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Transcript of Kerry Litvin, Ph.D.

Date: May 15, 2025

Case: Nokia of America Corporation, et al. -v- Iarnach Technologies, Inc. (PTAB)

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WORLDWIDE COURT REPORTING & LITIGATION TECHNOLOGY

Nokia of America Corporation et al.

Exhibit 1036

IPR2024-00899, USPN 9,806,892

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1 (1 to 4)

1	2
1 UNITED STATES PATENT AND TRADEMARK OFFICE	1 A P P E A R A N C E S
2 -----	2
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14 REMOTE DEPOSITION OF	14 Houston, Texas 77002
15 KERRY LITVIN, Ph.D.	15
16 May 15, 2025	16
17 9:02 a.m.	17 Also Present: Melody Adair, Technician
18	18
19	19
20 Reported by: Brooklyn E. Schweitzer, RPR, CRR	20
21 Job No.: 583115	21
22 Pages: 1 - 118	22
1	2
1 Deposition of KERRY LITVIN, Ph.D.,	1 C O N T E N T S
2 conducted virtually.	2 EXAMINATION PAGE
3	3 By Mr. Lareau 5
4	4 By Mr. Wyde 100
5 ** ALL PARTIES ATTENDED REMOTELY. **	5 By Mr. Lareau 111
6	6
7	7
8 Pursuant to Notice, before Brooklyn E.	8 E X H I B I T S
9 Schweitzer, Registered Professional Reporter,	9 EXHIBIT PAGE
10 Certified Realtime Reporter, and Notary Public in	10 Exhibit 2007 Declaration 10
11 and for the Commonwealth of Pennsylvania.	11 Exhibit 1007 10-Gigabit-Capable Passive
12	12 Optical Networks
13	13 (XG-PON): Transmission
14	14 Convergence (TC) Layer
15	15 Specification 18
16	16 Exhibit 1008 ITU-T G.988 18
17	17 Exhibit 1010 Recommendation
18	18 ITU-T G.9807.1 18
19	19 Exhibit 1001 '892 Patent 18
20	20 Exhibit 1006 Optically Powered Fiber
21	21 Networks 18
22	22 Litvin 99 Screen-Capture 86

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5 1 PROCEEDINGS 2 KERRY LITVIN, Ph.D., 3 was called, and having been duly sworn, 4 testified as follows: 5 EXAMINATION 6 BY MR. LAREAU: 7 Q Good morning, Dr. Litvin. Can you please 8 state your full name for the record? 9 A Kerry Litvin. 10 Q Thank you. Dr. Litvin, I'm Stephen 11 Lareau. We've never met before. I'm counsel for 12 Nokia and AT&T. I just want to go over a few 13 basic ground rules to help this proceeding go as 14 smoothly as we can. 15 I'm going to ask you a series of questions 16 today. You're under oath, so you're to provide a 17 complete and accurate answer to the best of your 18 ability. Do you understand? 19 A Sure. 20 Q Okay. And from time to time during this 21 deposition, your counsel may interpose an 22 objection for the record. Unless your counsel	7 1 today if you need to take a break, just let us 2 know, and we'll go off the record. The only 3 caveat to that is if there's a pending question, I 4 ask that we just -- you answer the question before 5 we take the break, but otherwise, you know, if you 6 need to grab some water, go to the restroom, 7 stretch your legs, that's totally fine. 8 Otherwise, short of you asking for one, I'll plan 9 to take a break every hour or so just -- just as a 10 good opportunity to stretch the legs. 11 Is that fair? 12 A Certainly. Yes. 13 Q Okay. And do you have any health issues 14 or anything that would prevent you from providing 15 truthful and honest testimony today? 16 A No. 17 Q Okay. Because we're doing this deposition 18 remotely, can you identify where you are currently 19 sitting? 20 A I am sitting in my home office located in 21 Huntingdon Valley, Pennsylvania. Suburban 22 Philadelphia.
6 1 instructs you otherwise, I expect you to answer 2 the question. Is that fair? 3 A Yes. 4 Q Okay. You know we're doing this 5 deposition today over Zoom, and so the court 6 reporter is taking down everything we say, and so 7 particularly with Zoom, I find it's very important 8 to do our best not to speak over each other. 9 And so I will do my best, and I ask that 10 you do your best as well. Let's just give pauses 11 for each other both for the purposes of giving 12 your counsel an opportunity to make an objection 13 and just to keep the record as clean as possible. 14 Is that fair? 15 A Sure. Yes. 16 Q If I ask you a question that you don't 17 understand, please let me know, and I'll rephrase 18 that question, but if I ask you a question and you 19 answer it, I'll assume that you understood the 20 question. Is that fair? 21 A Yes. 22 Q Okay. At any time during the deposition	8 1 Q Now, is anyone in the room with you? 2 A No. 3 Q Okay. I can see some papers in your 4 office that probably are unrelated to this, but 5 let me ask you a simpler question: Do you have 6 any papers related to this proceeding, this IPR 7 for the '892 patent available to you where you're 8 sitting right now? 9 A No. 10 Q Okay. And are you taking notes right now? 11 Is your arm on a piece of paper? 12 A My arm is on a piece of blank paper. 13 Q Okay. Totally fine. 14 A Okay. 15 Q Just asking. 16 A All right. 17 Q Do you have anything open on your computer 18 other than Zoom? 19 A No. 20 Q Okay. What did you do to prepare for your 21 deposition today? 22 A I reviewed my report, I reviewed the

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9 1 pertinent references or citings for my report, and 2 I had a -- just a brief discussion with Joshua 3 yesterday. 4 Q Approximately how much time did you spend 5 preparing for today's deposition? 6 A How much time? I would say probably over 7 the past several days, a total of six hours. 8 Q Okay. Did you speak with anyone other 9 than Joshua -- 10 A No. 11 Q -- regarding the -- 12 A No. 13 Q Okay. Let's take a step back and talk 14 about your declaration, and we'll go ahead and 15 publish this as an exhibit. 16 MR. LAREAU: If we can publish -- make 17 sure -- let's see how it's labeled. -- what I 18 believe is 2007 in the folder. 19 TECHNICIAN: Apologize, Counsel. Did you 20 say to the folder -- 21 MR. LAREAU: If you could make it 22 available for the witness to download, I'd like to	11 1 Q You can go ahead and download that, 2 Dr. Litvin. Just let me know when you've got it. 3 A In the Zoom chat -- 4 Q Yeah. If you go to the bottom of the 5 screen -- 6 A Okay. 7 Q -- you'll see chat. 8 A Yeah, yeah, yeah. Okay. I see chat. 9 All right. So I can just download it. 10 All right. One second. 11 Q Sure. 12 A Okay. Hang on. I have to go to the 13 folder where I downloaded it to. 14 All right. I have it. Sorry about that. 15 Q No, you're fine. 16 All right. So you're looking -- just for 17 the record, you're looking at Exhibit 2007, 18 correct? 19 A Yes. 20 Q And that is your declaration that you 21 prepared in conjunction with this proceeding, 22 correct?
10 1 go ahead and mark this exhibit. So it's 2 Exhibit 2007, and the file name is Exhibit 2007. 3 (Exhibit 2007 was marked for 4 identification and is attached to the transcript.) 5 BY MR. LAREAU: 6 Q It might be easier for you to just 7 download these, Dr. Litvin. These are all -- for 8 instance, the one that I'm discussing right now is 9 the declaration. 10 A Where do I get it from? 11 Q That's a great question. 12 TECHNICIAN: I'm putting it in the Zoom 13 chat. Just one moment. I'm just marking it and 14 saving it so I can put the marked version in the 15 Zoom chat. 16 MR. LAREAU: Got it. 17 TECHNICIAN: Yep. Apologies for the 18 delay. 19 MR. LAREAU: No, you're fine. 20 TECHNICIAN: The document should be in the 21 Zoom chat now. 22 BY MR. LAREAU:	12 1 A Yes. 2 Q Okay. Can you describe the process by 3 which you drafted Exhibit 2007? 4 A The process? Well, we -- Josh and I had 5 some just broad discussions concerning the 6 petition that was filed and where we found to be 7 the arguments, you know, lacking, with regard to 8 the Petitioner's claims, and from that I then 9 proceeded to develop the technical arguments as 10 presented in this petition -- excuse me, in this 11 declaration. 12 Q Did you draft the entirety of 13 Exhibit 2007? 14 A I was giving a framework, and then I 15 expanded upon everything. 16 Q Okay. So did you -- did you type all of 17 the words that are found in Exhibit 2007? 18 A No. The technical portions. 19 Q Sorry. I just don't quite understand your 20 response. Let me -- let me be clearer. 21 What portions of Exhibit 2007 did you 22 specifically draft yourself?

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13 1 A The patent description -- let me go -- let 2 me -- 3 Q If you need to review the -- your 4 recollection by looking at the declaration, 5 please, by all means, it's available to you. 6 A Certainly. I am going to look at it right 7 now. 8 The introduction; background and 9 qualifications; relevant time; overview of the 10 patented invention; Section 8, short discussion of 11 selected references; Section 10 concerning 1D; -- 12 so it would be Section 10A, parts A and B, 1A and 13 12D. 14 Q Okay. I noticed you did not say 15 Section 9. Should I take that to mean you did not 16 draft Section 9? 17 A Let's see. What is Section 9? 18 Q Page 22. 19 A Okay. Hang on. 20 I drafted that in consultation with Josh, 21 Joshua. 22 Q Okay.	15 1 essentially those are the groups that are the 2 group title of the experts that were assembled to 3 draft these specifications for G-PON, XG-PON, and 4 so forth. 5 My experience, particularly at Wowway, 6 FutureWay, I had a lot of interaction in 7 developing, actually, Raman crosstalk standards 8 with regard to interference and so forth that was 9 essentially occurring on a PON when you have 10 multiple wavelengths traveling in the same 11 direction. 12 Q Did you ever -- well, let me ask a broader 13 question. 14 A Mm-hmm. 15 Q Other than your experience or your time at 16 FutureWay, did you have any other professional 17 interactions with the ITU-T? 18 A Directly with the ITU? No. 19 Q And during your time at FutureWay or any 20 other time, have you ever attended an ITU meeting? 21 A No. 22 Q Have you ever authored any ITU-T
14 1 A So I'm not -- 2 Q Sorry. Did I -- I didn't mean to cut 3 you -- did I cut you off? 4 A No. 5 Q Okay. Sorry. 6 Let's switch gears briefly and talk about 7 your professional background. What experience do 8 you have with Study Group 15 of the ITU-T? 9 A Study Group 15 of the ITU-T? 10 Q Yes. 11 A That is the -- so that's essentially the 12 XG-PON and XGS-PON; is that correct? Yes? Is 13 that -- 14 Q Well, I appreciate the -- I'm taking your 15 deposition, sir. 16 A Yes. 17 Q What's your -- what's your understanding 18 of what Study Group 15 is of the ITU? 19 A Yes. Study Group 15 essentially is the 20 group of experts that drafted the I -- the 21 G.987.3, XG-PON, XGS-PON, NG-PON 2. I don't know 22 if they're all exactly titled the same, but	16 1 contributions? 2 A Yes. As I mentioned, the Raman crosstalk. 3 Q Was that an ITU-T contribution or was that 4 a paper that you wrote? 5 A No, no. That is the -- it's integrated 6 into one of the ITU standards. 7 Q All right. Are you familiar with the 8 mechanism by which the members of the ITU draft 9 standards? 10 A On a general basis, there's -- there are 11 essentially periodic meetings. They discuss the 12 issues and essentially debate them and vote on 13 them. 14 Q Do you know the name of the contribution 15 that you submitted to the ITU-T? 16 A I believe it's concerning Raman crosstalk 17 mitigation. 18 Q Did you -- and did you author that, or was 19 that based on work you were doing? Can you 20 provide some additional context for that? 21 A Yeah. I authored it, yes. 22 Q Okay.

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17 1 A And it was based on work that I was doing 2 at the time, yes, both because that was a -- of 3 concern. 4 Q Do you know what that was integrated into? 5 Like, which standard? 6 A Off the top of my head, I don't recall the 7 standard number, but I -- it may be the NG-PON 2 8 standard because that is the one that the -- has 9 multiple wavelengths. 10 Q Did you contribute anything to the 11 development of G.987.3 or XG-PON? 12 A No. 13 Q Okay. And if I say XG-PON, you'll 14 understand that I'm referring to 987.3 -- 15 A Yes. 16 Q -- as -- and you agree that 987.3 is one 17 of the standards that makes up the larger XG-PON 18 standard, right? 19 A Yes. 20 Q Okay. And another one would be 988, 21 right? 22 A G.988?	19 1 Before we took a break, we were discussing 2 G.988, which is Exhibit 1008. 3 Can you just confirm that that is the OMCI 4 specification for XG-PON? 5 A Well, I can confirm it's the OMCI 6 specification. It actually cuts across all of the 7 standards. It's not specific to XG-PON. 8 Q But you would agree that it covered 9 XG-PON, correct? 10 A Yeah. XG-PON would comply with the 11 relevant sections in it. 12 Q And it would -- excuse me. G-PON would 13 also comply with it, correct? 14 A Yes. 15 Q And the specific version that's in 16 Exhibit 1008 is the October 2010 rendition of 17 G.988, correct? 18 A Yes. 19 Q And so that wouldn't apply to XGS PON 20 because the XGS PON standard didn't exist at that 21 time, correct? 22 A Well, it's not that it would not apply.
18 1 Q Yes. 2 A What's the title of that one? 3 MR. LAREAU: If we could publish 4 Exhibit 1008? And let's just do 1007 and 1008 5 while we're doing this. And let's do 1010. 6 (Exhibits 1007, 1008, and 1010 were marked 7 for identification and are attached to the 8 transcript.) 9 MR. LAREAU: Let's just publish everything 10 in the entire download folder to make it faster. 11 We can go off the record. 12 MR. WYDE: Just to confirm, there hasn't 13 been anything about to be published that isn't 14 already of record? 15 MR. LAREAU: No. 16 MR. WYDE: Okay. 17 (A recess was taken.) 18 (Exhibit 1001 and 1006 were marked for 19 identification and are attached to the 20 transcript.) 21 BY MR. LAREAU: 22 Q Welcome back, Dr. Litvin.	20 1 XGS-PON would build upon this. Right? In other 2 words, XGS-PON didn't exist, but once XGS-PON 3 standard was developed, it still may rely upon 4 this standard or OMCI. 5 Q And you don't -- you don't know one way or 6 the other whether the XGS-PON standard relies on 7 this edition of '988 or a later edition, correct? 8 A Well, if there is a later edition -- I'm 9 not familiar with how frequently this is updated, 10 but if there was a later edition, obviously when 11 XGS-PON was released, the standard, it would rely 12 on the -- you know, the most -- latest edition. 13 Q Talking more about your professional 14 background, I didn't see any identification of 15 your previous testifying experience in your CV. 16 Can you tell me what other times you've testified 17 other than today? 18 A Relevant to patent -- patent and IP, this 19 is the first time. 20 Q Okay. Have you been deposed before? 21 A Only with regard to an automobile 22 accident.

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21 1 Q Okay. So this is the first time you've 2 ever had your deposition taken as an expert in a 3 patent case? 4 A Correct. 5 Q Okay. What other -- have you ever issued 6 any expert reports in conjunction with litigation? 7 A In conjunction with ongoing litigation, or 8 are you talking about, for example, an IPR 9 declaration, other IPR declarations? 10 Q Let's separate out IPRs. Let's just -- 11 setting IPRs aside for a second, have you ever 12 issued an expert report in conjunction with any 13 district court case? 14 A No. 15 Q Have you ever issued an expert report in 16 conjunction with any International Trade 17 Commission case or investigation? 18 A No. 19 Q Okay. And so you have issued declarations 20 in regard or in support of a party in an IPR 21 proceeding, correct? 22 A Yes.	23 1 A Yes. Via a third-party, but yes. 2 Q What's that third party? 3 A GHB Intellect. 4 Q And who is GHB Intellect? 5 A Basically, they manage experts in various 6 fields, and then when a particular organization 7 needs an expert in a particular field, they 8 provide the expertise and services that they 9 require. 10 Q Got it. So GHB Intellect is an expert 11 search firm? 12 A Yes. I wouldn't -- I wouldn't actually 13 call it a search firm. In other words, they're 14 not, like, a one-off. Right? I've been working 15 with them for several years. 16 Q Okay. 17 A Yeah. 18 Q Are you employed by GHB Intellect? 19 A No, no. 20 Q You do work -- did you work -- do you have 21 an engagement with them, or do you have an 22 engagement with Iarnach Technologies?
22 1 Q And I was able to find at least one other 2 instance for Iarnach in conjunction with a 3 petition filed by Charter and then another one 4 related to the Xtera -- 5 A Yes, yep. 6 Q -- case. 7 A Several years ago. 8 Q Yeah. Are those the only other two? 9 A Yes. 10 Q Okay. 11 I notice in your CV it referenced 12 consulting work you do on intellectual property 13 related to, among other things, optical networks. 14 Have you done any other consulting work 15 for the patent owner in -- outside of this IPR or 16 the charter IPR? 17 A Yes. They've come to me to evaluate the 18 numerous patents over the years. 19 Q So to be clear, Iarnach has come to you 20 over the years to get you to -- to engage your 21 services to evaluate patents for them; is that 22 correct?	24 1 A With GHB. 2 Q Did you evaluate the '892 patent for 3 Iarnach Technologies outside the scope of this 4 IPR? 5 A Yes. 6 Q What was the substance of that analysis? 7 A Well, in its infancy, they came to me with 8 probably, I don't know, 30 to 50 patents to look 9 at, and then I selected, based on my expertise, 10 the ones that I thought had the most relevance or 11 most likelihood of being implemented. 12 MR. WYDE: Dr. Litvin, I'll just caution 13 you that if you were working with an attorney, 14 your analysis might be attorney-client privileged. 15 I'm not aware of the scope. So to the extent that 16 you were working with an attorney and you're 17 providing the information to the client with the 18 attorney, be aware that that could implicate 19 attorney-client privilege. 20 THE WITNESS: I see. 21 Okay. Well, as I recall, then, I was 22 working with an IP attorney at GHB who then worked

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1 directly with Iarnach. 2 BY MR. LAREAU: 3 Q Is that how you pronounce it? Is it 4 Iarnach or Iarnach? 5 A I don't – I'm not sure. It's an Irish 6 organization. So... 7 Q Fair enough. I've always done Iarnach, 8 but I don't profess to know that that's correct. 9 I learn a new pronunciation every time I take a 10 deposition. 11 Approximately how much time did you spend 12 evaluating patents owned by Iarnach for -- through 13 your work with GHB? 14 A Just in whole? 15 Q Mm-hmm. 16 A Probably thousands. 17 Q Thousands of hours? 18 A Over the past several years, it'd probably 19 amount to close to a thousand hours, yeah. 20 Q For just Iarnach? 21 A Well, okay. That's a -- I don't know, 22 actually, how many hours I would have spent	1 Q And ONU is an optical network unit? 2 A Yes. 3 Q And if I say ONT, will you understand that 4 to be the same thing? 5 A As in ONU? 6 Q Yes. 7 A Yeah. 8 Q Okay. Are they the same thing? 9 A Yeah. Yes. I – the IEEE uses one 10 terminology; the ITU uses another terminology, but 11 in whole, they're essentially the same thing. 12 Q Okay. And OLT and ONU, they communicate 13 to each other over optical fiber, correct? 14 A Yes. 15 Q Okay. An ONU has a receiver and a 16 transmitter, correct? 17 A Yeah. Optical receiver and an optical 18 transmitter. Yes. 19 Q An ONU that's receiver is off cannot 20 receive transmissions from an OLT; is that 21 correct? 22 A Yes.
1 exactly when Iarnach – I don't – I would say 2 over the years I've evaluated several thousand 3 patents. What percentage of those are actually 4 Iarnach's, I don't know offhand. 5 Q Would it be fair to say that you spent 6 hundreds of hours evaluating Iarnach's patents? 7 A I would say hundreds but not – probably 8 not more than 200 hours on all of their patents. 9 Q And what rate do you charge GHB for your 10 services? 11 A For the background work? My rate is \$175 12 an hour. 13 Q When did you first come to start working 14 on Iarnach patents? 15 A Probably – approximately three or four 16 years ago. 17 Q Got it. Let's switch gears real quick and 18 talk more generally about the relevant technology. 19 If I say OLT, you'll understand I'm 20 referring to an optical line terminal; is that 21 fair? 22 A Yes.	1 Q Okay. And if an OLT knows that an ONU's 2 receiver is off, there would be no reason to send 3 a transmission to that ONU because it would know 4 that it cannot receive it, correct? 5 A If it knows, yes, it would not send a 6 transmission to it. 7 Q Okay. If you open up -- I believe it is 8 Exhibit 1007, which is '987. 9 A Okay. 10 Q Do you have it up? 11 A Yeah. 12 Q Okay. This is -- you recognize this to be 13 G.987.3, which is the primary reference that was 14 at issue in -- is at issue in the IPR, correct? 15 A Yes. 16 Q Okay. And are you familiar with this 17 standards document? 18 A Yes. 19 Q And this is the TC layer specification for 20 XG-PON, right? 21 A Yeah. 22 Q And the difference between XG-PON and

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29 1 XGS-PON from a high level is that XGS-PON is 2 symmetric, whereas XG-PON is not symmetric in 3 terms of upload and download speed, correct? 4 A Yeah. XGS-PON is approximately 5 10-gigabits per second up and down, and XG-PON is 6 10 gig down and 1 gig upstream. 7 Q In drafting your declaration, did you 8 review any of the standardization history for 9 G.987.3? 10 A I only used what you were -- what was 11 provided or what's cited. So this specific 12 document. 13 Q Right. So you didn't consider or review 14 or investigate any of the contributions in Study 15 Group 15 of the ITU-T that led to the issuance of 16 Exhibit 1007, correct? 17 A No. Just the final released version. 18 Q Your declaration doesn't explain why 19 G.987.3 includes both the Doze mode and the Cyclic 20 Sleep mode, right? 21 A No, it does. 22 Q Where does it do that? And your	31 1 downstream traffic. 2 So those were the two low power modes that 3 were ultimately integrated into the standard. I 4 believe the standard says the Sleep mode is 5 optional, but the Doze mode is, you know, the 6 primary requirement to be supported. Cyclic Sleep 7 is optional. 8 Q Right. And I believe this says -- and I'm 9 reading from Paragraph 53 -- a conscious choice 10 had been made by the ITU standards body. 11 Do you see that sentence? 12 A Yes. 13 Q You don't cite any evidence evidencing the 14 reasoning or the basis for your alleged conscious 15 choice, do you? 16 MR. WYDE: Objection; form. 17 A Well, from a technical point of view, it 18 seems quite apparent that the standards body 19 wanted to be able to have the ability to receive 20 downstream traffic even in an energy-saving mode. 21 Q Right. And I'd like you to focus on my 22 question, Dr. Litvin. My question is: Do you
30 1 declaration is -- you've downloaded it. It's 2 Exhibit 2007 if you want to open it up. 3 A Mm-hmm. 4 Q And just to confirm, Dr. Litvin, you're 5 looking right now? 6 A Yeah, I'm looking. 7 Q Okay. 8 A I know what it says. I'm just trying to 9 find where it says it. 10 Starting on Page 19, low power mode 11 objectives. 12 Q Is that Paragraph 53? 13 A Yeah. 14 Q All right. And there's no discussion in 15 Paragraph 53 of the historical reasons as to why 16 there's a Doze and Cyclic Sleep mode in G.987.3, 17 is there? 18 A A historic discussion? The technical 19 reasons are that the Doze mode allows for 20 continual downstream traffic to be received, and 21 the Sleep mode provides potentially higher energy 22 savings but at the expense of not allowing any	32 1 cite any evidence in that sentence or after that 2 sentence to support the conclusion that a 3 conscious choice was made by the ITU standards 4 body? 5 A Well, the conscious choice is evident by 6 the fact that it was integrated into the standard. 7 Q Right. And so what I'm asking is, other 8 than the standard, do you cite any evidence to 9 support that conclusion? 10 A I don't think it's needed. It's there. 11 Q But that's -- I appreciate that's your 12 opinion, sir. My question is do you cite any 13 evidence other than the standard? 14 A No. 15 Q And I believe your testimony earlier was 16 that you did not review anything outside of the 17 record of the IPR up to the point where you 18 started working on it; is that correct? 19 A Yes. 20 Q If you could open up Exhibit 2010 -- 21 excuse me, 1010. Apologize. 1010. 22 A 1010?

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33 1 Q 1010. 2 A Okay. Hang on. 3 Okay. 4 Q Do you recognize that to be the XGS-PON 5 standard? 6 A Yes. 7 Q And the XGS-PON standard which is 8 G.9807.1, correct? 9 A Yes. 10 Q Okay. If I refer to that just as the XGS 11 standard, you'll know what I'm talking about, 12 right? 13 A Yeah. 14 Q Okay. It's simpler than getting the 15 numbers on top of each other. 16 XGS-PON was a -- XGS-PON standard was an 17 evolution of the XG-PON standard, correct? 18 A Yes. 19 Q So when the ITU-T developed XGS-PON, you 20 know, they started from XG-PON; is that fair? 21 A Yes. It was basically waiting for the 22 technology to catch up for the upstream.	35 1 A I worked on the -- a lot of the physical 2 layer technology; in other words, developing 3 modulation technology and -- well, and some 4 receiver technology, but then not -- not the 5 entire ONU. You know, just some very specialized 6 components, shall we say. 7 Q Is it fair to say you were working on sort 8 of higher level problems than building the actual 9 box? 10 A Yes. Integrated optics. 11 Q You understand that it's the patent 12 owner's position that Exhibit 2010 -- excuse me, 13 1010, the XGS-PON standard -- 14 A Mm-hmm. 15 Q -- embodies the claimed invention of the 16 '892 patent, right? 17 A Yes. 18 Q Did you consider that position in forming 19 your opinions that are found in your declaration? 20 A There was some brief discussion of the 21 Watchful Sleep mode, which was introduced in 22 XGS-PON.
34 1 Q And what -- what technology was -- was 2 that? 3 A The high-speed laser's modulation. 4 Q What -- what -- 5 A What needed to happen is the cost had to 6 come down for 10 gigabit; later, that can be 7 modulated to 10 gigabit per second. It was okay 8 in the downstream in the OLT because it had a very 9 expensive laser, but when you're deploying 10 hundreds of thousands or millions ONUs, you cannot 11 have things that cost several thousand dollars in 12 each ONU. 13 So the cost had to come down, primarily. 14 That was the primary driver. 15 Q Did you develop ONUs at your time at 16 either Wowway or -- I think you were at Motorola 17 before that? 18 A Yes. I -- well, worked on RFAUG, which is 19 another alternative standard or alternative 20 technology. But, yes, RFAUG ONUs. 21 Q Okay. Did you ever develop ONUs for XG or 22 XGS-PON networks; is that fair?	36 1 Q Right. So my question, though, is did you 2 consider the patent owner's position regarding the 3 fact that the XGS-PON standard embodies the 4 claimed invention of the '892 patent in forming 5 the opinions in your declaration? 6 A Only to the extent that it was relevant to 7 what was brought out in the petition. 8 Q So you reviewed -- are you familiar with 9 Appendix C-16 of the XGS-PON standard? 10 A Yeah. It's almost word for word identical 11 to the XG-PON. 12 Q And the corresponding section is what's 13 called Section 16, I believe, of XG-PON; is that 14 correct? 15 A Yes. 16 Q Okay. So if I say Section 16, we'll know 17 we're talking about XG-PON; if I talk about 18 Appendix C-16, we'll know we're talking about 19 XGS-PON. Fair? 20 A Okay. 21 Q And so you agree that Appendix C-16 was 22 developed from Section 16, correct?

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37 1 A Yeah. As I said, they're almost 2 word-for-word identical. 3 Q And so you would agree that this -- that 4 the folks in Study Group 15, they started with 5 Section 16 to develop section -- excuse me -- to 6 develop Appendix C-16, correct? 7 A They're -- you know, the exact order of 8 their development, I couldn't tell you, but it's 9 certainly apparent that they relied upon what they 10 had developed in XG-PON to evolve with -- for the 11 XGS-PON standard. 12 Q Right. But you would agree that XGS-PON 13 came after XG-PON, correct? 14 A Yes. 15 Q Okay. And the date on 987.3, 16 Exhibit 1007, is October of 20 -- 17 A Ten. 18 Q -- 10, and the date on Exhibit 1010 is 19 much later. You would agree with that, right? 20 A Yeah. February 2023. 21 Q Okay. And in forming the opinions in your 22 declaration, you didn't consider any of the	39 1 1010 next to each other, I just want to confirm a 2 few things. But if you can arrange that, that way 3 it might be easier. 4 And if you go to Section 16 and C-16 of 5 those two exhibits, it might -- it will make this 6 go relatively quickly. 7 A Sure. Yeah. Okay. 8 Q Just let me know when you get situated. 9 A Okay. Hold on. 10 Q And I'm specifically going to ask some 11 questions about Table 16.1 -- or 16-1, depending 12 upon which one you're talking about. 13 A Okay. 14 Q Okay. You're looking at Table 16.1 of 15 Section 16 and Table C-16-1 of Appendix 16; is 16 that right? 17 A Yes. 18 Q Okay. And these -- this is a table that 19 describes the power management parameters for the 20 power management functionality within these 21 respective recommendations; is that correct? 22 A Yeah.
38 1 standards contributions that took place that 2 resulted in Appendix C-16; is that correct? 3 A Correct, except for where I needed to 4 address Petitioner's reference to 987.1. 5 Q Well, let's -- I want to make sure I 6 understand your testimony. I'm asking in -- other 7 than Exhibit 1010, did you look at any standards 8 contributions that were submitted in order to form 9 Exhibit 1010? 10 A I only looked at 987.3. 11 Q All right. So you have -- you looked at 12 987.3 and you looked at 9807.1 and nothing in 13 between, correct? 14 A That's correct. 15 Q Okay. And I believe you testified earlier 16 that Appendix C-16 is almost word for word the 17 same as section -- Section 16; is that correct? 18 A Yeah. There -- there may have been some 19 evolution in terminology and I also state the 20 Watchful Sleep mode was added to the XGS-PON. So 21 obviously they're not, you know, exact replicas. 22 Q Right. And if you can pull up 1007 and	40 1 Q Okay. Now, you'd agree that many of the 2 same power management parameters exist in both of 3 these two tables; is that fair? 4 A Let me see. 5 I see many -- several similar names. I 6 would have to read the detailed description to 7 tell you if the definition of each evolved from 8 one to the next, from XG-PON to XGS-PON. 9 Q But you would -- I'll read some of these, 10 and if you can just confirm that at least the 11 parameter exists in both. Okay? 12 A Okay. 13 Q I aware? 14 A I aware? I see that name in the XG-PON 15 table and I see the name I aware in the XGS-PON 16 table. Whether or not they both contain exactly 17 the same meaning would depend upon, you know, a 18 reading of the description. 19 Q And you don't express any opinion 20 regarding that one way or the other in your 21 declaration; is that right? 22 A Whether or not the definitions changed or

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41 1 evolved? 2 Q Correct. 3 A I don't discuss that. 4 Q Right. You don't do any comparison of the 5 XGS-PON standard to the XG-PON standard in your 6 declaration; is that fair? 7 A I -- as I mentioned before, we briefly 8 discussed the fact that XGS-PON adopted the 9 Watchful Sleep mode. 10 Q Right. But my question is: In your 11 declaration, you don't provide any analysis that 12 compares XGS-PON as compared to XG-PON? 13 A No. 14 Q You would agree, though, that the 15 fundamental difference between the XGS-PON 16 standard and the XG-PON standard -- when I say the 17 XG-PON standard, I'm referring to the 2010 version 18 that we're looking at right now. 19 A Okay. 20 Q Just to be clear, when I'm talking about 21 the XGS-PON standard, that's the one I'm talking 22 about. I'm not talking about an updated version	43 1 appended to the exhibit in the bottom right corner 2 just for clarity purposes. 3 If you go to Page 230 of Exhibit 1010. 4 Just let me know when you're there. 5 A 1010? 6 Q Of exhibit -- 7 A Yeah. Okay. 8 Q Just let me know when you're there. 9 A Okay. Page 230 of 290. Yeah. 10 Q If you see kind of the last big paragraph 11 in the bottom half of the page, the last sentence 12 of that, to support XG-PON ONUs. 13 Do you see that? 14 A In 16.11? Is that where you're looking? 15 Q No, above that. The last big paragraph. 16 Like, kind of tall paragraph. 17 A Okay. All right. Where it says this 18 clause addresses? That paragraph? 19 Q Yeah, yeah. Correct. 20 A All right. 21 Q Read the whole paragraph, but I'm going to 22 ask you a question about the last sentence of that
42 1 that may exist today. 2 A Okay. 3 Q I just want the record to be clear. 4 You would agree that the fundamental 5 difference between those two standards is that the 6 XGS-PON standard includes an additional power 7 savings mode called Watchful sleep; is that fair? 8 A Yes. Let me just -- yeah. 9 Q Because the XGS-PON standard supports 10 three means of power management: Doze mode, 11 Cyclic Sleep, and Watchful sleep; is that right? 12 A Yes. 13 Q Because the XGS-PON standard needs to be 14 able to support XG-PON ONUs that might only 15 support those two power management modes; is that 16 correct? 17 A The XGS-PON standard needs to support the 18 XG-PON? Is that what you asked me? 19 Q Yes? 20 A No. They're separate. 21 Q Right. So if you go to -- when I use the 22 page numbers, I'm going to use the ones that were	44 1 paragraph. 2 A Okay. Let me read it. 3 Okay. 4 Q And so my question is, you would agree 5 that according to the XGS-PON recommendation, the 6 XGS-PON OLTs should support all three modes in 7 order to support XG-PON ONUs; is that correct? 8 A Only if a vendor has produced a piece of 9 equipment that is an OLT that is designed to 10 support both XG-PON and XGS-PON. 11 Q Right. So in order to maintain backwards 12 compatibility, XGS OLT must support all three 13 modes, correct? 14 A To support XG-PON ONUs, the XGS-PON OLT 15 must support all three modes. 16 Q Okay. And you agree with that, right? 17 A I agree that's what it says. 18 Q I mean, do you not -- do you not agree 19 with what it's saying? 20 A I agree that that's what it says. 21 Q Right. And I'm asking you if you -- do 22 you not agree that in order to support an XG-PON

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45 1 ONU an XGS-PON OLT must support all three modes? 2 A If the XGS-PON OLT is designed to support 3 XG-PON in a system, then yes. 4 Q Okay. So you would agree that the power 5 management architecture of XGS-PON is capable of 6 supporting Watchful sleep, Doze mode, and Cyclic 7 Sleep, correct? 8 A Yes. 9 Q All right. If you go down in both of 10 these documents to what is Table 16.3 or 16-3. 11 It's just a few pages down in each one. 12 A Okay. 13 Q Okay. These are the corresponding ONU 14 state machine inputs for XGS-PON and XG-PON, 15 correct? 16 A Yes. 17 Q And so one of the categories that's 18 present in both of these state machine input 19 tables are PLOAM events for sleep allow on and 20 off; is that correct? 21 A Yes. 22 Q And another that appears in both of these	47 1 Q Okay. And then the local events, we see 2 two local input events in the XGS-PON standard, 3 and we see just -- we see three, rather, in the 4 XG-PON standard, correct? 5 A Let's see. In the XG-PON -- okay. 6 Yes. Okay. 7 Q Okay. Now, you understand that there are 8 separate and distinct OLT and ONU state machines 9 in XG-PON, correct? 10 A Yes. 11 Q And you agree that these state machines 12 are only partially aligned, correct? 13 A Yes. 14 Q And I believe I understood this correctly 15 from reading your declaration, but you would agree 16 that the XG-PON standard acknowledges the 17 existence of direct transitions between a Sleep 18 and a Doze mode, correct? 19 A It acknowledges direct transitions? It 20 prohibits direct transitions. 21 Q Well, let's unpack that. I understand 22 it's your position that it prohibits direct
46 1 tables is bit level -- excuse me, strike that. 2 Bit-indication event. Do you see that? 3 A Yes. 4 Q And for there, it's a forced wake-up 5 indication in both of those tables; is that 6 correct? 7 A Yes. 8 Q And then in timer events, we see a Thold 9 expiration and a Taware expiration in both of 10 those tables, correct? 11 A Yes. 12 Q And the third, we see a Tlowpower 13 expiration in C.16, and a Tsleep expiration in 14 Section 16; is that right? 15 A Hold on. Tsleep expiration, 16-3. 16 Q Right. And a Tlowpower expiration in 17 C.16, correct? 18 A Yes. 19 Q And you would agree that those correspond 20 to each other, correct? 21 A Let me see. 22 Yes. Okay.	48 1 transmissions, and I believe you're referring to 2 Note 2; is that correct? 3 A Yeah. 4 Q Right. So that's -- just to be clear, we 5 are looking -- we are discussing Note 2 that's in 6 Table 16-7, the OLT state transition and output 7 table, correct? 8 A Yes. 9 Q Okay. And so my question is that, in your 10 words, you believe that this recommendation 11 prohibits those direct transitions, correct? 12 A Yeah. It says direct transitions between 13 Doze mode and Cyclic Sleep mode are disallowed. 14 Q Okay. So my question is in order for 15 something to be prohibited, it must be known, 16 correct? 17 A In order for something to be prohibited, 18 it must be known? Could you explain what you're 19 trying -- what you're meaning, what you're asking? 20 Q My question is was the concept of a direct 21 transition between Doze mode and Cyclic Sleep mode 22 known?

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49 1 A Well, it was recognized as an error, as 2 something that can't be handled properly with the 3 management framework that existed for XG-PON. 4 Q All right. And so my question is is it 5 your opinion that the ITU-T knew of direct 6 transitions between Doze and Cyclic Sleep mode? 7 A They recognize that a direct transition 8 would be problematic. 9 Q Sir, that's not my question. My question 10 is did they know of their existence, yes or no? 11 MR. WYDE: I'll add an objection to that 12 question. 13 A Did they know of the existence? 14 Q Yes. 15 A Well, given that they were – you know, 16 there are a limited number of potential 17 transitions, that was taken under consideration 18 and decided that it would be considered as an 19 error – an unmanageable error. 20 Q Right. So it's your opinion that the 21 ITU-T not only knew of them but considered them 22 and then prohibited them, correct?	51 1 possibility. But on the whole – given the 2 objective, it's rejected in this case because it 3 breaks the framework of the G.987.3 objective of 4 being able to continually receive downstream data. 5 Q Sir, I'm asking a very simple question, 6 yes or no: Were direct transitions known? 7 MR. WYDE: Same objection. 8 A The eventuality was contemplated. 9 Q Sir, yes-or-no question. Okay? Please 10 listen to my question, sir. 11 A Mm-hmm. 12 Q Were direct transitions known? 13 MR. WYDE: Same objection. 14 A A direct transition was known but 15 understood to be an error. 16 Q Okay. I understand you're refusing to 17 answer my question directly. Okay? So I really 18 am going to ask you to answer my question 19 directly. I know you'd like to add additional 20 information to your answers. Your counsel will 21 have plenty of opportunity to ask you questions at 22 the end of this deposition. So I'd like you to
50 1 A Yes, because it would destroy the 2 capability of the – an autonomous transmission 3 without any notification to the OLT would destroy 4 the capability of the Doze mode, which was desired 5 to be able to receive continual downstream 6 information. 7 So, yes, it was rejected because it 8 essentially broke – would break the Doze mode 9 capability to receive continuous downstream 10 service. 11 Q Okay. So just to be clear, you agree that 12 direct transitions between Cyclic Sleep and Doze 13 mode were known? 14 MR. WYDE: Objection. 15 A It was a contemplated error – 16 contemplated as an error given the framework of 17 the system. 18 Q So it was known, correct? 19 MR. WYDE: Same objection. 20 A It was – you know, when an engineer 21 thinks about things, yes, they take things into 22 consideration; they contemplate that that is a	52 1 focus on answering the questions that I'm asking. 2 Okay? 3 A Yes. 4 Q Okay. 5 MR. WYDE: Dr. Litvin, do not -- he's not 6 your attorney. Do not take instruction from him 7 regarding how you answer a question. You answered 8 the question how you'd like to answer. 9 Q Okay. Earlier you said -- let me ask you 10 a different question. 11 In XG-PON, if an ONU is in a Doze mode, an 12 OLT knows that the ONU may not receive all 13 downstream transmissions, correct? 14 A Yes. 15 Q In fact, the OLT may buffer -- 16 A Sorry. In a Doze mode? Sorry. In the 17 Doze mode, the receiver is on. 18 Q Okay. I misspoke. 19 In a Sleep mode, the OLT knows that the 20 ONU may not receive all downstream transmissions, 21 correct? 22 A Yes.

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53 1 Q In fact, in such a sleep state, the OLT 2 may buffer downstream traffic because of that, 3 correct? 4 A Yes. 5 Q Since we're talking about Note 2, Note 2 6 acknowledges the fact that an OLT could receive a 7 request for an ONU to execute a direct 8 transmission, correct? 9 A In error, but yes. It would be an error. 10 A very low probability, but an error. 11 Q Right. But that's -- again, sir, that's 12 not my question. 13 My question was: Does Note 2 acknowledge 14 that an OLT could receive a request to execute a 15 direct transition, correct? 16 A It shouldn't have happened, but it could 17 in error. 18 Q Right. In fact, the sentence in Note 2 19 starts with when an OLT receives a request, 20 correct? 21 A Yes. When, but the "when" has nothing to 22 do with the potential frequency which should be	55 1 confirm it: You're not relying on any 2 documentation support beyond the XG-PON standard 3 to assert to support the assertions that you're 4 making in Paragraph 106, correct? 5 A Well, considering how the standards are 6 adopted, you know, essentially through debate, 7 presentation, and a vote, there was a conscious 8 decision to do this, yes. 9 Q Right. And, sir, my question was you 10 didn't rely on any documentary evidence other than 11 the XG-PON standard to support these assertions, 12 correct? 13 A Right. 14 Q Okay. And you didn't do any analysis of 15 any of that debate or contributions or revisions 16 or compromises that resulted in the XG-PON 17 standard, correct? 18 A That is correct. 19 Q Okay. And you would agree that the XG-PON 20 standard contemplates that all compliant 21 implementations are expected to support the Doze 22 mode, correct?
54 1 ideally near zero. 2 Q Right. It doesn't say if, correct? 3 A Yes, that's correct. It says when. 4 Q All right. If you could open your 5 declaration, which is Exhibit 2007. Just let me 6 know when you've got that up. 7 A Okay. 8 Q And if you go to Paragraph 106 which is on 9 Page 39 -- 10 A Okay. 11 Q -- and I'm not going to read this word for 12 word. You know, I think the document speaks for 13 itself, and I don't want to make the court 14 reporter write all that down. 15 But you say that the architect still 16 consciously chose to restrict direct transitions. 17 Do you see that? 18 A Hold on. Paragraph 106? 19 Q Correct. 20 A Yes. 21 Q Right. And just to be clear -- and I 22 think we've covered this before, but I want to	56 1 A Yes. 2 Q But you would agree that as between the 3 Cyclic Sleep mode and the Doze mode, the Cyclic 4 Sleep mode saves more power, correct? 5 A Yes. 6 Q And it's your opinion as evidenced in your 7 declaration that there's a finite number of 8 possibilities for power states and transitions 9 between those power states in the context of ONU 10 power management? 11 A Correct. 12 Q Fair? 13 A Yes. 14 Q Okay. And so I believe it's your opinion 15 that there is no conceivable way the standards 16 body did not consider the proposed transition, 17 correct? 18 A The direct transition, you're talking 19 about? 20 Q Correct. 21 A Yes. 22 Q All right. So as we discussed earlier,

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57 1 it's your opinion that they knew of the direct 2 transition and disregarded it, correct? 3 A Yes. For the framework that they were 4 developing, it would have been considered to be an 5 error. 6 MR. LAREAU: Counsel, you want to take a 7 five- or ten-minute break? I'm about to switch 8 gears. 9 MR. WYDE: Okay. Ten minutes? 10 MR. LAREAU: Sure. Yeah, ten minutes. 11 Sorry. I didn't hear you. Yeah, that works. 12 (A recess was taken.) 13 BY MR. LAREAU: 14 Q Welcome back, Dr. Litvin. 15 Did you discuss the substance of your 16 testimony with anyone during the break? 17 A No. 18 Q Okay. If you can just go ahead and open 19 up what I believe is Exhibit 1006 -- maybe I 20 misspoke -- yeah, it's 1006. 21 A Okay. 22 Q Do you recognize this?	59 1 A Yes. 2 Q All right. Because R ger is generally 3 directed to an optically powered PON network; is 4 that fair? 5 A An optically powered network of sensors. 6 Q Right. But it's a -- it's a PON, correct? 7 A Yeah, in the sense that there are no 8 intervening active components between the control 9 office and the sensors in the field. 10 Q Right. And so that's a passive optical 11 network, correct? 12 A It could be considered a passive optical 13 network. 14 Q Right. And in the PON of R ger, the 15 subscribers -- or the end user equipment or the 16 sensors, as you called them, those are optically 17 powered, correct? 18 A That's correct. 19 Q Right. And R ger refers to those, you 20 know, interchangeably as ONUs or ONTs, correct? 21 A I believe I saw that language in there. 22 Q Okay. And so in an environment where the
58 1 A Yes. 2 Q All right. This is one of the -- what 3 I'll call secondary references in the petition, 4 the R ger reference? 5 A Yes. 6 Q Do you know -- another pronunciation 7 question: Do you say R ger or is it -- do you 8 know a different pronunciation? I very well could 9 be butchering this. 10 A R ger or Roger. Since he's not in the 11 room, it doesn't really matter. 12 Q Fair enough. I've been saying R ger, but 13 mentally I think Roger when I see it. So -- 14 A Same here, same here. 15 Q All right. Well, if we use either word, 16 we'll understand what we're talking about. Fair? 17 A Yes. 18 Q Okay. It's hard to type it in, so I type 19 Roger. 20 You would agree that R ger is directed to 21 an environment where power savings are critical; 22 is that fair?	60 1 ONU is optically powered, you would agree that 2 it's very important -- or it's a very important 3 design consideration to limit the amount of power 4 consumed by that ONU; is that fair? 5 A Yes. 6 Q Now, you would agree that R ger teaches in 7 ONU that it has its receiver and transmitter off 8 for a period and then turns on its receiver but 9 leaves its transmitter off for a period and then 10 deactivates its receiver to go back to a state 11 where both the receiver and transmitter are off, 12 correct? 13 A Yes. 14 Q Okay. So you're not disputing that R ger 15 teaches direct transitions to and from the claimed 16 first and second state, correct? 17 A We are not -- yeah. I'm not disputing 18 that it transitions between transmitter and 19 receiver off and receiver on. 20 Q And vice versa, correct? 21 A Yes. 22 Q Okay. Did you review the declaration of

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1 Bruce Schofield in preparing your declaration? 2 A No. 3 Q So you didn't consider Mr. Schofield's or 4 Schofield's opinions in forming yours? 5 A That's correct. I did not. 6 Q Did you review -- you know, you appreciate 7 that it is listed in the exhibits in the top of 8 your declaration, correct? 9 A I do. 10 Q Okay. Did you review -- well, let me -- 11 before we get there, if Mr. Schofield were to say 12 or opine that R ger does not teach direct 13 transitions to and from transceiver off to 14 receiver on, transmitter off and vice versa, you 15 would disagree with him, correct? 16 A Well, I haven't read his declaration, so I 17 don't have a distinct opinion on exactly what he 18 said. 19 Q And I appreciate that, but my question was 20 somewhat distinct from that, Dr. Litvin. 21 My question was if he were to say that 22 R ger does not teach those transitions, you would	1 with them, correct? 2 A The transitions in and of themselves are 3 there. 4 Q Right. So, again, my question was, you 5 would disagree with someone who said otherwise, 6 correct? 7 A Without further qualification, yeah. 8 Q Did you review Iarnach or the patent 9 owner's preliminary response in this proceeding? 10 A No. 11 Q Is there a reason you didn't consider 12 that? 13 A Primarily my time constraints. I was 14 focused on my declaration. 15 Q Right. So you chose not to consider the 16 positions that the patent owner took with respect 17 to the grounds that are asserted in this petition? 18 Is that fair? 19 A I didn't choose. There were time 20 constraints. I had to focus on what I felt was 21 most important. 22 Q Right. And so in assessing what you
1 disagree, correct? 2 A The transitions between the receiver on 3 and the receiver off? 4 Q Correct. 5 A While the transmitter remains off? 6 Q Correct. 7 A If he said it did not teach that 8 specific -- well, that would be -- I would -- I 9 would agree that those transitions are shown in 10 R ger. 11 Q Right. So if anyone were to say that 12 they're not shown in R ger, you would disagree 13 with them, correct? 14 A Yes. 15 Q Even Iarnach, correct? 16 A Even what? 17 Q Iarnach, the patent owner. 18 A Sorry. The transitions in and of 19 themselves were certainly part of the R ger low 20 energy MAC construction. 21 Q Okay. So regardless of who it is that 22 would say they weren't there, you would disagree	1 believed to be most important, you believed that 2 the patent owner's statements regarding the 3 grounds in the petition are less important? Is 4 that fair? 5 A No. I don't agree that that is -- that is 6 the case. 7 Q Then why didn't you review it? 8 A Because I had the IPR petition in front of 9 me, I had time constraints, and I focused on 10 addressing the issues, the relevant issues in the 11 petition. 12 Q Right. And you understand that the patent 13 owner's preliminary response addresses the grounds 14 in the petition, correct? 15 A Yes. 16 Q Right. And you reviewed, according to 17 your declaration, the institution decision as 18 well, correct? 19 A The institution's decision? 20 Q Yes. And it's Paragraph 24 of your 21 declaration, if you want to review that. 22 A Yeah. Okay.

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65 1 Yes, I personally reviewed them. 2 Q Right. And you understand that the 3 institution decision discusses Iarnach's 4 preliminary response, correct? 5 A Yes. 6 Q But despite that, you did not review the 7 preliminary response, correct? 8 A No. I'll correct my earlier statement and 9 say that I did a review of the preliminary 10 response, but given the time constraints, I -- I 11 extend in-depth opine (sic) on it as I had to move 12 on to writing the declaration. 13 Q I just don't see the preliminary response 14 listed in your materials considered, and so I'm 15 just trying to understand whether you did or 16 didn't actually review it. 17 It's not listed in your exhibit list, and 18 it's not listed in your materials considered, 19 unless you think I'm wrong, and you can point me 20 to it, but I've checked now, and I don't see it. 21 A Yeah. Okay. The timeline is what 22 confused me here.	67 1 upon an earlier declaration. 2 Q Got it. And you didn't think you needed 3 to consider the patent owner's positions on the 4 relevant grounds; is that fair? 5 A No, I didn't say that. I said given the 6 time constraints, I can -- I had to focus on 7 writing my declaration, and, you know, if I had 8 all the time in the world, certainly I would have 9 been able to consider everything, but I didn't. 10 Q Approximately how much time did you spend 11 preparing your declaration? 12 A I believe it was approximately a week. 13 Q So in the -- would you say that's 14 approximately 40 hours of work, just so we're 15 clear? 16 A I think it was 30. 17 Q Okay. 30 hours; is that fair? 18 A Mm-hmm. 19 Q So in the approximate 30 hours that you 20 spent preparing this declaration, you didn't feel 21 you had sufficient time to read the preliminary 22 response or the declaration from Bruce Schofield?
66 1 I considered the patent owner's response 2 somewhat in preparing for today's deposition. I 3 didn't consider the patent owner's response in 4 preparing the declaration. 5 Q Were you provided a copy of the 6 preliminary response? Did you have access to it? 7 A I didn't ask for it at the time. 8 Q Okay. Because in Paragraph 2, you 9 acknowledge its existence, but then you don't cite 10 it in either your exhibit list or your materials 11 considered, and so I'm just trying to understand 12 why it is that you knew of its existence but then 13 didn't consider it. 14 A Well, from my perspective writing the 15 declaration, I had enough information in hand. 16 Q And similarly, you had the declaration of 17 Bruce Schofield, which is identified in your -- 18 the exhibit list, and you similarly did not review 19 that in preparing your deposition. Was that 20 because of time or some other reason? 21 A Well, I had that in formulating my 22 conclusions, and I didn't feel I needed to rely	68 1 A That's correct. 2 Q Okay. And you spent hundreds of hours 3 analyzing Iarnach's patent portfolio, correct? 4 A Yes. 5 Q Okay. 6 A There are no deadlines there. 7 Q And you understand that the patent owner 8 had months to provide a response to the petition, 9 correct? 10 A I'm unfamiliar with the schedule within 11 the deadlines given to me. 12 Q Approximately when did you start working 13 on your declaration? 14 A I don't remember the exact date, but it 15 was approximately one week before it was due. 16 Q Okay. Let's switch back to Exhibit 1006, 17 which is the R ger reference. Let me know when 18 you have that back up. 19 A Okay. 20 Q If you go to -- scroll down the document 21 to what's labeled in the document as Figure 6. 22 It's on Page 12 of 14. Let me know when you're

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1 there. 2 A Okay. 3 Q You reviewed this figure in forming your 4 declaration, correct? 5 A Yeah. I took it into consideration. 6 Q And so you -- you studied this and the 7 corresponding text that describes what's depicted 8 in Figure 6; is that fair? 9 A I believe so, yes. 10 Q You would agree that this is a timing 11 chart that depicts a potential embodiment of the 12 system overshare; is that fair? 13 A Yes. Okay. 14 Q Is that fair? 15 A It's a timing chart for depicting the -- 16 Roger's low-energy MAC protocol. 17 Q Right. And that's what Roger's about, 18 right? It's about a low-energy MAC protocol, 19 fair? 20 A Yes. 21 Q Okay. And so across the X axis, we see -- 22 that's time, right?	71 1 Q Right. Because they all share the same X 2 axis, but they have individual Y axes for each 3 device. There's five devices, so there's five Y 4 axes. Is that fair? 5 A Okay. Yes. 6 Q Okay. Now, the Y axis depicts voltage, 7 correct? 8 A I don't see where it says that. Do you? 9 I don't see that. I think it's just relative 10 signal strength. 11 Q If you could read the second sentence of 12 the fig 6 text. 13 A Okay. Transmitter -- data transmitter 14 voltage. Okay. 15 All right. 16 Q With that in mind, would you agree that 17 the traces share voltage on the Y axis? 18 A Yeah. So it's -- yeah. Okay. Yeah. 19 Yes. 20 Q Okay. Because the Y axis isn't labeled on 21 the figure; is that fair? 22 A That is fair.
70 1 A Yeah. 2 Q Okay. And then within this chart, we see 3 a CO, which is central office, correct? 4 A Yes. 5 Q Right. That would be -- that's where an 6 OLT would be located, for example, correct? 7 A Yes. 8 Q Okay. And then we see S3 through S6, 9 which are subscribers. You see that? 10 A Well, they're sensors. Yes. 11 Q Okay. Well, let's look at the text 12 underneath Figure 6. It says, four randomly 13 self-activating subscribers, S3/6, synchronize and 14 communicate. 15 Right? 16 A All right. 17 Q So S3 to S6 are subscribers, correct? 18 A According to the text, yes. 19 Q Okay. And the Y axis, there's kind of an 20 individual Y axis for each of the five plots that 21 are in Figure 6; is that fair? 22 A Yeah, for each of the devices.	72 1 Q Okay. And you agree that in the blue 2 portion -- you see where there's blue and yellow 3 portions -- 4 A Mm-hmm. 5 Q -- for the four subscribers, correct? 6 A Yeah. 7 Q And there's a yellow portion that is in 8 the middle of the two blue portions, correct? 9 A Mm-hmm. 10 Q And you would agree that in the blue 11 portion, the receiver is on and the transmitter is 12 off; the yellow portion, the transmitter is on; 13 and in the blue portion, the receiver is on, but 14 the transmitter is off, correct? 15 A First, upon reading this again, it's only 16 the CO axis that is a voltage. 17 Secondly -- 18 Q Well -- sorry. Okay. Didn't mean to 19 interrupt you. 20 A The trace CO displays the data transmitter 21 voltage of the CO. 22 Q Okay.

73 1 Is your -- are you -- 2 A I'm just reading this. 3 High S3 to S6 levels indicate energy cost 4 date receive or transceiver modes. 5 Q Right. 6 A Not necessarily -- it's just indicating 7 when the receiver or the transmitters are turned 8 on, not necessarily a voltage. It's just a 9 depiction. 10 Q All right. So you believe that the CO 11 traces a voltage, but then you're not sure what 12 the S3 through S6 traces are? 13 A Well, it doesn't say exactly whether 14 there's a voltage, it receives signal level or 15 what have you. It's just the -- it's just a 16 signal level. 17 Q All right. But you would agree this is an 18 oscilloscope trace, right? 19 A It just says measure timing chart. I 20 don't know what instrument they used. 21 Q I mean, you're familiar with the 22 oscilloscopes, correct?	75 1 that the receiver is off and the transmitter is 2 off, correct? 3 A In the snooze period? Yes. 4 Q Okay. And you would also agree that's 5 true for the sleep period as well, right? 6 A That's correct. Yes. 7 Q Okay. Now, the blue period, you agree the 8 blue period, the receiver is on and the 9 transmitter is off, correct? 10 A In the blue period? 11 Q Correct. 12 A If that is the -- I -- I believe that 13 that's the -- I tried to determine -- the commode, 14 if that's the com period, the communications 15 period, then both the transmitter and the receiver 16 are on because the way this low-energy MAC works 17 is if a rendezvous signal is received by the 18 device during the wake-up period, it then wakes 19 the snooze time, the rendezvous time during the 20 snooze period between the transmitter and the 21 receiver. 22 Q All right. And is that the understanding
74 1 A Yes. 2 Q Okay. And you've seen oscilloscope traces 3 before? 4 A Yes. 5 Q Okay. Does this look like an oscilloscope 6 trace to you? 7 A It could be an oscilloscope tracing; it 8 could be a signal analyzer trace. It doesn't say 9 what type of instrument it is. 10 Q Okay. But it's some sort of measured 11 chart, correct? 12 A Based on the fact that it says measured, 13 I'm assuming it's an experimental measurement and 14 not a theoretical plot. 15 Q Right. And the fact that we see some 16 level of noise, right? Is that fair? In the 17 traces? 18 A Yeah. I mean, a simulation can show noise 19 as well, but we'll go with the fact that it says 20 measurable states and experimental. 21 Q Okay. And so my original question was 22 that you would grow that in the Tsnooze period	76 1 that you applied in forming your opinions about 2 R ger? 3 A In the com period? Yeah, during the 4 com -- during the communications period, I don't 5 know that I was necessarily referring to this 6 exact chart, but based on the description, the 7 text -- textual description in R ger, the com 8 period is when the device sensor turns on both 9 transmitter and receiver for two-way 10 communications with the CO. 11 Q And you believe that occurs in the light 12 blue -- or dark blue period that surrounds the 13 yellow period in these timing charts, correct? 14 A Assuming that the -- presuming that, for 15 example, S6 received a rendezvous signal with a 16 rendezvous timestamp during its brief wake-up 17 period between Tsleep and Tsnooze, then Tsnooze 18 ends when the rendezvous time expires, and then it 19 goes into com mode with the transmitter and 20 receiver on. That's my understanding of R ger. 21 Q Okay. Can you read the last sentence on 22 that page that starts "when for instance"? And

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77 1 this is the bottom of Page 12. 2 A At rendezvous time, all subscribers switch 3 to receive mode -- 4 Q Sorry. Just -- the sentence that 5 starts "when for instance"? 6 A Yeah, I see that. 7 Q Right. And so my question -- can you read 8 to yourself that sentence -- 9 A Mm-hmm. 10 Q -- that goes on to the next page? And let 11 me know when you're finished. 12 A Okay. 13 Okay. 14 Q Okay. Does that refresh your recollection 15 about what's occurring during the blue and yellow 16 periods of Figure 6? 17 A Well, it explains what's going on in 18 Figure 6. Okay. 19 Q Right. So what the text of R ger says 20 about Figure 6 is that during the blue period, the 21 receiver is on and the transmitter is off, and 22 during the yellow period, the transmitter is also	79 1 R ger you applied in forming the opinions of your 2 declaration. Is it the ones that you originally 3 told me or the ones -- the ones that we've just 4 now gone over together? 5 A My original understanding -- but my 6 understanding comes from the bullet points, not 7 from that single table, which is a -- one 8 particular experiment that was done. 9 For example, Page 6 of 14, all 10 communications, circuitries switched off, 11 autonomous wake-up needed, reception of scheduled 12 rendezvous time, return to snooze mode, no costing 13 energy, data transmission to CO -- to CO before 14 rendezvous time. Communications with CO at 15 rendezvous time, that's where my understanding 16 comes from. 17 Q Got it. And that's a -- those are what's 18 described in R ger as built-in features of Sleep 19 mode, correct? 20 A It's the features of the low-energy MAC. 21 Q Well -- 22 A Not particularly -- you're citing one
78 1 turned on, and when it transitions back to the 2 blue period, the transmitter turns off; correct? 3 A That's what that sentence says, yes. 4 Q Okay. And so that's different than the 5 understanding that you just expressed prior to 6 reading that portion of R ger, correct? 7 A Yes. It's different than what I just 8 said. 9 Q Okay. So -- so R ger says that it goes 10 from -- for instance -- I'm looking at, for 11 instance, Subscriber 4, during a Tsnooze period, 12 receiver off, transmitter off. During the 13 receiving portion in blue, it's receiver on, 14 transmitter off. During transmitting, it's 15 receiver on, transmitter on. Then it turns to 16 transmitter off to receiving. And then both the 17 receiver and transmitter are turned off to another 18 period that comes after that blue high portion. 19 Is that fair? 20 A According to the description here, yes. 21 Q Okay. And so I just want to understand 22 what -- what interpretation of the teachings of	80 1 particular experiment, I take it. 2 Q No. I'm talking about the bullets on 3 Page 6 that you were just reading. 4 A Mm-hmm. 5 Q Those bullets are sub bullets of the 6 minimum energy Sleep mode, correct? 7 A Those are requirements for the Sleep mode 8 to be operational, but they're also the low-energy 9 MAC requirements protocol. 10 Q And you understand that Figure 6 provides 11 additional detail regarding the low-energy MAC 12 that's described in R ger, correct? 13 A You're ignoring Figure 2. 14 Q Sir, that's not my question. My question 15 is Figure 6 provides additional detail regarding 16 the low-energy MAC network of R ger, correct? 17 A Figure 6 presents an experiment that they 18 did that is a -- is an example of a system that 19 complied with a version of their low-energy MAC. 20 Q Okay. Now, let's talk about Figure 2. So 21 if you can, go to Figure 2. 22 A Yes.

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1 Q This is another timing chart, correct? 2 A Yes. 3 Q Okay. And this is -- this was not 4 measured, right? This is a -- this is a 5 schematic, correct? 6 A Yes. 7 Q Okay. And we see gray portions in some of 8 the high portions where it says com, correct? 9 A Yes. 10 Q All right. And there is -- within the 11 high portions, there are instances where there's 12 white space that proceeds the com and then there's 13 instances, for example, in S3 or S4, where there's 14 white space that proceeds and follows the com. 15 Do you see that? 16 A Okay. 17 Q Do you agree with that? 18 A I don't know that there's necessarily 19 white space following the com in S3 and S4. 20 Q You don't believe there's white space? 21 A There may -- I mean, it may just be the 22 printing. I don't know. To me, if I look at S3,	81 83 1 You agree I'm on Page 7 of 14 of 2 Exhibit 1006, correct? 3 A Yes, mm-hmm. 4 Q Okay. So I'm going to zoom in and I'm 5 going to ask you a question about what we're 6 collectively looking at because I don't want -- I 7 don't want there to be any issue with your -- your 8 eyesight. 9 All right. This is as big as I can. All 10 right. You agree we're looking at the com portion 11 of S3 on Figure 2, correct? 12 A Yes. 13 Q All right. And you see there's a -- that 14 I'm talking about going from left to right here. 15 There's a black vertical line -- 16 A Mm-hmm. 17 Q -- followed by some white space followed 18 by a gray rectangle that's labeled com followed by 19 some white space followed by another black 20 vertical line. 21 Do you see that? 22 A Yes. Okay.
82 1 that's pretty much the entire block of com is 2 gray. Maybe it's my eyes. 3 Q Let me suggest you zoom in on it, sir. 4 Did you zoom in on it, sir? 5 A Yes. 6 Q Do you see there's white space on both the 7 left and right sides of the com portion in S3? 8 A A hairline on either side. 9 Q Okay. I'm going to share my screen. 10 Can everyone see this? Can you see this, 11 Dr. Litvin? 12 A Yes. 13 Q All right. And for the record, I'm 14 sharing a view of Exhibit 1006, which is R ger. 15 Do you agree with that? Dr. Litvin? 16 A Yes. 17 Q Okay. I'm going to zoom back out. I 18 apologize. 19 Okay. We're zoomed -- for reference, I'm 20 looking at the bottom right gray portions of S3 21 and S4 of figure 2 on Page 7 of 14. Do you agree 22 with that?	84 1 Q Okay. So you would agree with me that 2 there's white space on both the left and right 3 side of the gray column of S3 of Figure 2 of 4 Exhibit 1006, correct? 5 A Yes. 6 Q Okay. So you agree it's not a printing 7 error, correct? 8 A I'll presume it's not a printing error. 9 Q Okay. Because if we scroll down, we're 10 now looking at S4 of Figure 2 of Exhibit 1006. 11 A Mm-hmm. 12 Q Do you agree? 13 A Yeah. 14 Q And here we see a larger white portion -- 15 A Mm-hmm. 16 Q -- and a gray com portion and then another 17 white portion and then another vertical black 18 line. 19 Do you see that? 20 A Yes. 21 Q Did I accurately describe that? 22 A Yeah.

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85 1 Q Okay. So you'd agree that that same 2 functionality or feature appears in S4 as well of 3 Figure 2? 4 A Yeah. 5 Q Okay. So you would agree -- I'm scrolling 6 back up to S3 just so we're all -- the record's 7 clear -- that there's a snooze portion with the 8 receiver is off and the transmitter is off; 9 there's a received portion where the receiver is 10 on but the transmitter's off; there's a 11 communications portion where the transmitter is on 12 and the receiver's on; and there's another 13 received portion where the receiver is on, the 14 transmitter's off, and then it transitions to a 15 period where the receiver and transmitter are both 16 off, correct? 17 Dr. Litvin? 18 A Yeah. I'm just reading something. 19 What was your question? 20 Q My question was what we are looking at 21 here, the right-hand side of the timing schematic 22 for Figure 2 of Exhibit 1006, this shows a	87 1 Q Dr. Litvin, if you could just wait a 2 second for me to ask you a question. 3 TECHNICIAN: So you said you wanted this 4 saved. And do you want it marked as a separate 5 exhibit? 6 MR. LAREAU: Yes. Whatever exhibit number 7 is fine. 8 TECHNICIAN: Okay. I don't know what 9 exhibit we're on right now. 10 MR. LAREAU: We're not sequential. Just 11 say Litvin 99. 12 TECHNICIAN: Okay. Thank you, Counsel. 13 You should be good to go. 14 MR. LAREAU: Okay. I'll stop sharing. 15 BY MR. LAREAU: 16 Q Okay. Dr. Litvin, you agree that the 17 wake-up or WK-up portions of the white high spots 18 in Subscriber 3 correspond to times when the 19 receiver is on but the transmitter is off, 20 correct? 21 A Yes. 22 Q Okay.
86 1 subscriber that goes from a state where the 2 receiver and transmitter are off to a state where 3 the receiver is on, to a state where the 4 transmitter is also on, back to a state where just 5 the receiver is on, back to a state where the 6 receiver and transmitter are both off, correct? 7 A The double arrow is bidirectional 8 communication; the dashed arrow is unidirectional 9 communication. 10 MR. LAREAU: Melody, can we screen-capture 11 what's being shared right now and mark it as 12 Litvin 99. 13 (Litvin 99 was marked for identification 14 and is attached to the transcript.) 15 MR. LAREAU: Melody, did you hear me? 16 TECHNICIAN: Apologies. I forgot I was on 17 mute. Working on it right now. 18 MR. LAREAU: Okay. Just let me know when 19 I can change the -- 20 THE WITNESS: There's that rendezvous 21 time, the subscriber -- 22 BY MR. LAREAU:	88 1 All right. Let's switch gears. The 2 claims of the '892 patent -- and certainly if you 3 need to refer to the '892 patent, I believe it's 4 Exhibit 1001. So if you'd like to refer to that 5 at all, please feel free to open it up and look 6 through it, but I just want you to confirm a few 7 things to me about the claims. 8 You would agree that there's no limitation 9 in the challenged claims that's directed to the 10 type of an ONU in the PON, correct? 11 A Hold on a second. 12 Which one is the patent? 13 Q I believe it's 1001. 14 A Yeah. It doesn't specify that it has to 15 be an ITU compliant ONU or -- 16 Q Right. And there's no requirement or 17 limitation directed to if it's a really fast 18 PON -- excuse me, a really fast ONU or a really 19 slow ONU, right? There's no G-PON or XG-PON or 20 XGS-PON, NG-PON 2 type requirements for the ONU, 21 correct? 22 A Yes.

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89 1 Q Okay. And you agree with that, right? 2 A Yeah. There's no restriction. 3 Q Right. So there's no limitation that's 4 directed to the type of user, right, whether it's 5 a high bandwidth laser or low bandwidth user or a 6 user that consumes lots of data or doesn't consume 7 lots of data, right? You would agree with that? 8 A Well, the specification is certainly 9 geared toward a telecommunications PON with much 10 human-type interactions, and so from my 11 perspective, the implication is we're talking 12 about telecommunication systems, not a system of 13 sensors, a network of sensors. 14 Q Is that a -- is that understanding of the 15 claims something that you applied in forming your 16 opinions? 17 A Based on the description given in the 18 patent spec, it's what I applied. In other words, 19 my understanding is that this is geared towards 20 telecommunication systems, high data rate 21 telecommunication systems. 22 Q Right. But you agree that's not present	91 1 you believe a passive optical network is limited 2 to a situation where there's high bandwidth 3 commercial telecommunications traffic? 4 A Limited? That is the -- that is the 5 primary application of the passive optical 6 network. 7 Q Right. And upon that basis, you 8 disregarded the teachings of R ger, correct? 9 A What do you mean disregarded? 10 Q Believed they weren't relevant? 11 A Yes. Particularly with regard to 12 optically-powered devices. If you go through the 13 calculation, you'll find that you'll need about 14 two -- to power using Roger's 670 milliwatt power 15 and the losses at the 807 or 810 nanometers, 16 running through 20 kilometers of fiber and then 17 going through a 15-dB splitter; in other words, a 18 32-way split, you'll find that you would have to 19 launch 60 -- 65 dB more power. 20 In other words, that 670 milliwatts would 21 have required about 2.1 megawatts of power, and 22 that's not even considering the fact that the
90 1 in, for example, claim 1? 2 A Well, the general industry understanding 3 of a passive optical network is a 4 telecommunications network deployed by MSOs and 5 telecom. 6 Q So you limited your understanding of 7 claim 1 to be to telecom networks for high 8 bandwidth; is that fair? 9 A My understanding is that's what this is 10 geared towards. 11 Q Right. So based on that understanding, 12 that's how you interpreted the claim in forming 13 your opinions, correct? 14 A It certainly was a consideration. 15 Q Well, I'm asking if you did or you didn't 16 do it. 17 A If I did or didn't do what, exactly? 18 Q Rely on that understanding of what a 19 passive optical network is. 20 A Yes. That is what a passive optical 21 network is. 22 Q All right. Just so the record's clear,	92 1 32-way splitter is designed for the telecom 2 wavelength, not the up-wave length of 810 3 nanometers. 4 So, yeah, it's -- it's not really in the 5 realm of telecommunications practicality. 6 Q You agree that there's no limitation 7 within any of the challenged claims directed to 8 the quantity of power saved, correct? 9 A It doesn't specify. That would be a 10 design issue. 11 Q Right. And you understand that the 12 obviousness analysis is whether the claims are 13 obvious, correct? 14 A Yes. 15 Q And you believe, just to be clear, that a 16 passive optical -- let me withdraw that. 17 Do you believe that the preamble of 18 claim 1 is limited? Did you assume that it was? 19 MR. WYDE: Objection to scope. 20 A Did I assume that it was -- 21 Q Limiting? 22 A I presumed based on the patent text and

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93 1 the diagrams of the patent, which come from the 2 ITU's standard or modified from the ITU's 3 standards, that we were discussing 4 telecommunications networks, not remote sensing 5 networks. Telecommunication networks where there 6 are millions of users, not a remote sensing 7 network. 8 Q And, again, my question for you, 9 Dr. Litvin, is did you consider -- did you apply, 10 I believe, the preamble of claim 1 was limiting in 11 forming your opinions regarding the patentability 12 of claim 1? 13 MR. WYDE: Same objection as to scope. 14 A I used my understanding of what a passive 15 optical network commonly is understood to mean 16 within the industry. 17 Q Sir, do you understand what it means 18 for -- what I mean when I say a preamble is 19 limiting, do you understand what I'm saying? 20 A You're asking me whether or not passive 21 optical network means specifically 22 telecommunications passive optical network --	95 1 Q Okay. And so in a situation where it is 2 limiting, it's treated as a limitation of the 3 claim. Do you understand that? 4 A Yes. 5 Q Okay. And -- 6 MR. WYDE: If I just -- I just want to put 7 on the record an objection to scope. Please 8 continue. 9 MR. LAREAU: Okay. 10 Q In situations where it is not limiting, 11 it's not a limitation of the claim, it's not 12 treated as a limitation of the claim. Do you 13 understand that? 14 A Yes. 15 Q Okay. 16 MR. WYDE: So I don't break up the flow, 17 just -- this objection goes to this line of 18 questioning, and I won't make further objections 19 until you switch topics. 20 MR. LAREAU: Okay. 21 BY MR. LAREAU: 22 Q So now that we've kind of reset the table
94 1 Q No, sir. No, no. That's not my question. 2 A Okay. Well, then, please explain. 3 Q Okay. Are you familiar with the concept 4 of preambles in patent claims? Let's start there. 5 A Somewhat. 6 Q Okay. I will represent to you that when 7 looking at claim 1, a portion of the claim that 8 says a method of optical communication in a 9 passive optical network comprising -- 10 A Yes. 11 Q -- that is what's referred to as a 12 preamble? 13 A Yes. 14 Q Is that -- do you have -- 15 A Yeah, I understand that. 16 Q Okay. Do you understand that in the 17 context of the patents and understanding the claim 18 construction, a preamble in some instances can be 19 limiting and in other instances may not be 20 limiting. 21 Do you understand that? 22 A Yes.	96 1 with respect to what we're referring to when I ask 2 these questions, my question for you, Dr. Litvin, 3 is did you treat the preamble of claim 1 as a 4 limitation that must be met in performing your 5 analysis as reflected in your declaration? 6 A A method of optical communications and a 7 passive optical network. I did not restrict 8 myself in the general sense of a passive optical 9 network, but it was my understanding that the 10 primary application would be in 11 telecommunications. 12 Q Right. And my question is specifically 13 within the body of claim 1, where do you believe 14 that limitation exists? 15 A I just said that I didn't limit myself to 16 the telecommunications passive optical network, 17 but it's my understanding that this is where it is 18 primarily applicable. 19 Q Right. So you agree that the claims do 20 not require application to a telecommunications 21 system, correct? 22 A It would depend on the definition of

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97 1 passive optical network. 2 Q Again, that would also assume that passive 3 optical network -- excuse me, withdraw that. 4 It would also assume that the preamble of 5 claim 1 is limiting, correct, because passive 6 optical network does not appear anywhere else in 7 the body of claim 1, correct? 8 A I don't see it anywhere. 9 Q Okay. So you agree that the only place 10 that passive optical network or the abbreviation 11 PON appears in claim 1 is in the preamble, 12 correct? 13 A As far as I can tell, yes. 14 Q Okay. So there's no other limitation 15 within claim 1 that's directed to a PON or a 16 telecommunications network or a high bandwidth 17 network or a specific kind of subscriber, is 18 there? 19 A No, but you would have to refer to the 20 spec to understand what the inventors were focused 21 on, what they meant by passive optical network. 22 Q Okay. But you can't identify any	99 1 A The limitation just prior says it's 2 capable of responding to both upstream and 3 downstream traffic and controls. 4 Q Right. Correct. But that doesn't say it 5 receives upstream or downstream -- receives 6 downstream traffic or sends upstream traffic, 7 correct? It says it's capable of doing something, 8 correct? 9 A Yes. 10 Q Right. So my original question, again, is 11 putting aside the receiving limitation, the 12 second-to-last limitation, putting that aside, 13 there is no limitation in claim 1 that requires 14 the ONU to send or receive data, correct? 15 A Just that it would be capable of doing so. 16 Q Right. But the only receipt limitation 17 that exists within claim 1 is that the 18 receiving -- that the ONU receives a power 19 management message from the OLT, correct? 20 A Yes. 21 Q Okay. 22 MR. LAREAU: I don't have any further
98 1 limitation within the body of claim 1 that's 2 directed to any of the things that I just 3 described, the type of -- the type of subscriber, 4 the speed of the subscriber, the geography of the 5 deployment? None of those things appear within 6 the body of claim 1, correct? 7 A Yes. 8 Q Okay. And, in fact, looking at claim 1, 9 putting aside the second-to-last limitation, the 10 one that starts with receiving, putting that 11 aside, there's no actual limitation that's 12 directed to the ONU receiving or sending any data, 13 correct? 14 A Repeat that. 15 Q Sure. Again, for the purposes of this 16 question, I'm setting aside the second-to-last 17 limitation, the one that starts with receiving 18 column. Do you see that? 19 A Yes, yep. 20 Q Putting that aside, there's no limitation 21 within claim 1 that the ONU sends or receives any 22 data, correct?	100 1 questions. 2 Josh, you're on mute if you're trying to 3 talk. 4 MR. WYDE: I am, thank you. 5 EXAMINATION 6 BY MR. WYDE: 7 Q So I said I have just a few questions on 8 redirect. 9 Dr. Litvin, you -- you signed your 10 report -- did you sign your report? 11 A Yes. 12 Q And before you signed your report, did you 13 read the entirety of it? 14 A Yes. 15 Q Did you agree with what was written? 16 A Yes. 17 Q And what is -- what does it mean to you, 18 if anything, to sign your name to the bottom of 19 the report? 20 A If I sign my name to the report? 21 Q Mm-hmm. 22 A It's -- basically I'm attesting to

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101 1 everything that is in the report. 2 Q Near the end of the deposition today, is 3 there -- were there any corrections that you feel 4 you might -- anything that needs corrected in the 5 report in light of the deposition today? 6 A No. 7 Q Do you still stand by the opinions in the 8 report? 9 A Yes. 10 Q All right. Can we look at Exhibit 1010 11 and Page 230, which Mr. Lareau talked to you 12 about? 13 Please let me know when you've got it 14 open. 15 A 1010, Page 230? 16 Q Yes, and I'm referring to the additional 17 pages that have been added to the bottom, so it 18 would be 230 of 290. 19 A Okay. Hang on. 20 All right. 21 Q So on this page, a little bit above 22 Section C16.1 --	103 1 Q Cyclic -- 2 A Cyclic Sleep. 3 Q Cyclic sleep. Sorry. I didn't mean to 4 cut you off. 5 Why would the XGS-PON, then, support all 6 three modes -- need to support all three modes, I 7 should say? 8 A Only because it was introduced for 9 XGS-PON, and the ONUs of XGS-PON support the 10 Watchful Sleep mode. 11 And as I was alluding to, there are 12 potentially telecommunications service providers 13 who have deployed an XG-PON network and are 14 building out an XGS-PON network as well and don't 15 want to have to replace all of their equipment. 16 So the manufacturers of the OLTs have 17 built dual-mode OLTs that can support XGS-PON 18 and -- and XG-PON. 19 Q Okay. Switching topics. The very last 20 part of your deposition you were discussing the 21 preamble. It's labeled Limitation 1A. Do you 22 recall that?
102 1 A Mm-hmm. 2 Q -- earlier in the deposition, you 3 discussed -- I think it's the third paragraph up. 4 It starts "the cause addresses"? 5 A Yes. 6 Q And then the specific sentence you 7 discussed earlier was the one that says, to 8 support XG-PON, ONUs, the XGS-PON OLT must support 9 all three modes. 10 Do you remember discussing that? 11 A Yes. 12 Q And what three modes is being referred to 13 here? 14 A The Doze, cyclic -- Cyclic Sleep, and the 15 Watchful sleep. 16 Q Mm-hmm. Now, would an XG-PON ONU support 17 all three of those modes? 18 A No. 19 Q Which ones would they -- which one would 20 an -- which one or ones would an XG-PON ONU 21 support? 22 A It would support Doze and the Sleep mode.	104 1 A Sure. Yes. 2 Q Did you provide an opinion in your report 3 regarding whether a Limitation 1A was or was not 4 anticipated or rendered obvious by the references? 5 A No, I didn't say anything about that at 6 all. 7 Q Okay. I want you to open exhibit -- I 8 believe it's 106 (sic), R ger. 9 A Okay. 10 Q All right. If you would, turn to Page 7. 11 Again, I'm referring to the added page numbers at 12 the bottom, so 7 of 14. 13 A Okay. I'm there. 14 Q Okay. So if we -- could you turn your 15 attention to -- I guess it's subscriber S3 and S4 16 at the bottom in blue? And let me know if you see 17 what I'm identifying there. 18 A Yeah, I see it. 19 Q Okay. Are there indications here about 20 when the CO -- which I believe stands for captive 21 office -- is transmitting to S3 and S4? 22 A It is the dashed arrow pointing in the

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105 1 direction of S3 or S4. 2 Q Mm-hmm. So I'll also draw your attention 3 to the -- to the very right. There is a double -- 4 a double-ended arrow. Would that also be an 5 indication of communication from the capital (sic) 6 office to the subscribers? 7 MR. LAREAU: Object to form. 8 A Are you speaking of the green and red 9 arrows? 10 Q No, the blue -- you said the single-ended 11 dashed lines, and I just wanted to know -- 12 A Yes. 13 Q -- if that's the only indication, or what 14 to make of the double-ended solid -- 15 A The double-ended line? That's when 16 there's two-way communications between the device 17 and the control office. 18 Q Okay. 19 A Or central office. 20 Q Okay. And so going left to right on the 21 first dashed office -- sorry. Let me start over. 22 Going left to right on the first dashed	107 1 that information is sent? 2 MR. LAREAU: Objection; outside the scope. 3 A That information is sent because the idea 4 in this case is to save every bit of energy, and 5 so before the control office is prepared to 6 communicate with a device, it tells it when it's 7 going to communicate with the device, there's no 8 stream of information being sent to the device. 9 It's only preparing it to communicate with the 10 control office after this -- after the rendezvous 11 time. 12 Q So sticking with S4 as we travel right 13 down the timeline, we come to the -- I will call 14 it a rectangle with the gray com label in it. 15 Do you see that? 16 A Yeah. It's the communications window. 17 Yes. 18 Q Okay. Do you remember talking in depth 19 with Mr. Lareau about that section of the chart? 20 A Yes. 21 Q Mm-hmm. And I don't want to 22 mischaracterize your testimony, but correct me if
106 1 line that goes from the captive office down to the 2 S4, do you have an understanding of what's being 3 sent at that time? 4 A Yes. It's just the rendezvous signal. 5 Q Mm-hmm. You say just the rendezvous 6 signal. Does that mean there wouldn't be -- let 7 me restart this question. 8 So what do you mean by just the rendezvous 9 signal? 10 A In other words, there's no information 11 being sent to the S4 device with regard to 12 instructions that it needs to carry out or 13 requests for data and so forth. It's simply a -- 14 based on my understanding of R ger, it's a -- 15 essentially a control signal with a timestamp 16 containing the rendezvous time, which is basically 17 just a single bit of information so that the S4 18 device can set its snooze timer to -- to 19 correspond to the rendezvous time at which point 20 it would wake up and communicate with the control 21 office. 22 Q Do you have an understanding of why only	108 1 I'm wrong: Earlier you said there was 2 communication from the captive office to the 3 subscriber during this period. 4 Is that -- did I characterize your 5 testimony correctly? 6 MR. LAREAU: Okay. 7 A In the com window, I believe if I recall 8 correctly the device wakes up after the snooze 9 time and then awakes -- awakes the CO to address 10 it, which is the beginning of the gray arrow or 11 the gray -- gray rectangle. 12 Because as you see in S3, right, the com 13 window opens there at the same exact time pretty 14 much, the communications window, but it's 15 addressed earlier. So it communicates with the CO 16 during an earlier time slot within the com window, 17 it ends, and then the dashed arrow points to S4 18 addressing it, meaning it can now commence 19 communications as well. 20 So at the beginning of this com window at 21 the end of the snooze period or the rendezvous 22 time, the transmitter and the receiver are

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109 1 activated, and it's prepared to communicate when 2 called upon by the CO. The CO basically is the 3 master of the S3 and S4 devices. 4 Q What do you mean when you say that the CO 5 is the master of the S3 and S4 devices? 6 A S3 and S4 have no autonomy. They can't 7 request to go into a Sleep mode or a snooze mode. 8 Everything must be in a -- they can't select the 9 mode that they're in. Everything is essentially 10 micromanaged by the CO, every state that it's in. 11 There's no autonomy for it to select a Sleep mode 12 or a snooze mode. It can't decide when it's going 13 to communicate. It can't decide when it's going 14 to wake up. There's no -- for example, in the 15 PON, there's no local wake-up indicator that would 16 be, for example, a user clicking on a mouse or 17 something, requesting a web page or what have you, 18 or someone picking up an IP telephone off the hook 19 and waking up the ONU if it were in the Sleep 20 mode. 21 Q Does S3 and S4 receive data during the com 22 period?	111 1 Dr. Litvin. 2 RE-EXAMINATION 3 BY MR. LAREAU: 4 Q Earlier you were talking about the three 5 XG-PON power modes that must be supported in 6 Exhibit 1010 on Page 230. Do you recall that? 7 A Yes. Page 230. Let me just -- in 8 general, I recall it. 9 Q Okay. And I believe your counsel asked 10 you some questions about why an XG-PON or XGS-PON 11 OLT would need to support three modes for XG-PON 12 ONUs. 13 Do you agree that this document states 14 that the XGS-PON OLT must support all three modes 15 that includes Watchful Sleep, Cyclic Sleep, and 16 Doze, right? 17 A It says to support ONU PONs use, if the 18 XLT is not overlay, then it doesn't have to do it. 19 Q Right. But if it supports XG-PON ONUs, it 20 must support all three modes, not just two modes, 21 correct? 22 A That's essentially what that says.
110 1 A During the com period, yes. 2 Q Does S3 or S4 receive data during any 3 other times as -- let me -- 4 A There's a -- it only receives an 5 instruction -- if it receives a rendezvous signal 6 addressed to it during its wake-up period to 7 receive the instruction, which is basically the 8 rendezvous time indicating that the CO would like 9 to communicate with it at some time in the future; 10 mainly the rendezvous time period, after the 11 rendezvous time period expires. 12 Q So does it receive data during the sleep 13 period? 14 A No. 15 Q Snooze period? 16 A No. 17 Q The wake-up period other than the 18 rendezvous time? 19 A No. 20 MR. WYDE: Okay. I don't have any further 21 redirect. 22 MR. LAREAU: I have one question for you,	112 1 Q Right. Because you understand that 2 Watchful sleep was added to the XG-PON standard 3 before the publication of Exhibit 1010, correct? 4 A Do you mean XGS-PON? 5 Q No, XG-PON. 6 A Well, as I said, I examined the -- the 7 cited reference, not the later document. 8 Q Right. So you do or you do not have an 9 understanding that Watchful sleep was subsequently 10 added to the XG-PON standard? 11 A I did not -- no, I don't have that 12 understanding because I only saw what I researched 13 in the XG-PON standard that we discussed today. 14 Q Right. But in the XGS-PON standard which 15 is dated 2023, right -- 16 A Yes. 17 Q -- it indicates that to support XG-PON 18 ONUs, the XGS-PON OLT must support all three 19 modes, referring to the three power-saving modes, 20 including Watchful sleep, right? That would -- 21 that would indicate to a person of ordinary skill 22 in the art --

113 1 A No. 2 Q No? 3 A No, it wouldn't. To support XG-PON ONUs, 4 that would indicate that it needs to -- based on 5 the document we were primarily discussing today, 6 it needs to discuss -- excuse me. It needs to 7 support the Doze and Cyclic Sleep modes and the 8 Watchful sleep as is obvious in this 9 specification. It is to support XGS-PON. 10 So, in other words, if it's going to 11 support an XGS-PON, it has to support Watchful 12 sleep, and if it's going to also support XG-PON, 13 you'd have to also support the other two. 14 Q Yeah, that's not what this document says, 15 though, is it? 16 Right? There's one sentence that's 17 directed at supporting XG-PON ONUs that requires 18 support of the three modes, and there's a second 19 sentence that follows it that's talking about 20 XG -- excuse me, XGS-PON ONUs, and that talks 21 about a single mode, correct? 22 A Right, and that's pretty much what I just	115 1 Q Right. And in the process of forming that 2 opinion, you never considered whether the XGS -- 3 excuse me, the XG-PON standard, Exhibit 1007, was 4 actually modified to include direct transitions, 5 correct? 6 A I only used the cited documents that were 7 provided to me. 8 Q Right. But -- so just to be clear, that 9 means you did not -- you did not confirm one way 10 or the other whether that occurred, right? 11 A Yes. 12 Q All right. No further questions. 13 MR. WYDE: Okay. I think we're done. 14 (Off the record at 12:38 p.m.) 15 16 17 18 19 20 21 22
114 1 said two minutes ago, that if the PON OLT is to 2 support -- is designed to also support XG-PON, 3 which is, you know, very common or possible, it 4 needs to support all three modes, including 5 XGS-PON for the XGS-PON ONUs, and it also needs to 6 support Doze and Cyclic Sleep to support any 7 remaining XG-PON ONUs. 8 Q Okay. And it's your opinion expressed in 9 your declaration that a person of ordinary skill 10 in the art would not be motivated to modify the 11 architecture of G.987.3 to omit direct 12 transmissions, right? 13 A Yeah. The direct transition -- given the 14 framework of that specification and the motivation 15 to be able to have continuous downstream data 16 flowing, even in a low power mode, as in the Doze 17 mode, the POSITA would not have been motivated to 18 do that. Because it would have broken that 19 capability, and it would also destroy the ONU's 20 ability to manage -- excuse me, the OLT's ability 21 to manage the ONUs if it did it autonomously 22 without notification.	116 1 ACKNOWLEDGMENT OF DEPONENT 2 3 I, KERRY LITVIN, Ph.D., do hereby 4 acknowledge that I have read and examined the 5 foregoing testimony, and the same is a true, 6 correct and complete transcription of the 7 testimony given by me and any corrections appear 8 on the attached errata sheet signed by me. 9 10 11 12 _____ 13 (DATE) (SIGNATURE) 14 15 16 17 18 19 20 21 22

Transcript of Kerry Litvin, Ph.D.
Conducted on May 15, 2025

30 (117 to 120)

117 1 CERTIFICATE OF SHORTHAND REPORTER-NOTARY PUBLIC 2 3 I, Brooklyn E. Schweitzer, the officer 4 before whom the foregoing deposition was taken, do 5 hereby certify: 6 7 That KERRY LITVIN, Ph.D., the witness 8 whose deposition is hereinbefore set forth, was duly 9 sworn by me before the commencement of such 10 deposition and that such deposition was taken 11 virtually and is a true record of the testimony 12 given by such witness. 13 14 I further certify that the adverse party, 15 IANARCH TECHNOLOGIES LIMITED, was represented by 16 counsel at the deposition. 17 18 I further certify that the deposition of 19 KERRY LITVIN, Ph.D., occurred virtually, on 20 Thursday, May 15th, 2025, from 9:02 a.m. to 12:38 21 p.m. EDT. 22	
118 1 I further certify that I am not related to 2 any of the parties to this action by blood or 3 marriage, I am not employed by or an attorney to any 4 of the parties to this action, and that I am in no 5 way interested, financially or otherwise, in the 6 outcome of this matter. 7 8 IN WITNESS WHEREOF, I have hereunto set my 9 hand and affixed my notarial seal this 20th day of 10 May, 2025. My commission expires: May 20th, 11 2026. 12 13 14  15 _____ 16 Brooklyn E. Schweitzer, RPR, CRR 17 18 19 20 21 22	

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