1 UNITED STATES PATENT AND TRADEMARK OFFICE

2 BEFORE THE PATENT TRIAL AND APPEAL BOARD

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4 SAMSUNG ELECTRONICS CO. LTD., Case No. IPR2025-00935

5 Petitioner, US Patent No 11,129,163 Ref. 39843-0196IP1

6 v.

7 WILUS INSTITUTE OF STANDARDS AND TECHNOLOGY INC., IPR2025-00936 US Patent No 11,700,597

8 Ref. 39843-0197IP1

Patent Owner.

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13 REMOTE DEPOSITION OF

14 TODOR V. COOKLEV, Ph.D.

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16 April 13, 2026

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Misty Klapper, RMR, CSR, RPR, RSA

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SAMSUNG 1024
Samsung v. Wilus
IPR2025-00935

Monday, April 13, 2026
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Taken pursuant to notice, before Misty Klapper, Registered Merit Reporter, Certified Shorthand Reporter, Registered Professional Reporter, Realtime Systems Administrator and Notary Public.

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C O N T E N T S

WITNESS:	EXAMINATION BY:	PAGE:
Todor V. Cooklev	Mr. Monaldo	5, 142
	Mr. Milkey	135

E X H I B I T S

NO.:	DESCRIPTION:	PAGE:
Exhibit A	Korean Patent Application No. 10-2016-0029975	138

PREVIOUSLY MARKED EXHIBITS REFERRED TO:	PAGE:
Exhibit 1001	12
Exhibit 1005	69
Exhibit 2016	9

P R O C E E D I N G S

TODOR V. COOKLEV, Ph.D.,

The witness herein, called for examination by the Petitioner, having been duly sworn, was examined and testified as follows:

EXAMINATION BY COUNSEL FOR PETITIONER

BY MR. MONALDO:

Q. Good morning, Doctor. Could you please state your name for the record.

A. Todor Cooklev.

Q. Have you been deposed before?

A. Yes.

Q. You understand that you've given an oath here today, correct?

A. Yes.

Q. And that oath requires you to tell the truth, correct?

A. Yes.

Q. And you'll agree to do that today?

A. Yes.

Q. If at any point in the deposition you want to supplement or change an answer, will you please let me know?

A. I will try to do that, Counsel.

Q. Great. Is there any reason you can't give your best, most accurate testimony today?
A. None that I'm aware of.
Q. What sort of preparation did you do for today's deposition?
A. Well, I reviewed the -- the documents of the IPR, I mean, the exhibits. I reviewed my declaration. I reviewed the identified prior art. I also took another look at the -- at the '163 patent. And I -- and I also had discussions with counsel.
Q. How many discussions did you have with counsel?
A. About three, I think.
Q. When did those occur?
A. Over the last, I think, the previous -- maybe the previous three days or something like that.
Q. How long were those discussions?
A. The first one was -- was a bit longer, on the order of -- maybe on the order of three, three and a half hours or something like that. And then they were getting shorter.
Q. Okay. I will try to take a break about every hour or so. If you ever need a

break, please just let me know.
A. Thank you.
Q. And then do you have a preference when we break for lunch?
A. No, no preference.
Q. Okay. We can play that by ear then.
Do you understand that we're covering two proceedings involving two patents during today's deposition?
A. Yes, I do.
Q. The first proceeding is numbered IPR2025-00935. It involves U.S. Patent Number 11,129,163. I'll refer to that patent today as the '163 patent.
Is that okay?
A. Yes.
Q. The second proceeding is numbered IPR2025-00936. It involves U.S. Patent Number 11,700,597. I'll refer to that patent today as the '597 patent.
Is that okay?
A. That's fine. I don't remember that patent number off the top of my head, but that's fine.
Q. You understand that the

specifications and drawings of the '163 patent and the '597 patent are generally the same, correct?

A. Yes.

Q. So to save time and to make our jobs easier here today, I will primarily refer to the '163 patent. Given the similarity between the patents and the issues involved in the two proceedings, my questions will apply equally to both the '163 and '597 patents unless I specify that a question applies to only one of the patents.

Is that okay?

MR. MILKEY: Object to form.

THE WITNESS: Yes.

BY MR. MONALDO:

Q. And when you answer a question, I will assume your answer applies equally both to '163 and '597 patents, unless you specify an answer applies to only one of them.

Is that okay?

A. Yes, that's fine. I will try to clarify if there is a need to clarify.

Q. Did you review the '163 and '597 patents in preparation for the deposition?

A. Well, I said that I reviewed the '163 patent. I think for the other IPR I -- I looked at my declaration. I don't recall at the moment most recently -- I reviewed that patent when I submitted the declaration. Maybe not -- maybe not in the last, like, few days.

Q. Did the '163 and '597 patents make sense to you?

A. Yes.

Q. Now, Dr. Cooklev, I'm going to refer to Exhibit 2016.

(Thereupon, Exhibit 2016, previously marked, was referred to.)

BY MR. MONALDO:

Q. Do you have access to that? I can also share my screen here.

A. Well, Counsel, I want to ask for your permission to use -- here with me I have -- it's -- it's -- everything is unmarked, clean copies. I have -- this is a copy of my declaration in the 935 IPR.

Q. Okay.

A. And I also have hard -- I also have a hard copy of the '163 patent and maybe of some of the identified prior art.

Q. Okay. Yes, that is perfectly fine. If you'd like to refer to those copies, please do so.

A. Yeah, but I also would -- would ask, you know, for permission to use -- sometimes an electronic copy is useful. Maybe I can do a quick search or something, depending on your question.

So I expect to, if you will, go back and forth between a paper copy and an electronic copy.

Q. That is fine.

So I've started sharing my screen here. Can you see the copy of the declaration?

A. Yes.

Q. Okay. Do you recognize this as Exhibit 2016, the declaration you submitted in the '163 patent IPR?

A. I -- that's the title page.

Q. At this time do you have any corrections or changes you want to make to the declaration?

A. I think there is one minor issue that -- it's not substantive. In one paragraph, the words -- I don't exactly remember, but the

word "disable" might be missing and it might say coloring bit, where it means coloring disable bit, although that is clear from the context.

So, again, it's not a substantive change.

Q. Do you know which paragraph that occurred in?

A. It might be around -- at or around paragraph 56, but we can -- maybe I can right now.

Q. So coloring bit being set to 1 should be coloring disable bit?

A. Yes, I think so.

Q. Okay. Fair enough.

Dr. Cooklev, did you draft this declaration?

A. Well, I worked with counsel in preparing this declaration.

Q. So counsel helped you prepare the opinions set forth in the declaration?

MR. MILKEY: Objection to form.

THE WITNESS: No. The opinions are my opinions. Counsel helped me -- helped me with the writing/formatting of the declaration.

BY MR. MONALDO:

Q. Did counsel prepare a first draft of the declaration for your consideration?

A. I don't exactly remember, but -- but -- maybe not.

Q. But you provided the first draft, written draft, of the declaration?

A. Again, I don't exactly remember in this case, but perhaps.

Q. I'm going to turn to the '163 patent now.

(Thereupon, Exhibit 1001, previously marked, was referred to.)

BY MR. MONALDO:

Q. Dr. Cooklev, do you recognize what I'm sharing on the screen as Exhibit 1001, the '163 patent?

A. Yes, I do. That's the title page. And as -- as I said, just -- just for ease, here I have a clean hard copy of it.

Q. Absolutely. I'll share my screen and have that available to you. But also, please refer to your hard copy or an electronic copy you have on your computer. That is completely fine.

A. Thank you.

Q. Can I turn you to column 11, line 62 of the '163 patent.

Do you see the sentence there that begins, Figure 6 shows that a wireless terminal according to an embodiment of the present invention, enters a power save mode based on a BSS color?

A. I do see this, yes.

Q. What is a BSS color?

A. Yes, I'm -- I'm mindful of the question.

I will take a look at an electronic copy that I -- that -- I will try to give you a little more accurate answer.

Q. Okay.

A. So not as a definition of BSS color, but as a general idea, it's -- it is a concept to distinguish frames or -- excuse me. It's a concept to distinguish basic service sets.

I mean, maybe another way to look at -- to look at it, it's -- it's a field in a PPDU, which it is an identification of the basic service set.

Q. You'd agree with me that BSS color is a general field used to identify a basic service

set, correct?

MR. MILKEY: Object to form.

THE WITNESS: Well, almost. What do you mean by general?

BY MR. MONALDO:

Q. I guess just the general concept that a color is something that's used as an identification of a basic service set.

MR. MILKEY: Object to form.

THE WITNESS: Oh, I think it's called BSS color. And I think I just said that, yes, you can look at it as a concept or you can look at it as a field in a PPDU, which identifies the basic service set.

BY MR. MONALDO:

Q. Were you familiar with the concept of BSS color before reviewing the '163 patent?

A. Yes.

Q. In what context?

A. In the context of 802.11ax.

Q. Can I turn you to column 12, line 3 of the '163 patent.

A. Yes, I'm looking at it.

Q. Do you see the sentence that begins,

When the PPDU received by the non-AP wireless communication terminal is the HE-MU-PPDU, the BSS color value signaled by the corresponding PPDU indicates the BSS associated with the wireless communication terminal?

A. Yes, I see this.

Q. What is the BSS color value signaled by the corresponding PPDU?

A. Well, I mean, I think this is -- I think this is pretty clear, that the BSS color value here is -- is -- I mean, what -- it's like a set of bits.

Q. Okay. So you'd agree with me that the BSS color value is the set of bits, whereas the BSS color is the field or concept for the identifier of a BSS, correct?

A. Well, perhaps almost. I think sometimes a person can refer to -- as -- as you were saying, can refer to the BSS color value as a set of bits or, depending on the context, it could be the BSS color is that set of bits.

Q. But you'd agree with me that the '163 patent, as we've just discussed, uses BSS color and BSS color value separately and distinctly, correct?

MR. MILKEY: Object to form.

THE WITNESS: I think that's a little too strong, too -- too -- a little too strong to say. I think just the BSS color value is -- is a little long. I think a person of skill at the time of the invention would use -- as I said, depending on the context, could use BSS color value and just BSS color, would use them pretty much interchangeably.

BY MR. MONALDO:

Q. Would it be a fair interpretation to refer to the BSS color as the field or concept of BSS color and the BSS color value as the specific bits included in that field?

MR. MILKEY: Objection to form.

THE WITNESS: It is a -- in general, that's -- it seems to me correct what you are saying.

But -- and I think you are -- in that question you were very -- you were at least trying to be very precise. And I don't think technical documents -- again, generally -- may consistently maintain that level of precision and distinction.

BY MR. MONALDO:

Q. So your opinion is that sometimes the terms "color" and "color value" may be used interchangeably, but it's also fair to say, if you're being precise, that BSS color is the field or concept in BSS color value are the specific bits within the field?

MR. MILKEY: Objection to form.

THE WITNESS: Well, while -- again, in some general sense, perhaps yes, but I think it's -- I think in all cases, one has to look at the context. And I think that would be -- that would be a better approach.

BY MR. MONALDO:

Q. And in the context of the '163 patent, we see the term "BSS color" used and we also see the term "BSS color value" used.

In that context, would it be fair to say that BSS color value is intended to be more specific and represent the bits that are included in the BSS color field?

MR. MILKEY: Objection to form.

THE WITNESS: Well, as far as the '163 patent using the term "BSS color,"

well, sure, it uses that term many times. And as -- as -- as you found here, this example in column 12, is also uses BSS color value.

But I think in -- in -- in all contexts, to be -- to be -- to understand it accurately, one would have to look at the context.

BY MR. MONALDO:

Q. Okay. And in the context of column 11 and 12, the portions we've just discussed, what would be your understanding of the distinction between BSS color and BSS color value?

MR. MILKEY: Objection to form.

THE WITNESS: Let me -- and just for reference, I -- I will open an electronic copy of my declaration.

First, I -- I don't think I've opined on any distinction between BSS color and BSS color value. Of course, please correct me if I'm wrong.

So you're asking me to -- to -- I guess to tell you how I understand the '163 patent and, in particular, this

passage from columns 11 and 12.

I'm not sure that in -- in -- even in this passage there is a distinction, which I think in your question you were asking about a distinction. And I'm not sure there's a distinction between BSS color and BSS color value.

For example, in the -- in column 11, line 62, that sentence ending, in based on a BSS color, again, I haven't provided an opinion, but it seems to me that one could say based on a BSS color value here.

BY MR. MONALDO:

Q. Okay. But you'd agree with me that a possible distinction is that BSS color refers to the field, whereas BSS color value refers to the bits in the field, correct?

MR. MILKEY: Object to form.

THE WITNESS: It might be a little too strong, what you are saying. I'm not sure I can entirely agree. As I -- as I said, in this sentence in column 11, if it says based on a BSS color value, so the entering the power save mode based on a

BSS color value, would this change the meaning of this sentence? It seems to me no.

And in the other sentence -- just let me -- the BSS color value signaled by the corresponding PPDU, I think a person of skill would -- would understand it pretty much in the same way if it says the BSS color signaled by the corresponding PPDU.

So even in this case, I think -- it seems to me that they could be used interchangeably, and, as I said, depending on the context.

BY MR. MONALDO:

Q. But they may not be used interchangeably also, correct?

MR. MILKEY: Object to form.

(Thereupon, Dr. Cooklev left the deposition.)

MR. MILKEY: I assume he'll be rejoining shortly. I just sent him a text letting him know that he dropped just in case.

THE WITNESS: I think there was an

interruption. I'm not sure what happened. I apologize.

BY MR. MONALDO:

Q. No problem.

So you testified earlier today that BSS color could be interpreted as a field, correct?

A. Yes.

Q. And you testified earlier today that BSS color value could be interpreted as bits within that field, correct?

A. Could be.

Q. So you'd agree with me that one possible distinction between BSS color and BSS color value is that BSS color could refer to the field and BSS color value could refer to the bits within the field, correct?

MR. MILKEY: Objection to form.

THE WITNESS: Although -- yes, I -- I did testify that BSS color in -- could be -- one could mean the concept, could mean the field. And BSS color value would be the -- the set of bits that -- yes.

But I think when we start to make a distinction between these, I do think that

is a little bit strong statement. And it is strong because I think a person of skill or general technical people, including myself, if you will -- technical people are not that -- maybe are not that precise.

BY MR. MONALDO:

Q. And I understand that your opinion is that people are not always this precise, sometimes these terms can be used interchangeably, but my question is one possible interpretation when you're being precise is that BSS color refers to the field and BSS color value refers to the bits in the field, correct?

MR. MILKEY: Objection to form.

THE WITNESS: In some general sense -- in some general sense it seems to me, yes; but, again, it always is important to look at the context.

BY MR. MONALDO:

Q. Okay. Can I turn you to column 10, line 54 of the '163 patent.

A. Column 10?

Q. Yes, line 54.

A. I'm there.

Q. Do you see the sentence that reads, To solve this problem, a wireless communication terminal may perform a spatial reuse operation?

A. Yes.

Q. What is a spatial reuse operation?

A. Well, for example, the next sentence in column 10 says, Specifically, the spatial reuse operation may include an operation of accessing the channel depending on whether the received frame is a MAC frame transmitted from a BSS including a wireless communication terminal or a MAC frame transmitted from another BSS.

So I think that this -- this sentence tells you that a spatial reuse operation is an operation of accessing the channel depending on whether the received frame -- frame is transmitted from the same BSS or transmitted from another BSS.

Q. You'd agree with me that a spatial reuse operation is an operation related to accessing a resource such as a channel, correct?

A. Yes.

Q. It's fair to characterize the spatial reuse operation as a resource/reuse-related operation, correct?

A. I think in -- in -- in a sense, yes. It's -- or at least based -- yes, based on how I understood the question. But space is a resource and spatial reuse is -- it relates to accessing the channel in a way that this resource is efficiently used.

Q. Can I turn you to column 10, line 63 of the '163 patent.

A. Yes.

Q. Do you see the sentence there that reads, In a specific embodiment, the operation of accessing the channel may include setting a NAV and resetting NAV operation, a CCA operation and a deferral operation?

A. Yes.

Q. What is a CCA operation?

A. Clear channel assessment operation.

Q. Okay. And how does that operation relate to spatial reuse?

A. Well, if we continue at the bottom of column 10, I think line 65, For example, the wireless communication terminal may adjust the clear channel assessment threshold value according to whether a frame received by the wireless communication terminal is a frame

transmitted from a BSS including a wireless communication terminal or a frame transmitted from an overlapping BSS. Also, the wireless communication terminal may adjust the transmission power of the PPDU.

So a clear channel assessment threshold is the threshold -- again, I'm not -- not providing here a definition here, but just in some -- describing in -- in some general sense, it is the threshold according to which a terminal decides if the medium is busy or if it is available.

Q. Okay.

A. And if it's --

Q. But you'd agree with me that a CCA operation is part of a spatial reuse operation, correct?

MR. MILKEY: Object to form.

THE WITNESS: I think the -- the answer to your question and perhaps the question itself can become a little confusing, what is a part of spatial reuse.

But as a general idea, clear channel assessment is something that is

performed when a terminal tries to access the channel.

BY MR. MONALDO:

Q. And that would be part of a spatial reuse operation, correct?

MR. MILKEY: Object to form.

THE WITNESS: Well, spatial reuse relates to a specific form of channel access. And whether clear channel assessment would be performed prior to spatial reuse and, in this sense, not part of spatial reuse, or as part of spatial reuse -- I'm -- I don't think I provided an opinion about that.

BY MR. MONALDO:

Q. Okay. If you look at column 11, line 6 of the '163 patent, it talks about the CCA threshold value adjustment during the SR operation.

Do you see that?

A. Yes.

Q. So in this context, the language of during the SR operation suggests that the CCA threshold value adjustment is performed as part of the spatial reuse operation, correct?

MR. MILKEY: Objection to form.

THE WITNESS: I think I don't agree, because this sentence says, the wireless communication terminal may adjust the transmission power of the PPDU to be transmitted according to the CCA threshold value adjustment during the SR operation.

And I can -- I would be happy to -- to read a little bit more columns 10 and 11, but just from this sentence -- there are two adjustments, right? The first is adjusting the transmission power of the PPDU to be transmitted and during the SR operation could refer to -- could relate to adjusting the transmission power of the PPDU to be transmitted.

BY MR. MONALDO:

Q. Okay. I guess my question more is in a general sense.

How does clear channel assessment relate to spatial reuse and whether a person of ordinary skill in the art would understand those concepts to be related to operations for reusing a resource?

MR. MILKEY: Objection to form.

THE WITNESS: If I may, could you please repeat the -- the question?

BY MR. MONALDO:

Q. My question is just, in general, how does clear channel assessment relate to spatial reuse?

MR. MILKEY: Objection to form.

THE WITNESS: Well, clear channel assessment is -- just -- just CCA is the procedure according to which the medium is determined to be busy or available, again, in a general sense.

No, but that -- it relates to what's called the physical carrier sense. So I think that's how it relates to spatial reuse, that a terminal has to perform the clear channel assessment procedure -- in general has to perform this procedure before it wants to -- before it transmits something.

BY MR. MONALDO:

Q. I see we've been going for about an hour. Is it a good time to take a break?

A. Okay.

Q. How long would you like?

A. 15 minutes.
Q. So we'll resume at 10:15 a.m.
MR. MONALDO: If we could go off the record.
(Thereupon, a brief recess was taken.)
BY MR. MONALDO:
Q. Dr. Cooklev, can I turn you to column 4, line 20 of the '163 patent.
A. Yes, I'm looking at it.
Q. Do you see the sentence that reads, The processor may be configured to determine whether the PPDU includes the trigger frame based on information related to a spatial reuse operation included in the PPDU?
A. I see the sentence, yes.
Q. You'd agree with me that this portion of the '163 patent describes determining that the PPDU includes the trigger frame based on information related to a spatial reuse operation, correct?
A. Yes.
Q. Can I move you to the next sentence at column 4, line 24 of the '163 patent.
A. Yes.

Q. Do you see the sentence that reads, Based on that information related to the SR operation included in the PPDU indicates whether the SR operation is restrictively allowed or the SR operation is delayed while the PPDU is transmitted, the processor may be configured to determine whether the PPDU includes the trigger frame?

A. I see the sentence, yes.

Q. So in the sentence, the information related to the SR operation indicates whether the SR operation is restrictively allowed or the SR operation is delayed, correct?

A. It's a little bit of a long sentence, but it seems to me that's what it says.

Q. Would it be fair to say that the information related to the SR operation is information restricting a reuse -- resource/reuse-related operation?

MR. MILKEY: Object to form.

THE WITNESS: I think it's -- like I said, it's a little bit longer sentence. And -- and, again, if -- if -- if I was writing it, maybe I would put one or two commas and maybe even would write shorter

sentences to -- to make it clearer.

But, yes, it says, Based on that information related to the SR operation included in the PPDU indicates whether the SR operation is restrictvely allowed or the SR operation is delayed.

BY MR. MONALDO:

Q. And the information related to the SR operation is used to determine whether the PPDU includes the trigger frame, correct?

A. I'm sorry. Maybe I -- if you could please repeat the question.

Q. Yeah. My question is, the information related to the SR operation, that information is used to determine whether the PPDU includes the trigger frame, correct?

A. Well, isn't that the previous sentence, that the processor may be configured to determine whether the PPDU includes the trigger frame based on information related to a spatial reuse operation?

Q. Yes. So you'd agree with me that that sentence confirms that the information related to the SR operation is used to determine whether the PPDU includes the trigger frame,

correct?

MR. MILKEY: Objection to form.

THE WITNESS: I think that this -- I think I'd agree that, yes, it seems to me this is what this sentence is saying.

BY MR. MONALDO:

Q. So I'd like to move a few more lines down to discuss an example of restricting the spatial reuse operation. And I'll point you to the example at column 4, line 37.

Do you see the sentence that reads, When the BSS color indicated by the PPDU is a predetermined value, the processor may not perform the SR operation for the PPDU?

A. Yes.

Q. You'd agree with me that this portion of the '163 patent describes not performing the SR operation when the BSS color indicated by the PPDU is a predetermined value, correct?

A. Yes.

Q. And you would agree with me that this is an example in the '163 patent of restricting the SR operation, correct?

A. Yes, this is one example.

Q. Okay. So when the BSS color is the

predetermined value, the reuse operation is restricted, correct?

A. Yes, when the BSS color is a predetermined value.

Q. So the information -- go ahead. Sorry.

A. Just I was going to finish the spatial reuse operation is not performed.

Q. So the information that the BSS color is the predetermined value is information restricting a reuse-related operation, correct?

A. Well, SR is spatial reuse, so it is reuse.

Q. But when the BSS color is the predetermined value, the reuse operation is not performed, correct? It's restricted?

A. I think that's fair. Yes, I agree.

Q. Okay. So my question is that the information that the BSS color is the predetermined value, that information is information restricting a reuse-related operation, correct?

A. In this example, yes.

Q. All right. I'd like to turn you further down in the patent to column 21, line 16.

A. So all the way to column 21?
Q. Yes, all the way to column 21, line 16.
A. Yes.
Q. You see the sentence that reads, Specifically, the wireless communication terminal may transmit the PPDU by including signaling information indicating that the operation based on the BSS color is not allowed in the signaling field of the PPDU?
A. Yes, I see this.
Q. What does it mean to a person of ordinary skill in the art in the context of the '163 patent for an operation to be not allowed?
MR. MILKEY: Object to form.
THE WITNESS: Oh, I -- I think that the words "operation not allowed," I think these words are fairly clear. It's just not allowed.
BY MR. MONALDO:
Q. Would that be equivalent to prevented?
MR. MILKEY: Objection to form.
THE WITNESS: I mean, I -- I don't think an explanation -- I mean, we're not

talking about claims to -- for this to be an exercise in claim construction.

This is in the specification. But I don't think an explanation of the words "not allowed" is here necessary.

BY MR. MONALDO:

Q. How would something be not allowed in the wireless communication terminal of the '163 patent?

MR. MILKEY: Objection to form.

THE WITNESS: Well, if -- if something is not allowed, then that something is not performed. Again, it's not as a definition, but as a general idea.

BY MR. MONALDO:

Q. So would the operation be prevented?

A. In some contexts -- in some context you could say prevented.

Q. How would you prevent an operation in a wireless communication terminal?

MR. MILKEY: Objection to form.

THE WITNESS: If -- if the terminal doesn't perform, doesn't do that operation, in some context, as I said,

that operation is -- is prevented. It's not allowed.

BY MR. MONALDO:

Q. Would disabling something be a way to prevent an operation?

MR. MILKEY: Objection to form.

THE WITNESS: Just for reference, I'm looking at the paper copy of the patent. And I'm -- I was looking at claim 1 because we -- we -- I think you've been talking about not allowed. And -- and specifically I was looking at the part of claim 1 saying signaling information indicates. So there is an indication that's accomplished by signaling information that an operation based on the -- in this case, an operation based on the BSS color is not allowed.

BY MR. MONALDO:

Q. My question is how is the operation based on the BSS color not allowed.

MR. MILKEY: Objection to form.

THE WITNESS: I'm not sure. The question is different from the question what does it mean, an operation to be not

allowed. It -- as far as the meaning, it means that the terminal is not going to do an operation based on the B -- is not going to do that operation.

BY MR. MONALDO:

Q. Would disabling the operation be an example of the operation not being allowed?

A. I think no. At least no in the context of claim 1.

Q. So disabling is not covered by claim 1?

MR. MILKEY: Objection to form.

THE WITNESS: No. I did not -- I disagree with that. An operation based on the BSS color is not allowed means any operation based on the received BSS color is not allowed.

BY MR. MONALDO:

Q. So you're reading the term "an operation" as any operation?

MR. MILKEY: Object to form.

THE WITNESS: And I also turn to my declaration here. And so -- so my declaration I can say is of somewhat limited scope and, in particular, I tried

to respond to Dr. Mahon's declaration.

So as I state in paragraph 40 of my declaration -- in other words, Dr. Mahon alleges that Lee -- so this is in the context of the Lee reference -- Lee discloses that the coloring bit in Lee is not used to perform any operations when the coloring disable bit indicates a trigger frame.

So here I -- and in -- in this paragraph and in the following paragraphs, I respond to Dr. Mahon's declaration, including how he has understood claim 1.

BY MR. MONALDO:

Q. So my question is your understanding of claim 1. And you mentioned when we were earlier discussing claim 1 any operations.

My question is, are you reading an operation in claim 1 to mean any operations, based on BSS color?

MR. MILKEY: Objection to form.

THE WITNESS: And for the record, I -- I was reviewing my declaration and just browsing.

I think an operation -- and there's

no antecedent basis -- and an operation not allowed, I think yes, it means -- it -- it -- it means not just one operation is not allowed.

And I think Dr. Mahon -- although it's a little bit unclear in his declaration, but I think ultimately that is -- from reading his declaration, I think that's how he has understood the claim.

BY MR. MONALDO:

Q. Okay. So your understanding of the claim is that all operations based on BSS color have to be not allowed to meet the claim, correct?

MR. MILKEY: Objection to form.

THE WITNESS: Well, it says an operation based on the BSS color. And so it's not just one operation.

BY MR. MONALDO:

Q. So disabling all operations based on BSS color would meet this claim, correct?

A. Excuse me?

Q. Would disabling all operations based on BSS color meet this claim?

A. I'm not sure I've offered an opinion like that.

Q. So you haven't opined on whether disabling all operations based on BSS color would meet this claim?

A. You're saying all operations here, based on BSS color not being allowed. And so in my declaration I analyzed, among other things, whether Lee discloses or renders obvious this claim limitation. And I concluded that Lee does not.

Q. Okay. Would that conclusion have been different if you interpreted Lee to disable all operations based on BSS color?

MR. MILKEY: Object to form.

THE WITNESS: Well, in your question if I -- your question is -- is -- Counsel, is a little bit if Lee is not Lee, would my conclusion have been different and to which I would say well, that's -- if Lee is not Lee, that's -- it's possible that my conclusion would be different. I just need to -- I analyzed Lee, I think, in -- in -- for -- for everything that -- that Lee teaches.

BY MR. MONALDO:

Q. Okay. And I guess my question is trying to understand what the prior art must show to meet this claim, in your opinion. And I'm asking if the prior art showed and disclosed disabling all operations based on BSS color, would that render obvious this feature of the claim?

MR. MILKEY: Objection to form.

THE WITNESS: It's difficult for me to answer a question like that. We are talking about claim limitation 1.4. I would have to evaluate a prior art reference specifically and it's -- it's difficult for me to answer a hypothetical question like that.

BY MR. MONALDO:

Q. Okay. So as part of your analysis, you did not consider whether disabling all operations based on BSS color would meet this claim; is that correct?

A. Well, in my analysis I considered the identified prior art, Lee, Choudhury, Zhou and combinations involving also Stacey. So my declaration -- and I -- I stand by my opinions

whether these particular references disclose claim 1. I mean, obviously, looking at limitation 1.4, limitation 1.5, the next limitation, it's -- and I think that's the scope of my declaration. And anything kind of more broad than that, a hypothetical, what needs to happen for claim 1 to be disclosed, that I think is -- falls a little bit outside my -- the scope of my declaration.

Q. Okay. And I guess my question is, I'm trying to get an understanding of what your understanding of claim 1, specifically limitation 1.4, what that requires and what you're requiring of the prior art.

A. Okay.

Q. And I'm --

A. Well, with that context -- with that context, then I think in paragraph 40 of my declaration, kind of I -- I respond to one opinion of Dr. Mahon, where he says the station operates without regard to information indicated by the coloring bit, which -- which I think is incorrect. So it is -- and, in particular, it's incorrect to say that the coloring bit is not used to perform any operations.

Q. I'm trying to get a sense if it performs any operations, would that be met by disabling all operations.

MR. MILKEY: Objection to form.

THE WITNESS: Maybe -- in the context of my declaration, Lee does not disclose this claim limitation because, as I state in paragraph 41, Lee does not disclose the -- that the processor would be configured such that no operations using BSS color would occur.

BY MR. MONALDO:

Q. Okay. But if it had disclosed that no operations occur based on BSS color, would that be met by the claim?

A. Well, if it had disclosed that, which is like well, if -- if Lee is not Lee, but something different, I would examine it. And it's possible that it would have disclosed this limitation again. But I would have to examine it before I come to that opinion.

Q. Would receiving a PPDU with a BSS color be an operation based on BSS color?

MR. MILKEY: Objection to form.

THE WITNESS: Excuse me. Receiving

a PPDU --

BY MR. MONALDO:

Q. With a BSS color, would that be considered an operation based on BSS color?

MR. MILKEY: Objection to form, outside the scope.

THE WITNESS: I don't know right now.

BY MR. MONALDO:

Q. Sitting here today, you don't know if receiving a PPDU with a BSS color is an operation based on BSS color?

A. I don't know.

Q. Let's turn back to an example in the '163 patent. I'll turn you to column 21, line 31.

A. Just a second. I do -- for context, I also -- if I may, I am looking at the electronic copy of the declaration of Dr. Mahon.

Q. Okay.

A. And you said column 31?

Q. Yeah, column 21, line 31 of the '163 patent.

A. I'm there.

Q. Do you see the sentence that reads,

Further, when the wireless communication terminal receives the signaling information indicating that the operation based on the BSS color is not allowed, the wireless communication terminal may not perform the operation based on the BSS color value?

Are you having trouble locating the sentence, Dr. Cooklev?

A. No. I was reviewing column 21.

Q. Okay.

A. No. I -- I agree with the -- the sentence says what it is saying. That's what it says here, that when it receives the signaling information indicating that the operation based on the BSS color is not allowed, then it's not performing that operation based on the -- the -- the BSS color.

Q. You'd agree with me it says the operation singular, correct?

A. Yes. That's -- I mean, that's what this sentence is saying.

Q. Okay.

A. Now, I agree with you, it is singular. I mean, just as a -- as a -- I have a thought here that the inventors of the '163

patent -- I think they're based in Korea. And it's -- it's -- just I'm -- sometimes there are some translation issues and I think in particular translation issues related to the use of definite and indefinite articles.

Q. So your opinion is that there's a translation issue with this sentence of the '163 patent?

MR. MILKEY: Object to form.

THE WITNESS: No, I'm not saying that -- this particular sentence. I said sometimes there are translation issues.

BY MR. MONALDO:

Q. Here it says the operation, singular, correct?

A. Correct.

Q. Do you believe that's a translation issue?

A. And just for a little more context, I think earlier we were talking about the claim. And here we are in the body of -- in the specification of the patent, which I -- I think -- which I think is -- is significant.

Q. So what is the significance that this is the body of the specification as compared to

the claim?

A. Well, just that -- just that this fact, I think, is significant.

Q. But you'd agree with me that the body of the specification says the operation, singular, correct?

A. In this instance. In this instance, yes, it says the operation. I -- I have not provided an opinion whether or not there is a translation issue here. So I don't have an opinion on whether or not there's a translation issue.

Q. In your opinion, you would assume this statement is accurate, correct?

MR. MILKEY: Object to form.

THE WITNESS: Well, but the next sentence it says, Specifically, when the BSS color value indicated by the signaling field of the PPDU received by the wireless communication terminal is a predetermined value. The wireless communication terminal may not perform the SR operation described above based on the BSS color value.

///

BY MR. MONALDO:

Q. Yeah. And I actually was going to turn you to that sentence because, again, it says the SR operation, singular, correct?

A. Well, although it says the SR operation, singular, I am sensing that you are trying to make an incorrect conclusion from this because the -- the SR operation, it uses the definite article because it's the operation described above.

So -- and what causes the terminal not to perform this operation based on the BSS color value is the BSS color value indicated by the signaling field of the received PPDU being a predetermined value.

So this -- here, the operation that is not performed in this sentence is not indicated in the signaling field. It says the BSS color value indicated by the signaling field is a predetermined value.

Q. Right. But it says that just one operation, the SR operation, is what's not performed, correct?

A. Well, but it -- the sentence begins with the word "specifically."

Q. Does the '163 patent describe other operations that are not performed based on BSS color in this section?

MR. MILKEY: Object to form.

THE WITNESS: You said in this section. Which -- which is this section? Is it --

BY MR. MONALDO:

Q. The column 21 disclosure we've been talking about.

A. But is column 21 a section?

Q. This example -- don't read too much into my term "this section." I was just trying to give you some context.

A. I was trying to a little bit narrow kind of my quick -- quick review of the -- of the patent.

Q. Sure. And I'm talking about this specific example where the SR operation, singular, is not performed.

A. Well, in this -- in column 21, the specification is talking about channel access. And as an example of an operation that is not allowed based on BSS color, it gives this spatial reuse operation.

Q. Okay. So in your opinion, this example of not performing in spatial reuse operation is covered by claim 1 of the '163 patent?

MR. MILKEY: Objection to form.

THE WITNESS: Well, you said covered by. I think the claim says an operation based on the BSS color is not allowed and the specification gives an example as spatial reuse based on the BSS color not being allowed. I think this is -- this is an example. And to me, if I may say, it makes sense.

BY MR. MONALDO:

Q. So preventing the spatial reuse operation meets the claim limitation that an operation based on the BSS color is not allowed, correct?

A. It is one example of an operation based on the BSS color that is not allowed.

Q. And in this section it mentions a predetermined value for the BSS color. And I believe at column 21, line 29 to 30, the '163 patent describes the predetermined value may be zero.

Do you see that?
A. I do.
Q. So in your opinion, is setting the BSS color value to a predetermined value of zero met by claim 1 of the '163 patent?
MR. MILKEY: Objection to form. Outside the scope.
THE WITNESS: I don't know if this is within the scope of claim 1.
BY MR. MONALDO:
Q. Why not?
A. I mean, if I -- if I don't know, I don't know. It's not, I think, something that I investigated. So what claim 1 claims says the -- it claims the processor being configured not to use a BSS color, and then when the signaling information indicates that an operation based on the BSS color and the BSS color has to be an identifier of a BSS.
So this is what is claimed.
Q. And my question is, is this example in column 21 where the BSS color is set to a predetermined value of zero, and based on that predetermined value of zero, the SR operation is not performed, is that example covered by claim 1

of the '163 patent?

MR. MILKEY: Objection to form, outside the scope.

THE WITNESS: Not an analysis that I did. I don't know.

BY MR. MONALDO:

Q. Okay. I'm going to turn you to, let's see, claim 7 and claim 8 of the '163 patent.

A. Yes.

Q. Do you see claim 7 where it says, wherein the processor is configured not to perform a spatial reuse operation when the BSS color indicated by the signaling field of the PPDU is a predetermined value?

Do you see that?

A. Yes, I do. I'm just -- I was just thinking about it.

Q. And do you see claim 8, where it says, wherein the predetermined value is zero?

A. Yes.

Q. My question is, do those claims align with the example we discussed at column 21, where the BSS color was set to a predetermined value of zero and the SR spatial reuse operation was not

performed?

A. I think that's -- that's possible. It's -- I -- I haven't offered this opinion.

Q. You didn't review claims 7 and 8 as part of your preparation of your declaration?

MR. MILKEY: Objection to form.

THE WITNESS: I can't say I didn't review them entirely, but I -- my declaration, I think, is in response to Dr. Mahon's opinions in connection with claims 1 and 9.

BY MR. MONALDO:

Q. Okay. And because dependent claims further limit the independent claim from which they depend, since it's possible the example in column 21 that we discussed is met by claims 7 and 8, you'd agree with me that it's also possible that the example of column 21 is met by claim 1 of the '163 patent, correct?

A. But the -- so -- so your question is whether it's possible?

Q. Whether that example is within the scope of the claim, yes.

A. Whether it's in the scope of claim 1 or whether it's possible that it's within the

scope of claim 1?

Q. Why don't you answer possible first and then maybe we'll get to the -- the second question.

A. And I think the -- the honest answer here is that I did not make this analysis.

Q. You didn't consider whether a predetermined value of zero and not performing a spatial reuse operation, whether that was part of claim 1 or covered by claim 1?

MR. MILKEY: Object to form.

THE WITNESS: Not exactly. I did not consider whether the example in column 21, whether that is within the scope of claim 1.

BY MR. MONALDO:

Q. Okay. And maybe it's a good time to take a break, but my question -- I have a question and that's can you point me to an example in the '163 patent that is covered by claim 1. And maybe if you want to take a look at the '163 patent over the break and then come back to that question --

A. Well, thank you for -- for giving me this opportunity.

Yes, I -- I will review the '163 patent and will try to give you -- will try to give you an answer.

Q. Okay. So maybe we'll go off record now and maybe come back at, maybe, 11:50 a.m. Eastern.

Is that okay?

A. Okay. That's fine.

(Thereupon, a brief recess was taken.)

BY MR. MONALDO:

Q. Dr. Cooklev, have you communicated with counsel during the course of today's deposition?

A. I -- yes. Specifically I -- like I said, I -- I told counsel that I will make a bathroom break and I was considering asking for a few more minutes. And counsel advised me to go -- to go back on the record and maybe if I need some time to review the patent.

Q. Okay. But you didn't speak about the substance of your testimony today, did you?

A. No, I did not.

Q. Okay. So after -- before the last break my question to you was can you identify an

example in the '163 patent that is met by claim 1.

MR. MILKEY: Objection to form and outside the scope.

THE WITNESS: That's a difficult question to answer, Counsel, in the -- if I may say in the heat of the deposition. But I can say that -- so we were talking about operations -- an operation based on the BSS color not being allowed, and which is -- which is part of claim element 1.4 and also claim element 1.5, wherein the BSS color is an identifier of a BSS.

So these are key elements. These are key elements of -- of claim 1 and maybe even the example that we were talking earlier about BSS color being a predetermined value. And as long as the BSS color is an identifier of -- of -- of a BSS, then I think that would be an example.

So I think that will be my answer.

BY MR. MONALDO:

Q. Okay. So my question is, the example we discussed earlier at column 21 of the '163

patent, where the BSS color value is a predetermined value of zero, is that what you are pointing to as an example that meets claim 1?

MR. MILKEY: Objection to form. Outside the scope.

THE WITNESS: And I also, for the record, am reviewing an electronic copy of the '163 patent and also an electronic copy of my declaration. And -- and maybe here a more complete answer -- I think I've -- I've given an answer to this question that I did not make this analysis.

But to the extent your question is challenging, perhaps my paragraphs 85 and 86 and 87 -- it's possible that BSS color zero in column 21 is within the scope of claim 1 because it doesn't -- because it's possible that a BSS color of zero is an identifier of a BSS in the -- in the context of column 21.

However, Choudhury's disclosure is different, because even Dr. Mahon acknowledges that in Choudhury, a BSS or color field -- excuse me -- color field

value of 0000 is not a valid BSS identifier.

BY MR. MONALDO:

Q. Is a color --

A. And --

Q. Go ahead. Sorry.

A. Yeah -- which is what I state in my paragraph 86 and -- and also in paragraph 87.

Q. Is a color value of zero a valid BSS color in the 802.11 standard?

MR. MILKEY: Object to form. Outside the scope.

THE WITNESS: I have not provided this opinion. I think that's the -- the most important part that I -- and you're asking me a detail about the standard. I think it's -- again, not study you're asking me right now, but I think it's not impossible.

BY MR. MONALDO:

Q. Okay. So in the 802.11 standard, you could have a BSS color value of zero used to identify a BSS?

Is that your testimony?

MR. MILKEY: Objection to form.

Outside the scope.

THE WITNESS: That's -- that goes -- becomes a little strong. I -- because it's not in my declaration and -- so it's a little bit strong.

Again, just sitting here right now, I think it's not impossible, but I have not studied this in preparation for today.

BY MR. MONALDO:

Q. Does the '163 patent describe a color value of zero being used to identify a BSS?

MR. MILKEY: Objection to form, outside the scope.

THE WITNESS: Well, it's a little bit long patent. So I could be wrong, but I think it doesn't say that it -- it doesn't say the -- that you cannot use zero for that.

BY MR. MONALDO:

Q. You would agree with me, though, it says it is a predetermined value of zero, correct?

A. Yes.

Q. If a BSS color is going to be used to identify a BSS, would that be predetermined?

MR. MILKEY: Objection to form. Outside the scope.

THE WITNESS: I don't know that.

BY MR. MONALDO:

Q. Are BSS color values determined on the fly, or are they set in advance and unchangeable for BSSs?

MR. MILKEY: Objection to form.

THE WITNESS: I have not opined on this, but it seems to me those two are not mutually exclusive.

BY MR. MONALDO:

Q. Okay. So just to clarify, your position is that the example in column 21 of the '163 patent is covered by claim 1 because the predetermined value of zero identifies a BSS, whereas the predetermined value of zero on Choudhury does not; is that correct?

MR. MILKEY: Objection to form.

THE WITNESS: I think two parts of your question, one part about column 21 and another part about Choudhury. And as far as the second aspect, color field all zeros in Choudhury.

And Dr. Mahon is saying that color

field value of all zeros does not represent a valid BSS identifier in paragraph 172 of his declaration. And -- and he provides a reason for that. It says, When a device receives a PPDU with this value, it can't use the BSS color for its intended purpose of BSS identification because no valid BSS color has been provided.

And I, in my paragraph 86, I agree with -- with this. I agree that -- that in Choudhury a color field of all zeros does not represent a valid BSS identifier.

And -- and for this reason, I think claim element 1.5 is not disclosed.

BY MR. MONALDO:

Q. Well --

A. Column 21 -- in column 21 it could be a BSS identifier.

Q. And so your opinion is that in column -- the example in column 21, zero could be a BSS identifier, correct?

A. Well, subject to -- as I said, I have -- this is not something that I studied. Subject to that, sitting here right now, it seems

to me yes.

Q. Okay. So the difference between Choudhury and the '163 patent is that in the '163 patent, zero could be a valid BSS identifier, correct?

A. Could be.

Q. And that's why, even though Choudhury discloses zero, it does not meet the claim?

MR. MILKEY: Object to form.

THE WITNESS: It's not the only reason. It's -- it's one reason.

BY MR. MONALDO:

Q. Okay. So let's move on. I'm going to turn you to Figure 45 of the '163 patent.

Do you see Figure 45?

A. I do.

Q. You'd agree with me that there are three steps shown in the flowchart of Figure 45?

A. Yes.

Q. You agree with me that the first step is Receive PPDU?

A. Yes.

Q. You'd agree with me that the second step is Identify whether received PPDU is inter-BSS PPDU or intra-BSS PPDU, correct?

A. Yes.

Q. How does the mobile terminal identify whether the received PPDU is inter-BSS or intra-BSS?

MR. MILKEY: Object to form.

THE WITNESS: Yes, I can give an example. For example, in column 3, line 21.

BY MR. MONALDO:

Q. Okay.

A. And so here it says that -- on line 20 if we begin the predetermined value for the BSS color may be zero. But then, line 21 says that a PPDU signaling the predetermined value as the BSS color.

So if that's used as the BSS color, then that PPDU may not be identified as an inter-BSS or an intra-BSS based on the BSS color because the BSS color is zero.

But the intra-BSS PPDU indicates a PPDU transmitted from the same BSS to which the wireless communication terminal belongs. I'm not quoting verbatim, but just I'm adding some of my words here.

And the inter-BSS PPDU may indicate

the PPDU transmitted from a BSS other than the BSS, which includes the wireless communication terminal.

Q. Okay. So is it fair to say that whether a PPDU is an inter-BSS PPDU or an intra-BSS PPDU is determined based on the BSS color?

A. I don't think this -- this paragraph teaches that. I think this -- this paragraph in column 3 teaches that the determination whether -- the determination whether the PPDU is intra-BSS or inter-BSS is not based on BSS color when the BSS color is this predetermined value.

So in other cases, I think you could do that. But when the BSS color is this predetermined value, then -- then -- then you'd use -- you'd do it differently.

Then the intra-BSS is -- intra-BSS PPDU is a PPDU transmitted from the same BSS. And inter-BSS is a PPDU transmitted from an address other than the BSS that includes the wireless communication terminal.

Q. Okay. So in your opinion, the mobile -- or the wireless communication terminal -- strike that.

In your opinion, the wireless communication terminal receives the PPDU, accesses the BSS color -- in this case, that BSS color is a predetermined value of zero -- and then prevents an operation based on BSS color, based on the predetermined value being zero, that is covered by claim 1?

MR. MILKEY: Object to form. Outside the scope.

THE WITNESS: I did not understand.

BY MR. MONALDO:

Q. So to determine that a BSS color has a predetermined value of zero, you would have to access the BSS color and evaluate the value of the BSS color, correct?

A. Yes.

Q. So performing that step of evaluating the value of a BSS color field falls within the scope of claim 1 of the '163 patent, correct?

MR. MILKEY: Object to form. Outside the scope.

THE WITNESS: Performing this step is within the scope of claim 1? I did not do this analysis.

///

BY MR. MONALDO:

Q. You'd agree with me that a predetermined value of zero, when it identifies a BSS, is within the scope of claim 1, based on your earlier testimony, correct?

A. Well, I said it could be.

Q. And you also testified that you must access and evaluate the BSS color value to determine that it is the predetermined value of zero, correct?

A. Well, it seems to me you're asking me do you have to receive that and properly receive that BSS color field. I -- I think yes.

Q. So in your opinion, properly receiving the BSS color value field and evaluating it is covered by claim 1 of the '163 patent, correct?

MR. MILKEY: Object to form. Outside the scope.

THE WITNESS: Well, I don't think this is an opinion that I've given in my declaration. You said properly receiving, which is basically receiving. I'm not sure what that evaluating is here, distinct from receiving. It's -- I think

it's just the receiving.

But in -- in any case, I think the answer is that I did not investigate that in my declaration.

BY MR. MONALDO:

Q. So you have no opinion on whether receiving a BSS color value of zero, identifying that it is zero and then preventing an operation based on BSS color is covered by claim 1 of the '163 patent?

MR. MILKEY: Object to form.

THE WITNESS: No, I wouldn't say that. I think I have formed an opinion about Choudhury and Choudhury's color field of 0000. And, in my opinion, that does not represent the valid BSS identifier.

BY MR. MONALDO:

Q. I understand your opinion on Choudhury.

My question is, does the act of receiving a BSS color value and evaluating it, does that put you outside the scope of claim 1 or is performing that operation acceptable within the scope of claim 1?

MR. MILKEY: Objection to form.
THE WITNESS: And let me think.
Does the act of receiving BSS color field, and specifically BSS color field of zero?
Is that the question, if that is -- if that act is outside the scope of claim 1?
BY MR. MONALDO:
Q. Yes.
MR. MILKEY: Objection to form. Outside the scope.
THE WITNESS: I -- I don't know.
BY MR. MONALDO:
Q. Maybe let's switch gears here. I'll turn you to the Lee reference now, which is Exhibit 1005.
A. Yes. And with your permission, I can use -- I think I have a hard copy of Lee, again, unmarked.
Q. Yes, please refer to your hard copy. I'll also put it on the -- on the shared screen here as well.
A. Okay.

///

(Thereupon, Exhibit 1005, previously marked, was referred to.)

BY MR. MONALDO:

Q. So I'd like to turn you to paragraph 68 of the Lee reference.

You see the first two sentences of paragraph 68?

A. I do.

Q. So you'd agree with me that the first sentence establishes that the frame can include a coloring disable bit, correct?

A. In the condition that it's a trigger frame or a CTX frame, yes.

Q. And the second sentence confirms that if the coloring disable bit indicates that the frame corresponds to a trigger frame related to multiuser transmission, the station may not perform the change of the CCA level, irrespective of information indicated by the coloring bit, correct?

A. Yes, that's what it says.

Q. And the change of the CCA level is similar to the CCA operation we discussed with respect to the '163 patent, correct?

A. CCA is CCA, yes.

Q. So you'd agree with me that if the coloring disable bit is set, the station does not perform the CCA operation in Lee, correct?

A. Yes. If the coloring disable bit -- if the coloring disable bit is set, meaning the frame corresponds to a trigger frame, the station may not perform the change of the CCA level, regardless of the coloring bit.

Again, not -- not verbatim, but I think this is what this sentence is saying.

Q. You'd agree with me that that example is similar to the example in column 21 of the '163 patent, where the spatial reuse operation is not performed when the BSS color has a predetermined value of zero, correct?

MR. MILKEY: Objection to form.

THE WITNESS: And just to explain, I'm looking at -- turned again to '163 patent.

As far as may not perform an operation, irrespective of the coloring bit, it is similar in this aspect. In column 21, it's not performing the SR operation based on the color value.

So in this aspect, it's -- it is

similar. It's a little bit different that in Lee, there's a coloring disable bit, which indicates that the frame is a trigger frame. And in column 21 it says the BSS color value is a predetermined value.

BY MR. MONALDO:

Q. Okay. And I'd agree with you there's a difference in that column 21 uses a predetermined value for the color and Lee uses a coloring disable bit. But the result of not performing an SR or CCA operation is similar, correct?

MR. MILKEY: Object to form.

THE WITNESS: Well, what is similar is that something is not performed, regardless of, in the case of Lee, the color bit or the -- excuse me -- the coloring bit.

BY MR. MONALDO:

Q. Okay. Can I turn you to paragraph 89 of Lee.

A. 89?

Q. Yes.

A. Yes.

Q. Do you see that paragraph 89 describes, According to the aforementioned embodiments, when RTS/CTS or a trigger frame/CTX are transmitted by 802.11ax frame format, the device receiving the frame is able to know that the frame corresponds to the RTS, the CTS or the CTX by adding not only a BSS coloring bit, but also a coloring disable bit and applies CCA using a method different from other frame.

Do you see that?

A. I do. I think you read it correctly.

Q. And so in this case, the coloring disable bit is set if the frame is an RTS, CTS or CTX, correct?

A. Yes. Yes.

Q. So the coloring disable bit in Lee can refer to multiple things, correct?

A. Like I -- I also say in my declaration that the coloring disable bit in Lee is used to denote trigger frame or RTS/CTS.

Q. But you wouldn't know which one specifically based on the coloring disable bit of Lee, correct?

A. I don't think I've provided an opinion about this.

Q. You'd agree with me that the coloring disable bit is a single bit in Lee, correct?
A. Yes.
Q. And a single bit would not be able to specify whether a frame is RTS, CTS or CTX, correct?
A. And I think a bit can signify whether it's any one of these or not.
Q. But it cannot signify which of those three options it is, correct?
A. I don't think so.
Q. So, in your opinion, the coloring disable bit of Lee could indicate multiple things, correct?
MR. MILKEY: Object to form.
THE WITNESS: Well, multiple things is a little bit open-ended. It indicates a trigger frame or RTS/CTS.
BY MR. MONALDO:
Q. Can we move back to paragraph 68.
A. Yes.
And, Counsel, I would be happy to answer a question, maybe two, and would ask for a break after that.
Q. Okay. It may be a good time to break

for lunch after this. Is that your preference?
A. That is what I was thinking, yes.
Q. Okay. So let me try to ask a few more questions on Lee, see if we can't wrap this up.
A. Okay.
Q. In paragraph 68, the last sentence, do you see that? It says, Since a current frame corresponds to a trigger frame, the coloring disable bit can also be comprehended as a bit indicating that CCA level change is not performed and whether or not a medium is busy is not determined.
A. And I see this and you read it correctly.
Q. So you'd agree with me that the coloring disable bit in Lee could be an indication that CCA level change is not performed, correct?
A. Yes.
Q. So in your opinion, the coloring disable bit could indicate multiple things, such as trigger frame, RTS, CTS or that CCA level change is not performed, correct?
MR. MILKEY: Object to form.

THE WITNESS: That would depend on the context, but, yes, here it says that the coloring disable bit can be comprehended as a bit indicating that CCA level change is not performed.

BY MR. MONALDO:

Q. When Lee says disabling BSS color, what does that mean to a person of ordinary skill in the art?

MR. MILKEY: Objection, form.

THE WITNESS: I mean, Lee says disabling BSS color. Which paragraph of -- of Lee do you have in mind?

BY MR. MONALDO:

Q. Maybe just start with the paragraph saying coloring disable bit.

So coloring disable, what does that mean to a person of ordinary skill in the art?

MR. MILKEY: Objection to form.

THE WITNESS: I think in the context of Lee, a coloring disable bit is -- is a bit that denotes whether or not the frame is a trigger frame or RTS/CTS.

BY MR. MONALDO:

Q. Is a coloring disable bit known in

the 802.11 standard?

MR. MILKEY: Objection to form.

THE WITNESS: A coloring disable bit is something that Lee talks about. And so this is how a person of skill reading Lee -- as I said, reading Lee would have understood what this coloring disable bit is doing, as denoting trigger frame or RTS/CTS.

Whether the 802.11 standard has something which is called coloring disable bit, I don't know.

BY MR. MONALDO:

Q. You don't know if the standard has a coloring disable bit?

MR. MILKEY: Objection to form.

THE WITNESS: I mean, you said coloring disable bit. It's not an opinion that I have given here and I have general familiarity with the standard, but I have not reviewed the standard with this question in mind.

BY MR. MONALDO:

Q. And when you see the term "coloring disable," would a person of ordinary skill in the

art have thought it possible that that means that BSS color is disabled?

MR. MILKEY: Objection to form.

THE WITNESS: Well, Counsel, I think your question is trying to take this term outside the context of Lee, and to make it even different from Lee's teaching.

So in the abstract -- in the abstract, if it's just a different disclosure that I haven't seen, something like that is possible. And that's a hypothetical question. In the abstract it might be possible. But it's not in the context of Lee.

BY MR. MONALDO:

Q. In the context of Lee, the coloring disable bit could indicate multiple things that we've discussed, RTS, CTS, trigger frame, CCA, adjustment is not performed, correct?

MR. MILKEY: Objection to form.

THE WITNESS: I think that's -- I think that's fair.

BY MR. MONALDO:

Q. And so isn't it possible that since

the coloring disable bit can be set for multiple reasons, a person of ordinary skill could have simply understood the coloring disable bit as disabling BSS color, correct?

MR. MILKEY: Objection to form.

THE WITNESS: I don't agree with that.

BY MR. MONALDO:

Q. Why not?

A. Because I -- I -- that's not supported by the Lee reference. Lee does not teach that the coloring disable bit disables. You said disables. I forgot exactly what the question was, but disables BSS color or all operations based on BSS color. I think that's not supported by the Lee reference.

Q. I guess my question was, we've talked about this BSS color disabling bit and it being set based on multiple different reasons.

So in that context, could that bit have been understood to simply correspond to an indication that BSS color is disabled?

A. No. And in your question, you said BSS color disable bit, which is a little different from how Lee calls it.

So although I agree that Lee says coloring disable bit, I think you are trying to -- you're going beyond the scope of what Lee is teaching. You're trying to make this coloring disable bit in Lee -- it seems to me right now you're trying to make it more than what Lee is teaching.

Q. I'm not trying to make it anything. I'm just trying to get an understanding of, you know, how a person of skill would read the disclosure of Lee and its -- its coloring disable bit.

And so I think I understand you that the coloring disable bit in Lee would disable an operation based on BSS color, but it would not broadly disable BSS color itself.

Is that your opinion?

A. That's -- that is close. I think we -- we agreed earlier that BS -- that the coloring disable bit can denote a trigger frame or RTS/CTS. And it also, even as we -- in paragraph 68 of Lee, it can be comprehended as a bit indicating that CCA level change is not performed.

So, yes, it could denote this. What

it doesn't do is it does not say or -- that all operations based on BSS color are not allowed or it doesn't disable all operations based on BSS color.

Q. Does the '163 patent provide an example where all operations based on BSS color are not allowed?

MR. MILKEY: Objection to form. Outside the scope.

THE WITNESS: Sitting here right now, I -- I don't know if there is an example like that.

BY MR. MONALDO:

Q. Okay. Fair enough.

MR. MONALDO: I think maybe this is a good time to break for lunch. Let's maybe go off the record.

(Thereupon, at 1:07 p.m. EDT, a lunch recess was taken.)

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AFTERNOON SESSION (1:34 p.m. EDT)

BY MR. MONALDO:

Q. Dr. Cooklev, I would like to turn now to the Choudhury reference.

Do you have a copy of Choudhury?

A. I do. Also, with your permission, here is a clean paper copy of Choudhury.

Q. Absolutely. So I'd like to turn you to paragraph 23 of Choudhury.

A. 23, I'm looking at it.

Q. Okay. Great. So do you see how Choudhury describes that low power devices and devices in high SINR regions use an indication that a device is operating at low power or is otherwise unusually susceptible to interference or experiencing interference?

A. Yes. Yes, I do.

Can I -- can I take a one-minute break?

Q. Yes.

A. Okay. I apologize.

(Thereupon, a brief recess was taken.)

BY MR. MONALDO:

Q. So, Dr. Cooklev when you took a short

break, we were discussing paragraph 23 of Choudhury.

A. Yes.

Q. And in the second sentence of paragraph 23, you see that Choudhury discloses that one approach is to use a one-bit indicator in the SIG, with the indicator suitably being called low power bit.

A. Yes.

Q. And the following sentence indicates that if a station is able to decode the SIG and the low power bit is set, limitations are placed on its use of the channel, such as inhibition from using the channel or use of a lower CCA threshold.

Do you see that?

A. Yes.

Q. So inhibiting use of the channel or using a lower CCA threshold relate to the spatial reuse operation we discussed earlier today, as described in the '163 patent, correct?

A. Yes.

Q. And you agree with me that those operations are restricted when the low power bit of Choudhury is set, correct?

A. Well, you said restricted is the use of the channel by -- by a station if the low power bit is set.

Q. Yes. Would inhibition from using the channel be a restriction of using the channel that is similar to restricting the spatial reuse operation described in the '163 patent?

MR. MILKEY: Objection to form.

THE WITNESS: Well, there is a restriction on something, a restriction on an operation, such as using the channel.

BY MR. MONALDO:

Q. So in that way, you'd agree with me that that is similar to what the '163 patent describes in restricting its spatial reuse operation, correct?

MR. MILKEY: Objection to form.

THE WITNESS: Well, is this -- so the -- I understand the question. The question is, is this similar to the restrictions that the '163 patent is describing.

And while I think the -- well, the way I have performed the analysis whether or not the claims of the '163 patent are

rendered obvious by Choudhury, I -- I looked at the claims of the '163 patent.

And I can see here in Choudhury the words "inhibition from using the channel," something like that, but I think overall the -- the Choudhury reference falls short and does not render obvious the claims of the '163 patent.

BY MR. MONALDO:

Q. Okay. But you'd agree with me that the limitations placed on use of the channel, such as an inhibition from using the channel, is similar to the example in the '163 patent we discussed earlier today at column 21, where the spatial reuse operation is restricted, correct?

MR. MILKEY: Objection to form.

THE WITNESS: Well, just -- just this part that something is not allowed. Just this part, yes.

BY MR. MONALDO:

Q. Okay.

A. In the sense that, yes, something is not allowed, if that's your question.

Q. Okay. And the difference between this disclosure in Choudhury and the example in

column 21 of the '163 patent is that Choudhury uses the low power bit, whereas the '163 patent uses a predetermined value of the BSS color field, correct?

MR. MILKEY: Objection to form.

THE WITNESS: I'm again taking another look at column 21.

The -- column 21, what is not allowed when the BSS color field is a predetermined value, it's -- this is around line 38 or so. What's not allowed is the SR operation based on the BSS color. That is not -- and what is not allowed in Choudhury is channel use.

I mean, yes, something is not allowed, but it's -- but it is a little bit different if we look in detail.

BY MR. MONALDO:

Q. In Choudhury, isn't channel use based on BSS color?

MR. MILKEY: Object to form.

THE WITNESS: In which paragraph of Choudhury?

BY MR. MONALDO:

Q. Maybe we could go down to

paragraph 25 of Choudhury.

So do you see paragraph 25 where it says, In the first variant, the color field is used, so that all stations belonging to the same BSS set the same color field. All stations are thus aware that there is an ongoing intra-BSS transmission so that the station will not reuse the channel if it decodes a valid SIG field from the same BSS?

So in that section, the reuse of the channel is based on the BSS color and whether the color indicates a communication from the same BSS, correct?

MR. MILKEY: Objection to form.

THE WITNESS: Well, yes, it says -- so I would agree that it says the station will not reuse the channel. So this refers to channel use, not necessarily spatial reuse.

BY MR. MONALDO:

Q. Okay. Perhaps you can look at the table at page 5 in Choudhury.

A. Oh, yes.

Q. Do you recall this table, Dr. Cooklev?

A. I do.
Q. So in table -- in this table on page 5, do you see the last two rows of the table?
A. I do.
Q. You'd agree with me that those two rows relate to the situation when a communication is received from a station in a different BSS, correct?
A. Well, it says here different BSS, yes.
Q. And in the second row from the bottom, you'd agree with me that the low power/high interference indicator is zero and, therefore, the receiving station is allowed access to the channel, correct?
A. Yes.
Q. And in the final row of the table, the low power/high interference indicator is set to 1 and, therefore, the receiving station has limited access to the channel, correct?
A. Yes.
Q. So in that last row, setting the low power/high interference indicator to 1 limits access to the channel, irrespective of the BSS

color value, correct?

MR. MILKEY: Objection to form.

THE WITNESS: In the last row?

BY MR. MONALDO:

Q. Yes.

A. And just as a -- for reference, I am looking at my declaration. I think -- I think somewhere I did analyze this.

I don't think I agree with you. In fact, I don't agree with you that in the last row of Table 5, if the low power indicated as 1, it doesn't matter the color field.

Q. Sorry. Are you saying that because the low power/high interference indicator is 1, the station has limited access and it doesn't matter what the color field value is set at?

MR. MILKEY: Objection to form.

THE WITNESS: No. I'm not saying that it doesn't matter. I mean, in fact, as -- as I state in my paragraph 74, even when the low power indicator is set to 1, Choudhury will still evaluate the color field to determine whether or not the PPDU is part of an intra- or inter-BSS.

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BY MR. MONALDO:

Q. So if you compare the second to last row in the table on page 5 to the last row in the table on page 5, the difference between the two rows is the low power/high interference indicator, correct?

MR. MILKEY: Objection to form.

THE WITNESS: Well, as far as those two rows, yes.

BY MR. MONALDO:

Q. And so the difference in limiting access for the bottom row of the table on page 5 is that the low power/high interference indicator overrides the ordinary operation based on BSS color, correct?

MR. MILKEY: Objection to form.

THE WITNESS: No. In my paragraph 74 I give an answer to this question. And I state that if the station determines that the PPDU is not part of an intra-BSS transmission, which basically means it's different, that the station is a different BSS, the station will then evaluate the low power indicator to see if it equals to 1, and, if so, it will limit

channel access.

BY MR. MONALDO:

Q. Right. So if the station is in a different BSS, there's two potential options.

Option one is you're allowed access because the communication is from a different BSS and option two is you're limited access and that occurs if the low power/high interference indicator is set to 1, correct?

MR. MILKEY: Objection to form.

THE WITNESS: Well, to the extent that's the same thing what I state in my paragraph 74, then I agree. I state that the station will evaluate the BSS color field to know -- to find out if the PPDU is -- is or is not part of an intra-BSS transmission and will then evaluate the low power indicator to see if it equals 1.

BY MR. MONALDO:

Q. But does your opinion on Choudhury depend on the order with which the color field and the low power/high interference indicator are considered?

MR. MILKEY: Objection to form.

THE WITNESS: Well, Choudhury says,

as we were talking in paragraph 24, that the color field may include or be accompanied by a low power indicator and, in the third case, a modified version of the color field.

So -- so I think the color field here is -- it is important in the sense that there may not be a low power indicator without the color field. I mean, the color field may include the low power indicator, so it might be there, or it might be accompanied by a low power indicator.

And in the third case, it's just the color field.

BY MR. MONALDO:

Q. So I guess my question relates to the first variant here, where you have an indicator following the color field concept described in 802.11ah, may include or be accompanied by a low power indicator. I believe that's what's shown in the table on figure -- or on page 5, correct?

MR. MILKEY: Objection to form.

THE WITNESS: Yes.

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BY MR. MONALDO:

Q. In that case, does it matter the order with which you assess the color field and the low power/high interference indicator?

MR. MILKEY: Objection to form.

THE WITNESS: Well, for the table, the color field achieves the functionality of both the low power indicator and the color field as defined by 802.11ah. So -- so this is what my opinion is based on.

BY MR. MONALDO:

Q. Okay. But I don't know that answered my question. My question was, does the order with which you evaluate the color field versus the low power indicator matter?

MR. MILKEY: Objection to form.

THE WITNESS: I think yes, because there is a case of -- such as if the receiving station determines that the PPDU is part of an intra-BSS or within the BSS transmission, then -- then it doesn't need to evaluate the low power indicator.

BY MR. MONALDO:

Q. Okay. So if the order was reversed and it considered the low power/high interference

indicator first, would that meet claim 1 of the '163 patent?

MR. MILKEY: Objection to form.

THE WITNESS: But that's not exactly -- if -- if it -- if Choudhury operates a little differently, would that meet the limitation; I mean, if Choudhury is different, then -- then I would have to evaluate it, I guess, and I would evaluate it with an open mind. And in that sense, it's possible. But the way Choudhury is, no.

And we -- we see -- also in -- in this table we see the low power/high interference indicator is just a bit -- is just a bit, but the table has -- there are five rows, like five different cases. And to me, that's also -- that is an indication that, well, you have to evaluate the color field.

It doesn't say okay, you -- just -- the low power indicator is just a bit. Look at that and see what you could do that way.

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BY MR. MONALDO:

Q. So you'd agree with me that rows 1, 3 and 5 cover the case where the low power/high interference indicator is 1, correct?

MR. MILKEY: Objection to form.

THE WITNESS: Almost. All three says 001 so could be either.

BY MR. MONALDO:

Q. Right.

A. It doesn't matter.

Q. All three of those rows limit access, correct?

A. Yes.

Q. So couldn't Choudhury simply look at the low power/high interference indicator and, if it's 1, limit access without considering the BSS color?

A. I think this example operates a little differently. Where the -- the example where the color field concept is generalized to achieve both the -- the functionality of both, the low power indicator and the color field.

Q. In this table?

A. Yes.

Q. How so?

A. It's -- it is a little differently from just constructing the truth table, little differently from a truth table, which -- which is -- contains the logic that you were describing.

I think that you have five different cases in this table. And the -- as I state in my paragraph 74, the station will determine if -- if the PPDU is an intra-BSS or inter-BSS.

Q. It wouldn't make that determination for rows 1 and 2, correct, since the color field isn't used?

A. Yes.

Q. So in that case, it would -- Choudhury would go straight to the low power/high interference indicator and determine whether to allow access or not based on the low power/high interference indicator itself, correct?

MR. MILKEY: Objection to form.

THE WITNESS: I think -- I think in those two cases it will do that.

BY MR. MONALDO:

Q. Well, couldn't you do that also in the other cases and look at the low power/high interference indicator and, if it's 1, simply

limit access?

MR. MILKEY: Objection to form.

THE WITNESS: I think that my paragraph 74 is accurate, that the station must evaluate the BSS color field to know whether channel access is limited, regardless of the low power indicator.

BY MR. MONALDO:

Q. I guess my question is, couldn't you do the opposite, where you evaluate the low power indicator, if it's 1, you limit access as shown in rows 1, 3 and 5; if it's zero, then you could turn to the BSS color and determine whether the station -- the communication is from the same BSS or a different BSS?

Isn't that possible?

MR. MILKEY: Object to form.

THE WITNESS: I think that you could implement it like this. But even then, my paragraph 74 is still accurate. So even in this case, I think my analysis is accurate.

BY MR. MONALDO:

Q. But if you considered low power/high interference indicator first and it was a 1, why

would you look at the BSS color field?

MR. MILKEY: Object to form.

THE WITNESS: Well, because there is a case where -- when even the low power indicator is zero.

BY MR. MONALDO:

Q. I'm asking about the case where it's 1.

A. That's not completely -- it doesn't completely describe this table.

Q. Well, I'm asking if you considered Choudhury's low power/high interference indicator first and that value is 1, every time that occurs you limit access. So in that case, you would not need to consider the BSS color to determine whether to limit access or not. You already have the answer because you always limit access when the low power/high interference indicator is 1, correct?

MR. MILKEY: Objection to form.

THE WITNESS: But I think that this is -- this does not completely describe this table. It only partially describes this table.

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BY MR. MONALDO:

Q. Okay. But in the case where it's zero, I would agree with you that you would then have to turn to the BSS color. But in the circumstance where the low power bit is 1, I do not believe you need to turn to the BSS color to figure out whether or not to limit access.

Would you agree with me?

A. I agree that in -- like, in isolation, you can take here the low power indicator and, if it's equal to 1, access would be limited. But I think this -- an operation of a device according to this table would be a little different.

And also, I was looking at Dr. Mahon's declaration in paragraph 168, where I think he also understood it, that in this case -- which I think is the third row of this table -- in this case, the value of the low power/high interference indicator does not matter, so -- because channel access is limited.

And -- and even the logic of that, while it's -- if -- if you have an inter- -- excuse me -- intra-BSS, that's the same BSS, then -- then it makes sense to limit access,

regardless of the low power indicator.

So I think on this issue in the third row of this table, in the -- it seems to me that with Dr. Mahon, we are in -- have the same opinion. And, for example, in paragraph 25 of Choudhury, it says -- and so we were talking about the first variant, right, when -- so the color field is used, all stations belonging to the same BSS set the same color field and all stations are thus aware that there is an ongoing intra-BSS transmission so that the station will not reuse the channel if it decodes a valid SIG field from the same BSS.

So this is what I think in response to your question.

Q. Okay. And I think I understand your position.

I guess my question is, couldn't you have written this table differently, because it doesn't really matter if you consider the color field first or the low power bit first, and written the table so that low power/high interference indicator is 1 and then the color field is same BSS or different BSS?

Isn't that possible?

MR. MILKEY: Objection to form.

THE WITNESS: I think I understand the question. And formally, if you -- if you -- I think if you just are trying to build -- I think in -- in boolean algebra and digital logic this is -- or similar tables are called truth tables if I -- if I recall correctly. And so in the abstract, you could -- you could build a truth table as you were suggesting.

However, this is not how Choudhury is operating. It's not -- it's not how Choudhury -- we said the first -- so the first variant -- that's paragraph 24 -- an indicator following the color field may include or be accompanied by the low -- by a low power indicator.

And then -- and then it's -- it -- it's describing that when the color field is used, stations will -- will monitor that color field.

And you are constructing an example where -- well, they're not doing that; they're only examining the low power indicator, which is included. It's

included with the color field or -- or accompanied by the color field.

And I think Choudhury would not -- Choudhury does not operate like this.

BY MR. MONALDO:

Q. Would it be more efficient to process a 1-bit indicator than a multi-bit field?

MR. MILKEY: Objection to form.

THE WITNESS: Well, in the abstract, yes, just if -- if the question is as far as complexity, one bit is one bit simpler. Dealing with one bit, is it simpler than multiple bits? Yes, it is simpler.

BY MR. MONALDO:

Q. But wouldn't it be obvious to process the simpler 1-bit low power/high interference indicator prior to the multi-bit color field in Choudhury?

MR. MILKEY: Objection to form. Outside the scope.

THE WITNESS: Well, I think this would contradict Choudhury saying that the color field is used and -- because now it turns out, okay, it's in the -- what you

are constructing it's not used.

BY MR. MONALDO:

Q. I'm not constructing something where it's not used. My question relates to it being used second to the low power/high interference indicator.

MR. MILKEY: Objection to form.

THE WITNESS: I think at the minimum, it's used together with. And we see one example where it's used before the low power indicator. That's in paragraph 25.

So if it is intra-BSS, don't use the channel, that -- that actually makes -- as I said, makes -- makes technical sense. But at the minimum, it's used together with the low power indicator.

BY MR. MONALDO:

Q. Is using it together outside the scope of the claim, claim 1 of the '163 patent?

MR. MILKEY: Objection to form.

THE WITNESS: Well, I think it's -- this is -- this I address in my paragraph 74, that -- and I say in either

scenario, the station must evaluate the color field to know, in the case of intra-BSS, whether channel access is limited.

BY MR. MONALDO:

Q. So in the circumstance where the BSS color and the low power indicator are evaluated together, which was the example you introduced, is that example covered by claim 1 of the 6 -- or '163 patent?

MR. MILKEY: Objection to form. Outside the scope.

THE WITNESS: I'm not sure I've offered an opinion about this.

BY MR. MONALDO:

Q. If we could turn to claim 1 of the '163 patent.

A. Yes.

Q. Can you tell me which limitations in claim 1 impart an order on consideration of the BSS color field and signaling information, such as Choudhury's low power/high interference indicator?

MR. MILKEY: Objection to form.

THE WITNESS: Well, as far as order

in claim 1, I don't know that any particular order is required.

BY MR. MONALDO:

Q. Okay. But you testified that order is important in evaluation of Choudhury. I'm just trying to understand why order is important when evaluating Choudhury against claim 1.

MR. MILKEY: Objection to form.

THE WITNESS: I'm not -- I think in my paragraph 74, which is where I am looking -- first, I think that my paragraph 74 is correct. And a reason that it's correct is if you look at the footnote on page 32 at the bottom, I explain that Choudhury's station would be unable to evaluate the BSS color, only when the BSS color is different, because Choudhury would first have to evaluate the BSS color to know whether or not the BSS color is different.

BY MR. MONALDO:

Q. I guess my question is, why does it matter that the BSS color is -- is evaluated first? Where in the claim is there a requirement of an order?

MR. MILKEY: Objection to form.
THE WITNESS: I don't think in my declaration I say that claim 1 of the '163 patent requires a certain order. And, again, correct me if I'm wrong, but I think that's true.
BY MR. MONALDO:
Q. Are you saying, then, that the valuation of the BSS color at all falls outside the scope of claim 1 of the '163 patent?
MR. MILKEY: Objection to form. Outside the scope.
THE WITNESS: I'm not sure I completely understand the question here. All I'm saying is that the low power indicator, it has not been shown by Dr. Mahon that it -- it indicates that an operation based on BSS color is not allowed.
BY MR. MONALDO:
Q. I guess my question, if we turn back to the footnote at page 32 of your declaration that you mentioned, the last sentence --
A. And if I may, I would -- after this question I would ask for a break.

Q. So you say here Choudhury would first have to evaluate the BSS color to know whether the BSS color is different.

Is it your opinion that a valuation of the BSS color to know whether the BS color -- BSS color is different falls outside of the scope of claim 1 of the '163 patent?

MR. MILKEY: Objection to form. Asked and answered.

THE WITNESS: I think the low power indicator is not the claimed signaling information.

BY MR. MONALDO:

Q. So your opinion is that the low power indicator is not signaling information?

MR. MILKEY: Objection to form.

THE WITNESS: It's not the claimed signaling information.

BY MR. MONALDO:

Q. And why not?

A. Because it does not indicate that any operation based on the BSS color is not allowed.

Q. You had asked for a break, so we can go ahead and go off record.

A. Thank you, Counsel.

(Thereupon, a brief recess was taken.)

BY MR. MONALDO:

Q. So, Dr. Cooklev, I'd like to discuss with you paragraph 29 of Choudhury.

A. All right.

Q. Do you see the first sentence where Choudhury describes that the color field concept can be generalized to achieve the functionality of both the low power indicator and the color field, as defined by 802.11ah?

A. Yes, I see this.

Q. And then Choudhury provides an example where the first three bits of the color bit can be used to set the basic service set identification, BSS ID, and the fourth bit can be used as a low power/high interference indicator.

Do you see that?

A. Yes.

Q. You'd agree with me that the low power/high interference indicator would have a value of zero or 1, correct?

A. Yes.

Q. So in this case, the color field could identify a BSS using the first three bits

of the color field and then have a predetermined value of zero as the fourth bit of the color field, correct?

MR. MILKEY: Object to form. Outside the scope.

THE WITNESS: Well, if you're asking me if the fourth bit, which here can be used as a low power/high interference indicator, if that bit can be zero, I think that that bit can be zero.

BY MR. MONALDO:

Q. And you'd agree with me that the other three bits identify the BSS, correct?

MR. MILKEY: Objection to form.

THE WITNESS: The first three bits -- here it says to set the BSS identification. Yeah, therefore, the BSS ID.

BY MR. MONALDO:

Q. So in this example, the color field identifies the BSS and can have a predetermined value of zero in the fourth bit, correct?

MR. MILKEY: Object to form.

THE WITNESS: Well, what is the -- here you keep asking about the

predetermined value of zero. And I said if -- if -- if you mean whether the fourth bit can be zero, I mean, a bit can be zero.

So what is the significance of this predetermined?

BY MR. MONALDO:

Q. I guess I'm referring to the example we discussed in column 21 of the '163 patent, where it uses the term "predetermined value." I'm not sure if there's significance to it beyond that, other than I wanted to confirm with you that this portion of Choudhury, the color field serves as both a BSS identifier and can have a value of zero.

MR. MILKEY: Objection to form.

THE WITNESS: Well, as far as -- and thank you for -- for clarifying that. I -- I kind of remembered the discussion about predetermined values.

So as far as can the fourth bit be a zero, yes. I don't think it's going to be a predetermined value as in column 21 of the '163 patent.

///

BY MR. MONALDO:

Q. Why is that?

A. I think there is a clear distinction. So in column 21 of the '163 patent it says when the BSS color value is a predetermined value. The low power indicator that's the -- the fourth bit here, I mean, that -- that -- the low power indicator indicates is this a low power device or is it susceptible to interference. And so that is -- and that right there, that's a different thing than the BSS color value being -- being a predetermined value. And that predetermined value in column 21, when that happens, the device may not perform spatial reuse based on the BSS color.

So that is what is associated with this predetermined value, not performing the spatial reuse based on the BSS color.

Q. Okay. I guess my question, though, is, in Choudhury's paragraph 29, the color field itself can identify the BSS and also be a value of zero or 1, correct?

MR. MILKEY: Objection to form. Outside the scope.

THE WITNESS: Well, the first three

bits of the color field in this case can -- can identify the BSS.

I think that's my answer.

BY MR. MONALDO:

Q. Could I turn you to paragraph 38 of your declaration.

A. 38.

Q. And I'd actually like to look at the footnote at the bottom of page 12 that's referenced in paragraph 38.

Do you see that footnote?

A. I do see that, yes.

Q. And you say, I assume that a coloring disable bit value of 1 indicates either a trigger frame or an RTS/CTS frame.

And that's in the context of Lee, correct?

A. Yes.

Q. Do you recall that we discussed earlier that Lee's coloring disable bit could be comprehended as a bit indicating that CCA level change would not be performed?

A. I have a recollection of that, yes.

Q. So the assumption you put in this footnote on page 12 is incorrect?

A. What? Incorrect?
MR. MILKEY: Objection to form.
BY MR. MONALDO:
Q. Because the coloring disable bit could also indicate that the CCA level adjustment is not performed.
MR. MILKEY: Objection to form.
Do you have a question, Counsel?
BY MR. MONALDO:
Q. My question is, is the assumption set forth in the footnote on page 12 of the declaration incorrect based on our earlier discussion that the coloring disable bit in Lee could also be comprehended as an indication that CCA level adjustment is not performed?
A. No, I -- I do remember the question. I -- my footnote is correct. And --
Q. But your footnote does not cover the case where Lee describes the coloring disable bit is comprehended as a bit that indicates that CCA level adjustment is not performed, correct?
MR. MILKEY: Objection to form.
THE WITNESS: I don't think so, because, as I stated, the -- and the same page 12 and beginning of page 13, I

assume, okay, that at most, Lee discloses that the processor is configured not to change the CCA level based on the BSS color when the coloring disable bit indicates a trigger frame.

So I don't think that here I have missed something taught by Lee.

BY MR. MONALDO:

Q. And if we turn back to Lee paragraph 68, that last sentence says, The coloring disable bit can also be comprehended as a bit indicating that CCA level change is not performed and whether or not a medium is busy is not determined.

Correct?

A. That's what it says, yes.

Q. And that statement is broader than the statement in your footnote on page 12, correct?

MR. MILKEY: Object to form.

THE WITNESS: But -- first, if one examines Lee, I think they would conclude that my footnote is correct. And not only that, I do say that -- I say at most, Lee discloses that when the coloring disable

bit indicates a trigger frame, the processor is configured not to change the CCA level based on the BSS color, which I think is consistent with this sentence from Lee.

BY MR. MONALDO:

Q. I'll take you to paragraph 41 of your declaration.

A. Yes.

Q. Do you see the last sentence here that says, Lee does not disclose the processor would be configured such that no operations using BSS color would occur, as required by the claim requirement that the processor be configured not to use a BSS color?

My question is, does Lee disclose performing operations using BSS color when the coloring disable bit is set?

A. And I may be here a little slow, but I was thinking first about the double negative, perhaps, in my -- in the last sentence of my paragraph 41. And as I was thinking, I think my sentence is correct.

But having said that, if I may, can I have the question repeated?

Q. Yeah. My question is, does Lee disclose operations using BSS color that are performed when the coloring disable bit is set?

A. Okay.

So, for example, in -- so starting with paragraph 82 of Lee, so where Lee -- Lee describes when -- describes the case relating to RTS/CTS frames, rather than a trigger frame.

And so in paragraph 82 it says, okay, in this case, the -- a transmitter of the RTS/CTS sets a coloring disable bit to 1 to indicate that it is RTS/CTS.

But then -- so your question is well, are there operations that are allowed here. So one operation -- so now, if we -- there are two cases here, I think.

So paragraph 83 says if the device belongs to the same BSS, and then the operation described in paragraph 84 -- the operations described in paragraph 84 are performed. And if -- yes -- and if the RTS/CTS is transmitted by a device belonging to a different BSS, then we have the operations in paragraph 86.

And in these operations -- in these operations, what is going on is that the NAV --

the NAV is an acronym for the network allocation vector, which is the virtual carrier sense mechanism. And so among the other things, let's say paragraph 84, it says the station terminates NAV and may be able to perform a back-off procedure again.

And there is a similar -- similar language in paragraph 86 where the device terminates the NAV and may be able to perform a back-off procedure.

So, for example, since I think your question asked for an example, I think these are operations which are allowed, even if the BSS coloring disable bit is set to 1.

Q. Where does it describe that these operations are based on BSS color and that the coloring disable bit is set to 1?

A. Well, first, regarding the coloring disable bit, isn't this described in paragraph 82?

Q. Okay.

A. I think it is.

So in response to the second question, where does it say that the NAV or basically using -- using the NAV is based on BSS

color?

The NAV is -- as I -- as I said -- I mean, here Lee doesn't describe in detail how the network allocation vector operates. But the NAV is -- I mean, I can -- I can -- yes. I think it is correct that Lee doesn't describe in detail how network allocation vectors operate, but these -- the network allocation vectors are for -- they are operations based on BSS color.

And setting or resetting that timer -- the NAV is basically a timer and it shows whether the medium is busy or available and for how long. If the timer is counting down, it counts down for how long will the medium be busy. But when we have -- when we have intra-BSS and inter-BSS situations. So the NAV is based on BSS color.

Q. In this case, paragraph 84 states that the station terminates NAV or TXOP?

A. Yes.

Q. Terminating NAV would not be based on BSS color, correct?

A. No. I mean, I just -- I think I was just saying that it is.

Q. Terminating the NAV is based on BSS

color? I thought you said setting the NAV was based on BSS color.

A. Well, the NAV, it's -- there is -- there's a separate NAV for -- so the NAV is -- is tied to the concept of BSS color. So I don't think there is a distinction that the NAV itself is -- is a concept based or associated with a BSS color.

And terminating the NAV -- I don't think that there's a distinction there, so terminating the NAV would be, in this context, an operation based on BSS color.

Q. Wouldn't terminating a NAV prevent an operation based on BSS color and that operation would be setting the NAV?

A. I'm just looking at my declaration.

Excuse me. What was the question?

Q. The question is, wouldn't terminating the NAV actually be preventing an operation based on BSS color because the NAV would be set based on BSS color and terminating it would end the operation, correct?

MR. MILKEY: Objection to form.

THE WITNESS: I -- I would not agree with this. And I think, at the

minimum, it is a very confusing statement. Terminating NAV here is an example of an operation based on BSS color.

BY MR. MONALDO:

Q. How is terminating a NAV based on BSS color?

MR. MILKEY: Objection to form.

THE WITNESS: How? Well, I think a good answer to the question how or -- or maybe why, why is -- why am I saying that here terminating the NAV or the transmission entity, the TXOP, why is this an operation based on BSS color, a good answer is that, look, the entire -- entire paragraph 84 is -- pertains to the case when the device belongs to the same BSS. Right? That's what paragraph 83 says.

So in paragraph 84 we have actions -- we have actions performed based on BSS color because these actions are performed in the case when the device belongs to the same BSS.

And if -- paragraph 85 says if the RTS/CTS is transmitted by a device belonging to a different BSS, well, that's

BSS color, right, the same BSS or different BSS, that is -- that is the concept of BSS color.

So then -- then you have everything in paragraph 86. So all the operations in paragraph 86 are based on BSS color.

BY MR. MONALDO:

Q. So in both paragraph 84 and paragraph 86 the device terminates the NAV and performs a back-off procedure, correct?

A. Yeah. Yes, terminates the NAV.

Q. So that operation in itself is not based on the BSS color, correct?

MR. MILKEY: Objection to form.

THE WITNESS: No, I -- I don't agree with that. It's -- there is -- there is one NAV. There is a NAV for -- for -- for the same BSS. And there is a NAV for a different BSS.

And so when you -- so this is why the NAV itself is based on BSS color. And I said even if we just look at terminating NAV, just that, because the NAV is -- is based on BSS color or associated with BSS color, as I explained, terminating the NAV

is an operation based on BSS color.

But even more than that, I mean, if -- if -- if I may, and if I have two colors, everything in paragraph 84 will be in -- based on one color and everything in paragraph 86 will be based on -- will be -- I'll call it differently, meaning it's based -- based on a BSS color.

BY MR. MONALDO:

Q. So in your opinion, if a BSS color is used to determine whether a device belongs to the same BSS or a different BSS, that falls without -- outside the scope of claim 1 of the '163 patent?

MR. MILKEY: Objection to form.

THE WITNESS: And, I'm sorry, I need to look once again at the claim since the -- the claim is so important.

Well, the claim requires the -- the device not to use BSS color when signaling information indicates that an operation based on the BSS color is not allowed.

So what is not allowed is an operation based on the BSS color.

///

BY MR. MONALDO:

Q. And my question was, determining whether a communication is from the same BSS or a different BSS using the BSS color, is that outside of the scope of this limitation of claim 1 of the '163 patent?

MR. MILKEY: Objection to form. Outside the scope.

THE WITNESS: I'm not sure I've offered an opinion about this. And please correct me if I'm wrong, but to give you an opinion, I think I need to -- I basically would need to study the issue.

BY MR. MONALDO:

Q. So sitting here today, you can't testify as to whether using BSS color to determine whether a communication is from the same BSS or a different BSS falls within the scope of the claim?

A. It's -- to the extent I have not given an opinion -- I mean, I'm doing my best here to answer truthfully all of the questions. But for questions for which I did not investigate, I would need a little more time.

Q. Fair enough. I'm just trying to get

an understanding of your assessment of the scope of the claim as it relates to the prior art.

Did you consider whether there's a time frame on how long operations, based on BSS color, are not allowed within the scope of claim 1 of the '163 patent?

MR. MILKEY: Objection to form. Outside the scope.

THE WITNESS: I don't think I considered that. I did not.

And, to the best of my recollection, Dr. Mahon did not. I don't think that this is an issue brought up by Dr. Mahon.

BY MR. MONALDO:

Q. In your opinion, would it be sufficient for a single operation based on BSS color to not be performed as long as no other operations based on BSS color are performed to meet this limitation of claim 1 of the '163 patent?

MR. MILKEY: Objection to form.

THE WITNESS: Counsel, I'm not sure I completely understand the question. That -- is it sufficient one operation to

not be performed?

BY MR. MONALDO:

Q. Yes.

A. Well, if we stop here, is it sufficient one operation not to be performed, I don't think that's sufficient.

Q. Why not?

MR. MILKEY: Same objection.

THE WITNESS: Because in my opinion, the claim, claim 1, requires any operation. And as we've been talking today, Lee -- yes, Lee teaches that CCA level change or -- teaches that that's not allowed, but allows other operations.

BY MR. MONALDO:

Q. So in your opinion, if claim 1 was met by not performing or not allowing one operation, Lee would disclose it; but because you interpret claim 1 as any operations, Lee does not satisfy claim 1?

MR. MILKEY: Objection to form.

THE WITNESS: That's close. You said if claim 1 is -- is restricting one operation -- so that's -- in this sense the question is -- is hypothetical, right,

if -- if -- if the language in claim 1 is a little different. And so in this sense I can't just -- I think it becomes too open-ended to say well, if -- if it's -- the language is a little different, Lee would disclose it. So for this reason not -- I wouldn't completely agree with this.

Now, obviously, if the claim language is changed -- if it's changed somewhat -- I'm not sure exactly how, but if it's changed somewhat, yeah, possibly Lee would disclose that.

BY MR. MONALDO:

Q. Okay. So if the claim wasn't interpreted to require any operation, as you've discussed today, and could be met by disallowing one operation, Lee could disclose that, correct?

MR. MILKEY: Objection to form.

THE WITNESS: For example, in -- starting with paragraph 44 in my declaration, I explain why Lee's device or processor is not configured not to use BSS color when the coloring disable bit indicates a trigger frame.

And even -- even though I say here a trigger frame, it's for a trigger frame or RTS/CTS, it's -- here I have shortened the title of this section of my declaration.

So back to your question. Even if -- even if it's not any operation, but even if it's one operation based on the BSS color, I'm -- it seems to me that at least for these paragraphs, beginning with paragraph 44, it seems to me Lee would not disclose claim 1.

(Thereupon, a discussion was had off the record.)

(Thereupon, a brief recess was taken.)

BY MR. MONALDO:

Q. I'd like to turn you now to paragraph 59 of your declaration.

Do you see the fourth sentence that says, Furthermore, Dr. Mahon does not explain why a person of ordinary skill in the art would have sought to disable all operations based on color in response to color collisions as opposed to implementing techniques to avoid collisions in

the first place, or resolve those collisions quickly through prompt color reassignment?

A. Yes, I see this.

Q. My question is, are those techniques related to avoiding color collisions in the first place or resolving them quickly exclusive of disabling operations based on color when a color collision occurs?

MR. MILKEY: Objection, form.

THE WITNESS: Excuse me. When a color collision occurs, are these operations what?

BY MR. MONALDO:

Q. Exclusive of preventing the use of color, at least temporarily, when you detect a color collision.

A. At least to some extent. I have not investigated here that they are completely exclusive.

Q. Okay. So in other words, if you detect a color collision, you could temporarily stop using color, work to avoid collisions in the first place and work to resolve collisions promptly through color reassignment all together?

A. I don't think I can agree with that.

I was just trying to be conservative when I said that at least to some extent, resolving color collisions through color reassignment is -- is exclusive of not using color.

Again, at -- at least to some extent.

Q. Yeah. I guess my question is temporarily not using color while the reassignment process is happening.

A. I understand that logic. That's not how I understood Dr. Mahon's declaration.

Q. Okay. But it's possible that one might temporarily not use color while the reassignment process is occurring, correct?

A. Well, that's -- that's a hypothetical, I think, that -- I don't think it's -- it's -- it's being articulated by Dr. Mahon. And I also believe, as you know, my declaration is only in response to his opinions.

But in addition to that, so in addition to the reason why I can't -- can't agree with this hypothetical is that -- is I say all right, so that -- now moving on to paragraphs 60 and 61, from Dr. Mahon's declaration I did not -- I did not understand that there is any explanation how Lee and Stacey would cease

color-based operations. So how is that going to happen?

You're -- you're asking me a hypothetical which, in some abstract sense, may make sense, but not -- not here. So how is that going to happen or even for a short period of time before we do -- before color reassignment is done.

And, for example -- for example, here I describe the -- the NAV operations. And so I continue in my paragraph 61 and -- so I'm saying well, if there is -- if you stop -- if you stop using a NAV, at the minimum, that's not obvious. Right? That's a big deal.

So for a while, while you resolve the color collision and do color reassignment, stop doing -- stop operating the NAV. Those two -- there's not just even one time -- start operate the -- those timers.

So that -- that's -- it's not -- and I want to be clear, it's -- I don't mean that it's impossible, but at the minimum, it wasn't an obvious thing to do.

And -- but the second thing is, okay, if you -- if you are going to have a NAV -- so

that is at the top of my page 26, around there.
So assuming that Dr. Mahon is not suggesting to eliminate the NAV, but then how are we going to operate that NAV not using BSS color?
Q. So, Dr. Cooklev, is it possible to set a NAV without BSS color?
MR. MILKEY: Objection to form.
THE WITNESS: In the context of Lee and Stacey?
BY MR. MONALDO:
Q. Generally. In a general context, is it possible to set a NAV without using BSS color?
MR. MILKEY: Objection to form.
THE WITNESS: Well, in legacy 802.11, where there was no BSS color and there was a NAV, in such legacy networks, yes, the NAV would be operated not using BSS color.
BY MR. MONALDO:
Q. So it's possible the NAV can be set without the use of BSS color, correct?
MR. MILKEY: Objection to form.
THE WITNESS: I think the clarification is important that we're talking about legacy networks where there

is no BSS color, but there is a NAV.

BY MR. MONALDO:

Q. In a situation where you have a BSS color field, is it possible to set a NAV using other information different from the BSS color?

MR. MILKEY: Objection to form.

THE WITNESS: Well, I do not have an opinion whether that's possible or impossible. But first time I'm just stating that Dr. Mahon has not explained how could -- in the context of Lee and Stacey, right, which is different from legacy 802.11, how in that context could the NAV be set not using BSS color.

BY MR. MONALDO:

Q. Okay. So your opinion relates to Dr. Mahon's lack of explanation, rather than an impossibility of the BSS -- sorry, strike that.

Your opinion is based on the lack of explanation by Dr. Mahon as opposed to it being impossible to set the NAV using something other than BSS color, correct?

MR. MILKEY: Object to form.

THE WITNESS: I think that's fair, yes. And I'm sorry for mispronouncing his

name.

I don't want to say that it would be impossible for this to happen. Just I did not understand that there is any explanation about this.

But even more than that, it's right, I think, that there should have been together with that an explanation that a person of skill would have been motivated to do it and that a person of skill could have got it.

And I'm just saying that these things I did not -- based on my understanding, I did not see in Dr. Mahon's declaration.

BY MR. MONALDO:

Q. As it relates to power save operations, do power save operations require a BSS color?

MR. MILKEY: Objection, form.

THE WITNESS: Well, in paragraph 62 I think I state that, yes, in this -- in the context of paragraph 62, which is -- which is now Stacey, the Stacey reference, power save is an operation based on BSS

color.

BY MR. MONALDO:

Q. But could you perform some power-saving techniques without the use of BSS color?

MR. MILKEY: Objection to form.

THE WITNESS: Again, it -- it wasn't my task to investigate that. I don't want to say that it is impossible, this to be done. It might be possible, but it's just -- it has not been presented to me to analyze.

BY MR. MONALDO:

Q. As it relates to spatial reuse operations, is it possible those can occur without the use of BSS color?

MR. MILKEY: Objection to form.

THE WITNESS: Well, as I explain in the following paragraphs here on -- on what is page 27, spatial reuse -- as stated in paragraph 64, spatial reuse requires different CCA levels and BSS coloring. And I even quote for support, I think, the Stacey reference, Exhibit 1006.

And it's -- it's just -- not only,

I think, that this has not been explained in Dr. Mahon's declaration, but at the minimum, I think spatial reuse without BSS color is -- or was at the time -- not obvious, if at all possible.

BY MR. MONALDO:

Q. Your opinion is that spatial reuse would not be possible without BSS coloring?

MR. MILKEY: Objection to form.

THE WITNESS: I don't want to just give such strong statements.

BY MR. MONALDO:

Q. Does spatial reuse occur before BSS color was added to the standard?

A. I think that question requires a more detailed analysis. I cannot at the moment --

Q. You don't know if spatial reuse occurred before BSS color was added to the standard?

MR. MILKEY: Objection to form.

THE WITNESS: As I -- as I said, it's -- and that question requires a more detailed analysis of spatial reuse, the way -- the way it is understood now versus -- versus to whatever extent some

ideas about efficient channel use existed years ago.

So that -- the question is -- the question requires a more detailed investigation and -- and at the moment, I can't give you an answer.

MR. MONALDO: Well, I have no further questions, so I will pass the witness at this time.

MR. MILKEY: All right.

Could we take a ten-minute break?

MR. MONALDO: Sure.

MR. MILKEY: Let's go off the record.

(Thereupon, a brief recess was taken.)

EXAMINATION BY COUNSEL FOR PATENT OWNER

BY MR. MILKEY:

Q. Dr. Cooklev, do you recall that you discussed terminating the NAV in the context of Lee earlier today?

A. I do, yes.

Q. Okay. And at a high level, what is terminating the NAV?

A. As I said, the NAV is a timer. And

terminating the NAV is setting that timer to zero. I mean, this is how I understood Lee when Lee says terminating the NAV.

Q. Okay. And you were asked by counsel for Samsung whether specific examples in the specification of the '163 patent practice certain claims.

Do you remember that?

A. Generally, yes.

Q. Okay. In forming your opinions, did you analyze whether any specific examples in the specification of the '163 patent practiced the claims?

A. In forming my opinions that are in my declaration, no, I did not analyze if any -- if any embodiments are covered by the claims.

Q. Okay.

A. No, I did not do that.

Q. And was that required for you to do the analysis in forming your opinions?

A. Not to my understanding. I understood my task as essentially responding to the declaration of Dr. Mahon. And this is why I did not analyze at all which embodiments are covered by the claims or, in particular, claimed

by claim 1.

Q. Okay. Could you please turn to paragraph 30 of your declaration, three-zero.

A. Yes, I'm there.

Q. Okay. And does paragraph 30 of your declaration provide an accurate understanding of what you understand the -- the legal standard is for claim construction?

A. Paragraph 3?

Q. Paragraph 30, three-zero.

A. Oh, three-zero. I apologize.

Yes.

Q. Do you recall Dr. Mahon in his declaration providing any opinions regarding lexicography or disclaimer?

A. I do not recall that.

Q. Okay. And do you recall being asked earlier today if the '163 patent describes an embodiment where all operations using BSS color are not allowed?

A. Again, I generally remember those questions, even if I, perhaps, don't recall the specific question.

Q. Okay. Could you please turn to the '163 patent at column 1 and just let me know when

you're there.

A. I am looking at '163 patent and -- column 1, I'm there.

Q. Okay. And do you see in the very first section in column 1 the cross-reference to related applications, there are a number of applications listed in that paragraph and then that paragraph concludes by saying, the entire contents of which are incorporated herein by reference?

A. Yes, I see this.

Q. Okay. And do you see that at lines 14 to 15 of that same column, one of those incorporated by reference applications is Korean Patent Application Number 10-2016-0029975?

A. Yes, I do.

Q. Okay. And I'm going to upload as Exhibit A to this deposition.

(Thereupon, Exhibit A was marked for identification.)

BY MR. MILKEY:

Q. Dr. Cooklev, could you please open Exhibit A and let me know when you have it open.

MR. MONALDO: I'll lodge an objection to the use of the deposition --

or the exhibit as outside of the scope.

MR. MILKEY: Could you please explain how it's outside the scope if you're asking about whether the '163 patent discloses something and this is incorporated by reference into the '163 patent?

MR. MONALDO: I didn't ask any questions related to the priority applications. I was asking what was in the specification of the '163 patent. And this exhibit was not cited in Dr. Cooklev's declaration, to my knowledge.

MR. MILKEY: Is it your position that this isn't part of the '163 patent?

MR. MONALDO: It's my position that this wasn't the subject of his testimony given today or part of his declaration and therefore is outside the scope of this deposition.

MR. MILKEY: Okay. Well, I think we clearly disagree on that.

BY MR. MILKEY:

Q. So, Dr. Cooklev, could you please

turn to the second page of the PDF of Exhibit A. And this shows -- it lists an application number there.

Do you see that?

A. I do.

Q. Okay. Does this show Korean Application Number 10-2016-0029975?

MR. MONALDO: I'll lodge an objection to scope for this entire line of questioning.

MR. MILKEY: Okay.

THE WITNESS: Yes.

BY MR. MILKEY:

Q. Okay. And did counsel for Samsung provide this document to you as you were -- as they were asking you about whether certain aspects of the claims were disclosed by the '163 patent?

A. No.

Q. Okay. Could you please turn to paragraph 69 of this document? It's on PDF page 21.

A. I'm there. 69?

Q. Yes.

A. I'm there.

Q. And do you see 69 states, Figure 6 is a diagram illustrating intra-PPDU power save when a BSS color collision occurs?

Do you see that?

A. Yes.

Q. Okay. And then going down to the last sentence of paragraph 71, do you see -- or -- strike that.

The last two sentences of paragraph 71 read, Additionally, upon detecting a BSS color collision, the STA may cease operations based on the BSS color. More specifically, it may stop performing operations based on the same BSS color?

A. Yes.

Q. Okay. And this wasn't something that you had considered when you were answering questions earlier today about whether certain examples were provided in the '163 patent, correct?

A. I have to agree with that, that this is not what -- I did not consider this document.

Q. Okay.

MR. MILKEY: I have no further questions.

MR. MONALDO: Can we take maybe a five-minute break?

MR. MILKEY: Okay.

MR. MONALDO: Off the record.

(Thereupon, a brief recess was taken.)

FURTHER EXAMINATION BY COUNSEL FOR PETITIONER

BY MR. MONALDO:

Q. So, Dr. Cooklev, do you recall counsel asking you about Exhibit A, which purports to be a translation of a Korean priority application cited by the '163 patent?

A. Yes, I do.

Q. And counsel asked you about paragraph 71 of that document, correct?

A. That's correct.

Q. In paragraph 71, you'd agree with me that it does not describe signaling information that indicates an operation based on BSS color is not allowed, correct?

MR. MILKEY: Object to form.

THE WITNESS: I have to take a moment to review paragraph 71.

If the question is whether in paragraph 71 it describes signaling

information not allowing an operation based on BSS color, is this -- if I may restate the question, is this correct?

BY MR. MONALDO:

Q. Yes, that's correct.

A. So as I think I've -- as I said earlier today, I said what was the -- my task and what was the scope of my declaration, that -- and so analyzing whether an embodiment or which embodiment is covered by the claim, I -- I didn't do -- I did my best to answer the questions. And also, in -- your question is -- your question is about signaling information that indicates that an operation based on the BSS color is not allowed.

I mean, this type of analysis is -- is, I think -- I mean, that's -- that's like -- whether something is within the scope, like, this is like infringement analysis, which is not my task. And it's a significant work.

But in -- if we scroll to the next page -- that's page 22 of the PDF -- it says in one embodiment the station may operate using a specific reserve -- reserve BSS color, for example, zero, to restrict BSS color-based

operations.

So subject to what I said, this, seems to me, comes close to your question about signaling information.

Q. Okay. So you consider a color value of zero to be within the scope of the claims of the '163 patent?

MR. MILKEY: Object to form. Outside the scope.

THE WITNESS: Well, I think we were -- we were discussing earlier about that example of BSS color zero. And my -- my answer would be the same, that it could be.

BY MR. MONALDO:

Q. And it could be only in the case where a color of zero identifies a BSS as a proper BSS identifier, correct?

A. In the sense that the BSS color has to be an identifier of a BSS, according to claim element 1.5. In that sense, yes, claim element 1.5 must be met for something to be within the scope of claim 1.

Q. So if a color value of zero is not a valid BSS identifier, then that would be outside

the scope of the claim, correct?

A. This -- as I said, this particular example -- in this particular example, which is about reserve BSS color such as zero, if color zero is not an identifier of BSS, it would not be within the scope. There could be another example there that -- that is, but this one won't be.

Q. If we could go to the last sentence on page 21 of the PDF in paragraph 71.

Do you see that says, More specifically, it may stop performing operations based on the same BSS color?

A. Yes.

Q. You'd agree with me it does not describe stopping performing operations based on a different BSS color, correct?

A. It says it may stop performing operations based on the same BSS color.

Q. So it would allow operations based on a different BSS color, correct?

MR. MILKEY: Object to form.

THE WITNESS: I mean, just this sentence -- just this sentence, I -- it seems to me yes. But often one -- you know, to answer in detail these questions,

one would need to study carefully the entire document.

BY MR. MONALDO:

Q. But sitting here today with this sentence, you agree with me that it allows operations based on a different BSS, correct?

MR. MILKEY: Objection to form.

THE WITNESS: It doesn't say -- it doesn't say that they are allowed, but it says that operations, based on the same BSS color, are not performed.

BY MR. MONALDO:

Q. So it's possible that operations based on a different BSS color might be performed, correct?

MR. MILKEY: Objection to form.

THE WITNESS: And like I said, it's -- to -- if -- if I study in detail this document, I might give you a -- a better answer because I had time to properly study and consider it.

But just -- just here, this -- these couple of sentences on PDF page 21, it leaves that possibility, yes.

///

BY MR. MONALDO:
Q. You hadn't seen this document prior to today's deposition, correct?
A. That's correct.
Q. You did not consider paragraph 71 in forming the opinions set forth in your declaration, correct?
A. That's correct.
Q. So you'd agree with me that this would be new information that was not considered in your declaration?
A. I have to agree with that.
MR. MONALDO: No further questions.
MR. MILKEY: And for the record, you know, to the extent that -- I assume that petitioner is aware of its obligations, but to the extent you're going to raise new claim constructions or, you know, new theories based on inconsistent claim constructions with the District Court, we reserve all rights and we're obviously going to present any information, including District Court expert reports or anything else that's inconsistent with claim construction

positions to the extent petitioner is going to try to take new or inconsistent positions.

But I have no questions for Dr. Cooklev.

(Thereupon, signature having not been waived, at 5:22 p.m. EDT the deposition concluded.)

CERTIFICATE OF DEPONENT

I, Todor V. Cooklev, Ph.D., do hereby certify that I have read the foregoing pages, which contain a correct transcript of the answers given by me to the questions propounded to me herein, except for changes, if any, duly noted on the enclosed errata sheet.

_____
TODOR V. COOKLEV, Ph.D.

Sworn and subscribed to before me this ___ day of _____, 2026.

My commission expires: _____

Notary Public: _____

CASE: Samsung Electronics Co. Ltd. v. Wilus
Institute of Standards and Technology Inc.
DEPOSITION OF: Todor V. Cooklev, Ph.D.
TAKEN: April 13, 2026

PAGE	LINE	ERROR	CORRECTION	REASON

_____
TODOR V. COOKLEV, Ph.D.

CERTIFICATE OF NOTARY

I, MISTY KLAPPER, the officer before whom the foregoing deposition was taken, do hereby certify that the witness whose testimony appears in the foregoing deposition was duly sworn by me; that the testimony of said witness was taken by me in shorthand and thereafter reduced to typewriting by me; that said deposition is a true record of the testimony given by said witness; that I am neither counsel for, related to, nor employed by any of the parties to the action in which this deposition was taken; and, further, that I am not a relative or employee of any attorney or counsel employed by the parties hereto, nor financially or otherwise interested in the outcome of this action.

Misty Klapper, RMR, CRR, CSR,
RSA and Notary Public

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