and
25 one part for mobile stations."

1 Do you see that?

2 A. Yes.

3 Q. To your knowledge, is your proposed
4 likely solution was the solution ultimately adopted
5 by 802.16(e)?

6 A. I think, yes.

7 Q. Okay. Can you point me to where in the
8 802.16 standard, what is the basis of your
9 opinion -- let me rephrase that.

10 Can you point me in the 802.16(e)
11 standard the basis for your view that the standard
12 adopted your proposed solution?

13 And the (e) standard is Exhibit 1014.
14 I'll be happy to put it in the chat so you can have
15 it.

16 A. Oh, okay.
17 1014?

18 Q. That's my understanding is that that's
19 802.16(e). But double-check that. I don't know if
20 that's accurate.

21 A. I may not --

22 Q. I'll put it in the chat. No worries.

23 A. If you could --

24 Q. I just put Exhibit 1014 in the chat box,
25 and it says that it's uploaded.

1 A. Oh, yes. I see it.

2 Q. Let me reask the question so the record
3 is clear.

4 Looking at the standard, what is the
5 basis of your opinion that IEEE 802.16(e)
6 implemented your proposed solution of dividing the
7 superframe to two parts, one for fixed stations and
8 one for mobile stations?

9 A. And so I'm reviewing Exhibit 1014. And
10 since this is the way I understand the question, the
11 answer is not exactly my declaration. It might take
12 me a little bit more time.

13 Q. And that's fine. I'll -- so if you
14 need --

15 A. I -- I did take a look during the lunch
16 break, but only briefly.

17 Right?

18 So the -- as far as foundation for
19 mobile, the foundation is the OFDMA physical layer.

20 So, the 2004 version of the standard
21 defines several physical layers essentially to -- to
22 specify more options. There are even some single
23 carrier physical layers there.

24 But it was recognized -- and I think
25 even I somewhere accounted that the OFDMA physical

1 layer is a physical layer that in principle is
2 appropriate for mobile.

3 Q. Did you say is or is not appropriate
4 for mobile?

5 A. Oh, is. OFDMA is.

6 And so what we see in the -- now,
7 Exhibit 1014 is a little bit more than 802.16(e).
8 But that's fine.

9 So we see that most of the amendments
10 are focused on section 8.4. And 8.4 is the OFDMA
11 physical layer. That's -- that is most of the -- of
12 the amendments.

13 And as part of that, in Exhibit 1014
14 A.4.4 is the frame structure.

15 But OFDMA is present in the 2004 version
16 of the standard. And there's no -- in the 2004
17 version there is no hand-over.

18 But as far as mobility within a --
19 within a cell or mobility while connected to one
20 base station, you know, that -- that is present even
21 in the 2004 version of the standard. Now
22 it becomes -- it becomes quite a bit more solid in
23 the -- in what is Exhibit 1014.

24 And further, this is -- the way
25 Exhibit 1014 is written is one can make a comparison

1 with the 2004 version of the standard and just to
2 see that, yes, OFDMA is the foundation, or at least
3 at that time was the foundation for mobile
4 communications and broadband mobile communications.

5 Q. I don't want to interrupt. I just don't
6 know if you're done or not. I'm sorry.

7 A. Yes. And I'm still -- I'm still
8 reviewing 1014 and what was its --

9 Q. Right. So my question is -- and I don't
10 think I have an answer yet -- the question was what
11 is the basis of your opinion that the 802.16(e)
12 adopted your solution of dividing the superframe
13 into two parts; one for fixed stations and one for
14 mobile stations?

15 A. First, because it adopted OFDMA, what I
16 testified earlier, that OFDMA is the foundation of a
17 mobile physical layer. That is one basis for my
18 opinion.

19 Also, if we see on the -- the 2004
20 standard on page 500 says the OFDMA frame may
21 include multiple zones.

22 So this idea that the OFDMA allows
23 efficient -- there is an efficient way to provide
24 service to subscriber stations with different
25 capabilities when you have multiple zones. So even

1 in -- that's in Exhibit 1006. It says multiple
2 zones including, for example, AMC, adaptive
3 modulation and coding, including other -- other
4 things.

5 So Figure 219 says OFDMA frame with
6 multiple zones. And these different zones are
7 described in the downlink map. So first there's the
8 downlink map and then it says how many zones are
9 there and how long are they.

10 And this is how this information is --
11 is organized. Even in high stress, even in 2004.
12 Now -- when we get to the 2004 version.

13 Now, if we get to the Exhibit 1014, we
14 see on page 358 it says,

15 "Replace Figure 219 with the
16 following figure."

17 And now we see that these -- there's
18 a -- there's a slight change in these zones.

19 So this is the basis for my opinion.

20 Q. 358 you mentioned of Exhibit 1014?

21 A. Yes.

22 Q. What's the figure number?

23 A. 219.

24 Q. I see. And let me quickly check that.
25 So in Figure 219 of Exhibit 1014, which

1 of the zones are for mobile devices, which are for
2 fixed devices?

3 A. And for the record, I am looking at
4 mostly Exhibit 1014, sometimes 1006.

5 Q. Thank you very much for that
6 explanation.

7 A. I'm sorry. I did not really prepare
8 to --

9 (A clarification was requested by
10 the reporter.)

11 THE WITNESS: I said I did not
12 specifically prepare about discussing -- if we group
13 all the changes that .16 brought into MAC changes
14 and physical layer of PHY changes, just generally
15 speaking, at the MAC we see significant changes with
16 the introduction of hand-over. And with the PHY, we
17 see substantial similarity to the 2004 version of
18 the standards.

19 I am mindful of the question. A little
20 bit concerned that I might need more time just to --
21 to give a good answer to that question.

22 Q. Roughly how much time would you estimate
23 you may need?

24 A. It's a little bit hard to say.

25 MR. LeROY: While Dr. Cooklev is

1 thinking, or maybe he's done, I just want to lodge
2 an objection that it's out of scope.

3 I've given you a lot of flexibility
4 here, but I think the line of questioning is out of
5 scope.

6 MR. HENDIFAR: Noted. Thank you.

7 THE WITNESS: At the high level of part
8 of the basis for my opinion that I said is backwards
9 compatibility. So a base station that is compliant
10 to both 16(e) and 16-2004 would have to communicate
11 with subscriber stations, some of which are complied
12 to only the 2004 version of the standard and semi
13 compliant to 16(e). And those that are compliant to
14 16(e), they -- they typically also comply to the
15 older version of the standard but they would like to
16 get service according to 16(e).

17 And petitioning the frame in this way in
18 zones is a way to accomplish this.

19 I -- I can -- since I'm -- based on my
20 quick review, I mean there are -- now I'm getting to
21 some portions of the document which are relevant. I
22 just have to -- you know, I think I have to rely on
23 different parts of the standard and just assemble,
24 if you will, an answer from what might be somewhat
25 partial answers otherwise.

1 I'm doing my best, but it's -- it's
2 quite difficult this to be done, if I may say, in
3 the heat of a -- of a deposition.

4 For example, what is relevant, if we --
5 we can go to -- so, on page 698 of 1014 are the
6 capabilities of a subscriber station. And so now we
7 see what -- how did these capabilities change from
8 the 2004 to 16(e).

9 And even if -- even if the overall frame
10 structure -- I mean it has these zones. Okay? In
11 both cases these zones. But the -- within -- within
12 a zone there will be changes.

13 So, section 11.8.3.6.2 is OFDM -- oh,
14 wait a second. Not here.

15 On 11.8.3.7.1. I apologize. OFDMA
16 mobile station. And then we see different FFT sizes
17 that were introduced as -- then we also see -- if we
18 continue 699, we see dif- -- other parameters.

19 So, a mobile station has more robust --
20 some more robust coding, some other parameters that
21 changed.

22 Q. So is it fair to say that sitting here
23 now, you are not able to tell me in Figure 219 of
24 Exhibit 1014, which is the 802.16(e) standard, which
25 zones are allocated for mobile users and which zones

1 are allocated for fixed users?

2 MR. LeROY: Same objection.

3 THE WITNESS: It seems to me the
4 adaptive modulation and coding zone that's part of
5 the uplink sub frame is part of the mobility
6 amendment.

7 BY MR. HENDIFAR:

8 Q. How about the downlink sub frame?

9 MR. LeROY: Same objection. Out of
10 scope.

11 THE WITNESS: I'm still looking at
12 Exhibit 1014.

13 I really need to study this more.

14 BY MR. HENDIFAR:

15 Q. Going back to Exhibit 1014, page 358.

16 A. Yes.

17 Q. In Figure 219 what is the TUSC region?

18 A. We can -- it is described. It's a
19 similar region as the AMC in the downlink.

20 We can see it's described in page 538, I
21 think, at least TUSC 1. So it is similar in
22 structure to the uplink -- I think that's pronounced
23 the post or the partial use of subcarriers, PUSC.
24 And it is described starting page 538.

25 Q. Is there any indication whether this

1 zone is for mobile users or stationary users?

2 A. Now, it's -- it is possible that these
3 are for mobile stations.

4 Q. And what is the basis for your view that
5 the TUSC regions are for mobile stations?

6 A. I said -- if I may say, it is possible.
7 As I say, I have not -- I have not studied this to
8 just render an informed opinion.

9 But, well, one basis is that these two
10 regions are not present in the 2004 version of the
11 standards.

12 Q. Going back to 358 of Exhibit 1014 again
13 and Figure 219 --

14 A. One second. 358.

15 Q. Yes. In the figure there is an arrow
16 with the text that says "Zone switch IEs in DL-MAP."

17 Do you see that?

18 MR. LeROY: I'm sorry, Parham. What
19 figure are you in or what page?

20 MR. HENDIFAR: The same thing we've been
21 discussing on page 358.

22 THE WITNESS: Yeah. Just a second.

23 MR. LeROY: And, Parham, the audio broke
24 up a little bit on my end.

25 Can you -- what aspect of the figure are

1 you directing our witness to?

2 MR. HENDIFAR: I'll repeat the question
3 so the record is clear and you have it as well.

4 BY MR. HENDIFAR:

5 Q. Figure 219 page 358 of Exhibit 1014,
6 towards the bottom of the figure there are a few
7 arrows with the text that says "Zone switch IEs in
8 DL-MAP."

9 Do you see that?

10 MR. LeROY: Thank you.

11 BY MR. HENDIFAR:

12 Q. And Dr. Cooklev, do you see that text,
13 as well?

14 A. In page 358 you said zone switch?

15 Q. Figure 19, in the figure there are some
16 arrows with the text --

17 A. Yes, I do see that.

18 Q. Great.

19 Okay. Is it the case that each of the
20 zones have their own DL-MAP message?

21 A. Each of the zones do have their own
22 DL-MAP?

23 Q. Right.

24 A. I don't think that's the case. I think
25 there is one DL-MAP.

1 Q. What is -- what does "IE" stand for?
 2 A. ID or IE?
 3 Q. IE. I think it's information element,
 4 but you are the expert so I need to ask the
 5 question.
 6 A. Yes. It is information element.
 7 Q. What does it mean? What is an
 8 information element?
 9 A. Information element is -- it's a message
 10 with which -- a good message that carries some
 11 system information.
 12 Q. What type of information does it
 13 contain?
 14 A. Well, there is -- there are, I think, a
 15 number of these information elements. So they carry
 16 a lot of information.
 17 I mean we can look at the 2004 version
 18 of the standard and we'll see many, I think.
 19 Q. Let me direct your attention -- because
 20 I want to make sure we accurately discuss this. So
 21 if there is -- if there is something I may point you
 22 to just to make sure I understand the answer.
 23 Can you look at Exhibit 1006. That's
 24 the 2004 standard, page 500.
 25 A. Yeah. I'm exactly looking at that

1 A. Yes. Yes.
 2 But I would qualify my answer that, you
 3 know, I would need to study this more carefully.
 4 Q. Table 197 in the same Exhibit 1006, and
 5 that would be --
 6 A. 197?
 7 Q. Page 408.
 8 A. And if I -- we did not -- we did not
 9 mention my declaration.
 10 If somewhere in my declaration I am
 11 commenting on this, please let me know.
 12 Q. I will. I actually -- what I'm asking
 13 you is beyond my experiences, and I don't think --
 14 A. I mean trust me, I'm doing my best to --
 15 Q. If there is, I didn't see it.
 16 A. I'm doing my best, but it's -- normally
 17 I think I need a little bit of time outside of
 18 deposition.
 19 You said Table 197?
 20 Q. Let me actually ask. Which -- which
 21 table is this --
 22 (Off-the-record discussion.)
 23 BY MR. HENDIFAR:
 24 Q. Just 97. I'm sorry. Just 97, not 197.
 25 So Table 97 in the standard --

1 exhibit. I will get to page 500.
 2 Yes. I'm looking at that page.
 3 Q. Page 500 Exhibit 1006 the 2004
 4 standard --
 5 A. Yes.
 6 Q. -- the sentence before the last reads,
 7 "No DL-MAP or UL-MAP allocations
 8 can span over multiple zones."
 9 Do you see that?
 10 A. Yes.
 11 Q. Okay. What does -- does this sentence
 12 mean that there are different DL-MAP messages for
 13 different zones? Or if not, what does it mean?
 14 A. You know, that's a good question.
 15 If we look at the previous sentence,
 16 the --
 17 "The transition between zones is
 18 indicated in the downlink map by
 19 the zone switch information
 20 element."
 21 So, the -- what -- what I think this
 22 means is that the downlink map itself cannot go over
 23 multiple zones.
 24 Q. Is it the actual message that contains
 25 the map cannot go over multiple zones?

1 A. Oh, okay.
 2 Q. -- which is page 110.
 3 A. Yes.
 4 Q. So it says that "DL-MAP IE format."
 5 Do you see that as the title of Table
 6 97?
 7 A. Yes, I do.
 8 Q. Is DL-MAP IE a component of the DL-MAP
 9 message?
 10 A. So on page 43 of the 2004 standard
 11 Exhibit 1006, you see the MAC management messages.
 12 Q. Yes.
 13 A. And it begins with uplink -- uplink
 14 channel descriptor, downlink channel descriptor, and
 15 then downlink map and uplink map. They -- these are
 16 broadcast messages. They are on the broadcast
 17 connection as identified in this table.
 18 And then there are other -- a number of
 19 other management messages. I think this is the
 20 section -- this is the section that contains
 21 Table 97.
 22 Q. What is the section that contains Table
 23 97? I'm sorry.
 24 A. It's MAC management messages.
 25 Q. Right. But there are 49 messages listed

1 in Table 14, right?

2 A. Yes.

3 Q. So, in which of those -- actually 50,
4 because it starts at zero.

5 In which of those 50 messages is Table
6 97 located?

7 Let me withdraw the question.

8 I'll tell you what my understanding was
9 and you correct me if I'm wrong.

10 My understanding was that DL-MAP IE
11 messages for different zones -- let me strike that.

12 My understanding was that the allocation
13 for different zones would be in a DL-MAP IE message
14 for that zone. And either they would all be
15 collected in one map or it would be spread, I don't
16 know. But that's how I understood this to work.

17 Is that incorrect?

18 Table 16 on page four, this may help.
19 That was the basis of my understanding, which is a
20 general DL-MAP message --

21 A. The -- one second.

22 So there is -- there is a DL-MAP
23 message. But this DL-MAP message can contain
24 multiple DL-MAP information elements. And these
25 DL-MAP information elements, they describe the

1 bursts.

2 Q. When you say they describe the bursts,
3 is that different from them describing the different
4 zones?

5 A. Maybe we can look at Figures 46, 47,
6 they are on page 155.

7 Q. One moment, please.

8 Okay. I'm there.

9 A. So these figures show -- they're
10 generally about the minimum and maximum time
11 relevance of downlink map and uplink map.

12 And so they -- the downlink map pertains
13 to the current frame. Now, for uplink map it's more
14 complicated.

15 And so we see in the case of time
16 division duplexing -- actually, if we -- if we look
17 at first Figures 46 and 47, because both of them
18 pertain to time division duplexing.

19 Q. And this is a superframe, right? It has
20 multiple frames?

21 A. Yes. And I mean why it says clearly
22 multiple frames are shown. And there is maximum
23 time relevance for downlink map and minimal time
24 relevance for downlink map.

25 And we actually see there the site. For

1 downlink map the time relevance is the current
2 frame.

3 Now, for -- for the uplink map it's more
4 complicated because the uplink time of the uplink
5 map pertains to the subscribers transmitting. And
6 are transmitting using the parameters in the uplink
7 map.

8 So it could be the same frame, the
9 uplink sub frame of the same frame, but it could
10 be -- could be after the -- the current frame.

11 But in any event, that's -- your
12 question was limited to downlink map.

13 So that's about time division duplexing.
14 And then frequency division duplexing we see a
15 similar -- a similar picture that the minimum and
16 the maximum for downlink map, they are the same, and
17 it is the current frame.

18 Q. Going back to Table 16, which was on
19 page 46.

20 A. Table 16?

21 Q. Yes.

22 A. Yes.

23 Q. So, Table 16 is the DL-MAP message you
24 were showing me at the beginning of each frame on
25 Figures 46, 47, 48, right?

1 A. Yes.

2 Q. Towards the middle it has a "for" loop
3 which says for i equals one through n, you run
4 through the DL-MAP IEs.

5 Do you see that?

6 A. Yes.

7 Q. And then as the note it says,
8 "See corresponding physical" --
9 "PHY specification."

10 Do you see those, as well?

11 A. I mean there is a loop -- there are a
12 number of downlink map information elements.

13 Q. Okay. So that means there are a number
14 of DL-MAP IE's in the DL-MAP message, correct?

15 A. Yes.

16 Q. Okay. Is it fair -- now let me step
17 back to now Table 97, which was on page 110.

18 A. Yes.

19 Q. You are faster than me.

20 Is Table 97 one DL-MAP IE element to the
21 DL-MAP message for one user with allocated resources
22 in the band AMC region?

23 A. So Table 97 first is a compact DL-MAP
24 information element. So, to -- it's -- it's not
25 just a DL-MAP information element, but a compact

Page 90 1 DL-MAP information element. 2 There are several types of these compact 3 DL-MAP information elements. 4 Q. What are the other types of compact 5 DL-MAP information elements? 6 A. Well, Table 96, it's -- it's for the 7 normal subchannel. Table 97 is for band AMC. There 8 are -- there is a table that lists all of the types. 9 And we can find it. 10 Q. Okay. So what does it mean by normal 11 subchannel as opposed to band AMC? 12 If it helps, Table 89 on page 103 has a 13 list of compact DL-MAP IE types if that's what 14 you're looking for. 15 A. Yeah. I noticed, I saw that table. I'm 16 just looking for some additional context. 17 Q. Please let me know when you're ready so 18 I can ask my question. 19 A. Yeah. No. You can ask. 20 Q. The question was what is the difference 21 between a normal subchannel and band AMC in the 2004 22 standard? 23 A. Yes. I'm looking only at the 2004 24 standards. 25 I will need more time to study this.	Page 91 1 Q. Is there a place in this 2004 standard 2 that defines what a normal subchannel is? 3 A. I mean I was looking at -- so, for 4 example, the -- in page -- I'm right now looking at 5 the standard. So it's not like I have formed an 6 opinion about it. 7 But on page 269 it talks about -- kind 8 of on line five talks about normal subchannel 9 allocations. So in this sense normal subchannel 10 appears to be a type of allocation. 11 And band AMC is -- seems to be a type of 12 allocation. 13 Q. But sitting here now you're not sure 14 what the difference is between band AMC and normal 15 subchannel allocation in 2004 standard? 16 A. I think I would agree with that. 17 MR. HENDIFAR: Now is a good time for a 18 West Coast lunch break, short one? 19 THE WITNESS: That's fine. 20 MR. HENDIFAR: John -- 21 MR. LeROY: How long -- well, let's go 22 off the record. 23 24 (Whereupon at 1:06 P.M. a lunch 25 recess was taken.)
Page 92 1 * * * 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25	Page 93 1 DECEMBER 3, 2024 2 1:40 P.M. (PACIFIC TIME) 3 * * * 4 5 (Whereupon at 1:40 P.M. the 6 deposition proceedings were 7 resumed.) 8 9 EXAMINATION (Resumed) 10 BY MR. HENDIFAR: 11 Q. So, Dr. Cooklev, welcome back. 12 Did you speak with anybody during the 13 break regarding the deposition? 14 A. No, I did not. 15 Q. Do you have access to electronic or a 16 hard copy, either way, of Exhibit 1025? 17 A. Yep. Oh, 1025. Excuse me. I will 18 answer your question. 19 Yes, I do. 20 Q. May I please refer you to Exhibit 1025 21 native page number 267. 22 A. Native page, yes. 23 Q. First paragraph on page 267, 24 Exhibit 1025 reads, quote, 25 "Within the IEEE 802.16(e) effort

24 (Pages 90 to 93)

1 it was soon realized that the OFDM
2 physical, PHY, as defined did not
3 provision sufficient uplink budget
4 to move from a fixed deployment
5 with relatively large SS antenna
6 gain to a mobile platform with
7 typically very low SS antenna gain
8 while maintaining a reasonable cell
9 size. Subchannelization was a
10 known tool to extend the link
11 budget."

12 Did you see that sentence?

13 A. Yes.

14 Q. In layman terms what is this paragraph
15 saying?

16 A. Well, I think this paragraph is fairly
17 clear that -- so it's saying that fixed subscriber
18 stations typically used big antennas. And these big
19 antennas -- it's more accurately saying large
20 antenna gain. But large antenna gain is, again,
21 typically associated with big antennas.

22 Now, mobile platforms, on the other
23 hand, they don't have large antennas. They have
24 small antennas which very local antenna gain. And
25 it's saying this affects the link budget.

1 And the link budget just means there's
2 not enough power reaching the receiver.

3 Q. So is it fair to say that for fixed
4 devices, because the antenna was large, the base
5 station needed lower power transmission for the
6 fixed subscriber as compared to a mobile subscriber
7 with smaller antennas?

8 A. Well, almost. But it's talking about
9 uplink. So in the uplink the subscriber is
10 transmitting.

11 Q. I'm sorry. I understand.

12 Okay. Got it.

13 And now what is subchannelization?

14 A. So, subchannelization is here when not
15 all of the subcarriers are used but only some of the
16 subcarriers.

17 Q. Okay. And how does subchannelization
18 help with the problem of not enough uplink link
19 budget to move from fixed to mobile devices?

20 A. Subchannelization helps because, first,
21 power is spread not only not among all of the
22 subcarriers, but only among some of them. And
23 second, because it can be based on selecting the
24 best subcarriers.

25 So, assuming that some of the

1 subcarriers generally will be good, meaning the
2 signal to noise ratio will be high on these
3 subcarriers, and some of the subcarriers will not be
4 good.

5 Now, if you can select those that are
6 good and potentially selecting those that are the
7 best and spreading the power only among them, for
8 sure this will extent extend the link budget as it
9 says here.

10 Q. I see.

11 And then would it help -- in order to be
12 able to use the best subcarriers, would it generally
13 be true that you need a diversity allocation to be
14 able to use the best subcarrier?

15 A. Diversity is different. I think even --
16 even with down diversity just subchannelization. So
17 subchannelization refers to the subcarriers.

18 Q. So my --

19 A. Grouping -- grouping the subcarrier, so,
20 using -- using some, not all as a set.

21 Diversity is different. But diversity
22 also can help.

23 Q. So my confusion is as follows: Wasn't
24 the IEEE 802.16 standard from inception an OFDM
25 system?

1 And if so, if there already orthogonal
2 subcarriers defined, how are you going to subchannel
3 the already subchanneled frequency time resource
4 system?

5 A. Well, subchannelization --
6 subchannelization refers to OFDMA, not exactly OFDM.

7 So, yes. .16 was you can say from the
8 beginning OFDM. From the beginning there were
9 several physical layers, and one of them was.

10 But OFDM doesn't have the
11 subchannelization. OFDMA does.

12 Q. And I apologize if my question is a bit
13 ignorant, because I don't have enough background in
14 this.

15 If I were to draw the sub-channels in an
16 OFDM system versus an OFDMA system, how will the
17 sub-channels be different?

18 Let me strike that question.

19 If I had -- and part of it is we are
20 remote. I'm sorry I can't have a paper in front of
21 you.

22 If you imagine a time frequency resource
23 with the X axis being the time, for instance, Y axis
24 being the frequency and I were to draw the
25 sub-channels defined in that system, how would those

1 sub-channels be different in OFDM system versus an
2 OFDMA system?

3 A. So let's assume that the FFT size is the
4 same. So in an OFDM -- essentially in an OFDM
5 scheme, the -- we're dealing with all of the
6 subcarriers. So all of the -- all or no -- no
7 subcarrier will be assigned. Or if some is
8 assigned, all of the subcarriers will be assigned.

9 Q. To a single user?

10 A. To -- I mean they will be assigned to a
11 single user. Now, a different time instance
12 different users will get the right to transmit, but
13 they -- but they will get all of the subcarriers.

14 Q. I see. So in an OFDM, a single user, if
15 allocated user says, it will be allocated all of the
16 different subcarriers?

17 A. Yes. And that's obviously not
18 convenient.

19 Q. Right.

20 A. And the -- it's called here in this book
21 subchannelization.

22 But now in an OFDMA system, now every
23 user can get only part of the subcarriers, as you
24 said, because they are orthogonal.

25 So that's a very important property

1 here. That's a critical property which allows that
2 different users get different subcarriers and
3 somehow they can be combined altogether because they
4 are orthogonal, they can be combined and later
5 separated by the receiver.

6 Q. Understood. Thank you very much. I
7 actually did not know today that OFDM allocates all
8 of the sub-channels to a single user, because that
9 kind of defeats the purpose. But what do I know.

10 A. And I agree. That's -- that's the
11 advantage of OFDMA now.

12 Q. Going to page 270 of the same
13 Exhibit 1025.

14 A. 270. Yes.

15 Q. The first paragraph starting with,
16 "One of the four major changes
17 introduced in wireless bandwidth DM
18 by the 802.16(e) amendment is --"
19 And the rest of the paragraph.

20 Do you see that paragraph?

21 A. Yes.

22 Q. This goes to the point that you
23 mentioned prior to 802.16(e), 802.16 was an OFDM,
24 not an OFDMA system, correct?

25 A. You mean 802.16 was OFDM but not OFDMA?

1 Q. Until 802.16(e), correct.

2 A. I think that's not correct. I think
3 802.16-2004 already included OFDMA.

4 Q. So do you disagree with this sentence in
5 this quote that says,

6 "One of the four major changes
7 introduced in wireless bandwidth DM
8 by the 802.16(e) amendment

9 Is the capability for provisioning
10 subchannelization in the DL"?

11 A. To begin with, I don't disagree with --
12 with this book.

13 Now, as an explanation, why -- so I
14 wouldn't -- I wouldn't challenge the authors of this
15 book for this sentence, but the fact that the 2004
16 version of the standard already had OFDMA, I mean
17 that's -- that is easy to --

18 If we look at Exhibit 1006, we will see
19 that -- so the physical layer is starting page --
20 page 307, I think. One second. I will -- page 307
21 is the physical layer.

22 And -- but we see all the physical
23 layers. So the first two are single carrier
24 physical layer, they did not get a lot of traction
25 later.

1 Now, there is an OFDMA -- excuse me --
2 OFDM physical layer starting at page 427 at section
3 8.3, but it doesn't stop there. And I think there
4 is a section 8.4.

5 Yes. So, there's a section 8.4 and
6 that's OFDMA.

7 Q. What page is that?

8 A. It starts page 493 of the 2004 standard.

9 Q. Is that for uplink or downlink on
10 page 493?

11 A. Oh, that's a good question. Generally
12 OFDMA is -- refers to the scheme in the downlink.
13 Because in the uplink there's -- no subcarriers have
14 been assigned.

15 I mean -- excuse me what I meant to say
16 is that all assignments are done by the -- by the
17 base station. And so it assigns subcarriers to
18 itself -- okay? -- in the downlink and it assigns
19 subcarriers for the stations to use in the uplink.

20 So the OFDMA subcarrier allocations we
21 see section 8.4.6. And where these are -- so 8.4.6
22 are the subcarrier allocations. First is in the
23 downlink.

24 Q. Are you done with your response?

25 A. I'm scrolling that section to get to

1 the -- to finish this 8.4. So, not -- not quite
2 done.

3 And then -- and then 8.4.6.2 is uplink.
4 So it talks about how subcarriers are assigned in
5 the uplink.

6 Q. Got it.

7 Now, going back to the beginning of
8 8.4.1 which was page 493.

9 A. Of the same document?

10 Q. Yes. Exhibit 1006.

11 A. 493?

12 Q. Right. That's the beginning of
13 section 8.4 that you referred us to.

14 A. Oh, yes.

15 Q. The first sentence says,
16 "The WirelessMAN-OFDMA physical
17 based on OFDM modulation, is
18 designed for NLOS operation in the
19 frequency bands below gigahertz per
20 1.3.4."

21 What is NLOS?

22 A. Known line of sight -- or no line of
23 sight.

24 Q. Got it.

25 Okay. So, how do you reconcile what you

1 just explained to me with what the book in 825 said
2 which was additional OFDMA to 802.16(e) was one of
3 the four major changes?

4 A. I will need to think more about it. It
5 might have to do with the following sentence on page
6 270 that this downlink subchannelization is provided
7 as a separate zone similar to the zone concept of
8 the OFDMA PHY.

9 Q. Okay. How so?

10 Let me rephrase my question.

11 Does page 270 of Exhibit 1025 say that
12 the OFDMA physical channel is its own zone in
13 802.16(e) separate from other zones?

14 A. If I get -- I would make a big pause if
15 I had studied this and opined in my declaration it
16 seems to be the case.

17 Q. Would you be able to point us to where
18 in Exhibit 1024 there is a zone defined as the OFDMA
19 physical for mobile devices?

20 A. Exhibit 1024?

21 Q. Exhibit 1014. I'm sorry.

22 A. Exhibit 1014.

23 Q. So, 1014 is 802.16(e).

24 The question is would you be able to
25 point in Exhibit 1014, which is 802.16(e) what the

1 Eklund book says is a separate zone for OFDMA
2 physical channel?

3 A. On page 327 --

4 Q. Yes.

5 A. -- there seems to be a -- I think is the
6 answer that this is a downlink subchannelization
7 zone.

8 Q. Okay. Is it a different zone than, for
9 example, the AMC zone?

10 A. So the question is is it different?

11 Q. I'll ask the question again so that the
12 record --

13 A. Yeah.

14 Q. Looking at 802.16(e) is the
15 subchannelization zone as shown, for example, on
16 page 327 of Exhibit 1014 a different zone than other
17 zones, for example, than the AMC zone?

18 A. So, first, is it a different zone? Yes.

19 Q. Okay.

20 A. It's -- it's a different zone.

21 Q. Okay. What does scalable OFDMA mean?

22 A. What is scalable OFDMA?

23 I see that this term is used on page 288
24 of Exhibit 1025. And it's used in the context that
25 there are multiple FFT sizes, multiple FFT sizes are

1 possible. That's the scalability.

2 Q. Got it. Okay.

3 I am now going to introduce a new
4 exhibit which we will mark as 2027.

5 And I will put it in the chat box if
6 that's okay.

7 (Whereupon the document referred
8 to was marked Exhibit 2027 and is
9 attached hereto.)

10 THE REPORTER: And you're skipping 2026
11 is that correct?

12 MR. HENDIFAR: 2027.

13 MR. LeROY: Parham, is there an
14 Exhibit 2026?

15 MR. HENDIFAR: Not yet. I don't know if
16 we need it or not.

17 It's just my notes are in that order.
18 If I change it, I look track. But at this point we
19 do not have 2026.

20 BY MR. HENDIFAR:

21 Q. Please let me know when you have
22 Exhibit 2026, Dr. Cooklev.

23 A. I have it.

24 Q. Have you seen this document before?

25 A. No. I don't think I have. It's

1 possible, but I don't think I have.

2 Q. Okay. At least on the title on the
3 abstract, can you provide an explanation of what you
4 believe the purpose of this paper is?

5 A. The title is "Capacity Analysis
6 Considering Channel Resource Overhead For WiBro."

7 Q. What is WiBro?

8 A. I think it's like short for wireless
9 broadbands. So here it's I think more accurately
10 described as mobile internet access.

11 Q. And do I recall correctly that before
12 you mentioned WiBro was based on draft two of the
13 802.16(e) amendment?

14 A. Yes. That's correct. At least when
15 WiBro started that was the case.

16 Q. Understood.
17 Going to page two of this document,
18 please. And the top paragraph on the left side of
19 the page reads, quote,

20 "Sub-channels are flexible for band
21 selection and diversity. Fixed
22 wireless indoor service is
23 supported with band selection mode
24 to maximum multi-user scheduling
25 gain by utilizing channel

1 selectivity for stationary users.

2 And mobile wireless outdoor service
3 is supported with diversity mode to
4 maximize wide band frequency
5 diversity and temporal diversity
6 gain for mobile users."

7 Do you see that?

8 A. I do.

9 Q. What does "band selection" mean?

10 MR. LeROY: I'm going to object to the
11 form of the question.

12 THE WITNESS: And for the record I'm
13 just quickly looking at this Exhibit 2027.

14 BY MR. HENDIFAR:

15 Q. Again, my intention is not to trick you.
16 So review whatever you need to review. And I
17 appreciate your time.

18 The question is what does "band
19 selection" mean.

20 A. Generally band selection or -- so what I
21 think, if we look at Figure 1 of -- of this
22 Exhibit 2027 that you just uploaded --

23 Q. Yes.

24 A. If you look at Figure 1, we see a
25 figure. This figure is consistent with Figure 1 of

1 Park.

2 And we see there is a -- and I think
3 earlier we were -- we were talking about different
4 zones. So we see at the bottom -- at the bottom we
5 see a -- so there is a diversity zone. This
6 diversity zone is the zone dedicated to mobile
7 users.

8 There is a zone that here it's referred
9 to as band selection. This is the zone that is for
10 fixed users.

11 So now this -- so you were asking about
12 that passage. And if we look, fixed wireless is
13 supported with band selection mode. So I think here
14 band selection mode is that -- is that part of the
15 frame called "band selection." That's for
16 stationary users.

17 And you have diversity mode, again, that
18 part of the frame which is directed to mobile users.

19 Q. Understood.

20 Now, was the details of the WiBro
21 standard publicly available as of September 2005, as
22 far as you know?

23 A. I think the -- the short answer to your
24 question -- I think the short answer is yes, they
25 were.

1 And the basis for my opinion is first
2 Park. Park references WiBro. So, yes. In
3 September of 2005 I think a person of skill would
4 have been familiar with WiBro and would have been
5 familiar generally with the characteristics of -- of
6 WiBro.

7 Now, some of the -- some of the details
8 of WiBro, some of the implementation details, they
9 might have been even worked out after that. But
10 overall, yes, WiBro was known.

11 Q. Other than Park referencing WiBro, do
12 you have any other basis for your opinion that
13 details of the WiBro standard was publicly available
14 as of September 2005?

15 A. Well, that's -- I can -- so I'm trying
16 to give a complete answer --

17 Q. Yeah.

18 A. -- to the question.

19 Now, obviously I'm mentioning Park
20 because that is in -- that's a reference that's used
21 in ground one. And I thought -- I thought that I --
22 when I was working on this I thought that that's
23 sufficient.

24 But have I seen other documents? I
25 think yes, I have seen documents prior to the

1 priority date that established it or widened --
2 WiBro was not -- was not a secret. Or the technical
3 characteristics were not a secret as of September
4 2005.

5 But for an even more complete answer, if
6 I look at -- I mean there were -- if I may, I think
7 that two exhibit numbers, 1022, 1024, 1023, that
8 also are about WiBro.

9 Q. So my reading of those were the ones
10 that pre-dated the priority date discussed WiBro as
11 a standard in development.

12 So that's why I'm asking -- and I
13 didn't -- I actually don't know the answer -- if the
14 WiBro standard was publicly available as of
15 September 2005.

16 And let me step back and give you a
17 little more context, as well.

18 So, you mentioned Park. If you look at
19 the first page of the Park patent, the assignee is
20 Samsung in Korean.

21 A. I did not get the last --

22 Q. If you look at page one of the Park
23 patent --

24 A. Yes.

25 Q. -- or publication Exhibit 1005?

1 A. Yes.

2 Q. The assignee is Samsung Electronics.

3 A. Oh, it's page one of the -- of the pdf.

4 Q. Sure. The very cover page. I'm sorry.

5 A. Yes. The Assignee is Samsung, yes.

6 Q. It discussed that Samsung was in the
7 course of developing chips for WiBro at the time,
8 correct?

9 A. I think that's -- I think that's
10 correct, yes.

11 Q. It's not surprising if Park would have
12 access to inside information about details of WiBro
13 that may not be otherwise publicly available,
14 correct?

15 A. I think that's -- it would not be
16 surprising.

17 Q. So then my question is do you have any
18 basis to opine that the WiBro standard was publicly
19 available as of September 2005?

20 A. Well, I think I do. Because -- well, I
21 would say even first at that time I was aware of
22 WiBro.

23 Q. Of its existence or of its detail
24 standard? Of the existence of WiBro or of the
25 details of the standard?

1 A. So it -- well, I knew at least that it
2 was a standard for mobile communication. I knew
3 that it was largely based on a draft of 802.16(e),
4 or at least, as I said, that was the starting point.
5 I knew that. I knew that the service would be
6 provided by Korea Telecom. So they also -- so
7 that's another company that -- well, I think knew --
8 knew quite a bit about WiBro, because they were
9 going to offer service based on it.

10 And actually I do note that the -- no.
11 They are different. The authors of this
12 Exhibit 2027, they come from SK Telecom, which I'm
13 not exactly sure what that is.

14 But -- so I was describing first what I
15 believe I knew at the time about WiBro. And I set
16 it at the -- at the minimum.

17 But I mean if -- even Exhibit 2027,
18 which is -- the date is 2005? Am I correct?

19 Q. Actually, I -- let me check.

20 A. I think at the bottom it says copyright
21 2005.

22 Q. Yes.

23 A. So Exhibit 2020 -- Exhibit 2027 is
24 copyright 2005. It doesn't say which month.

25 But these authors -- while these authors

1 were working on this paper possibly a year before it
2 was published.

3 So the authors at SK Telecom, and they
4 are at Hanyang University, I mean they were aware of
5 this at least -- I mean it's reasonable they were
6 aware at least a year before they wrote about it.

7 And Park itself, although -- yes, is an
8 employee -- appears to be an employee of Samsung.

9 But Park discusses WiBro not as something that is
10 proprietary to Samsung or -- and even if there were
11 some implementation details or something proprietary
12 to Samsung, the main parameters of WiBro, the main
13 technical characteristics were not.

14 So -- and as I said, additional basis
15 are these, and I can look at Exhibit 1022, 1023 and
16 1014. I think that all of this -- all of this
17 establishes that I think that WiBro is -- the
18 technical parameters of WiBro were known.

19 Q. Have you personally seen a copy of any
20 draft of the WiBro standard?

21 A. I think I haven't.

22 Q. You have not.

23 Now, in your declaration you also rely
24 on Exhibit 1008. It is marked as an English
25 translation or what is claimed to be an English

Page 114 1 translation of the Korean application underlying 2 Park. 3 Do you recall that? 4 A. Yes. 5 Q. Do you have fluency in written Korean 6 language yourself? 7 A. I do not. 8 Q. So is it fair to say that you do not 9 have any independent basis to confirm the accuracy 10 of the translation in Exhibit 1008? 11 A. Yes. 12 Q. So, to the extent any portion of the 13 translation in Exhibit 1008 is inaccurate, is it 14 fair to say that that portion of your opinion that 15 relies on that inaccurate translation would also be 16 inaccurate? 17 MR. LeROY: Objection to the form of the 18 question. 19 THE WITNESS: To a large extent, yes, it 20 would be fair to say. 21 BY MR. HENDIFAR: 22 Q. In your declaration you state that a 23 POSITA would have been knowledgeable about the 24 contents of Exhibit 1008 as of the priority date of 25 the patent in September 2005.	Page 115 1 Do you recall that? 2 A. Generally I do. Maybe I -- 3 MR. LeROY: I'm sorry. What paragraph? 4 MR. HENDIFAR: I actually don't have a 5 paragraph for that. It was a general question. 6 BY MR. HENDIFAR: 7 Q. The question was -- we can look for it. 8 But generally the question was in your 9 declaration, Dr. Cooklev, you opine that a POSITA 10 would have been knowledgeable of the contents of 11 Exhibit 1008 as of the priority date of the patent 12 in September 2005, for example, in paragraph 128 of 13 your declaration. 14 A. Yes. I say this in paragraph 128. 15 Q. What is the basis of your opinion that a 16 POSITA would have been knowledgeable of the contents 17 of Exhibit 1008 as of September 2005? 18 A. Well, the basis is my understanding 19 of -- my understanding of a person of ordinary skill 20 in the art and the definition of a person of 21 ordinary skill in the art. 22 Q. Okay. Let me ask my question a bit 23 differently. 24 What is the basis of your belief that 25 Exhibit 1008 was publicly available to a POSITA as
Page 116 1 of September of 2005? 2 A. And regarding dates, I -- I mean just -- 3 just the date of Exhibit 1008. 4 Q. Is that the date of the filing of the 5 Korean application you're referring to? 6 A. Now, that's -- that is a good question, 7 Counsel. 8 I think and I -- I am aware that the -- 9 between that date and today the -- if I may say that 10 the law has changed. 11 But my -- I think the correct answer is 12 the basis for my opinion in the declaration is just 13 the -- the date of the application. 14 Q. So, if the application was not public as 15 of the date of its filing, then you retract your 16 opinion that a POSITA would have been knowledgeable 17 about the contents of the Korean application? 18 MR. LeROY: Objection. For of the 19 question. 20 THE WITNESS: Let me -- well, based on 21 my understanding of -- of the -- generally I give in 22 the legal section that my understanding of a person 23 of ordinary skill in the art that in particular the 24 characteristic that a person of ordinary skill in 25 the art is presumed to have known the prior art, to	Page 117 1 have known it and to have understood it. 2 And I think the -- well, at least this 3 is what it seems to me -- again, to -- I'm not -- 4 I'm not in any -- in any case not providing any 5 legal here opinion, but it seems to me that the 6 Korean application or Exhibit 1008, in other words, 7 seems to me prior art. And whether or not it was 8 public it seems to me doesn't matter. 9 BY MR. HENDIFAR: 10 Q. So your opinion is based on your 11 understanding of what you believe is the law, that a 12 POSITA is presumed knowledgeable of all publications 13 predating the priority date even though those 14 publications may not be publicly available? 15 MR. LeROY: Objection to the form of the 16 question, if it's a question. 17 THE WITNESS: Regarding the public 18 availability and what -- or whether the Korean 19 application in 2004 is considered to have been 20 publicly available, I this -- I think my opinion in 21 paragraph 128 doesn't depend on this. 22 BY MR. HENDIFAR: 23 Q. Sure. But that was not my question. 24 My question is you provide an opinion 25 that a person of ordinary skill would have been

30 (Pages 114 to 117)

1 knowledgeable about the content of the Korean filed
2 application as of September 2005, correct?

3 A. That's how I understood the law. That's
4 how I applied it.

5 Q. Okay. So, when you say that's how you
6 understood the law, are you saying that you
7 understood the law to be that a POSITA would have
8 been knowledgeable of the Korean application even if
9 it was not publicly available as of the priority
10 date of the patent?

11 A. I think that's -- that's fair to say to
12 the extent that I understand the question. So I'd
13 say yes.

14 My understanding of the -- the law is
15 that the Korean application is prior art -- I mean
16 this is a fact that it's prior art. And as long as
17 it's prior art, a person of skill in presumed to
18 have been aware of it and to have understood it.

19 Q. Even if it was not publicly available?

20 MR. LeROY: Objection to the form of the
21 question.

22 THE WITNESS: I don't know if patent
23 applications in Korea became publicly available upon
24 filing. I don't know that.

25 But I said that's -- I would agree with

1 the -- with -- even if they were not publicly
2 available, as long as they were prior art, yes.

3 I am not -- and again, I -- this touches
4 upon an area that I just -- I'm just trying to apply
5 it.

6 But I think as long as it's prior art, a
7 person of skill would have been aware of it. And
8 that was my understanding, and that's why I provided
9 this opinion.

10 BY MR. HENDIFAR:

11 Q. Now, may I please refer you to
12 paragraph 137 of your declaration Exhibit 1003.

13 A. 137?

14 Q. Correct.

15 A. Yes.

16 Q. What is RCID?

17 A. I think paragraph 136 answers that.
18 It's reduced connection identifier or reduced CID.

19 Q. Okay. How is it reduced?

20 Let me strike -- let me ask a more
21 proper question.

22 What does "reduced" connote in the
23 phrase "reduced CID"?

24 A. I mean as I state in the same paragraph,
25 it's -- it reduces the number of bits that are

1 needed.

2 Q. Okay. How does the reduced CID or by
3 what method or skill reduce the number of bits
4 needed for the CID?

5 A. I'm looking at the 2004 version of the
6 standard. But usually there is some type of a
7 mapping which -- which allows to solve the -- not
8 reduce.

9 So the connection I -- I think the
10 connection ID is normally 16 bits, and the reduced
11 one is fewer bits. It may be 11 bits or -- but
12 it's --

13 Q. Let me then maybe build up to it.

14 Is connection ID an ID for a single user
15 or for one of the connections of a single user?

16 A. Yeah. And if I -- if I may just to
17 finish answering the previous question, how is the
18 reduced produced the reduced connection ID, how we
19 can see -- we can see Figure 229 page 402. It's 402
20 of Exhibit 1014.

21 Q. 1014 is the (e) version, right? Is that
22 what you're referring to?

23 A. Oh, 1014 is the (e) version. Yes. You
24 are right.

25 I will find it in the --

1 But it is a very similar figure. To
2 begin with, there is a -- again, as a general idea
3 how it's produced, we see figure 22 on page 106 --

4 Q. Of?

5 A. Of Exhibit 1006.

6 Q. And I'm sorry if -- I don't mean to be
7 picky about it, but I want the record to be clear
8 what you're referring to. So I appreciate your
9 patience with me.

10 Okay?

11 Page 106 of Exhibit 1006, Figure 22.

12 Okay. I'm there.

13 A. And we see this reduced connection ID in
14 the mapping between reduced connection ID and
15 connection ID.

16 Q. Okay. Now, does the reduced ID, you
17 lose any information in the process of the coming
18 reduced connection ID?

19 A. Generally if the reduced connection ID
20 is -- if fewer bits are sufficient, then the reduced
21 connection ID is preferable.

22 Q. Can the reduced ID -- let me clarify.

23 Does the standard use the reduced ID or
24 the diversity zone as opposed to the band AMC zone?
25 If you didn't hear me, I can repeat the

1 question.

2 A. No. I -- I heard the question. But
3 does the standard use the reduced ID in the
4 diversity zone --

5 Q. Let me step back. Maybe I should have
6 up to that. I apologize.

7 Is the CID an ID for a specific user or
8 is it an ID for a specific connection of a user when
9 they have multiple connections?

10 A. So it is not -- I think the -- this
11 question can be misleading.

12 I think I have an answer that it's not
13 exclusive or.

14 So, CID, sure, "C" stands for
15 connection. However, every subscriber station has a
16 basic connection identifier that's associated with
17 it.

18 I mean, for example, we can see on
19 page 80 of 1006.

20 So the connection identifier, the basic
21 connection identifier is associated with this
22 subscriber station. So it identifies even the
23 subscriber station.

24 But there are other connection
25 identifiers. The -- if we -- if we look at the

1 definition on page seven of Exhibit 1006, we see
2 that the connection identifies 16 bits, identifies a
3 connection, and is mapped somewhat -- it's mapped to
4 service flow ID, which defines the quality of
5 service parameters.

6 So I think this is a -- I tried give a
7 complete answer.

8 Q. So your answer -- I understood -- and
9 I'm sorry, I didn't mean to be misleading. I
10 understood the answer to be there is a CID number
11 that is associated with a subscriber overall. Is
12 that --

13 A. Yes.

14 Q. Is there also CID numbers or versions of
15 CID numbers that are associated with specific
16 connections to mobile to a given subscriber?

17 A. Yes.

18 Q. Okay. Would those also be called CID or
19 would they have a different name?

20 A. They would also be called the CID. So
21 they will identify -- they will identify a
22 subscriber and the service flow.

23 Q. So if a subscriber -- strike that.

24 In 802.16-2004 could a subscriber have
25 two simultaneous connections to a base station?

1 A. That's possible.

2 Q. So which of those two connections would
3 the CID describe?

4 A. Two CIDs.

5 Q. I see. So two or three?

6 Because one is for the mobile station, I
7 know.

8 So is there a CID for each of the two
9 connections; so, three total?

10 A. No. I -- well, the one that's for the
11 station, it can be used for any type of -- it can be
12 used for data communication.

13 Q. Now, if I may refer you to page 110 of
14 Exhibit 1006 the 2004 standard, Table 97.

15 A. Excuse me. I was still reviewing
16 Exhibit 1006.

17 Which paragraph of my declaration?

18 Q. Not your declaration. Exhibit 1006, the
19 2004 standard page 110.

20 A. Yes.

21 Q. Okay. So that's the table for Compact
22 DL-MAP IE message for band AMC.

23 Do you see that? Table 97?

24 A. Yes, I see Table 97.

25 Q. Okay. And then somewhere in that table

1 there is an RCID information element, a line item,
2 like the fourth one down on the line.

3 A. Yes.

4 Q. What feature of allocation in the band
5 AMC zone would allow the system to use reduced CID
6 as opposed to CID?

7 A. But this -- this is the compact downlink
8 map information element. And so because it's the
9 compact information element, that's why it's using
10 the reduced CID.

11 Q. I see.

12 What is the difference between a compact
13 downlink map element for band AMC as opposed to a
14 non-compact downlink map IE element for band AMC?

15 A. Well, we can -- to answer that we can
16 look at what the -- Table 97 is the compact link. I
17 guess we can try to find the other one you are
18 trying to compare with.

19 So you are suggesting to compare the
20 compact downlink map information element for band
21 AMC?

22 Q. Correct.

23 A. Well, only the downlink mapping --
24 compact downlink map information for information
25 element format for band AMC is explicitly defined.

1 Probably because the other one is -- to begin with
2 is genetic. And so it doesn't need to be defined
3 for all these different bands.

4 Q. Okay. Now, what feature of the
5 allocation in band AMC is Table 97 using so that
6 it's able to use a reduced CID as opposed to a
7 normal CID identifier?

8 A. I apologize. It's -- maybe now it's --
9 the question became a little too long for me.

10 Q. Of course. No worries.
11 And if you need a break, please let me
12 know.

13 So, looking at Table 97 of Exhibit 1006,
14 what feature of allocation in the band AMC allows
15 the DL-MAP message to use a reduced CID identifier
16 as opposed to a normal size identifier?

17 Do you understand the question?

18 A. I think I understand the question.

19 What feature of this band AMC allows the
20 use of this compact downlink map information element
21 with a reduced connection ID?

22 Q. Correct. Because otherwise why wouldn't
23 everybody everywhere use just a CID or a reduced
24 CID?

25 There must be something that allows the

1 system to use the reduced side as opposed to the
2 normal size here.

3 A. I'm not sure there is a specific
4 feature. I think these for some -- for these cases
5 that are considered to -- doesn't occur very often
6 to accuse -- to use often. It's possible the
7 standard just defines compact information elements
8 that -- they're specially defined. So that adds
9 some complexity. But because they are used often
10 and use fewer bits, that makes it more efficient.

11 Q. Understood. And thank you very much for
12 looking into that.

13 Before we leave Park, one last question
14 on the 2004 standard.

15 What would a typical cell size
16 implementing the 802.16-2004 standard in the
17 frequency range under 11 megahertz be?

18 A. If a -- I'm sorry. The volume is a
19 little bit low --

20 Q. Oh, I'm sorry. I'll --

21 A. I apologize. Sometimes I'm used to -- I
22 am accused of talking in a --

23 Q. I'm out of battery. Sorry.

24 What would a typical size of the cell
25 be, one that implemented 802.16-2004 in the

1 frequency range below 11 gigahertz?

2 A. Typical size?

3 Q. 11 gigahertz. Typical cell size.
4 Meters? Miles? Centimeters?

5 A. I'm scrolling this -- the standards,
6 Exhibit 1006.

7 I think it is generally intended for
8 cells of different sizes.

9 Q. All right. I'm sorry. I didn't mean to
10 interrupt.

11 A. I said different sizes. So, let me --
12 and I was trying to search, but my computer is --
13 has gotten -- there's some issues.

14 But generally I would say some cells
15 could be small on the order of a mile and -- and
16 some could be big.

17 Q. Going back to your declaration
18 Exhibit 1003, paragraph 137, which we already looked
19 at momentarily.

20 A. Which exhibit?

21 Q. Your declaration, Exhibit --

22 A. Oh, my declaration, yes.
23 137?

24 Q. Paragraph 137, correct.

25 A. I am right there.

1 Q. How does Park view the RCID identifier?

2 A. Well, let's -- let's go to paragraph 15
3 of Park. And isn't -- so, Table 1 of Park -- and by
4 Park I mean Exhibit 1005.

5 And doesn't it contain the RCID
6 information element?

7 Q. I don't want to interrupt, so please let
8 me know when your response is --

9 A. I'm done. I think Table 1 includes
10 RCID, the reduced connection identifier.

11 Q. When is the RCID received by the
12 subscriber station?

13 A. When is the RCID received?

14 Q. By the subscriber station.

15 A. It is received together with -- I mean
16 I -- to the extent that I understand the question,
17 it's received together with the downlink map.

18 Q. And the downlink map message specifies
19 to the user the region of the frame where the user
20 data is located, right?

21 A. Yes.

22 Q. So the RCID identifier is received by
23 the subscriber before the subscriber receives the
24 data that it wants to decode, correct?

25 A. Well, I think that's -- that's fine,

1 yes.

2 Q. And the RCID is only used before the
3 user received the data that it wants to subsequently
4 decode, correct?

5 A. If the user wants --

6 Q. I'll repeat the question.

7 A user -- let me strike that.

8 The RCID is received before the user
9 receives the data that it subsequently decodes,
10 correct?

11 Well, let me step back.

12 What's the term of art for the actual
13 data that the user wants to receive? Like the
14 message or the voice or the email? Payload?

15 A. I'm not sure there is a specific term of
16 art for -- we can call it user data with the
17 understanding sometimes this could be -- could refer
18 to a voice signal.

19 Q. Wonderful. So we will use the phrase
20 "user data" to refer to the data such as email,
21 voice, the actual data intended for the user.

22 Fair enough?

23 A. Yes.

24 Q. In Park, the user receives the RCID
25 identifier before it receives its user data,

1 correct?

2 A. I think yes.

3 Q. And the RCID in Park is only used to
4 tell the user the allocated region in the sub -- in
5 the frame where the user will subsequently locate
6 the user data, correct?

7 A. You say it's used only for this?

8 Q. In Park.

9 A. Well, the RCID identifies the
10 connection. I don't think it's only for that.

11 Q. Let me then narrow my question to
12 portions of Park you rely on in your declaration.

13 Let me -- let me direct you to your
14 declaration starting paragraph 137, which you
15 already looked at.

16 A. Yes.

17 Q. Okay. In portions of Park that you rely
18 upon in your declaration, the RCID is used by the
19 subscriber only prior to the subscriber receiving
20 the user data? That's it.

21 MR. LeROY: I'm sorry. Was that a
22 question?

23 MR. HENDIFAR: That was a question. Let
24 me ask it again.

25 ///

1 BY MR. HENDIFAR:

2 Q. Is it correct -- maybe that's how I
3 should have started.

4 Is it correct that in the portions of
5 Park relied upon by your declaration, the RCID is
6 used by the user only prior to the user receiving
7 its user data?

8 MR. LeROY: Objection, form of the
9 question.

10 THE WITNESS: I -- I mean to -- there
11 are -- there maybe -- I apologize.

12 But there may be a couple of reasons why
13 I don't really understand the question. And the
14 first reason is, if I may say it, I think I'm
15 relying on Park -- maybe I can say even in its
16 entirety.

17 When I'm citing throughout the
18 declaration there are extensive citations to Park.
19 Possibly not to every paragraph of Park, but I'm not
20 sure there is a difference between the -- what I'm
21 relying on and what is Park.

22 And the second reason is I'm not sure
23 even to -- I'm not -- I don't completely understand
24 the question.

25 ///

1 BY MR. HENDIFAR:

2 Q. Sure.

3 I am trying to establish the time
4 relationship between when Park's users received
5 RCID, when they use the RCID and when they receive
6 the user data.

7 How these three elements in Park, how
8 Park uses them relate to each other in time.

9 So let me rephrase my question hopefully
10 a bit more accurately.

11 Is there any disclosure in Park where
12 Park's users use the RCID identifier after receiving
13 the user data?

14 A. Well, the -- the one connection,
15 although there might be a downlink that -- downlink
16 map, like I state in paragraph 139, that downlink
17 map is sent on the downlink prior to the date of
18 transmission. That -- there is some periodicity.
19 So downlink map is sent, some data is received, then
20 maybe another one downlink map is received and
21 another piece of data is received and so on.

22 Q. Right. You are looking at a single
23 instance of that occurrence.

24 A. Okay.

25 Q. One transmission -- so I think an

Page 134 1 instance, not a periodical instance but a single 2 instance in Park, is there any disclosure in Park 3 where a user uses the RCID identifier after 4 receiving the user data? 5 MR. LeROY: Objection to the form of the 6 question. 7 MR. HENDIFAR: Let me ask a more 8 precise -- because I don't want to make Dr. Cooklev 9 uncomfortable either with periodic issues. So I 10 will ask the question again more precisely with more 11 parameters. 12 It may be long, so I apologize. 13 BY MR. HENDIFAR: 14 Q. When a user in Park receives a specific 15 DL-MAP IE message containing an RCID element, is 16 there any disclosure in Park where the user uses 17 that RCID after receiving the user data that was 18 mapped in the DL-MAP IE message? 19 MR. LeROY: Object to the form of the 20 question. 21 THE WITNESS: Park is directed only to 22 one aspect; in particular, directed to indicating 23 resource allocation. 24 So, for its purpose I think Park does 25 not describe that the RCID is used after obtaining	Page 135 1 the data. 2 But Park also references 802.16 in 3 WiBro. And so a mobile station could be using it. 4 BY MR. HENDIFAR: 5 Q. For other purposes, not for the purpose 6 of that specific user data map in the DL-MAP 7 message, right? 8 A. Yeah. Not for -- 9 MR. LeROY: I'm sorry. Excuse me, 10 Dr. Cooklev. 11 Objection to the form of the question. 12 THE WITNESS: And if I -- I think my -- 13 what I said is correct, that a station -- a mobile 14 station could be using that RCID. 15 BY MR. HENDIFAR: 16 Q. Right. 17 But for purposes other than recovering 18 the user data that was mapped with the DL-MAP 19 message containing that RCID, correct? 20 MR. LeROY: Objection to the form of the 21 question. 22 THE WITNESS: It's -- I mean -- I'm not 23 sure other purposes. It might be using that reduced 24 connection ID to -- just to produce a stream of data 25 and send that stream of data to an application, for
Page 136 1 example. And that might be -- that might be part of 2 recovering the data. 3 BY MR. HENDIFAR: 4 Q. I'm not sure, would you point me to 5 where you're discussing in Park? 6 A. No. I -- this was -- I'm not 7 specifically looking at any passage from Park for 8 this. 9 Q. Any passage from 802.16-2004? 10 A. Well, to begin -- it discusses on many 11 occasions connection identifiers. 12 But on page seven in the definition -- 13 where is it? -- where it says that connection 14 identifier map to a service flow ID -- oh, yes. On 15 page seven where it says the connection identifier 16 maps to a service flow identifier, which defines the 17 QoS parameters. 18 So the RCID will map to a service flow 19 identifier and so it could be -- it could be used. 20 Q. I am now going to put in the chat box 21 and view -- 22 MR. LeROY: I'm sorry, Parham. I didn't 23 understand what you just said. 24 MR. HENDIFAR: I'm going now to put in 25 the chat box a new exhibit.	Page 137 1 MR. LeROY: Okay. While you're doing 2 that, Patricia, can you tell us how long we have on 3 tape? If you know. I guess I should say our run 4 time. 5 (Off-the-record discussion.) 6 THE WITNESS: Around 7:30 Eastern I 7 would like to make a break. 8 MR. HENDIFAR: Sure. I'll do my -- 9 THE WITNESS: If -- I mean obviously I 10 won't object to that, but I'd like to make a break 11 of -- a little bit longer break. 12 BY MR. HENDIFAR: 13 Q. Let's shoot for finishing before then. 14 Can I -- do you have the exhibit I put 15 in the chat box? We're going to mark that 16 Exhibit 2033. 17 (Whereupon the document referred 18 to was marked Exhibit 2033 and is 19 attached hereto.) 20 THE WITNESS: Oh, okay. I have it 21 downloaded, looking at it. 22 MR. HENDIFAR: Madam Court Reporter, do 23 you have that Exhibit 2033 to be marked? 24 THE REPORTER: Yes. 25 ///

35 (Pages 134 to 137)

Page 138 1 BY MR. HENDIFAR: 2 Q. On the second page first line do you see 3 that Ford Motor Company is the party filing this 4 document? 5 A. Yes. 6 Q. May I please refer you to page 33 of 7 this document. 8 A. 33 at the bottom? 9 Q. Yes. Native page number. 10 A. I'm looking at it. 11 Q. Last complete -- or last paragraph 12 starting with, 13 "The accused products do not 14 infringe claim 7." 15 Do you see that? 16 A. Yes. 17 Q. It reads, quote, 18 "The accused products do not 19 infringe claim seven of the 20 '450 Patent because they do not 21 limit the number of alleged 22 time-frequency resource units to 23 exactly N equals two, four and 24 eight." 25 Do you agree with Ford that a product	Page 139 1 that allows N to be numbers other than two, four and 2 eight would not infringe? 3 MR. LeROY: Objection to the form of the 4 question. And that's improper. 5 I request, Parham, that you read for 6 purposes of context the preceding date. 7 MR. HENDIFAR: That's a speaking -- 8 that's a speaking objection. Next time it happens 9 I'll call the Board. 10 MR. LeROY: You -- 11 MR. HENDIFAR: I will. 12 MR. LeROY: You are trying to mislead 13 the witness, Parham. 14 MR. HENDIFAR: You can put a form 15 objection, and that's the extent of what you're 16 allowed to say. 17 MR. LeROY: Sorry. I object to form. 18 MR. HENDIFAR: And next time that 19 happens I will call the Board. 20 MR. LeROY: Parham, when I said I'm 21 sorry, I couldn't get off of mute. 22 I object to the way you have -- I object 23 to form. 24 BY MR. HENDIFAR: 25 Q. Doctor --
Page 140 1 A. Yes. I'm just quickly -- quickly 2 looking at this document. 3 First maybe I -- I haven't seen this 4 document before. And it seems to me that precisely 5 this portion -- again, I looked at the title page 6 and I'm going back to page 33, that this sentence -- 7 just to qualify my answer, this sentence is about 8 infringement. 9 So I have -- I have not considered 10 infringement. And I have not seen any infringement 11 reports to this spot. 12 So essentially you are asking me right 13 now on the fly to provide an opinion. 14 Q. Please let me know when -- 15 A. Yes. I can -- one second. 16 So in my declaration -- so I -- and I 17 cannot on the fly -- you know, responding to an 18 infringement report takes -- I think takes a lot of 19 time. 20 But for -- so, regarding this, I 21 consider that -- as I describe in paragraph 182 of 22 my declaration, that why not claim the '450 Patent 23 contemplates other values. 24 And that in my -- in my analysis I -- I 25 agree I think I'm familiar with the Board's	Page 141 1 institution decision where the Board said because of 2 the word "comprising" in that sentence, that the 3 claim covers other values, other values -- other 4 values than one -- than 2408. 5 Q. So in your opinion, a reference that 6 allows N to be one, two, four or eight would not -- 7 would -- would meet the requirements of claim seven 8 of the '450 Patent? 9 MR. LeROY: Objection to the form of the 10 question. 11 THE WITNESS: I will -- and if I may, 12 I'd like to look at the patent. 13 BY MR. HENDIFAR: 14 Q. Of course. 15 A. Just to -- may I? I have a copy -- 16 Q. Please do. 17 A. -- that's unmarked. 18 Q. As I mentioned, any claim copy of any -- 19 excuse me -- 20 A. Okay. So I'm looking at the 21 '450 Patent. And I think we are talking about claim 22 seven. 23 So, in claim seven it says only N equal 24 two, four or eight. There is no one, to be 25 accurate, in claim seven. It says where N equal to

36 (Pages 138 to 141)

1 two, four or eight.

2 But the claim element says the "segment
3 comprising N time-frequency resource units" within a
4 time interval. And these N time-frequency resource
5 units, N two, four or eight.

6 Q. Is your answer complete?

7 A. You know, I think -- so I will say two
8 things; that first as I said I -- I think, again,
9 based on my -- based on my understanding of -- of,
10 well, patent law and how I've applied it, I think
11 the claim seven does not exclude other values.

12 Q. Such as N equals one?

13 MR. LeROY: Objection to the form.

14 THE WITNESS: Such as N equal to one is
15 a special case, because we're talking about starting
16 time-frequency coordinates. And the segment
17 comprising one time-frequency resource units, okay,
18 such as N equal to one. One, three, five, six,
19 seven, I think they are -- they are not excluded
20 based on my understanding of patent law.

21 And again I'm saying this not -- I can't
22 right now form a response, form an opinion in
23 response to an infringement report. But that's how
24 I've considered -- that is how I apply patent law.

25 But also -- that's the second aspect

1 that I said.

2 I think if -- if the words were N equal
3 two, four or eight, if these were missing, if it
4 just said N time-frequency resource units, or even
5 if you have these -- you know, N time-frequency
6 resource units, I mean two -- two time-frequency
7 resource units, four, I think these values -- I
8 think it's correct if -- if I say -- I think they
9 are -- they are -- they are pretty much obvious.

10 You know, if -- if a person of skill is
11 told, well, N time-frequency resource units, these
12 are some of the -- some of the very first values.

13 So that's the second aspect.

14 Q. But why are N equal two four or eight
15 have any prominence to a POSITA than other N value?

16 MR. LeROY: Objection to the form of the
17 question.

18 THE WITNESS: They are -- I wouldn't say
19 they're more prominent, but they are powers of two.
20 BY MR. HENDIFAR:

21 Q. And why is that significant?

22 MR. LeROY: Object --

23 THE WITNESS: That's not -- I don't
24 think it's -- I mean I did not think about that and
25 did not think as that significant.

1 BY MR. HENDIFAR:

2 Q. Did I --

3 A. But being powers of two -- being powers
4 of two would be, I think here would be something
5 that a person of skill would have done.

6 MR. LeROY: Patricia, did you calculate
7 the amount of time? Maybe I missed it. I'm sorry.

8 THE REPORTER: I was just doing it and I
9 have a total of roughly six hours.

10 MR. LeROY: Okay. Thank you.

11 MR. HENDIFAR: So is -- I'm sorry.

12 MR. LeROY: No. You can go ahead.

13 BY MR. HENDIFAR:

14 Q. Dr. Cooklev, did I misunderstand your
15 earlier statement that the values two, four, eight
16 would be the first ones that would come to a
17 POSITA's mind or something to that effect? Did
18 misunderstand --

19 A. Among those values, yes. Among those
20 values that would come, yes.

21 Q. Why?

22 MR. LeROY: And while he -- Dr. Cooklev
23 is thinking, Patricia, I think we started at
24 11:00 A.M. Eastern and it's 7:00 P.M. Eastern. So
25 that's eight hours.

1 And I know we took a break, two lunch
2 breaks, but I think they were about a half hour
3 each.

4 MR. HENDIFAR: So, 45 minutes the first
5 one, half hour the second one.

6 THE REPORTER: I can give you the times
7 right now that we went on and off the record.
8 (Off-the-record discussion.)

9 MR. LeROY: Okay. Thank you.

10 THE WITNESS: So I think the answer to
11 that, why would the person have -- as they said,
12 basically would have considered these facts, because
13 in a -- in a network, having one base station and a
14 number of mobile stations, the goal is to service a
15 fairly large number of mobile devices or mobile
16 stations.

17 And so the goal in these assignments
18 would be to provide a relatively small number of
19 time frequency resource units within a time interval
20 to -- because, again, it's a resource, the
21 time-frequency resource altogether is divided
22 into -- is divided by a large number of stations.
23 And so the result is a relatively small number of
24 time-frequency resource units.

25 And so I think a small number of

Page 146 1 time-frequency resource units is something that a 2 person of skill would have considered. 3 BY MR. HENDIFAR: 4 Q. So why would power of two have any 5 advantage over, for example, three or five resource 6 units? 7 A. I mean I -- did I say it has an 8 advantage? 9 Q. That was my understanding. But if I 10 misunderstood, please correct me. 11 A. Oh, I'm not -- I don't think I've -- 12 I've thought about that if he has an advantage. 13 So I have to -- I don't think I've said 14 that. And if I did, maybe I -- I misspoke. 15 Q. Okay. May I please refer you to page 66 16 of your declaration Exhibit 1003. 17 A. Yes. I'm there. 18 Q. Footnote six, third sentence reads, 19 quote, 20 "A POSA would have understood that 21 a single subcarrier resource 22 allocation unit is too small for 23 AMC allocation unit." 24 Do you see that. 25 A. Which page is this?	Page 147 1 Q. Page 66 of your declaration 2 Exhibit 1003. 3 A. Yes. 4 Q. I'm looking at this. 5 A. Oh. Yes. A single subcarrier resource 6 location unit is too small. 7 Q. Why is that? 8 A. First, it's -- the overhead in providing 9 this -- a single carrier -- this single carrier 10 resource allocation unit, the overhead would have 11 been very significant. 12 So it's not -- it is not a practical 13 resource allocation unit. 14 Q. Is a single subcarrier resource 15 allocation more suitable for a diversity scheme as 16 opposed to an AMC region? 17 A. It's not appropriate for any scheme. 18 Because the overhead, I said, is -- is way too 19 significant. 20 So if we are providing just single 21 subcarrier resource allocation units, the specter 22 efficiency will be impacted. 23 But also for diversity -- well, it 24 probably depends on the kind of diversity. 25 With a single subcarrier resource
Page 148 1 allocation unit we can't get any frequency diversity 2 because all you have is a single subcarrier. 3 Q. I see. Understood. 4 May I please refer you now to the 5 '450 Patent, Exhibit 1001. 6 A. Yes. 7 Q. First and second columns. And please 8 let me know when you're there. 9 A. I'm looking at them. 10 Q. Do you see the section titled, 11 "Background"? 12 A. Yes. 13 Q. And column 1 line 51 the patent says, 14 "In the MAP scheduling message 15 defined by 802.16." 16 Do you see that? 17 A. Yes. 18 Q. And then it goes on to speak about 19 specific peak numbers for various aspects of this 20 map message. 21 Do you see that, as well? 22 A. Yes. 23 Q. Are you able based on the information 24 provided in the background section of the 25 '450 Patent point me in the 802.16 standard which	Page 149 1 map scheduling message is the background discussing 2 on this standard? 3 MR. LeROY: Objection to form. 4 THE WITNESS: So I'm looking at 5 Exhibit 1006. 6 Well, first I will say that in the -- 7 the sentence that we are looking at in the map 8 scheduling message defined by IEEE802.16, there is 9 significant control overhead -- the statement is 10 true. And generally it applies to all of the map 11 scheduling messages. 12 Now, some of them we went over, they may 13 be using the reduced connection identifier or ID, so 14 there may be compact cell and -- and therefore might 15 be -- the control overhead might be lower for some. 16 But generally the control overhead is 17 significant. 18 So this is true for any -- I think, if 19 we don't need to -- so even in the compressed 20 downlink map message format, I said this as a -- as 21 an example I'll say Table 16 on page 46 defines 22 downlink map message format that -- there is a -- at 23 least we're limited to downlink message -- map 24 message format. 25 So I would say Table 16.

38 (Pages 146 to 149)

Page 150 1 Q. Thank you. 2 Now, I don't see in Table 16 any 3 resource allocation line item. And I'm sure I'm 4 missing it because it's on my fill. 5 But where would in Table 16 these 6 starting time-frequency starting time coordinate, 7 starting frequency coordinate, ending time 8 coordinate, ending frequency coordinate, where would 9 those appear in the DL-MAP Table 16? 10 A. So we have to unpack the downlink map 11 information element, I think, in Table 16. 12 So, on the same page 46, there is tabs 13 that helps us understand this table. 14 So the -- there are some parameters 15 which are always present. 16 But then just above Table 16 it says, 17 "The encoding of the remaining 18 portions of the downlink map 19 messages is PHY-specification 20 dependent and may be absent in some 21 cases. So, refer to the 22 appropriate PHY specification." 23 So the reason you can't see these 24 allocations is because the remaining portions of the 25 downlink map -- downlink map message which include	Page 151 1 the downlink map information element, they are -- 2 they are PHY Dependent. 3 And so we have to see for the OFDMA PHY, 4 we have to see what the downlink map information 5 element is. 6 Q. I see. 7 So the actual coordinates of the 8 allocated region would be an information element 9 within the DL-MAP message? 10 A. I think that's correct. 11 Q. Okay. Based on the information in the 12 background of the '450 Patent, can we point or can 13 you point to any specific DL-MAP information element 14 that is discussed in the background of the 15 '450 Patent? 16 A. So can I point to a specific downlink 17 map information element? 18 Q. No. Not any. 19 So the question is do the information 20 discussed in the background section of the 21 '450 Patent, for example, it talks about a four bit 22 MAC code, two beat -- for coding applications and 23 other information. 24 Based on the information in the 25 background of the '450 Patent, does that information
Page 152 1 identify a specific DL-MAP information element in 2 the 802.16 standard? 3 MR. LeROY: Objection. Form. 4 THE WITNESS: You know, that's possible. 5 It says overall the overhead of a map message is 52 6 bits. 7 And I was trying to go over the map 8 messages and to see which one is like 52 bits. Some 9 have fields of variable sizes that it is -- I'm not 10 able to find the map message that has -- that has 52 11 bits. 12 BY MR. HENDIFAR: 13 Q. Now, what is the difference between AMC 14 and band AMC? Is band AMC a specific type of AMC? 15 A. Well, I think the AMC just by itself 16 refers to adaptive modulation and coding. And the 17 band's AMC is -- refers to an AMC area. 18 I think we were talking about that paper 19 from 2005, and even Park Figure 1, he has AMC area. 20 And so that's an area of -- and there you have a 21 band for those -- 22 Q. I see. So could you use adaptive 23 modulation and coding in, for example, diversity 24 area? 25 A. That's a good technical question.	Page 153 1 Because diversity is different from adaptive 2 modulation and coding. And so they could be -- 3 because they're just different things, you could 4 combine them, as just in the abstract it's difficult 5 for me to say that the -- either the 2004 standards 6 specify something like that. 7 Q. Understood. 8 What is the pedestrian speed -- what 9 speed is considered a pedestrian speed in this 10 field? 11 A. Zero to five. I think -- 12 Q. Five what? 13 A. Good question. I think it's five 14 kilometers about. 15 Q. You hesitated. 16 Is there a dispute about whether it 17 should be kilometers or miles? 18 A. No. I don't think there is a dispute. 19 I -- I just hesitated because I wanted to think a 20 little bit -- another moment before I answer. 21 Q. Understood. 22 I understand we have about ten more 23 minutes, but I understand you need a break at 24 four -- or 7:30 your time exact. 25 How long would you say you need just for

39 (Pages 150 to 153)

1 our planning purposes?

2 A. I would get a 45-minute break.

3 Q. It is fine with me. We don't want to
4 impose. But I defer to counsel and Madam Court
5 Reporter.

6 A. At the minimum 30 minutes. At the
7 minimum 30-minute break. But I may not be done by
8 then.

9 MR. HENDIFAR: It's a long deposition.
10 We'll work with your schedule.

11 And we're off the record.

12 (Off-the-record discussion.)

13 BY MR. HENDIFAR:

14 Q. May I please refer you to paragraph 36
15 of your declaration Exhibit 1003, please.

16 A. 36?

17 Q. Yes.

18 A. Yes. I'm there.

19 Q. Okay. And you opine that a person of
20 ordinary skill in the art would have, among other
21 things, three to five years of experience.

22 Do you see that?

23 A. Yes.

24 Q. Okay. How did you determine the level
25 of experience to be three to five years of

1 experience?

2 A. Well, three to five years of experience
3 is some experience beyond the academic training.

4 Q. Is there --

5 A. So that's how I did that.

6 Q. I believe in most, if not all, the other
7 declarations you've submitted for various parties
8 with various counsel, the level of experience you
9 have presented has been two to four years.

10 Is the technology at issue here more
11 complicated than all the other patents you have
12 opined on?

13 MR. LeROY: Objection to form.

14 THE WITNESS: Generally I would not say
15 that the technology is more complicated.

16 BY MR. HENDIFAR:

17 Q. Okay.

18 A. The technology is generally comparable.

19 Q. Now, have you performed your analysis in
20 your declaration from the perspective of a POSITA
21 who has a bachelor degree but only two to three
22 years of experience?

23 A. I think if -- I think it won't make a
24 difference. Two to three years versus three to five
25 years of experience or two to four years, I don't

1 think it would have -- it would make a difference.

2 Q. Okay. In the 802.16-2004 standard, why
3 does the AAS antenna scheme have to be used with --
4 only with the band AMC -- band AMC -- I forgot what
5 the technical word is.

6 A. You know, I noticed this one earlier
7 when we were looking at it. I cannot answer that
8 now.

9 Q. Why is that?

10 A. No. I -- I don't know right now. I
11 just need to analyze this more.

12 Q. Okay. But it is your opinion that AAS
13 antenna scheme can only be used with band AMC
14 region?

15 A. I noticed be a restriction about that.
16 Let's -- we can establish -- my -- my opinion is
17 whatever the standard says.

18 I don't want to --

19 (Indecipherable simultaneous
20 colloquy.)

21 BY MR. HENDIFAR:

22 Q. Let me re-ask the question like this.

23 Does 802.16-2004 standard permit the AAS
24 antenna scheme to only be used with the band AMC
25 permutation?

1 MR. LeROY: Objection. Form.

2 THE WITNESS: I don't know. But if you
3 have a particular page in mind --

4 BY MR. HENDIFAR:

5 Q. Well, paragraph 118 of your
6 declaration --

7 A. Yes.

8 Q. -- I understood your declaration to be
9 that the AAS adaptive antenna scheme can only be
10 used with AMC zones.

11 Did I misunderstand your declaration?

12 A. On page?

13 Q. Actually Exhibit 1025 page 293 may also
14 be helpful to you.

15 A. Oh, 1025? That's 16(e)?

16 Q. No. That's the Eklund book?

17 A. Oh, the Eklund book.

18 Q. Let me give you a reference. I don't
19 mean to put words in your mouth.

20 Let me withdraw this question. That's
21 fine.

22 MR. HENDIFAR: I have no further
23 questions. Because I already used up my ten minutes
24 and I don't want to be rude. So we have no further
25 questions.

Page 158 1 THE WITNESS: Okay. Well, thank you. 2 So if I -- now I will -- I assume we are 3 off the record. 4 MR. HENDIFAR: Yes. 5 6 (Whereupon at 4:39 P.M. an 7 extended recess was taken.) 8 * * * 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25	Page 159 1 (Whereupon at 5:57 P.M. the 2 deposition proceedings were 3 resumed.) 4 5 EXAMINATION (Resumed) 6 BY MR. LeROY: 7 Q. Okay, Dr. Cooklev. I have just a few 8 follow-up questions. 9 Earlier during your cross-examination 10 you were asked a few questions regarding the RCID 11 disclosed in the Park reference. 12 Do you recall that? 13 A. I do. 14 Q. And I believe you were asked the timing 15 of when the RCID was received by the mobile device 16 in relation to the data. 17 Do you recall that? 18 A. I do recall that. 19 Q. And do you recall being asked the 20 instances and manners in which the RCID was 21 thereafter used by the mobile terminal? 22 A. And this is one aspect where I -- I gave 23 an answer I think in the context of a system, almost 24 like a hypothetical system, that's built using Park. 25 But regarding Park, I analyze this in my
Page 160 1 declaration. 2 MR. HENDIFAR: Wait. Is there a 3 question here? I'm not sure what the question is 4 first. 5 BY MR. LeROY: 6 Q. Yeah. Sure. 7 Dr. Cooklev, I'm going to ask you a 8 question. And I was going to refer you to your 9 declaration. 10 Specifically, your declaration is 11 Exhibit 1003. If I can direct your attention to 12 page 68 and 69. 13 A. Yes. I'm looking at this. 14 Q. And do these paragraphs, and 15 specifically paragraph 195 and 196, describe and 16 usage of the RCID following its receipt at the 17 mobile terminal? 18 A. Yes. The -- so these paragraphs 19 describe -- and they are part of the entire section 20 beginning with paragraph 192 pertaining to the claim 21 elements. They cover the information using the 22 starting time-frequency coordinate N and in 23 conjunction with the identifier, which I will take a 24 look, which is the last claim element of claim 25 seven.	Page 161 1 And so -- and I will -- the way I will 2 answer this question is explain the -- the context 3 here of -- about my analysis that is even before -- 4 earlier I described what a connection identifier is. 5 And the connection identifier is described in -- 6 there's a -- a definition is I think at page seven. 7 MR. HENDIFAR: Page seven? 8 THE WITNESS: Page seven, excuse me, of 9 the 2004 standard. 10 So, page seven includes a definition 11 both for connection and connection identifier. 12 And I said the connection identifier 13 identifies both the subscriber station and 14 identifies a connection. 15 So a subscriber station can have more 16 than one connection identifier. And the reason it 17 can have more than one is that it is capable of 18 handling connections with different quality of 19 service. 20 So in the definition on page seven it 21 says it maps to a service flow identifier which 22 defines the quality of service parameters. 23 And now if I'm -- I'll go back to my 24 declaration Exhibit 1003. 25 And so this paragraph 194 I describe

41 (Pages 158 to 161)

1 here just how the system works, the system described
2 in Park.

3 And here is the base station encodes the
4 message for -- and this message is assigned a
5 certain quality of service. And in other words,
6 there's a certain connection. So voice will have
7 one -- one connection ID, data will have a different
8 connection ID.

9 I mean I think it's helpful to think in
10 terms of these two connection ID's as examples.

11 And then in paragraph 195 I describe
12 downlink map contains the information needed for the
13 mobile device to find the data and then decode the
14 data. And I think that -- that was established and
15 is supported by these documents here that are part
16 of the record.

17 And so the downlink map that's in Park
18 incorporates the starting time-frequency coordinate.
19 And there is an index.

20 So Park's downlink map is used for
21 recovering the information. So there is a start
22 allocation unit and there's a number of allocation
23 units, of course they have been -- they are used.

24 So I said as an example this voice and
25 data and the mobile device recovers a signal --

1 recovers information knowing that it is part of the
2 voice connection that is being established and then
3 recovers -- recovers information while only the
4 starting time frequency coordinate, which in Park is
5 to start the location and -- the number of location
6 units in Park. Only those, well, they may not be
7 enough if we have multiple connections.

8 But now together with -- in conjunction
9 with the identifier, then a receiver just will
10 recover the voice signal and will recover the data
11 signal. And then it will -- I think earlier I said,
12 well, then after that, well, the data signal, maybe
13 then it will pass it to -- to an application layer
14 and so then it will treat them differently.

15 So this is how Park recovers the
16 information from the received signal using the
17 starting time-frequency coordinate, which Park has a
18 different term, and in conjunction with the N and --
19 and in conjunction with the received identifier.

20 Q. Thank you.

21 During your cross-examination you were
22 presented with a variety of additional exhibits, and
23 you were also directed to passages of exhibits that
24 were already part of the record.

25 Did you observe any statements or

1 passages in any of the exhibits that you were
2 directed to today that change your opinions
3 regarding the invalidity of the challenged claims?

4 A. No. I stand by the opinions that I
5 provided in the declaration.

6 MR. LeROY: Thank you, Dr. Cooklev.

7 Parham, I have no further questions.

8 MR. HENDIFAR: I have a couple of minor
9 questions.

10
11 FURTHER EXAMINATION
12 BY MR. HENDIFAR:

13 Q. Welcome back. I promise to be just a
14 few minutes, Dr. Cooklev.

15 During the break did you speak with
16 counsel regarding the substance of the deposition?

17 A. I -- I spoke with counsel. Yes to that.

18 Q. Approximately how long did you speak
19 with counsel regarding the substance of today's
20 deposition?

21 A. 15 to 20 minutes.

22 Q. And did you discuss the use of the RCID
23 identifier in Park with counsel during the break?

24 MR. LeROY: Yeah. Dr. Cooklev -- excuse
25 me.

1 Parham, that's -- those are privileged
2 conversation we had.

3 MR. HENDIFAR: I can ask and you can
4 instruct him not to answer and the record will
5 reflect that. That's fine.

6 MR. LeROY: I just want to --

7 Hold on, Dr. Cooklev.

8 I just want to direct your attention to
9 the partial decision in Focal Therapeutics versus
10 Senorx in IPR2014-00116.

11 MR. HENDIFAR: I'm familiar with that.

12 MR. LeROY: I'm sorry?

13 MR. HENDIFAR: I'm familiar with that.

14 What I'm saying is you can lodge an
15 objection, instruct the witness not to answer, and
16 that's fine. The record will reflect that.

17 MR. LeROY: Fine.

18 MR. HENDIFAR: I'm not moving to compel
19 on it.

20 MR. LeROY: Okay.

21 BY MR. HENDIFAR:

22 Q. So the question, Dr. Cooklev, that I
23 presented is did you discuss with counsel during the
24 break Park's use of RCID in its system?

25 MR. LeROY: I instruct the witness not

1 to answer that question, Parham. Because the way
2 you've asked it reveals the substance of the
3 conversation.

4 MR. HENDIFAR: That's okay. That's
5 fine. I don't mind that.

6 I just want the record to reflect your
7 objection. That's not a problem.

8 BY MR. HENDIFAR:

9 Q. Dr. Cooklev, you just explained during
10 redirect that RCID can be used to identify one of
11 multiple connections to a given subscriber.

12 Did I understand that correctly?

13 A. Yeah. They could be multiple
14 connections to a subscriber. So it identifies both
15 the subscriber and the connection.

16 Q. Well, if a subscriber has two different
17 connections, each would have a different RCID?

18 A. Yes.

19 Q. And can a subscriber have simultaneously
20 two different connections under 802.16-2004?

21 A. Yes.

22 Q. And the way the RCID would be used would
23 be -- if I understood you correctly -- in the DL-MAP
24 message determine which allocation corresponds to
25 which connection, correct?

1 A. And we can look at the DL-MAP message,
2 but I would say generally, yes.

3 Q. And once the subscriber determines which
4 allocation is for the given RCID, the subscriber
5 would then go to that region to recover the data
6 that it contained in that region, correct?

7 A. Yes. So, and this is -- the RCID is --
8 well, it's both in the 2004 standard and in Park.

9 Q. Does the subscriber device know which
10 region of the frame contains the allocation for a
11 given connection before the data for that region is
12 received?

13 A. There was a part that maybe I didn't
14 get. I'll try to repeat.

15 Does the subscriber know which region of
16 the allocation --

17 Q. I'll rephrase the question.

18 Does the subscriber know which region of
19 the frame is allocated for a given connection prior
20 to receiving the data contained in that region?

21 A. So, receiving the data is recovering the
22 data. Right?

23 Q. I don't know.

24 A. I -- well, that's -- receiving the data
25 is the same as recovering the data. I mean I do

1 know.

2 Q. How so? Would you please elaborate?

3 A. Well, "recover" is used in connection
4 with recover what was previously sent. And
5 "receive" can be used in the same context, receive
6 what was previously sent -- or receive what was
7 sent.

8 So -- and I gave two examples, just
9 voice connection and a data connection.

10 And so, yes, it finds -- it determines
11 the allocation and then recovers.

12 The recovery happens using the starting
13 time-frequency coordinate, the number of units and
14 in conjunction with the identifier.

15 Q. So I think the reason we are having this
16 discussion is I believe you mentioned recovering
17 information is the same as receiving information.

18 And I'm not sure if I got an explanation
19 as to why you believe that is.

20 A. And I'm not here in terms -- not writing
21 dictionaries, but they could mean -- they could mean
22 the same thing.

23 Q. How so?

24 A. And just based on the plain and ordinary
25 meaning as they are understood by a person of skill.

1 So, "receive" just means perform all the typically
2 signal processing steps to receive what was sent.
3 And "recover" is -- as I said, can mean very
4 similar, is perform all the steps, all the
5 operations to recover what was previously
6 transmitted.

7 So I'm not -- I'm not sure -- I'm hoping
8 this helps. I'm not sure beyond that how to clarify
9 that a person of skill would use these terms -- in
10 many cases would use them interchangeably.

11 Q. Is your analysis in your declaration
12 based on the opinion that the receiving and the
13 recovering are the same tasks?

14 A. Is -- am I assuming that "receive" and
15 "recover" have the same meaning?

16 Q. Well, is your declaration based on that
17 opinion that the recovering and the receiving it
18 under the '450 Patent have the same meaning?

19 A. Not -- I'm not exactly, because I'm just
20 using the plain and ordinary meaning of "recover,"
21 which is the claim term.

22 Q. I'm sorry. Give me one moment. I think
23 I may be confused.

24 At what stage in Park is the DL-MAP
25 message decoded to obtain the necessary information

Page 170 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 from the DL-MAP message? A. At what stage in Park is what? Q. I'll repeat the question. At what stage is -- in Park is the DL-MAP message decoded to obtain the necessary information contained within it? A. At the beginning of a frame. Q. So is the DL-MAP message decoded as it's being received? A. Is it being decoded -- Q. As it is being received? A. Yes. Q. Okay. So, a subscriber station in Park is aware of the allocated region for each connection prior to receiving the data in that connection, correct? A. I -- I'm sorry. It has to be repeated. Q. So, a subscriber in Park is aware of the region that is allocated for each connection before receiving the data contained within that allocation, correct? A. Generally, yes. MR. HENDIFAR: I have no further questions. MR. LeROY: No further questions.	Page 171 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 Thank you, Doctor Cooklev. Thank you, Patricia. MR. HENDIFAR: Thank you. Sorry you had to stay this late. I appreciate your time. THE WITNESS: Thank you. And thank you for accommodating me and my breaks. THE REPORTER: Mr. LeRoy, do you want a copy of the transcript? MR. LeROY: Yes, please. THE REPORTER: It's been requested to be expedited. Do you want it expedited also? MR. LeROY: No. And we don't need any scanned exhibits. I think I have the new ones and we have the old ones. THE REPORTER: So no exhibits. MR. LeROY: Thank you. (Whereupon at 6:26 P.M. the deposition proceedings were concluded.) * * *
Page 172 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 I, TODOR COOKLEV, Ph.D., say I have read the foregoing deposition and declare under penalty of perjury under the laws of the State of California: That the foregoing is my deposition under oath; That I have read same and have made the necessary corrections, additions or changes to my answers that I deem necessary; That my answers as indicated are true and correct. Executed at _____, California, this _____ day of _____, 20____. _____ TODOR COOKLEV, Ph.D.	Page 173 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 REPORTER'S CERTIFICATE I, PATRICIA L. HUBBARD, do hereby certify: That I am a duly qualified Certified Shorthand Reporter in and for the State of California, holder of Certificate Number 3400, which is in full force and effect, and that I am authorized to administer oaths and affirmations; That the foregoing deposition testimony of the herein named witness, to wit, TODOR COOKLEV, Ph.D., was taken before me at the time and place herein set forth; That prior to being examined, TODOR COOKLEV, Ph.D., was duly sworn or affirmed by me to testify the truth, the whole truth, and nothing but the truth; That the testimony of the witness and all objections made at the time of examination were recorded stenographically by me and were thereafter transcribed by me or under my direction and supervision;

Page 174 1 That the foregoing pages contain a full, 2 true and accurate record of the proceedings and 3 testimony to the best of my skill and ability; 4 5 Before completion of the deposition, 6 review of the transcript [] was [xx] was not 7 requested. If requested, any changes made by the 8 deponent (and provided to the reporter) during the 9 period allowed are appended hereto. 10 11 I further certify that I am not a relative 12 or employee or attorney or counsel of any of the 13 parties, nor am I a relative or employee of such 14 attorney or counsel, nor am I financially interested 15 in the outcome of this action. 16 17 IN WITNESS WHEREOF, I have subscribed my 18 name this 4th day of December, 2024. 19 20 21 22 23 24 25 PATRICIA L. HUBBARD, CSR #3400	Page 175 1 ERRATA SHEET FOR THE TRANSCRIPT OF: 2 Case Name: FORD MOTOR COMPANY vs NEO WIRELESS LLC 3 Dep. Date: DECEMBER 3, 2024 4 Deponent: TODOR COOKLEV 5 Page Line Now Reads Should Read Reason 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 Signature of Deponent Date
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