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Transcript of Gary Wooley, Ph.D.

Date: August 3, 2023

Case: Dynaenergetics Europe GMBH, et al. -v- SWM International, LLC (PTAB)

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Email: transcripts@planetdepos.com

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5 1 PROCEEDINGS 2 GARY WOOLEY, PH.D., 3 being first duly sworn or affirmed by the Notary, 4 testifies as follows: 5 CROSS-EXAMINATION 6 BY MR. HEARD: 7 Q And good morning again, Dr. Wooley. How 8 are you? 9 A I'm good, thanks. 10 Q Good. And we met before, but for the 11 record, I'm Preston Heard at Womble Bond Dickinson 12 for -- on behalf of the Petitioners DynaEnergetics. 13 Do you understand that? 14 A I do. 15 Q And are you alone this morning? 16 A Yes. 17 Q Are you in your office? 18 A That's correct, yes. 19 Q And where -- where exactly -- the office is 20 not in your home, I take it. 21 A That's correct. 22 Q And we've -- I know you have been deposed	7 1 rules. 2 Q But you're saying that you will agree not 3 to discuss the content of your testimony on any 4 breaks that we may take? 5 A Yes. 6 Q And you've testified on behalf of SWM 7 several times; right? 8 A Yes. 9 Q You went and grabbed your, before we got 10 started, your report. Can you just identify what you 11 have sitting in front of you, please? 12 A Yes. I have a hard copy of my two 13 declarations in this matter. 14 Q And so that would be Exhibit 2001, the 15 declaration that you submitted last year in 16 connection with SWM's preliminary response to the 17 petition; is that right? 18 A Yes. 19 MR. STEIN: Object to form. 20 Q In particular, is that the declaration 21 dated November 28th of 2022? 22 A Yes, that's correct.
6 1 many times, so I'll spare you the ground rules. 2 But is there any reason you could not give 3 full and truthful testimony here today? 4 A No, there is not. 5 Q So you understand that this deposition is 6 being taken for purposes of IPR2022-01372 at the 7 Patent Trial and Appeal Board? 8 A I don't know the numbers, but I understand 9 that's the situation, yes. 10 Q You understand it's an IPR proceeding 11 between DynaEnergetics and SWM International? 12 A Yes. 13 Q And you have been retained by the patent 14 owner, SWM? 15 A That's correct. 16 Q And you understand that in these IPR 17 proceedings, that on any break you may not discuss 18 the content of your testimony with your counsel? 19 A I can do that. 20 Q You understand that that's a Patent Office 21 rule for these depositions? 22 A No, I'm not familiar with the Patent Office	8 1 Q And then the other declaration you have is 2 Exhibit 2007; is that right? 3 A Yes. 4 Q And that should be -- is that dated May 31, 5 2023? 6 A Yes. 7 Q Do you have a copy of any of the exhibits 8 printed out before you? 9 A No. Well, I do have the patent. 10 Q Okay. That's -- for ease of our day, I 11 want to know what I need to share with you or what 12 you already have sitting in front of you. So you 13 have a copy of Exhibit 1001, the '762 patent? 14 A I have the '762 patent, yes. I don't know 15 what exhibit number it is. 16 Q Let me -- I'm going to share Exhibit 1001, 17 make sure we are talking about the same patent. I 18 believe we are. 19 Can you see -- so you have a separate 20 laptop in front of you; is that right? 21 A I do, but I'm looking at the -- my phone 22 that's got it on there, so you'll need to blow it up

9 1 a little bit. 2 Q So can you see my screen, do you see a PDF 3 patent at the moment? 4 A Yes. If you would just blow it up a little 5 bit. 6 Q Sure. Are you saying that the patent that 7 you see is just on your phone? 8 A Yes. 9 Q Do you have the capability of getting a 10 separate computer where you can view documents more 11 easily? 12 A I have a large screen in my office, but 13 it's going to have some traffic today. I don't think 14 that will work for this. 15 MR. HEARD: Let's go off the record just a 16 minute. 17 (Discussion off the record.) 18 BY MR. HEARD: 19 Q Dr. Wooley, can you see the U.S. Patent 20 11,078,762 on your screen? 21 A Yes. 22 Q And that was, as I mentioned, Exhibit 1001	11 1 MR. STEIN: Objection to form. 2 A Yesterday would have been one day I looked 3 at it. 4 Q How many times would you estimate you've 5 read it? 6 MR. STEIN: Objection. Form. 7 A I can't answer that. Several. 8 Q Did you read it more than once in preparing 9 for your deposition? 10 A Well, just about everything I've done in 11 this case is preparing me for the deposition. I'm 12 not sure what you're asking. Are you asking about 13 how many times yesterday? 14 Q What did you do to prepare for the 15 deposition? 16 MR. STEIN: Objection to form. 17 A You mean recently? 18 Q Yeah. When did -- I assume that you 19 haven't been working constantly for 18 months to 20 prepare for the deposition; is that fair? 21 MR. STEIN: Objection. Form. 22 A As I mentioned, I think some of the things
10 1 to this -- in this proceeding. Do you see that? 2 A Yes. 3 Q And you have a paper copy of this patent in 4 front of you; right? 5 A Yes. 6 Q Are you familiar with the Yonghong 7 reference that's been discussed in this proceeding, 8 Exhibit 1004? 9 A I am familiar with that, yes. 10 Q But you don't have a printout of that 11 document in front of you? 12 A That's correct. 13 Q And then, likewise, Exhibit 1005, the 14 Hardesty reference, I'll share with you on your 15 screen now. You're familiar with that Hardesty 16 reference? 17 A Yes. 18 Q So when I refer to Yonghong or Hardesty, 19 you'll have an understanding of what I mean? 20 A Yes. 21 Q Going back to the '762 patent itself, when 22 is the last time that you reviewed this patent?	12 1 I've done over a long period of time are part of the 2 preparation. Now, recently I spent some time in the 3 last couple of days looking at documents. 4 Q And when did that recent activity begin? 5 A I don't know. Last few days I've looked at 6 it. 7 Q What would you consider to be the relevant 8 field of the '762 patent? 9 MR. STEIN: Objection. Form. 10 A We'll have to look and see what the patent 11 describes it. 12 Q While you're doing that, is your copy of 13 the '762 patent, does it have any markings, 14 annotations on it, handwriting? 15 A No. 16 Q How about your copies of the two 17 declarations, are those clean copies? 18 A Yes. 19 Q Do you have any other notes in front of 20 you? 21 A I do not. 22 The field of the invention described in the

13 1 '762 patent is the present invention relates to 2 components for perforating wellbores. 3 Q So is it your opinion that the field of 4 invention of the '762 is perforating wellbores? 5 MR. STEIN: Objection. Form. 6 A That's what the patent says, yes. 7 Q Do you agree with the patent? 8 A In a general sense I think that's pretty 9 close, yeah. 10 Q Are the Yonghong and Hardesty references in 11 that same field of invention? 12 A Yeah, it's probably worth saying, yes, 13 that's generally the area they're in. 14 Q You were also involved in a separate 15 District Court case or a related District Court 16 proceeding between these parties involving the '762 17 patent; is that right? 18 MR. STEIN: Objection. Scope. 19 A I believe that's right. I would have to go 20 look up what the legal proceeding was. But there 21 have been other matters that I have been involved 22 with.	15 1 before you joined. 2 MR. STEIN: No, I don't have that one. Is 3 it in the record of the PTAB proceedings? I don't 4 see it there. 5 MR. HEARD: This is a new exhibit, Exhibit 6 1015. 7 MR. STEIN: Okay. 8 MR. HEARD: Manita, would you mind dropping 9 or reposting that in the Zoom chat while I share the 10 screen here? Thank you. 11 (Exhibit 1015 marked for identification.) 12 MR. STEIN: I'm just pulling it down now. 13 BY MR. HEARD: 14 Q Make sure it's -- Dr. Wooley, are you able 15 to see the screen here? There's a document with a 16 title "Declaration of Gary Wooley"? 17 A Yes. 18 Q I'll go to the end to your signature here. 19 MR. STEIN: Just before we proceed, I'll 20 object on the record just to the admissibility of 21 this new exhibit. 22 MR. HEARD: On what basis?
14 1 Q Well, in your -- your testimony in this 2 case, you refer to claim construction proceedings in 3 the District Court, right, involving terms like 4 "collar"; right? 5 A I believe my report references that, yes. 6 Q So you took into consideration activity 7 that occurred in that District Court case for 8 purposes of submitting your declarations here? 9 MR. STEIN: Objection. Form. 10 A Well, I think my report fairly describes 11 the fact that that was part of that other matter. I 12 don't think it necessarily affects this matter. 13 Q You were involved during the claim 14 construction proceeding in that case, right, that was 15 before Judge Albright in the Western District of 16 Texas? 17 A That was a while back. I've done a lot 18 since then. I believe that to be correct. I'm not 19 sure. 20 MR. HEARD: Let me bring up Exhibit 1015. 21 It will be marked. I've already put it in the chat. 22 Alex, do you have access to that? It was put in	16 1 MR. STEIN: Relevance. 2 BY MR. HEARD: 3 Q You see the date April 11, 2022? 4 A Yes. 5 Q Is that your signature? 6 A Correct. 7 Q And you see the caption here is the -- from 8 the Western District of Texas in the proceeding 9 between these two parties, SWM and DynaEnergetics? 10 A I do. 11 Q Do you recall back in April of 2022 12 submitting this declaration for purposes of the claim 13 construction proceedings in that case? 14 A I do not recall the event. I recall being 15 involved. But you asked if I recalled submitting 16 this; I just don't remember that. 17 Q What documents from the District Court 18 proceeding did you review to form your opinions in 19 this IPR proceeding? 20 MR. STEIN: Objection. Form. 21 A I -- well, again, just about everything 22 I've looked at had some influence in my understanding

17 1 of the issues here and the -- my reports or my 2 declarations describe the documents reviewed. Would 3 you like me to go through those in the report? 4 Q Perhaps in a moment, but not at this time. 5 Just at a general level, you remember for 6 purposes of this proceeding in forming your opinion 7 with respect to the collar limitation, that you took 8 into account the claim construction that was put in 9 place in the District Court; is that correct? 10 MR. STEIN: Objection. Form. 11 A I recall that there was a claim 12 construction in the District Court and that's 13 mentioned, I believe, in my declaration. 14 Q You have Exhibit 2001 in front of you. Can 15 you go to paragraph 39? 16 A I have it. What's your question? 17 Q You mentioned parallel District Court 18 litigation there between Petitioners and Patent 19 Owner. What are you referring to? 20 A I'm not sure what your question is. That's 21 the part of my report I referred to a moment ago when 22 I said that was referenced in my report. What's your	19 1 MR. STEIN: Objection. Form. 2 A Well, I referenced them, and that's 3 certainly part of the background and my understanding 4 of the issues in this matter. 5 Q When -- you recall this was April of 2022. 6 Do you recall when you were first engaged for this 7 matter? 8 MR. STEIN: Objection. Form. 9 A What do you mean by "this matter"? Are you 10 talking about the current IPR that we're here today 11 for? 12 Q I'll be more specific. For the dispute 13 between SWM and Petitioners, so the parallel District 14 Court litigation, you understand that came first, was 15 filed first? 16 A I believe that to be correct. I don't 17 know. 18 Q When in the dispute between SWM and the 19 Petitioners over the '762 patent, approximately when 20 were you retained? 21 A I can't answer that question. This matter 22 has been ongoing for a long period of time and I
18 1 question about paragraph 39? 2 Q What specific parallel District Court 3 litigation between Petitioners and Patent Owner are 4 you referring to in paragraph 39? 5 A Oh, I would have to go look up the numbers. 6 Presumably it's the one you've got on the screen. 7 Q And you actually here in your IPR 8 declaration reference declaration testimony from 9 Dr. Rodgers in that proceeding; right? 10 A I do. 11 Q And then in paragraph 40 you refer to your 12 responsive declaration from that proceeding; is that 13 right? 14 A Yes. 15 Q And in particular, you reference what we 16 see on our screen here on page 7, paragraph 35, "In 17 my opinion, the plain and ordinary meaning of collar 18 is a ring-shaped object"; right? 19 A Yes. 20 Q So you took into account this declaration 21 and the claim construction proceedings in forming 22 your opinions for this case?	20 1 don't know what period your question is related to. 2 Q Well, specifically April 11th, 2022, do you 3 recall how -- approximately how long before you 4 submitted this declaration you were engaged? 5 MR. STEIN: Objection. Form. 6 A No. 7 Q You don't know if it was a matter of weeks? 8 A No. 9 Q Months? 10 A I don't know. I've already indicated that 11 twice. 12 Q Could you have been retained five years 13 ago? 14 MR. STEIN: Objection. Asked and answered. 15 A My guess would be no, but I don't know. 16 I've told you that three times now. 17 Q It's unlikely you would have been retained 18 before the '762 patent itself was filed; right? 19 MR. STEIN: Objection. Form. 20 A That seems to make sense to me. But I told 21 you, for the fourth time, I don't know when I was 22 retained. That would take some research and I would

21 1 have to dig that up for you. 2 Q How often do you send invoices to SWM? 3 A If there is activity, on a monthly basis. 4 Q Do you keep record of those invoices? 5 A Yes. 6 Q You've got an accountant coming in today. 7 Do you have them looking at the accounting records 8 when your first invoice went out to SWM for the '762 9 matters? 10 MR. STEIN: Objection. Form. 11 A I don't know. I would have to go back and 12 look at the correspondence to answer your question. 13 Q But it's -- it is fair to say by April 11 14 of 2022 you were engaged; right? No later than that 15 date you were engaged in this matter; right? 16 A I can't answer that question. I don't 17 know. 18 Q You can't answer by the date that you 19 signed and submitted a declaration in the dispute 20 between SWM and DynaEnergetics for the '762 patent 21 whether you were engaged or not? 22 MR. STEIN: Objection. Form.	23 1 product, the Dyna's DS Gravity in that case? 2 MR. STEIN: Objection. Form. 3 A Again, I don't recall. I haven't looked at 4 that lately. It's not part of this matter that we're 5 here today for. So it's just a reference in my 6 declaration with regards to a couple of specific 7 items, not the entire thing. 8 Q What do you -- what are you saying is not 9 part of this matter? 10 MR. STEIN: Objection. Form. 11 A I don't understand the legal matters well 12 enough to be answering questions about that. But 13 it's my understanding that the District Court matter 14 is different than this IPR matter. 15 Q But you took into consideration things that 16 happened in that District Court matter for purposes 17 of this IPR; right? 18 MR. STEIN: Objection. Form. 19 A I'm sorry. Those items that I mentioned in 20 my report, yes. 21 Q I mean the District Court matter involves 22 the '762 patent; right?
22 1 A That's a different question. You asked 2 when I was engaged in this matter and that's a -- 3 it's my understanding anyway, that's a different 4 matter. 5 Q Fair to say by April 11 of 2022 you were 6 engaged by SWM in relation to the '762 patent? Is 7 that fair? 8 MR. STEIN: Objection. Form. 9 A I can't answer the question with regards to 10 this matter. I think it's fair to say in that 11 District Court matter I would have been engaged at 12 the point where I filed the report, some time before 13 that. 14 Q So at least as of April of 2022 you were 15 familiar with the '762 patent? 16 A Yes. 17 Q Were you involved in reviewing or helping 18 with the infringement contentions in that case? 19 MR. STEIN: Objection. Form. Scope. 20 A I don't recall. We could perhaps go 21 through the declaration and decide that. 22 Q Do you recall ever reviewing the accused	24 1 MR. STEIN: Objection to form. 2 A Yes, it does. 3 Q This IPR matter involves the '762 patent; 4 right? 5 A It does. 6 Q But it's not your testimony that they're 7 unrelated? 8 MR. STEIN: Objection. Form. 9 A I can't answer that question. It's a legal 10 question. My limited legal understanding is there 11 are two different matters, one is in a District Court 12 and one is in front of the PTAB, and that's all I 13 know. 14 Q Do you believe it's proper for you to 15 consider what happens in the District Court for 16 purposes of your forming your opinions in this IPR 17 matter? 18 MR. STEIN: Objection. Form. 19 A Yeah, I have no idea what you're talking 20 about "proper." Are you asking a legal question or 21 something with regards to ethics, or what is it 22 about?

25 1 Q As an -- as an expert in this field forming 2 expert opinions to offer in this case, do you believe 3 it is appropriate for you to consider what happens in 4 the District Court and the positions taken by the 5 parties and rulings made by the court in that case? 6 A If you're asking about legal issues, I 7 can't answer. 8 Q I'm asking about expert issues. Do you 9 believe as an expert it is appropriate to consider 10 the goings-on in a District Court case involving the 11 same patent at issue here in forming your opinions 12 for this case? 13 A I guess I don't understand your question. 14 How would I divorce what I know about the patent from 15 another matter when I consider it in this matter? 16 Q And I think that answers the question. 17 They are connected in some way. I'm not asking 18 related in a legal sense. But they are connected in 19 that what you learn about and form opinions on in the 20 District Court matter with respect to the '762 patent 21 are connected to your opinions in this case; is that 22 fair?	27 1 lawyers. 2 Q And so in the second declaration where you 3 did not repeat any legal principles, did you apply 4 the legal principles that you laid out in the first 5 declaration? 6 A I would expect that's the case, yes. But 7 you'll have to take me through specifically which 8 legal principle you're talking about that's in the 9 first declaration. 10 Q You did repeat some material; right? You 11 didn't eliminate all duplicative material. You did 12 repeat some of the things you had in the Exhibit 13 2001; right? 14 A I believe there are some duplications, yes. 15 Q So how did you determine what should be 16 repeated versus eliminated as duplicative? 17 A Just a judgment call. Nothing complicated. 18 Q Based on what? 19 A No need to repeat some things. 20 Q How did you determine what needed to be 21 repeated versus what you thought had no need to be 22 repeated?
26 1 MR. STEIN: Objection. Form. 2 A At least with regards to those that I cite 3 in my declaration for this matter, yes. 4 Q Why did you take the legal principles 5 section out of your second declaration, Exhibit 2007? 6 A Well, it didn't seem that there was any 7 need to repeat some things that were in the first 8 declaration since the second declaration referenced 9 the first. There's no need to repeat sections. I 10 think the background section and some other things 11 were included in the first that are simply referenced 12 in the second declaration. 13 Q Did you apply the same legal principles 14 that are set out in Exhibit 2001 for your second 15 declaration? 16 A The first declaration is referenced in my 17 second declaration, and those legal principles, my 18 background, the background of the field, I think 19 those sorts of things are just not duplicated in 20 mine. 21 With regards to questions about legal 22 principles, I just work on what I'm told by the	28 1 MR. STEIN: Objection. Form. 2 A I think I already answered that it was a 3 judgment call. I can't tell you anything more than 4 that. 5 Q Just based on your judgment? 6 MR. STEIN: Objection. Form. 7 A Well, I'm sure the lawyers had some input, 8 too. 9 Q Would you agree that threaded concentric 10 connections are the way tool strings are created? 11 MR. STEIN: Objection. Form. 12 A Yeah, that's way too broad. You're going 13 to have to be very specific. In general, no, that's 14 not true. 15 Q Would you agree that concentric electrical 16 connections are ubiquitous and well-known ways to 17 transfer electricity to downhole tools? 18 MR. STEIN: Objection. Scope. 19 A Yeah, in general, no. That's silly. There 20 are tools that have it. But to be ubiquitous, in my 21 understanding meaning it's everywhere, the answer is 22 no.

29 1 Q Bear with me just a moment. 2 I'm putting in the chat the next marked 3 exhibit. I think I mismarked it. Hold on. 4 MR. HEARD: It should be 1016; is that 5 right, Manita? 6 THE TECHNICIAN: That's right. 7 MR. HEARD: I'm redoing it. 8 (Exhibit 1016 marked for identification.) 9 BY MR. HEARD: 10 Q All right. Dr. Wooley, I'm putting on the 11 screen what I'm marking as Exhibit 1016. Are you 12 able to view this on your screen? It looks like 13 there's a caption. Can you see that? 14 MR. STEIN: Just before we proceed, 15 Preston, I'll object to the admission of this 16 exhibit. It has no relevance here. It hasn't been 17 authenticated, so... 18 MR. HEARD: Anything else? 19 MR. STEIN: That's it. 20 BY MR. HEARD: 21 Q Do you see this is a declaration from you 22 on behalf of -- do you recall submitting -- let me	31 1 indicated. Do you see that? 2 A Yes. 3 MR. STEIN: Objection. Form. Scope. 4 Q And that's your signature? 5 A It is. 6 Q So do you recall submitting a declaration 7 in the Wellmatics GR Energy case IPR six weeks ago? 8 MR. STEIN: Objection. Form. Scope. 9 A I recall submitting a declaration, yes. 10 Q And I just want to direct you to paragraph 11 25 in this declaration where you said a POSA -- is 12 that a person of skill in the art? 13 A Yes. 14 Q -- would have known at least the following. 15 Let me direct you to on page 9, you have a list of 16 bulleted items, and one of them is "Threaded 17 concentric connections are the way tool strings are 18 created." Do you see that? 19 MR. STEIN: Objection. Form. Scope. 20 A Can you enlarge that just a bit? Thank 21 you. Yes, that's what the words say. 22 Q Are those your words?
30 1 take a step back. 2 Do you recall being retained by Wellmatics 3 and GR Energy for a Patent Office proceeding? 4 A I do. 5 Q And in particular, one that's captioned 6 IPR2023-01149 involving the '122 patent. Does that 7 sound familiar? 8 A If you could blow that up for me. 9 Q Sure. How is that? 10 A That's better, thank you. 11 Yes, those numbers appear to be correct. 12 Q And the -- you're on the Petitioner side in 13 that case challenging -- asserting that the '122 14 patent is invalid? 15 MR. STEIN: Objection. Scope. 16 A I don't recall the details of that. It was 17 a while back. It's not something I've reviewed 18 lately. I would have to read through the declaration 19 to answer your question. 20 Q Let me just take you to the signature page, 21 make sure this -- and again, we're not going through 22 this at length. But on June 29th, 2023 is the date	32 1 MR. STEIN: Objection. Form. Scope. 2 A Yes, for that particular case for that 3 particular application. 4 Q Well, just that statement where you say a 5 person of skill in the art would have known that 6 "Threaded concentric connections are the way tool 7 strings are created," do you agree with that 8 statement? 9 MR. STEIN: Objection. Form. Scope. 10 Relevance. 11 A With respect to the specifics of that 12 declaration, yes, I do. 13 Q So you don't think that's a general 14 principle that is true in the industry? 15 MR. STEIN: Objection. Form. Scope. 16 Relevance. 17 A Depends on the application. 18 Q What's the application? 19 MR. STEIN: Objection. Form. 20 A In that particular case we were looking at 21 creating a string of pipe that's threaded together, 22 and in that sense that would be the case.

33 1 Q And you go on to say that "Concentric 2 electrical connections were ubiquitous and well known 3 ways to transfer electricity to downhole tools." Do 4 you see that? 5 A I do, yes. 6 Q And do you agree with that statement? 7 MR. STEIN: Objection. Form. Relevance. 8 A Sure. Again, for the specifics of that 9 declaration, I do, yes. 10 Q Well, here the statement is directed to 11 downhole tools. That's a fairly broad category, is 12 it not? 13 MR. STEIN: Objection. Mischaracterizing. 14 A That is intended for the context of that 15 declaration and for that I do -- for that context I 16 do agree with it. 17 Q Do you agree that a perforating gun is a 18 downhole tool? 19 MR. STEIN: Objection. Form. Scope. 20 A Some people would refer to that as a 21 downhole tool, yes. 22 Q Would you refer to it as a downhole tool?	35 1 MR. STEIN: Objection. Form. 2 A I'm familiar with the fact that I submitted 3 it six weeks ago. And I'm not about to answer 4 questions without having it in front of me because 5 I've done an awful lot of other things in six weeks, 6 and I just don't recall what's in it without having 7 it in front of me. Now, if you'll provide me a copy, 8 I would be happy to go through it with you. 9 Q You would agree with me that this statement 10 is general in nature -- directed to downhole tools; 11 correct? 12 MR. STEIN: Objection. Form. Scope. 13 Relevance. 14 A In the context of that declaration, that's 15 correct. 16 Q You didn't say that concentric electrical 17 connections are ubiquitous in well-known ways to 18 transfer electricity between -- with release tools. 19 MR. STEIN: Objection. Form. Scope. 20 Relevance. 21 A I don't know what else to offer you. I've 22 already answered your question.
34 1 A In most circumstances I would, yes. 2 Q The perforating guns described in the '762 3 patent, those are downhole tools; right? 4 MR. STEIN: Objection. Form. 5 A Again, I don't know. I would have to look 6 at this declaration to answer questions about that 7 declaration. I haven't looked at it in a while. I 8 really can't answer any questions about that 9 declaration without looking at it. Now, if you'll 10 provide me a copy, I would be happy to go through it. 11 Q Well, you submitted it much more recently 12 than your declarations in this case; right? 13 A I don't think that matters in the least 14 with respect to the answer I just gave you. 15 Q Well, you're saying you're not familiar 16 with it. Certainly you put this subject matter 17 together, an 86-page declaration, just six weeks ago. 18 You're saying you're not familiar with it in the 19 least? 20 A That's not what I said at all. You're 21 changing my words now. 22 Q Are you familiar with it?	36 1 Q You don't specify particular downhole tool 2 in the language that we're talking about on the 3 screen right now, do you? 4 A No. But it's in a declaration with regards 5 to specific tools in a specific application. 6 MR. STEIN: You might have missed my 7 objections there, but same objections as the last 8 question. 9 A Yes. And I was going to add in a 10 completely different application than what we're 11 dealing with in this matter. 12 Q But a perforating gun is a downhole tool; 13 right? 14 A Some people would call it that, yes, and 15 sometimes I do. 16 Q And a perforating gun is a pipe or a tube? 17 MR. STEIN: Objection. Form. 18 A No. 19 Q You disagree that it's a pipe or a tube? 20 A Yes, I disagree. 21 MR. STEIN: Objection. Form. 22 Q And why is that?

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37 1 A That's not what it is. 2 Q What is it? 3 A It's a tool for perforating casing and 4 cement and formation. 5 Q Would you agree it's tubular? 6 MR. STEIN: Objection. Form. 7 A There are components of it that are -- that 8 could be described as tubular. Depends on the 9 design. 10 Q And the outer casing is a pipe, is it not? 11 A No. 12 Q What is it? 13 A Often the outer casing is a cylinder that 14 is not casing tubing or drill pipe. It's an outer 15 housing on a perforating gun. 16 Q And made of what material? 17 A Could be made of multiple materials. 18 Usually it's a carbon steel. Sometimes it's a 19 corrosion-resistant alloy. 20 Q So the outer casing is typically a carbon 21 steel cylinder? 22 A The outer housing of a perforating gun is	39 1 A Yes. 2 Q In particular, it's "Downhole perforating 3 gun tube and components"; right? 4 A That's the title, yes. 5 Q So at least the inventors of the '762 6 patent call it a tube; right? 7 MR. STEIN: Objection. Form. 8 A They do, that's correct. 9 Q Do you disagree with their 10 characterization? 11 A They may title their patent any way they 12 like. I'm not sure what you're asking about me 13 agreeing with what they've chosen for the title. 14 Q I believe you said a perforating gun is not 15 a tube or a pipe; is that your testimony? 16 A No. You -- you'll have to go back and 17 check the questions that you asked. That's not what 18 I remember that you asked. I remember you asked if 19 it's pipe, and it's none of casing tubing or drill 20 pipe, which are typical pipes in an oil and gas well. 21 Q I asked, "And a perforating gun is a pipe 22 or a tube?" Your answer was "No." Do you recall
38 1 typically made out of carbon steel or a 2 corrosion-resistant alloy. 3 Q And the '762 patent describes its 4 perforating guns as downhole; right? 5 A I don't know. I would have to go look at 6 it. Would you like me to do that? 7 Q Sure. Just go to Claim 1. 8 A Specifically where in Claim 1 would you 9 like me to look? 10 Q The preamble. 11 A The preamble to the -- to Claim 1 of the 12 '762 is a downhole perforating gun system comprising. 13 Q So you would agree that it's described as a 14 downhole tool? 15 A No, it's not. It's described as a downhole 16 perforating gun system. 17 MR. STEIN: And objection, form, to the 18 question. 19 Q Is a perforating gun system a tool? 20 A Some people might refer to it as a tool. 21 Q Do you see the title of the '762 patent on 22 its cover page?	40 1 that? 2 A Yes. I would not consider it a pipe or a 3 tube. 4 Q But the title of the '762 patent is 5 "Downhole perforating gun tube and components"? 6 MR. STEIN: Objection. Form. 7 A That's the title, yes, you're correct. 8 Q So do you believe the title is inaccurately 9 stated? 10 MR. STEIN: Objection. Form. 11 A I don't know what that means. They're 12 welcome to have whatever title they want. 13 Q What would you call it? 14 A What would I call what? The title? 15 Q The system described in the '762 patent. 16 A It's a description of a perforating gun and 17 various components. 18 Q Do you believe that concentric electrical 19 connections were well known ways to transfer 20 electricity to perforating guns? 21 MR. STEIN: Objection. Form. Scope. 22 Relevance.

41 1 A Well, that's just a very broad question. 2 There are times where electrical connections are 3 used. I would not say -- I would not agree with your 4 statement. But there are times that they are used. 5 Q So is what you disagree with in my 6 statement "well known"? 7 MR. STEIN: Objection. Form. 8 A I'm sorry, you're going to have to re-ask 9 the whole question. 10 Q Sure. I think what you're saying is it was 11 known to transfer electricity to -- between 12 perforating guns; is that fair? 13 MR. STEIN: Objection. Mischaracterizing. 14 A Would you just restate that, please? 15 Q Are concentric electrical connections well 16 known for casing pipes? 17 MR. STEIN: Objection. Form. 18 A No. 19 Q What other downhole tools are concentric 20 electrical connections ubiquitous in well known ways 21 to transfer electricity for? 22 MR. STEIN: Objection. Form.	43 1 Q When we take a break, we'll get you a full 2 copy so that you have a chance to review several 3 parts of this. It will be relevant. 4 MR. STEIN: We would have to review that on 5 the record, so we can use up the time for that then. 6 MR. HEARD: That's fine. Why don't we go 7 ahead and take a quick break. 8 MR. STEIN: How long? 9 MR. HEARD: Five minutes. 10 MR. STEIN: Sure. 11 (Recess 10:58 a.m. - 11:05 a.m.) 12 BY MR. HEARD: 13 Q Dr. Wooley, what is a feedthrough in the 14 context of downhole tools? 15 MR. STEIN: Objection. Form. Scope. 16 A Well, that word has different meanings for 17 different people depending on applications. With 18 regards to perforating guns, it is often used to 19 describe a feed through a connection for propagating 20 electrical current. 21 Q Why does electrical current need to 22 propagate through a perforating gun string?
42 1 A Transferring electrical connections are -- 2 yeah, transferring electrical connections is known in 3 the industry for certain tools. They're not common 4 for casing that you asked about. 5 Q Was it known -- were concentric electrical 6 connections for transferring electricity known for 7 perforating guns? 8 MR. STEIN: Objection. Form. 9 A For some perforating guns, yes. 10 Q And specifically before the 2018 time 11 frame? 12 MR. STEIN: Objection. Form. 13 A Now you're trying to pin down something I 14 would have to do some research on. I would have to 15 look at it. 16 Q The patent that you're challenging in this 17 '122 patent in the Canatex proceeding is a 2016 18 priority date. Does that sound familiar to you? 19 MR. STEIN: Objection. Form. Relevance. 20 A No. 21 Q It doesn't sound familiar? 22 A No.	44 1 MR. STEIN: Objection. Form. Scope. 2 A It depends on the designs. They are all 3 different. But sometimes they're used as a means to 4 ignite the perforating gun. 5 Q Have you heard the term "ballistic 6 feedthrough" before? 7 A Yes. 8 Q How is -- is a ballistic feedthrough 9 different than an electrical feedthrough? 10 A It can be, yes. 11 Q In what way? 12 A The electrical signal sometimes can be used 13 to create a ballistic signal and those two may not be 14 the same. Depends on the design. 15 Q What is a -- using the word "signal," what 16 is the signal? 17 A I'm not sure what you're asking. 18 Q Well, what is a signal? What does it do? 19 What is a signal? 20 A It's -- it's something that activates a 21 mechanism typically on a perforating gun. 22 Q Could it be a digital signal?

45 1 A That's possible, yes. 2 Q Are there other forms of signals used in 3 perforating? 4 A Sure. 5 Q What are other ones that you're aware of? 6 MR. STEIN: Objection. Scope. 7 A I mean, it's certainly not all-inclusive, 8 but you could use an electrical signal or a pressure 9 signal. 10 Q Are you familiar with the term "select 11 fire"? 12 A I've heard that term, yes. 13 Q What does that mean? 14 A The times I've heard it used, it referred 15 to having the ability to select which perforating 16 guns are ignited at which time. 17 Q When did you first get involved in the 18 perforating gun industry? You have been in the 19 industry a long time, but specifically what was your 20 first exposure to perforating that you can remember? 21 A It would have been the 1960s. 22 Q And did select fire perforating exist at	47 1 way through the perforating gun stream? 2 MR. STEIN: Objection. Form. 3 A There could be, yes. 4 Q What applications -- let me take that back. 5 Are you aware of perforating gun systems 6 where the detonation cord does not run all the way 7 through the system? 8 MR. STEIN: Objection. Form. 9 A I don't know. I would have to go back and 10 look at some of the designs I've seen. It is 11 certainly possible. I mean, you don't have to have a 12 continuous cord. You could communicate through the 13 connections without having some continuous cord. 14 Q What are the -- continue through what 15 connections? 16 A I don't know what your question means. 17 Q Well -- 18 A You're now asking partial questions. I 19 don't understand. Would you ask the whole question? 20 Q Sure. I'm just following up on the idea 21 that you say you don't have to have a continuous 22 cord, you could communicate through the connections
46 1 that time? 2 A I don't think so. 3 Q When did that come along, just approximate 4 time frame? 5 A I don't recall. 6 Q Do you remember it happening? I mean, do 7 you remember select fire being introduced into the 8 industry? 9 A I remember at some point it was just 10 available. It was a feature that was made available. 11 Q Were there benefits to it over the previous 12 way of doing perforating? 13 A In some applications there would be, yes. 14 Q What are some of those methods? 15 A If you want to fire in some sort of 16 sequence, that would be a benefit to have that 17 ability. 18 Q What is a booster? 19 MR. STEIN: Objection. Form. 20 A Yeah, give me some context here. 21 Q Sure. In select fire systems is there a 22 detonation cord or a detonating cord running all the	48 1 without some continuous cords, and what are those 2 connections that you're referring to? 3 A The connections between perforating guns. 4 Q You're familiar with the term "tandem 5 subs"? 6 A I've heard that term used, yes. 7 Q Is that one example of a way in which you 8 connect perforating guns and pass -- 9 MR. STEIN: Objection. Form. Relevance. 10 Scope. 11 Q Is that -- a tandem sub, is that an example 12 of a way in which you connect perforating guns? 13 A Some people use tandem subs in their 14 perforating guns, some people use that terminology. 15 Others use similar devices with different 16 terminology. 17 Q What's some other terminology for that type 18 of device that you're familiar with? 19 MR. STEIN: Objection. Form. 20 A I don't know. I'm going to have to do some 21 research to see what other choices there are. 22 Something like a bulkhead is sometimes used.

49 1 Q Is the purpose of a bulkhead to pass that 2 electrical connection from between perforating guns? 3 A No, that's not the question you asked. You 4 asked if tandem subs were used to connect perforating 5 guns. You didn't say anything about electrical in 6 that question. And I told you one alternative is 7 bulkheads and bulkheads can be used also. 8 Q Are you familiar -- 9 A The purpose of a bulkhead and the purpose 10 of a tandem sub is not to pass electrical 11 connections. 12 Q So are you saying then that you're not 13 familiar with pressure bulkheads and tandem subs 14 being used to pass electrical signal between 15 perforating guns? 16 MR. STEIN: Objection. Form. 17 Mischaracterizes. 18 A No, I didn't say that at all. It's a whole 19 different question, can a tandem sub and a bulkhead 20 pass an electrical connection, and the answer to that 21 is yes. 22 Q In a select fire type of arrangement, how	51 1 A No, I don't recall the number. I would 2 have to look at something to refresh my memory. 3 Q You don't recall -- or do you recall being 4 engaged by SWM to challenge a patent held by 5 DynaEnergetics relating to the passage of an 6 electrical signal between perforating guns? 7 MR. STEIN: Objection. Form. Scope. 8 A I've done a number of projects dealing with 9 disputes between SWM and DynaEnergetics, and I don't 10 recall which one specifically you're asking me about. 11 If you could show me something on it, it might 12 refresh my memory. 13 Q If you had -- if the detonation cord ran 14 all the way through a perforating gun stream, you 15 could not individually control the sequence of 16 detonation; is that right? 17 MR. STEIN: Objection. Form. Scope. 18 A You're asking a design question, is it 19 possible, and the answer is sure. It depends on 20 what's running through the cord. 21 Q Are you familiar with a system that has a 22 det cord running all the way through which individual
50 1 does a person of skill, how does the industry cause 2 the detonation to continue from one gun to the next? 3 MR. STEIN: Objection. Foundation. 4 A Yeah, the question doesn't quite make sense 5 the way you asked it. The way a select fire works is 6 you're able to send a signal to an individual 7 perforating gun in a perforating gun stream so that 8 you can fire in a specified sequence, and the way 9 that's done is by having electrical connection to 10 each of the perforating guns. 11 Q And so typically, in your experience, how 12 does that, that electrical signal, get passed between 13 the perforating guns? 14 MR. STEIN: Objection. Form. 15 A Well, there's any number of ways to do 16 that. There is a number of patents that deal with 17 it. 18 Q In fact, we haven't talked about it today, 19 but you were involved in the -- another case between 20 DynaEnergetics and SWM involving the '697 patent. Do 21 you recall that? 22 MR. STEIN: Objection. Scope. Form.	52 1 perforating guns can be sequenced for detonation? 2 MR. STEIN: Objection. Form. 3 A I can't think of one. That's a question 4 that requires some research. 5 Q What is your understanding of an end cap? 6 A In general or in regard to anything 7 specific? 8 Q Yeah. So for this case we're talking about 9 perforating guns primarily; right? 10 A Yes. 11 Q And so in the context of perforating guns, 12 what is an end cap? 13 A It's a term that's sometimes used to refer 14 to the cap or the screwed end on a perforating gun. 15 They're not always threaded, but often they are. 16 Q And then does that end cap -- so you're 17 saying on the one side it's connected to -- sorry, I 18 don't want to -- you said screwed on the end of a 19 perforating gun. So the casing, the gun -- or the 20 gun body, what are you referring to? 21 A I don't understand your question. 22 Q Well, you said the cap is -- can be screwed

53 1 on -- screwed in to the perforating gun. What part 2 of the perforating gun are you referring to? 3 A Typically on the outer housing. It's 4 certainly possible to imagine other designs. But 5 typically something that's named an end cap would be 6 a cap that's screwed on to the end of the outer 7 housing. But there are other designs. They're not 8 all like that. 9 Q And just for clarity, what do you call the 10 thin-walled tube that carries the shaped charges in a 11 perforating gun, what's your typical nomenclature for 12 that? 13 MR. STEIN: Objection. Form. 14 A What are you referring to? Are you talking 15 about what's often called the outer housing? 16 Q Well, let's look at a figure to make sure 17 we're talking about the same thing. You have the 18 Exhibit 1001, the '762 patent, in front of you? 19 A Yes. 20 Q And you can just look at Figure 1. 21 A Okay. What's your question? 22 Q What do you call typically the thin-walled	55 1 Q That's external to the gun body or tube 2 body that we're looking at? 3 A Yes. 4 Q Flip all the way down to Figure 23, please, 5 and if you have the one with the legend on the bottom 6 right, it's page 41 of the exhibit. 7 A Okay. What's your question about Figure 8 23? 9 Q Well, this helps us orient the discussion a 10 little better just so we're on the same page with 11 terminology. When you referred to "outer housing" 12 just a moment ago, are you referring to item 706? 13 A I'll have to look. Give me a moment, see 14 what the patent refers to 706 is. 15 706 is the outer surface in the '762 16 patent. 17 Q And "outer casing," item 700, is the 18 terminology used in the claims, does that sound 19 familiar? 20 A It's an unfortunate choice of words, but 21 I've seen that used, yes. 22 Q Well, I would agree with you there. But do
54 1 tube that's carrying those shaped charges? 2 A First of all, there's no typical answer. 3 Every inventor on a patent has a different name for 4 them. I believe for the '762 patent item 12 was 5 called the tube body. 6 Q And that's really why I'm asking, to make 7 sure we're talking about the same thing, because the 8 '762 patent uses gun body, and you may be right, tube 9 body, whereas I've seen it -- have you seen it called 10 a charge tube before? 11 A I've heard that term, yes. 12 Q And just -- so what I'm getting at is what 13 do you typically call it? I've heard you use the 14 word like "outer housing" this morning. I just want 15 to make sure I know what you're referring to. 16 Is the outer housing the charge tube, tube 17 body, or do you mean the outer casing of the 18 perforating gun? 19 A When I said "outer housing," I was not 20 referring to the -- what the '762 refers to as the 21 tube body. I was talking about the outer usually 22 cylindrical member.	56 1 you see 700 generally pointing there on Figure 23 to 2 that outer casing, the outer -- what you called the 3 outer housing a moment ago? 4 A No, that's not what it's referring to. 5 Q What is it referring to? 6 A 700 is pointing generally at the entire 7 Figure 23. 8 Q Are you certain about that? 9 A The Figure 23 I'm looking at has 700 just 10 pointing generally in the direction of Figure 23, 11 same thing with 1000, neither one is attached to any 12 component. 13 Q 700 is indicated as the outer housing in 14 the '762 patent in the detailed description. Is it 15 your understanding that the outer housing refers to 16 everything we see on Figure 23? 17 MR. STEIN: Objection. Form. 18 A Could you show me where you're referring to 19 in the spec? 20 Q Sure. Same place you just found 706, 21 column 14 on page 58, for instance. 22 A Column 14, line 58 says second part of

57 1 compressed position in a bias back to the first, so 2 I'm not sure that's what you were pointing to. 3 Q Sorry. I said page 58, to get you 4 oriented, go up starting at line 51. 5 A Yes, 51 says, "In this embodiment, gun tube 6 10 is pressed into outer casing 700." Seems a little 7 inconsistent with Figure 23, but that's what it says. 8 Q So when you go back and look at Figure 23, 9 is it -- it still appears to you that 700 is 10 referring to the overall figure? 11 A Well, as you can see, 700 does not point to 12 anything specific. But based on the wording, I would 13 take that to mean the same thing as the outer surface 14 of 706. But there's a little inconsistency there 15 between the figure and the spec language. 16 Q Is the Figure 23 somewhat ambiguous then? 17 MR. STEIN: Objection. Form. 18 A No. I just think it's language issues. 19 Everybody has got their own words for everything. 20 Q Turn over to Figure 25, two pages beyond 21 that. 22 A What's your question?	59 1 Figure 23, to your understanding, are those end caps? 2 A Some people might use that terminology. I 3 think the '762 on column 14, line 24, indicates that 4 it's an end fitting. 5 Q Right. And so what is your understanding, 6 what's the difference between an end fitting and an 7 end cap, if any? 8 A That would depend on the application. 9 They're just words, names given to things, and those 10 things could be different in different applications. 11 Q Are you -- have you used the term "end 12 fitting" before, outside of this, this matter? 13 A I would expect so, yes. 14 Q How would you typically -- what do you 15 refer to when you refer to an end fitting? 16 A The kind of terminology in the '762 would 17 be the type of thing. But there are lots of other 18 applications where you might use the term "end 19 fitting." 20 Q And how about the word "end contact," does 21 that have a different meaning to you when you hear 22 the word "end contact"?
58 1 Q Do you see the reference numeral 700 here 2 pointing to the outer casing again? 3 A Yes. As you can see, the distinction 4 between 23 and 25, 25 is much more specific in terms 5 of where the arrow points. 6 Q And is it your understanding that the outer 7 casing refers to the cylindrical tube or pipe that's 8 holding the perforating gun system? 9 A One moment. Yes. 10 Q So going back to the end cap question, 11 what -- I believe you were saying your -- one 12 understanding you have of end cap is an item that 13 would thread on to the end of the outer casing that 14 we see in Figure 25? 15 A Sometimes that terminology is used, yes. 16 Q Okay. Going back to Figure 23, and then 17 focusing on the internal, so what the '762 patent 18 calls the gun body or sometimes known as the charge 19 tube, are you aware of end caps being used on the end 20 of the gun body? 21 A That's possible. 22 Q Are the items 16 and 20 that we see on	60 1 A Different than "end fitting" and "end cap," 2 is that what you're asking? 3 Q Yes. 4 A Could be, yes. 5 Q In what way? 6 A I don't know what. You just made that term 7 up. Tell me, is it in the '762 somewhere you want to 8 look at? 9 Q Sure. Let's go to column 9, and starting 10 at line 9, that paragraph, there's a discussion about 11 end contacts, and let me know when you see that. 12 A Yes, I've got it. 13 Q So in this context, in the '762 patent, 14 what do you understand "end contact" to be? 15 A It's item 22. 16 Q And how is that -- how is it distinct from 17 an end fitting? 18 A I don't know. I would have to analyze that 19 a bit. You want me to take the time to do that? 20 Q No. I'm -- just sitting here, having 21 prepared for the deposition, you're not -- I'm not 22 asking for you to study up on it, but just that

61 1 doesn't mean anything to you, a difference between an 2 end cap and an end contact? 3 MR. STEIN: Objection. Form. 4 A I did not prepare that specific question. 5 You didn't give me advance notice that's what you 6 wanted to ask. 7 Q Look at line 17, do you see a sentence 8 starting "Known end caps"? 9 A I do, yes. 10 Q So when you read that sentence, "Known end 11 caps do not compress or may compress only slightly, 12 e.g., about one-eighth inch or less," what do you 13 understand that to mean? 14 A Well, if you'll back up to line 13, it 15 says, "The distance between the first position and 16 the second position is at least 0.150 inches, or at 17 least three-eighths of an inch, or at least a half an 18 inch, or at least five-eighths of an inch, or at 19 least three-quarters of an inch, or at least one 20 inch, or any amount from 0.150 inches to one inch," 21 and it's talking about different positions as you 22 have end caps applied. Generally it says in the line	63 1 Q Why not? 2 A Well, it's a matter of how they're applied. 3 The inventor is indeed talking about the end caps 4 that they know about compress an eighth of an inch or 5 less, and they're describing an invention -- more 6 travel in the invention. 7 Q And do you see that immediately after that 8 in lines 18 to 21 they're describing the advantage of 9 that greater compression being a better reliability 10 in maintaining an electrical connection? Do you see 11 that? 12 A Yes. 13 Q So is it your understanding that what's 14 being described here in the '762 patent is that the 15 end contact that's biased away from the end of the 16 support because it can compress more than end caps 17 that came beforehand, you get a more reliable 18 electrical connection? 19 A Yes, that's what they believe the invention 20 provides. 21 Q And so what they're describing here is that 22 there was a -- there were end caps and contacts that
62 1 that you referred to, 17 there, "Known end caps do 2 not compress, or may compress only slightly." So 3 it's a matter of how the end cap is applied and what 4 the specifics of the application are. They could be 5 biased with a spring. They could have some 6 de-foamable material in them. 7 Q And so is this saying that there were end 8 contacts that did that before, just not -- they 9 didn't compress as much as the end contacts described 10 here in the '762 patent? 11 A I don't understand your question. What do 12 you mean by "before"? 13 Q Well, it's saying "known end caps." Do you 14 understand that to mean end caps that came before the 15 '762? 16 A Yes, that's what I would understand that to 17 mean. 18 Q And the named inventors here are, would you 19 agree, describing how their end contacts and end caps 20 differ from ones that were known beforehand. Is that 21 your understanding? 22 A Not necessarily.	64 1 came before that enabled that electrical connection; 2 it just in their mind wasn't as reliable? 3 A I believe that's correct, yes. 4 MR. STEIN: Preston, can you hear me? 5 MR. HEARD: Yeah. 6 MR. STEIN: Zoom has frozen on me. So if 7 we can just go off the record for like a minute and a 8 half, I have to sort of force it to quit and then 9 come back. 10 MR. HEARD: Yeah, you're frozen. 11 MR. STEIN: Yeah. Just give me a minute 12 off the record. I'll be right back. 13 (Recess 11:38 a.m. - 11:40 a.m.) 14 BY MR. HEARD: 15 Q Dr. Wooley, you understand that SWM 16 officially disclaimed 10 of the claims that were 17 originally challenged in the petition in this IPR? 18 A I don't know that. I know there were some 19 changes. 20 Q So did you form -- let's take Claim 1, for 21 example, we looked at Claim 1 a moment ago, do you 22 have an understanding that it was challenged in the

Conducted on August 3, 2023

65 1 petition but then disclaimed by SWM in connection 2 with the preliminary response? 3 A I don't know about that. That's legal 4 proceedings. I've heard something about it. It's 5 not complete news. 6 Q Let's go to Exhibit 2001, your first 7 declaration, and on page 2 you have a footnote 1 8 about the subject. 9 A Which page? 10 Q Page 2 of your Exhibit 2001. 11 A Okay. I see that. What's your question? 12 Q Just that understanding that you lay out in 13 the footnote, does that refresh you on which 14 particular claims were originally challenged but then 15 disclaimed by SWM? 16 A Yeah, at that point in time, that describes 17 what I understood at that time. 18 Q And you conclude, "Accordingly, I've only 19 considered the validity of," and you lay out the 20 numbers, "3, 4, 7, 16, 24 to 26, 29, 30, 34 to 36"; 21 is that right? 22 A Yes.	67 1 Q And you don't recall. Okay. 2 Can you go to paragraph 19 of that same 3 exhibit. 4 A What's your question? 5 Q You lay out there what you call five basic 6 claim elements. Do you see that? 7 A Yes. 8 Q And 1, 2 and 3, the outer casing, the gun 9 body 12, and the one or more explosive charges 122, 10 would you agree those are common components of a 11 perforating gun system? 12 MR. STEIN: Objection. Form. 13 A I would agree that most perforating guns 14 have those three components. 15 Q And 4 and 5, the bearing assembly and one 16 or more weights, those are components used in an 17 internally orienting perforating gun system; right? 18 MR. STEIN: Objection. Form. 19 A They are used for that purpose, yes. 20 Q Have you heard of the eccentric weight 21 principle? 22 A Sure, I've heard the terminology. I'm not
66 1 Q So did -- at any time did you form an 2 opinion about the validity of the disclaimed claims 3 that you list there, 1 going through 33? 4 A A little hard to answer at any time. 5 Perhaps, but I would expect that I just focused on 6 what I was asked to look at. 7 Q Well, I asked more specifically did you 8 look at Claim 1, for instance, and determine that it 9 was invalid and you could not form an opinion that 10 would challenge -- that would refute what was 11 presented in the petition? 12 MR. STEIN: Objection. Form. 13 Mischaracterizing. 14 A Yeah, I don't think that's what this 15 footnote says. I don't think I considered. It 16 clearly says I have only considered the validities 17 of, and 1 is not in the list. 18 Q Well, I'm just going off you said it's hard 19 to answer at any time. So I asked had you at any 20 time considered the validity of the disclaimed 21 claims? 22 A I don't recall.	68 1 sure specifically what you're asking about. 2 Q Well, how were -- how do you use a weight 3 to affect rotation in a perforating gun? 4 A The weight is acted on by gravity and that 5 affects the rotation. 6 Q And is one way of doing that putting the 7 weight at a place in the gun body that causes a 8 disparity in the amount of weight in the tube with 9 respect to gravity? 10 A I don't understand that question. 11 Q Does the placement of the weight in the gun 12 body affect the rotation? 13 A If the weight is free to move, gravity will 14 act on it at all times. So where you place it at the 15 surface probably doesn't affect things a lot. Now, 16 if it's not free to move, if there were a design that 17 locked it in place until you got it where you wanted 18 it, perhaps that might be true. 19 Q Are perforating gun components typically 20 axisymmetrical? 21 MR. STEIN: Objection. Form. 22 A You and I are going to have to talk about

69 1 axisymmetric. I don't think we're going to 2 communicate properly on that. Generally, perforating 3 guns internally have components that are not 4 axisymmetric. 5 Q Are they typically cylindrical? 6 A Not the components inside. Sometimes the 7 outer housing is. 8 Q And how about the gun body? 9 A Depends on the design. Generally, 10 partially is cylindrical, parts of it are, portions 11 of it are. 12 Q How do you determine the longitudinal axis 13 of a gun body? 14 A If it's cylindrical, you would use the 15 center line of the cylinder. 16 Q And so if it's cylindrical then, and the 17 weight is placed off of that longitudinal axis, will 18 it affect rotation? 19 A I'm not sure how all those are related. 20 The rotation is affected by gravity acting on the 21 weight. 22 Q And if the weight was placed, for example,	71 1 know how to read and understand CAD models and 2 machine drawings? 3 A I would guess some do. 4 Q Is that -- is it important for designing, 5 building, and analyzing downhole tools to be able to 6 do so? 7 A For designing, not necessarily for 8 designing a wellbore. But if you want to design a 9 tool, I would think CAD drawings would be helpful. 10 Q Have you ever built a downhole tool? 11 A Yes. 12 Q Have you ever assembled -- I'm sorry -- 13 A We got to be careful with the words. 14 Generally, there's not one person that builds a tool, 15 it's done with a team of people, and then there are 16 machinists to cut the tool, and there's usually other 17 folks that assemble them. I have at some point done 18 all of the above, but typically would be involved in 19 -- when you say built a tool, typically I would be 20 involved in the design aspects, there would be shop 21 people for assembly and machinists that would do the 22 machine work.
70 1 only on the -- along the longitudinal axis in a 2 symmetrical fashion, what would happen? 3 A Depends on the design. If the weight is 4 free to move, it would move downward with gravity. 5 Q If it was not free to move, if it was 6 fixed, the weight was fixed on the longitudinal axis 7 within a cylindrical gun body, would there be 8 rotation downhole? 9 A Well, depending on the shape, it's possible 10 you could get a little bit of rotation, but it would 11 not move off the axis if it's indeed attached to the 12 axis. 13 Q Did you ever get trained in 3D CAD? 14 A No, I've never had a class, if that's your 15 question. Now, for what it's worth, I preceded CAD 16 drawings, I had drawing classes. But in terms of a 17 software, that was self-taught. 18 Q So you have self-taught on how to use 3D 19 CAD programs? 20 A On some. There are multiple versions of 21 it. 22 Q Do mechanical and/or petroleum engineers	72 1 Q And have you designed a downhole tool? 2 A Yes. 3 Q Would that include a perforating gun or 4 perforating gun system? 5 A I have not worked for a company like 6 Schlumberger that that's their primary business. 7 I've been responsible for that design. But as a 8 consultant, I have helped oil field service companies 9 with their designs and evaluating designs. And as an 10 oil and gas operating engineer, I have evaluated 11 designs for use in specific well applications and 12 made selections. 13 Q And that answer, were you directing it to 14 perforating guns or perforating gun systems? 15 A Yes, and a lot of other downhole tools, I 16 might add. 17 Q And in downhole tools, is it common to 18 assume that a cylindrical part in a downhole tool 19 drawing is continuous if no indication is given to 20 the contrary? 21 A Oh, you're being way too general. You 22 would have to show me the CAD drawing. I can't

73 1 assume what you're imagining. 2 Q Are you familiar with reviewing machine 3 drawings that relate to cylindrical downhole tools? 4 A Yes. 5 Q And are you familiar with CAD drawings or 6 machine drawings that use partial views, partial 7 cutaway views? 8 A Yes. 9 Q Including quarter cutaway views? 10 A Well, one may select whatever type of 11 cross-section they want to use. 12 Q What's the intent of a cutaway view? Why 13 does a draftsman use a cutaway view? 14 A To get a better understanding of what the 15 internal components are. 16 Q In mechanical petroleum engineering is it 17 common to install a radial bearing in a structure 18 that holds the outer race? 19 MR. STEIN: Objection. Foundation. Form. 20 A Depends entirely on the design. Sometimes 21 yes; sometimes no. And are you talking about me or 22 some generic petroleum engineer?	75 1 A Depends on the design, what do you need. 2 You can buy them that have an outer race. 3 Q And when would that be useful? 4 A Well, depends on the design again. If 5 you – if you have the roller bearings, you need 6 something to contain them, and the inner and outer 7 races are typically what you use but not always. 8 Q What else could you use to contain the 9 roller bearings? 10 A Any other component that it might be 11 inserted. We're talking – you're asking what's 12 possible here and there's lots of possibilities. 13 Q Can you house a radial bearing in a 14 bushing? 15 A Could you? Yes. 16 Q And could you house a radial bearing in a 17 collar? 18 A Is that possible? Yes. 19 Q What's the difference between a bushing and 20 a collar as used to house a radial bearing? 21 MR. STEIN: Objection. Form. 22 A Those are just words, and it depends on the
74 1 Q We'll be specific with you. Have you ever 2 designed or installed a radial bearing before? 3 A Again, you got to be careful of the words. 4 Yes, I have. Typically, if I was involved in a 5 design that involved a bearing, I would have somebody 6 in the shop for assembly and somebody else doing the 7 machine, or the bearings might be selected off of a 8 catalog or a shelf. I'm not sure what you're asking. 9 Are you asking did I do the bearing design, select 10 the size of the bearing? 11 Q Either one. 12 A Well, most bearings are available in stock 13 and it's usually just a matter of selecting one 14 that's appropriate for your particular design. But, 15 I mean, it's certainly in the realm of my mechanical 16 design experience to actually select the materials 17 and the dimensions of a ball bearing, for example. 18 Q And a ball bearing, like you said, those 19 are typically available just off the shelf? 20 A Yes. 21 Q And in those off-the-shelf applications, is 22 there an outer race?	76 1 particular application and who the people are you're 2 talking to. Some people would use those terms. 3 Others would use different terms. 4 Q Are bushings or collars that house radial 5 bearings typically ring-shaped? 6 A Often they are. Not always. 7 Q Does having a fully ring-shaped bushing or 8 collar help bear the load of the radial bearing? 9 MR. STEIN: Objection. Form. Foundation. 10 A Would you say that again, please, just 11 repeat. 12 Q Yeah. Is it important to support the 13 radial bearing all the way around its circumference? 14 A Depends on the application. You're talking 15 about a rotating shaft, probably, yeah, for example, 16 on an electric motor. 17 Q What is a bearing seat? 18 A It is a place where a bearing makes 19 contact. 20 Q Is it -- is the function of a bearing seat 21 to position a bearing in a structure? 22 A One of the things it does is holds it in

77 1 place, yes. 2 Q Is a -- so is a bearing seat typically a 3 stand-alone component that you hold in your hand or 4 separately install? 5 MR. STEIN: Objection. Form. 6 A That's possible, yes. 7 Q Are you familiar with such a bearing seat? 8 A Yes. 9 Q When have you used one? 10 A Oh, I can't count the times. The tools 11 that have bearings in them are a long list. 12 Q Have you -- 13 A I don't know what you're asking. 14 Q Have you encountered a bearing seat that's 15 a feature of a larger structure? 16 A Yes. Most are. 17 Q And how are those -- can you describe one 18 that you've encountered that is a feature of a larger 19 structure? 20 A Sure. A diesel engine, electric generating 21 gas turbine, a hydraulic pump for a drilling pump, 22 hydraulic fracturing pump. The list goes on and on	79 1 THE WITNESS: Sorry, Alex, I'll try to slow 2 down with my answers. 3 (Reporter clarification.) 4 A I said could be, yes. 5 Q The Yonghong reference that we've talked 6 about and that you discuss in your testimony, does 7 that disclose a charge tube assembly that can rotate 8 continuously? 9 A It has a charge tube assembly in it. It 10 certainly does not rotate continuously like the 11 examples you have been asking me about, rotating 12 shafts and engines and pumps. 13 Q So you believe the Yonghong reference, the 14 charge tube assembly does not or cannot rotate 15 continuously? 16 A It does not. If you're asking is it 17 possible, that's not its intention. I doubt that it 18 would. But I would have to look at the design 19 possibility. 20 Q And just remind me, you don't have a copy 21 of Yonghong in front of you; is that right? 22 A That's correct.
78 1 for the oil field. 2 Q And just use that last one as an example, 3 hydraulic pump for a drilling pump, what 4 specifically -- where is the bearing seat? What's it 5 a feature of? 6 MR. STEIN: Objection. Form. 7 A As you can imagine, engines and pumps in 8 the oil field have rotating parts and the shaft often 9 has a bearing. 10 Q And so where, then, is the bearing seat in 11 relation to the shaft in the bearing? 12 MR. STEIN: Objection. Form. 13 A We're talking very hypothetically and 14 generically here. For rotating shafts, typically 15 they are supported by bearings, usually at each end 16 of the shaft, perhaps in the middle, but could be a 17 number of designs. 18 Q And are those bearings then seated in a 19 bearing seat, is that what helps them position within 20 the shaft or within the structure? 21 (Simultaneous speaking.) 22 MR. STEIN: Objection. Form.	80 1 Q I'll pull it up for us. 2 MR. STEIN: I believe he does have excerpts 3 in the declarations if you wanted to use them. 4 MR. HEARD: Thank you. 5 Q So I've put in the chat Exhibit 1004, so 6 it's previously marked, and now we'll share the 7 screen. 8 Are you able to view that, Dr. Wooley? 9 A What's your question? 10 Q Are you able to see the -- 11 A Oh, yes, I can see it. 12 Q And this is you can see Exhibit 1004 in the 13 bottom right, and this is a -- this is the Yonghong 14 reference, I'll represent to you that both the 15 original and the translation. Have you seen this 16 before? 17 A Yes. 18 Q And you make a comment in your declaration 19 about the translation. You don't speak Chinese or 20 read Chinese, I take it? 21 A That's correct. 22 Q You didn't go to a translator and get an

81 1 alternative translation or attempt to determine any 2 inaccuracies in the translation, did you? 3 A I relied on the translation that was 4 provided. 5 Q And you're not aware of any other 6 alternative translations? 7 A I'm not, no. 8 Q And you're not -- you haven't been 9 presented with any evidence that it's inaccurate, the 10 translation; is that right? 11 MR. STEIN: Objection. Form. 12 A I don't -- well, that's a two-way street. 13 I don't have any confirmation that it's correct. I 14 just take it at face value. There certainly are some 15 inconsistencies in it, but I don't know if that's 16 related to translation or to the original writing. 17 Q What inconsistencies are you referring to? 18 A I don't have a list for you, but we'll see 19 them as we go through it. Go ahead and ask your 20 questions. 21 Q Sure. Did you read the patent? 22 A I read the translation of the patent, sure.	83 1 Q You understood that there are 2 counterweights, as described placed throughout the 3 charge tube assembly, that would allow gravity to 4 enact rotation downhole; is that fair? 5 A I think that's accurate, yes. 6 Q I direct you to page 9 -- excuse me. So 7 it's page 9 by the legend, page 8 on the original 8 PDF. It's towards the end of the specification. I 9 want you to read the sentence I've highlighted now, 10 if you can. 11 A Can you enlarge that a bit, please? 12 Q Sure. Don't know that I can get it all on 13 one screen, but we'll try. How's that? 14 A Yeah, I think I can read it. Go ahead. 15 What's your question? 16 Q Do you see Yonghong describes the claim 17 system as "With such design, the charge tube assembly 18 in each perforating gun can rotate continuously to 19 adjust with the change of wellbore trajectory"? 20 A Yes, that's what it says. 21 Q So Yonghong does describe a system in which 22 the charge tube assembly can rotate continuously?
82 1 Q And generally, what's it describe, does the 2 Yonghong reference describe? 3 A Well, if you'll blow that up for me. The 4 title there is the "Perforating Gun for Horizontal 5 Well." 6 Q Anything else that you recall it 7 discussing? 8 A Sure, there's lots of discussion in it. 9 You want to go through that? 10 Q So it's a perforating gun; you'll agree 11 with that? 12 A Yes. 13 Q Used downhole? 14 A That's where perforating guns are used, 15 downhole. 16 Q And there's an internal rotation aspect to 17 the Yonghong reference -- perforating gun system; is 18 that right? 19 A Yes. 20 Q And it in particular talks about the 21 eccentric weight principle; is that right? 22 A Yes.	84 1 MR. STEIN: Objection. Form. 2 A Those are two different questions. That's 3 what the words say. I would doubt that it's 4 continuous rotation. That's not what -- that's not 5 how this design works. 6 Q Despite the plain words from Yonghong 7 itself? 8 MR. STEIN: Objection. Form. 9 A I have a pretty good understanding of how 10 this works, despite some of the comments that have 11 been made, and it is not intended to be a continuous 12 rotation such as the shafts that we were talking 13 about earlier. 14 Q I thought your -- in your declaration you 15 say you cannot understand Yonghong. 16 A It's very ambiguous. Between the language 17 problem and inconsistencies in the drawings and the 18 specification, there are enough inconsistencies you 19 cannot unambiguously decide what it means, certainly 20 not from a standpoint of disclosing elements for 21 anticipation. 22 Q So are you able to understand the system in

85 1 Yonghong? 2 A I have an idea what it's trying to do. 3 Q Would you agree that you do not fully 4 understand Yonghong? 5 A No, I think I fully understand it. Again, 6 despite some comments that have been made, it's clear 7 to me what Yonghong is trying to do, but it's 8 ambiguous in terms of its disclosure. There are 9 inconsistencies and language problems and drawing 10 issues that are pointed out in my report. If you 11 would like, we can go through them. 12 Q Well, pull up your report and go to 13 paragraph 46. This is Exhibit 2007, your second 14 report. 15 A Paragraph 26 you said? 16 Q 46. 17 A Oh, I'm sorry, I misunderstood. My fault. 18 Okay. I'm there. What's your question? 19 Q At the last sentence you say, "I do not 20 fully understand the ambiguous disclosure of this 21 reference"; right? 22 A Paragraph 46 says, "I am not suggesting	87 1 A Yes, I'm basing that on the legal standard 2 as I understand it as described by the lawyers. 3 Q But I was pointing you to the last sentence 4 where you say, "I do not fully understand the 5 ambiguous disclosure of this reference." Is that 6 what you wrote? 7 A Yes, that's what I wrote, the ambiguous 8 nature of it prevents anyone from fully understanding 9 what's disclosed. 10 Q But just a moment ago you said: I fully 11 understand this reference. So I'm trying to 12 understand do you fully understand it or you don't? 13 A Yeah, you're mischaracterizing what I said. 14 That's not at all what I said. I said I understand 15 what it's intending to do. I do not understand the 16 ambiguous nature of it. There are inconsistencies 17 that I point out in the report between the spec and 18 the drawing, and the drawing is lacking in terms of 19 what it discloses, it needs additional drawings and 20 additional words to clearly disclose. 21 Q There's nothing ambiguous about the text, 22 the sentence that you see on your screen, that the
86 1 that the Yonghong reference clearly discloses a 2 device which is materially different from the claims 3 of the '762 patent. At the same time, I do not 4 believe it can reasonably be said that this reference 5 unambiguously discloses to one of ordinary skill in 6 the art a device that is the same as the claimed 7 invention," which is the point I just made a moment 8 ago. 9 Q Let me ask you about that. Where do you 10 get the understanding that for anticipation the 11 device must be that bold underlined portion that you 12 have, the same as the claimed invention, where does 13 that come from? 14 A Well, clearly, I'm not a lawyer, so I don't 15 know what the rules are. But it's my understanding 16 that anticipation requires that a prior art disclose 17 all of the elements of a claim. And I don't think -- 18 and clearly disclose them. It's not something you 19 can imagine maybe it could occur. 20 Q But specifically that, those words, "the 21 same as the claimed invention," are you referring to 22 a specific legal standard there?	88 1 charge tube assembly can rotate continuously, is 2 there? 3 MR. STEIN: Objection. Form. 4 A Yes, I believe there is, because I do not 5 believe that type of invention is intended and 6 probably cannot rotate continuously. It's not an 7 electric motor or a shaft that runs continuously. 8 Q So what you're saying is you have 9 interpreted what you believe you can interpret from 10 the reference, it's at odds with the words on our 11 screen, and so you discount the plain words on the 12 screen? 13 MR. STEIN: Objection. Form. 14 Mischaracterizing. 15 A I don't understand that question. 16 Q Well, it sounds like -- go back to -- 17 because you said I'm mischaracterizing, but I'm 18 reading your words, you say, "I do not fully 19 understand the ambiguous disclosure of this 20 reference." And I want to make sure is that the 21 case? Or do you stand by your statement that you do 22 not fully understand it?

89 1 A Well, you mischaracterized again, you cut 2 the sentence short. The reason fully understanding 3 is not possible is because it's ambiguous. You have 4 to include the word "ambiguous" in that sentence. 5 And that's sort of the definition of ambiguous, in my 6 mind. Ambiguous means you cannot clearly decide 7 what's intended by both the words and the drawings. 8 And I imagine you might speculate as to what it might 9 be, but it's not clearly disclosed. 10 Q And what you are -- what you have then 11 concluded as the intention of the invention or how it 12 would work is more important, in your opinion, than 13 the description that the charge tube assembly in each 14 perforating gun can rotate continuously to adjust 15 with the change of wellbore trajectory; is that 16 right? 17 A I don't know what you mean by more 18 important. It's my job as a person of ordinary skill 19 to interpret the language and the drawings. 20 Q You said that you think this is possible, 21 that what we're reading from the inventors themselves 22 describing the invention, you don't think that's what	91 1 It's a perforating gun. It's not a rotating shaft 2 and an electric motor. 3 Q So your understanding of can rotate 4 continuously, is it a shaft that is powered and 5 doesn't stop, so continuously meaning does not -- 6 there is no ceasing to the rotation? 7 A That's what the word means. 8 Q It's not your understanding that this 9 refers to free rotation, not limited, like in the 10 Hardesty reference? 11 A That's not what it says. Now you're 12 putting words into the patent. 13 Q The plain words say "to adjust with the 14 change of wellbore trajectory." You understand that 15 the wellbore trajectory changes in a formation in a 16 wellbore; right? 17 A Yes. 18 Q So you wouldn't understand that to mean 19 based on the trajectory, there is rotation allowed to 20 get the desired orientation? 21 A I think you're pointing out exactly my 22 point, and that is this language is ambiguous.
90 1 was intended? 2 MR. STEIN: Just a moment, Preston. I 3 think Dr. Wooley wasn't finished answering. It would 4 probably be good if he finished with his answer. 5 THE WITNESS: Yeah, Alex, correct, I didn't 6 finish what I was trying to answer earlier. 7 A But to answer your new question, it's the 8 same as the question you asked multiple times before, 9 and that is the word "continuously," I do not think 10 it's appropriate for that sentence. I do not believe 11 that's the intent of this invention is to have a 12 continuously rotating shaft. And I don't know if 13 it's part of the ambiguous nature of the patent or if 14 it's a language interpretation problem. 15 But as a person of ordinary skill, I 16 understand what the inventor is trying to describe 17 and I do not believe it's a continuously rotating 18 shaft. 19 Q What in the reference can you point to that 20 indicates that the rotation is intended to be 21 limited? 22 A Just the application of the invention.	92 1 Rotating continuously means something like a shaft in 2 an engine or a motor or a pump, and the ambiguity is 3 what you're pointing out in your question. 4 Q Would it make any sense for -- have you 5 ever encountered a perforating gun system that is 6 intended to have the charge tube assembly rotate 7 continuously like a shaft in a motor? 8 A No. 9 Q So it's not reasonable for a person of 10 skill to read that language and believe that it must 11 continuously without stopping rotate -- 12 MR. STEIN: Objection. 13 A That's precisely my point, it's ambiguous. 14 Q You actually don't treat -- give any 15 treatment to this language at all in your 16 declaration, do you? 17 A I don't know. I would have to look. Would 18 you like me to look? 19 Q You can look. But would you be surprised 20 that the fact that this sentence in this disclosure 21 from the specification does not appear in your 22 declaration?

93 1 A I don't know. I would have to look. Would 2 you like me to? 3 Q We can take that up later. You don't need 4 to do it now. 5 Do you have any belief that the system in 6 Yonghong is -- has any pins or any structure that 7 limits the rotation of the charge tube assembly? 8 A I don't know what you mean by "limits." 9 Q You're familiar with the Hardesty reference 10 that has a mechanism for limiting the rotation? 11 A I believe it does, yes. 12 Q And you're not aware of any such structure 13 to limit rotation in Yonghong; right? 14 A I would have to look. I haven't looked for 15 that in Yonghong. Perhaps there's something that 16 would stop it from rotating. It's certainly not 17 intended to rotate continuously. 18 Q But putting your interpretation of 19 continuously aside, you would understand that if it 20 is to rotate with the change of wellbore trajectory, 21 that it is like the internally orienting systems that 22 we have been talking about this morning that have a	95 1 MR. STEIN: That's fine. 2 (Recess 12:24 p.m. - 12:35 p.m.) 3 BY MR. HEARD: 4 Q Dr. Wooley, you offered some opinions with 5 respect to claim construction in this proceeding, do 6 you recall that, in the IPR? 7 A In my report you're referring to? 8 Q Yes. 9 A Where in my report are you referring to? 10 Q Yeah, go to paragraph 43, starting at 43 in 11 Exhibit 2001. So your first declaration. 12 A What's your question about paragraph 43? 13 Q Well, I was asking do you remember offering 14 opinions with respect to claim construction, you 15 asked me to point you to something, so I'm pointing 16 you to this paragraph and what follows. You have 17 some opinions that lay out your view on how terms in 18 the '762 patent should be construed; is that fair? 19 A Yeah, those, I think that's fair. 20 Q And starting at 43, going to the end of 21 that section, paragraph 50, you're talking about your 22 opinion that various claimed elements must be
94 1 weight to orient the shaped charges in a desired 2 direction; right? 3 A I believe it's trying to do that, yes. 4 Q And sitting here right now, you can't think 5 of any mechanism that's intended to limit that 6 rotation? 7 A I have not evaluated that. I would have to 8 look at it. 9 Q In a perforating gun system that's 10 deployed, downhole gravity is always acting on the 11 system; right? 12 A Gravity is always acting on anything, 13 including perforating guns downhole. 14 Q In a weighted system, in an internally 15 orienting system that uses a weight, is gravity 16 always acting on that weight? 17 A Yes. 18 Q And gravity is a constant or a continuous 19 force; right? 20 A Yes, it's a constant force. 21 MR. HEARD: Let's -- I need a short break. 22 Can we go off the record?	96 1 structurally distinct components; is that right? 2 A Yes. 3 Q And in particular, you're talking about gun 4 body collar, support member, and one or more weights, 5 those specific terms; is that right? 6 A Yes. 7 Q And your view is those four must be 8 structurally distinct components; they can't be part 9 of one integral component? 10 A That's correct. 11 Q And that -- so you put that view in the 12 first declaration and then again repeated it in the 13 2007. So flip over to 2007, paragraph -- starting at 14 paragraph 29 through the end of that section that 15 ends on paragraph 36. 16 A Yes, that's correct. 17 Q And it essentially lays out the same 18 position; right? That those recited claim elements 19 must be structurally distinct components; right? 20 A Yes. 21 Q And do you recall reviewing the Board's 22 institution decision which instituted this IPR

97 1 proceeding? 2 A Yes, I've seen that. 3 Q And do you recall whether the Board stated 4 an opinion on that claim construction position that 5 you took? 6 A I don't recall what they said exactly, but 7 we can look at it. 8 Q Do you believe they agreed with you? 9 A Well, let's look at it. 10 Q We can. This is the paper 7 in this 11 proceeding, the Board's decision granting institution 12 of inter partes review. I believe you've seen this 13 before? 14 A Yes. 15 Q And, obviously, it's a long document I'm 16 pointing you to. So starting on page 9, and I'll try 17 to blow it up as much as I can without -- there's a 18 claim construction section where they address some of 19 the positions raised by SWM and included in your 20 declaration; right? 21 A Yeah, it just talks -- go ahead, what's 22 your question?	99 1 depiction of the support member and the weight in 2 Hardesty, that one structure can satisfy the claim 3 limitations? 4 MR. STEIN: Objection. Compound. Form. 5 A I understand Hardesty is involved, if 6 that's your question. 7 Q What is your understanding of the issue? 8 Why does this have any relevance to the proceeding? 9 MR. STEIN: Objection. Form. 10 A That's a very broad question. I'll give 11 you generally. Hardesty shows the weight and the 12 support collar, support member are two separated 13 distinct pieces, and that, as I recall, Dr. Rodgers 14 tried to separate an integral piece in the two 15 components, which are, of course, completely 16 opposite. 17 Q So you believe that two components -- or 18 two claimed components can't be part of the same 19 piece? 20 MR. STEIN: Objection. Form. 21 A I mean, there are some legal issues 22 involved there. But the patent refers to them
98 1 Q Specifically they get into the position 2 that the claimed gun body, collar, support member, 3 and one or more weights are required to be separate 4 from each other and also from other elements of the 5 remaining claims. Do you see that? 6 A Yes. 7 Q And then they discuss your -- I assume this 8 was the legal argument. You don't include case law 9 in your declaration. But they talk about some legal 10 standard, and then conclude, "After considering 11 patent owner's claim construction argument, we 12 determine that it is best addressed in the context of 13 considering whether the asserted prior art 14 anticipates the challenged claims." 15 Do you see that? 16 A Yes. 17 Q Do you recall that, of them saying rather 18 than offer a construction here, we'll talk about it 19 when we discuss the prior art? 20 A That seems to be what they're saying, yes. 21 Q And you understand this relates primarily 22 to the Hardesty anticipation ground and whether the	100 1 separately, names them separately, and in my opinion, 2 that means that they are separate components and not 3 portions of the same piece. And Hardesty clearly 4 shows them as separate pieces. 5 Q Let's go to the discussion in Hardesty on 6 the institution decision, if you recall this. Can 7 you see that colorized figure on your screen? 8 A I can. 9 Q And you recall that the Board considered 10 the position that you're laying out, that the support 11 member and weight cannot be satisfied by the Hardesty 12 reference, but in their -- as it states, in the 13 preliminary view found otherwise; do you understand 14 that? 15 A Yes, that's the preliminary view they 16 state. 17 Q And in particular, they -- they understood 18 Petitioner and Dr. Rodgers' description of Figures 7 19 and 8 that it was an integral structure, and he was 20 pointing to that integral structure, different 21 portions as satisfying those two claim limitations; 22 right?

101 1 MR. STEIN: Objection. Form. 2 A That's an awfully long question. Can you 3 break that down a little bit? 4 Q Well, it's always been Dr. Rodgers' and 5 Petitioners' position, to your understanding, right, 6 that what we see in this colorized figure satisfied 7 those two claim limitations; right? That's always 8 been the position? 9 MR. STEIN: Objection. Form. 10 A Yeah, I still don't understand your 11 question because it's just too general. 12 But as I understand it, Petitioner and 13 Dr. Rodgers have claimed that one piece, one 14 component makes up -- it can be divided into two 15 components, and I just disagree with that and hope 16 that the Board, with further examination, might 17 change their preliminary view. It depends on the 18 evidence they see. 19 Q Right. But that -- that position didn't 20 change. I mean, you saw Dr. Rodgers' deposition 21 transcript; right? 22 A I did.	103 1 Q I'm asking what you -- what you would 2 understand to be on the end of a charge tube like the 3 one depicted in Figure 8 on our screen. 4 MR. STEIN: Objection. Form. 5 A I don't understand that question. Are you 6 asking is there an end cap in Figure 8? 7 Q Not an end cap. What is there? What is on 8 the end? 9 A I don't understand your question. Are you 10 asking what's on the end of the outer housing? 11 Q Not of the outer housing. Of the charge 12 tube. 13 A Charge tube. I would probably have to go 14 back to Hardesty and see what they call each 15 component. 16 Q How is a charge tube typically made? 17 A That varies dramatically. Some are metals, 18 some are hard metals, some are soft metals, some are 19 plastic that are intended to disintegrate. Just a 20 lot of different materials and they are made a lot of 21 different ways; some are extruded, some are machine. 22 Q Of the metal, the typical metal thin-walled
102 1 Q And in which he -- and you put in quotes in 2 your second declaration where he stated the same, 3 right, which is that the two claimed elements, in his 4 view, are met by the -- what we see in Hardesty in 5 the purple and the yellow; right? 6 A I understand that to be his opinion, yes. 7 Q Right. That didn't change, there was no 8 change of opinion from the petition and his 9 original -- or his declaration, was there? 10 A That I can't be sure of. I would have to 11 compare. But I don't recall seeing a change. 12 Q We talked earlier about end fittings and 13 end caps and all of that. What would you understand 14 the end -- what is highlighted in purple to be in 15 Hardesty? 16 MR. STEIN: Objection. Form. 17 A I don't know. 18 Q You don't know -- 19 A Never tried -- never tried to evaluate that 20 for an end cap. And if you could show me in Hardesty 21 where it refers to an end cap, we could have that 22 conversation.	104 1 charge tube variety, how are those manufactured? 2 MR. STEIN: Objection. Form. 3 A I can't answer that question. They are not 4 all the same. You're asking as if every perforating 5 gun charge tube is made the same. That's not -- 6 Q Charge tubes, metal charge tubes, cheap 7 ones that you can order in bulk, or for perforating 8 gun applications, they are common, are they not? 9 MR. STEIN: Objection. 10 A What did you say? Please repeat. 11 Q They are common, are they not, metal charge 12 tubes? 13 A There are some similar characteristics on 14 charge tubes, but they're not all the same. Some are 15 dramatically different. 16 Q What's the most common metal charge tube 17 construction that you're aware of? 18 A Are you asking about geometries or 19 materials or dimensions? What are you asking about? 20 Q Materials. 21 A They tend to be made out of various metals. 22 Could be steel, could be some other metal.

Conducted on August 3, 2023

105 1 Q And how would those be fabricated? 2 MR. STEIN: Objection. Form. 3 A Different ways. They would -- they could 4 be pierced, or they could be rolled and welded, then 5 they're machined. 6 Q Can you see Figure 7 on your screen? 7 A Yes. 8 Q Do you recall this figure from Hardesty? 9 A Not that figure. The Figure 7 from 10 Hardesty. That figure has got color added to it. 11 Q You're familiar with this figure? 12 A Yes. 13 Q Do you believe the charge tube, the 14 thin-walled charge tube or gun body is integral with 15 the what's shaded purple? 16 A That's not clear. It appears that it may 17 be attached to it. But I'm just not sure. 18 Q Would it be common to construct the gun 19 body, what's shaded in red in the purple shaded 20 portion, all as an integral unit? 21 MR. STEIN: Objection. Form. 22 A Typically I would expect those to be	107 1 Q Are end fittings in charge tubes or gun 2 bodies, are they typically machined from a largely 3 solid steel round or bar stock? 4 A That would be one common way to do it, yes. 5 Q And what about a semicylindrical weight, 6 would it be machined from a solid steel round or bar 7 stock? 8 MR. STEIN: Objection. Form. 9 A Certainly could be. 10 Q Would there be any disadvantage to forming 11 those -- the end fitting and the weight from a single 12 solid steel round or bar stock? 13 A I don't know. I haven't evaluated that. 14 Q Would there be any advantages to doing 15 that? 16 MR. STEIN: Objection. Form. 17 A I haven't evaluated that either. 18 Q Would integrating two similarly fabricated 19 components be something an engineer would consider 20 for cost savings in a production line? 21 MR. STEIN: Objection. Form. 22 A A design engineer would consider cost of
106 1 separate components, but there's nothing here that 2 says they must be. 3 Q Is cost an important consideration in 4 building perforating guns? 5 A Yes. 6 Q And that's true with select perforating 7 guns as well? 8 MR. STEIN: Objection. 9 A Yes. 10 Q Is the most common manufacturing method 11 that you're familiar with to build charge tubes laser 12 cut thin-walled steel tube? 13 MR. STEIN: Objection. Form. 14 A Would you repeat your question, please? 15 You broke up right at the tail end. 16 Q Sure. Is laser cutting a thin-walled steel 17 tube the most common manufacturing method for shaped 18 charge tubes? 19 A I don't know if I would call it the most 20 common. It is a method that's used. 21 Q Is it prevalent in your mind? 22 A It's relatively common.	108 1 machining, if that's what your question is. 2 Q How is length, the length of a perforating 3 gun important in the design and manufacture of gun 4 systems? 5 MR. STEIN: Objection. Form. 6 A Those are two different questions, design 7 and manufacture. 8 Q Let's start with design, is it -- how does 9 length factor into as it relates to the design of 10 perforating gun systems? 11 A Well, the length has to be sufficient to 12 allow enclosure of all of the components. Typically, 13 the design you would not want to be excessively 14 larger than that for cost reasons. 15 Q Has there been a move over the years for 16 shorter gun strings or shorter guns? 17 A Where possible, yes, to save costs. 18 Q How does making the gun shorter save costs? 19 A Less material, less machining. 20 Q Can you turn to paragraph 35 of your 21 declaration, and this is the Exhibit 2007, your 22 current declaration.

109 1 A Okay. I have it. What's your question? 2 Q You state here that the collar, the claimed 3 collar must be separate from the gun body; is that 4 right? 5 A Which sentence are you referring to here? 6 Q It's -- that's in the first sentence. 7 A It says, "The construction of collar 8 discussed above and adopted by the District Court 9 also demonstrates that this element must be separate 10 from the gun body," that's what you were asking 11 about? 12 Q Yes. So do you -- you stand by the opinion 13 that the claimed collar element must be separate from 14 the gun body? 15 A Yes. 16 Q And then you conclude in that paragraph 17 that what the collar cannot be, it cannot be part and 18 parcel of another component that does inherently 19 require rotation; right? 20 A Right. 21 Q And so that's why the collar cannot be part 22 of the gun body which must inherently rotate in the	111 1 lay out on a claim element by claim element basis 2 where each feature is allegedly found in the accused 3 product? 4 MR. STEIN: Objection. 5 A Generally, generally that's my 6 understanding. But, of course, you understand I'm 7 not a lawyer. 8 Q And you've been on both sides of it, right, 9 on the plaintiff's side in supporting a party's 10 infringement position, and also on the flip side, 11 defending against a party's infringement allegations; 12 right? 13 A I have, yes. 14 Q And you know that typically the way this 15 plays out is that the -- there would come a point in 16 time where you submit an expert declaration -- or, 17 excuse me, an expert report in the District Court 18 that lays out the infringement case for a party, or a 19 defense to that case? 20 A Generally that's been my experience, yes. 21 I don't know what the requirements are. 22 Q And what we see on the screen is the
110 1 system; right? 2 A Correct. 3 Q Let me drop in our next exhibit here, so 4 we've got Exhibit 1017, which I put in the chat and I 5 will bring up on your screen. 6 (Exhibit 1017 marked for identification.) 7 Q Dr. Wooley, are you able to see this? 8 MR. STEIN: Before we move too far, I just 9 object to the admissibility of this exhibit as being 10 beyond the scope of the deposition and relevance. 11 Authentication, too. 12 Q Can you see your screen? Can you see the 13 PDF? 14 A Yes. 15 Q And this comes from infringement 16 contentions filed or served by SWM in the District 17 Court litigation that you mention in that same 18 paragraph 35. Have you seen these before? 19 A I suspect I have. I don't recall 20 specifically. 21 Q And you've done enough of these to know 22 what the purpose of infringement contentions is to	112 1 accused product, the DS Gravity, it's what SWM has 2 said in the District Court litigation is practices 3 the '762 claims. Do you have any understanding of 4 that? 5 MR. STEIN: Objection. Form. Scope. This 6 isn't an infringement deposition. 7 A No, I do not have that understanding. I 8 would have to go back and look at it. 9 Q I just want to take you to -- bear with me. 10 Here we are. So claim 3 is a claim that is still at 11 issue in this case. Do you understand that? 12 MR. STEIN: Objection. Form. 13 Q And by "this case" I'm referring -- 14 (Simultaneous speaking.) 15 Q Sorry, I apologize, Dr. Wooley. I was 16 trying to clear up the form objection, which is claim 17 3 is a challenge claim, hasn't been disclaimed, and 18 it's still subject to your declaration in the IPR 19 matter. Do you understand that? 20 A I don't understand any of the first part of 21 your question, but I -- as I recall, it's included in 22 that list that's in the footnote in my report or

113 1 declaration. 2 Q You had to look at claim 3 of the '762 3 patent in forming your opinions as to whether they 4 were patentable or unpatentable; right? 5 A Yes. 6 Q Did you ever participate in any of the 7 infringement analysis that went into these 8 infringement contentions? 9 MR. STEIN: Objection. Form. Scope. 10 A I don't recall. 11 Q These were served -- they are dated July 12 18th of 2022. You were at least engaged by SWM in 13 the District Court case by this time; right? 14 MR. STEIN: Objection. Asked and answered. 15 A I cannot tell you that. I don't know. I 16 have been engaged with SWM with respect to Dyna's 17 infringement issues for a period of time before that, 18 but I don't recall what the case was, or I would have 19 to go look up what was going on at that point in 20 time. 21 Q Sure. But just as we covered earlier, you 22 submitted -- you signed a declaration in the District	115 1 MR. STEIN: Objection. Form. 2 A I don't recall. 3 Q Assuming this case, if the District Court 4 case were to proceed, would you intend to offer 5 opinions on infringement? 6 MR. STEIN: Objection. Form. 7 A I would only intend to do whatever work was 8 requested by my client. 9 Q I just want to point you to a figure here 10 that's been annotated. Do you know if -- did you add 11 these annotations? 12 MR. STEIN: Objection. Form. 13 A I don't remember doing that, but could be. 14 Q Do you recall reviewing these annotations? 15 MR. STEIN: Objection. Form. 16 A I just don't recall. 17 Q Have you ever seen these figures before? 18 MR. STEIN: Objection. Form. 19 A Don't recall. 20 Q In what we see on the screen, do you see 21 what's been identified as the collar? 22 MR. STEIN: Objection. Form.
114 1 Court case in April of 2022; right? 2 A Yes, we looked at that earlier. 3 Q So you were at least engaged by that time? 4 A Yes. 5 Q And if these are dated July of 2022, you 6 were engaged by this point; right? 7 MR. STEIN: Objection. Form. 8 A Engaged with respect to whatever that 9 matter was that was going on at that point in time, 10 the answer is yes. 11 Q Were you engaged -- was your engagement 12 strictly limited to opining on claim construction in 13 the District Court? 14 A I don't remember. 15 Q Have you entered multiple engagement 16 letters or engagement agreements with respect to the 17 District Court case? 18 MR. STEIN: Objection. Form. 19 A I don't recall. I would have to go look. 20 Q Do you have a separate engagement agreement 21 or letter for the IPR matter from the District Court 22 matter?	116 1 A I see on the screen the word "collar" and 2 an arrow. 3 Q In this figure with different annotations 4 do you see what has been identified as the gun body 5 in the DS Gravity system? 6 MR. STEIN: Objection. Form. Relevance. 7 Hopefully at some point we get back to the issues of 8 the IPR. 9 MR. HEARD: I think it's highly relevant. 10 MR. STEIN: We can keep going for a bit, 11 but we may need to get the Board to weigh in on that. 12 MR. HEARD: I'm happy to. But I think you 13 submitted infringement contentions in the '697 case 14 to dispute certain positions. 15 BY MR. HEARD: 16 Q Do you see what's been identified, 17 Dr. Wooley, as the gun body? 18 A Yeah, I see the words "gun body" and the 19 arrow pointing to a component. 20 Q A component that's -- then holds the shape 21 charge? 22 MR. STEIN: Objection. Form. Foundation.

117 1 A I can't say that. I haven't looked at 2 that -- may never have looked at it, or if I did, it 3 was a while a back. I would have to look at it 4 again. 5 Q Let me go back to what's identified as the 6 collar. If that collar is integral with or part of 7 the same integral structure with the gun body, you 8 would agree that it cannot meet the claim limitation; 9 right? 10 MR. STEIN: Objection. Foundation. 11 Objection. Form. 12 A I don't know if that's the case or not. I 13 haven't evaluated that. 14 MR. HEARD: I think this is a good 15 opportunity to take our lunch break, because I'm 16 going to ask that Dr. Wooley review this document and 17 the patent publication that shows these internal 18 components in the DS Gravity system, because I think 19 it's relevant to his testimony offered in this IPR 20 case and highly relevant to the claim construction 21 positions offered and the reputation of the prior 22 art.	119 1 him to review these contentions. It should not take 2 long. He's seen these plenty of times. 3 MR. STEIN: You've not -- you've not laid a 4 foundation for that. You've not shown anywhere that 5 he's seen these many times -- 6 MR. HEARD: Come on. Would you represent 7 on the record that he's not seen these infringement 8 contentions, you didn't show them to him before they 9 were served? 10 MR. STEIN: I'm not aware one way or 11 another. I'm counsel in the IPR. I'm not involved 12 with the District Court case, so I don't know. 13 MR. HEARD: Okay. 14 MR. STEIN: So what were you -- I'm not 15 clear on what you're asking here, Preston. So you 16 want a break so that he can read this? Or you want 17 to have a lunch break now? Because he's not going to 18 use his lunchtime to read this if we haven't resolved 19 the issue of whether this is outside the scope. So I 20 don't know what you've asked for. 21 MR. HEARD: I'm asking for him to review 22 the infringement contentions.
118 1 MR. STEIN: I mean, it's pretty clear 2 you're asking issues of infringement. So if we're 3 going to keep going on this path, eventually I'll 4 have to instruct him not to answer and we'll have to 5 get a resolution from the Board, which would be sort 6 of a waste of everyone's time, but if we have to do 7 that, we have to do that. Because these issues are 8 about infringement and we're not here to talk about 9 infringement. 10 MR. HEARD: If he had not directly brought 11 in the infringement -- or excuse me, the District 12 Court case and the claim construction at issue there 13 and used it to support his opinions here, you might 14 have a leg to stand on. But I think it's highly 15 relevant. 16 MR. STEIN: He's told you numerous times 17 that he can't recall looking at this, he doesn't 18 remember, so there's no basis to keep going down this 19 path. It's just wasting -- 20 MR. HEARD: That's fine. That's fine. 21 We're asking for a break and you can count it against 22 the time, if you want, but we can take a break for	120 1 MR. STEIN: It seems like you're asking him 2 to use his lunch to do that. So he's entitled to a 3 lunch. And then separately on the record we can 4 continue this discussion of relevance and see if we 5 need -- and scope and see if we need to bring in the 6 Board, but that all has to be on the record. So if 7 you're taking a break and it's for lunch, that's 8 separate. 9 MR. HEARD: We can keep it on the record, 10 that's what I've said, and count it against the time. 11 MR. STEIN: Okay. 12 MR. HEARD: Sit here and watch as it's 13 done. But I want him in a manner that's where he can 14 actually see it and review it, to look at this and 15 tell me when we're ready to proceed. 16 MR. STEIN: If that's what you're asking, 17 then I think I'll have to instruct him not to do 18 that, and I'll ask that we, you know, jointly email 19 the Board or call them and get them to weigh in on 20 whether he needs to do that. Because I, as we 21 discussed a moment ago, I don't think he needs to do 22 that. There's no foundation for him to do that.

121 1 MR. HEARD: He's got deposition time. This 2 is cross-examination testimony. If I want to use 3 that time for him to look at something that will 4 potentially contradict or undermine testimony that 5 he's given on direct in any way, then I'm permitted 6 to do that. 7 MR. STEIN: Like I said, we can get the 8 Board to weigh in on that. Because all you've 9 established is that he considered issues that were 10 raised for claim construction from the District Court 11 case in the context of his understanding of the claim 12 terms in the IPR. You've not established any 13 relevance or foundation from him having to review 14 infringement contentions that he's told you many 15 times he can't recall. 16 MR. HEARD: Let's do it this way. 17 BY MR. HEARD: 18 Q Dr. Wooley, if you were handed one integral 19 component, one component, would you agree, based on 20 your opinions and testimony in paragraph 35, that it 21 could not be both the gun body and the collar of the 22 '762 patent?	123 1 then tell me what he's going to need and we'll pause 2 the deposition. 3 MR. STEIN: But you're -- you're dancing 4 directly into infringement issues, which is my 5 fundamental issue. 6 MR. HEARD: It's a claim construction 7 issue. 8 MR. STEIN: You can continue to ask him 9 about the figures in the Hardesty reference, the 10 figures in Yonghong, the figure in Schacherer or 11 Eitschberger, any of the references. But when you're 12 moving into and very directly asking issues that bear 13 on infringement, which is not at issue here, and he's 14 told you numerous times he can't recall ever looking 15 at these things, there's no basis to keep going on 16 that line of questions. 17 But you have ample time and ample drawings 18 in the references to ask him questions that do have a 19 bearing on the issues at stake in the IPR, which he's 20 told you he is familiar with. But if you're going to 21 continue to ask him about things that he's told you 22 he can't recall, it's just wasting time, and we're
122 1 A I would think I would have to evaluate the 2 specific circumstance. Provide me the component, let 3 me look at it and see how it's used in that 4 particular instance. 5 Q Okay. Perfect. 6 MR. HEARD: And so Dr. Wooley has requested 7 to see the component. I will give him the 8 infringement contentions and the patent publication 9 with specific figures to show the component that I'm 10 asking the question about so that he may answer the 11 question. 12 MR. STEIN: That's not what you asked. 13 You're asking him about a physical integral 14 component. Now you're asking him to look at 15 pictures. Those aren't the same thing. 16 MR. HEARD: He said he's an expert in 17 reading CAD drawings and machine drawings. So if 18 you're saying that he can't look at a component 19 drawing and tell me, if we're doing that with respect 20 to the Hardesty reference and the Yonghong reference, 21 he can't look at that and tell me if one integral 22 unit can be both the claimed collar and the gun body,	124 1 going to need to ask the Board to weigh in on that. 2 MR. HEARD: It's not about things he can't 3 recall, Alex. This is directly -- it's not about an 4 infringement issue either. It's a direct question 5 about claim question from paragraph 35 of his 6 declaration. So I'm testing the contours of what it 7 means to be separate from and integral to, that's 8 replete in his declaration. 9 MR. STEIN: Sure. So use a document or a 10 figure that he's familiar with. Don't use something 11 that he's told you he can't recall and -- 12 MR. HEARD: That's not how 13 cross-examination works, Alex. If you've been in 14 trial, I don't have to tell you what every document 15 that's going to be used. You're not limited to the 16 record and the record evidence. That's not how 17 depositions work, cross-examination works, or PTAB 18 practice works. So if you want to discuss more, we 19 can. 20 MR. STEIN: Discuss that issue with the 21 Board, because I think I've made my position pretty 22 clear and I'm happy to provide that position to the

125 1 Board. Again, I think we're wasting time, but if 2 that's what we need to do, that's what we need to do. 3 MR. HEARD: Okay. Let's go off the record, 4 because I think we'll have to carry this over and 5 raise the issue with the Board and potentially 6 continue the deposition. 7 MR. STEIN: Well, we can email them now, 8 Preston. That's why we do a deposition notice. 9 They're available to resolve these disputes during 10 the deposition, so we don't have to carry over. We 11 just email them now. 12 MR. HEARD: Okay. You're the one raising 13 the dispute, you can draft it. 14 MR. STEIN: Do you have other questions 15 you'll be able to ask while we wait to hear from the 16 Board? 17 MR. HEARD: Perhaps. 18 MR. STEIN: Okay. So I'll send the email 19 and why don't we either -- I guess you didn't let us 20 break for lunch here, but either we can break for 21 lunch or you can continue with the questions if 22 Dr. Wooley is going to do that. But I will send the	127 1 MR. STEIN: Okay. Yeah, I mean, I agree, I 2 stand by everything that was said on the record, but 3 I'm happy to move on. 4 MR. HEARD: Okay. 5 BY MR. HEARD: 6 Q What does, Dr. Wooley, an integral 7 structure mean to you? 8 A Well, it doesn't have a separate distinct 9 meaning, just the English interpretation of the 10 English language. It's integral means one piece to 11 me. 12 Q So even if it's irregularly shaped, are 13 there different -- could there be portions of one 14 integral structure or sections? 15 A Sure. 16 Q But that doesn't take it away from being 17 one integral structure? 18 A You certainly are allowed to identify 19 portions of a structure, if that's what you're 20 asking. 21 Q So what does it mean for something to be 22 part and parcel of another component?
126 1 email and request a call to discuss the issue. 2 MR. HEARD: Sure. Let's -- can you send me 3 a quick draft -- let's do the lunch so we're not, to 4 Dr. Wooley's point, wasting his time, and then I'll 5 make sure any questions that don't fall into this 6 ambit we can get done while we're waiting on the 7 Board to weigh in. 8 MR. STEIN: Sure. So we should be off the 9 record now, for the court reporter. 10 (Recess 1:17 p.m. - 1:50 p.m.) 11 MR. HEARD: Before we took the break, 12 Mr. Stein and I, we were having a discussion or 13 dispute about the questions relating to the 14 infringement contentions document and discussed 15 raising the issue with the Board, and we continue to 16 believe that it's relevant and permissible to be used 17 in this case. At the same time we don't think -- 18 we've covered what we need to cover and can move on 19 at this time. I don't know if Mr. Stein agrees. If 20 he does, then we'll proceed. But just as a 21 clarification, we don't agree with the scope or 22 relevance objections.	128 1 MR. STEIN: Objection. Form. 2 A I don't know what that means. You're 3 talking about generically? Hypothetically here? Are 4 you talking about the -- 5 Q So go back to paragraph 35 of your 6 declaration. 7 A One moment. 8 MR. STEIN: Which declaration, Preston? 9 MR. HEARD: 2007. 10 A Got it. What's your question? 11 Q The last sentence, "the collar cannot be 12 part and parcel of another component that does 13 inherently require rotation," what does "part and 14 parcel of another component" mean? 15 A You're talking about the last sentence in 16 paragraph 35? 17 Q Yes. 18 A It's simply saying what's described above, 19 it's a bit of a summary, that the collar defined 20 above in the first sentence cannot be part and parcel 21 of another component that has a distinct separate 22 name and function.

129 1 Q Does that mean it's not of the same 2 integral structure? 3 A That's the way I would interpret it, yes. 4 Q Do you have the patent owner, so SWM's 5 response that was submitted with your -- along with 6 your declaration? I believe that was one of the 7 documents we talked about being printed out, but 8 perhaps you have it. 9 A No. I've got just what I told you I have. 10 Q We'll put it on screen. This is paper 11 11 from the IPR. Let me know when you're able to see 12 this. 13 A It's on the screen, so show me what you 14 want. 15 Q Page 21 there's a footnote here that says, 16 "An integral structure is, like the name says, 17 integral, it does not have 'distinct structural 18 portions.'" Would you agree with that statement? 19 A Yes. 20 Q What's the difference between having 21 distinct portions rather than distinct structural 22 portions?	131 1 from each other? 2 MR. STEIN: Objection. Form. 3 A Yeah, generally I would consider distinct 4 structures to be different from each other, not the 5 same structure. 6 Q As to the fabrication, the manufacture of 7 it, is one -- are two distinct structures fabricated 8 independently? 9 MR. STEIN: Objection. Form. 10 A You know, are you talking about 11 possibilities? Typically I would expect they would 12 be fabricated separately. But would it be possible? 13 I imagine -- I would have to think about that. 14 Q If a piece connects to -- so it must be 15 connected to another piece, is there any way to 16 describe those as being integral? 17 A Yeah, I don't know what you mean by 18 "connected." It's certainly possible and common for 19 two distinct structures, two components to be 20 attached to each other. 21 Q Right. And in such a case would you ever 22 consider that combined structure to be integral, one
130 1 A Well, to me the word "structural" indicates 2 that it's a separate structure as opposed to just a 3 portion of one integral structure. 4 Q So by way of example, you can point to a 5 right end and a left end of an integral structure and 6 that would cover the distinct portions or distinct 7 sections of one integral structure? 8 A As an example that's possible, yes. 9 Q Does the distinct structural portions, does 10 that mean that you fabricate it independently, or 11 what does that mean? 12 MR. STEIN: Objection. Form. Foundation. 13 A Well, all I can do is try to interpret the 14 words for you. "Distinct" means different, different 15 from, and "structural" means a structure, not one 16 structure, but distinct structures. 17 Q What makes two structures distinct from one 18 another? 19 A They are separate structures. Distinct 20 means different from. A good example is Hardesty. 21 Q Do you mean they can be separated one from 22 another, the two distinct structures can be separated	132 1 integral structure? 2 A Not typically. Depends on how it's used. 3 Q In the way that it's being discussed in 4 this case, if you had two separately -- two separate 5 structural components that came together into one 6 combined structure, would you ever describe that as 7 an integral structure? 8 MR. STEIN: Objection. Form. 9 A We're getting kind of hypothetical here. 10 But if I understand your question, I think the answer 11 to that would be no. They would be considered two 12 structures that have been combined with each other or 13 connected or attached. 14 Q So if -- just going back to your opinion, 15 and you sum it up in paragraph 36, the next 16 paragraph, would you agree that one integral 17 structure could not meet more than one of those four 18 separate components that you lay out there, the gun 19 body, collar, support member, and one or more 20 weights? 21 MR. STEIN: Objection. Form. 22 A Yes.

133 1 Q I'm sorry, did you say "yes"? 2 A I did, yes. 3 Q Can you go to right toward the end of your 4 declaration, actually the last two pages, paragraph 5 98, please. 6 A Okay. What's your question? 7 Q In this section you're discussing a ground 8 combining the Hardesty and Yonghong reference; right? 9 A Yes. 10 Q And I just want to confirm that the total 11 of your opinion against this ground is in paragraphs 12 98 and 99? 13 MR. STEIN: Objection. Form. 14 A Certainly it's stated in 98 and 99, but I 15 would not leave out the rest. 16 Q Well, yeah, you have a lot of discussion 17 elsewhere about the Hardesty and Yonghong references; 18 right? 19 A I believe that's correct. 20 Q And is it correct your opinion about the 21 Hardesty reference is that it has -- it's missing 22 separate support member from a weight; right? Is	135 1 A Well, I thought you were referring to my 2 report and all of the places in my report. I just 3 don't remember all of them. 4 Q Well, I'm just -- in the interest of time, 5 you're trying to get off to some functions -- you 6 point out a flaw, an alleged flaw in your mind in 7 Hardesty in that Dr. Rodgers points to the same 8 integral structure as needing the support member and 9 the one or more weights; right? 10 A Well, you got two questions there. Yes, 11 Dr. Rodgers separates one integral piece into two 12 separate pieces mistakenly, in my view. 13 Q And that is your primary criticism of the 14 Hardesty anticipation ground; right? 15 A Yeah, Hardesty does not anticipate, nor 16 does Yonghong. This section you've asked about is an 17 obviousness approach. 18 Q Right. In Yonghong what you take issue 19 with is the claimed collar; right? You say that 20 Yonghong fails to disclose the claimed collar of the 21 challenged claims? 22 A Right.
134 1 that a fair characterization? 2 MR. STEIN: Objection. Form. 3 A Well, Hardesty clearly illustrates separate 4 components for the weight and the -- I don't know 5 what it calls the other piece, maybe a support 6 member. 7 Q But you don't -- you don't allege or opine 8 in here that the -- that Hardesty fails to disclose a 9 collar as recited in the '762 patent; right? 10 MR. STEIN: Objection. Form. 11 A Would you ask that question again? 12 Q In your declaration you never say Hardesty 13 fails to disclose a collar as claimed in the 14 challenged '762 patent claims, do you? 15 A I would have to look through for all of the 16 references, you asked if it's anywhere in there. I 17 don't have it memorized. I can't talk off the top of 18 my head. But if you would like, I'll look through it 19 and see if I find all the references to collar -- 20 (Simultaneous speaking.) 21 Q Well, all the references -- sorry. Excuse 22 me. Go ahead.	136 1 Q But you do not take an opinion that 2 Yonghong fails to disclose the support member; right? 3 MR. STEIN: Objection. Form. 4 A I would have to go back and look at that. 5 Let me look. You want me to go through my report to 6 see if I address that? 7 Q First go to paragraph 72. Are you there? 8 A Yeah, I think paragraph 72 makes it clear 9 that Hardesty fails to disclose a support member as 10 that term is used in the '762. 11 Q Right. And so my question earlier is you 12 don't point to anything else that's missing in 13 Hardesty; is that fair? 14 A Well, there's a lot more discussion on the 15 next few pages about Hardesty, and it addresses other 16 subjects. For example, in 85 it talks about a person 17 of ordinary skill would understand the challenged 18 claims to require that the claimed gun body collar 19 support member, and one or more weights are separate 20 from each other, and also from the other elements of 21 the challenged claims. So that references all four 22 of those items in Hardesty. But that sentence is

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137 1 primarily from the viewpoint that it be separate. So 2 it's not just the support member. There's some other 3 discussion in there about Hardesty. 4 Q Well, what you just read, that's getting at 5 the support member. You're saying there is no 6 separate support member; right? 7 A That's what it says, yeah. 8 Q For Yonghong, you can turn there, go back 9 to paragraph 41. 10 A What's your question about 41? 11 Q Here's where your opinion is that Yonghong 12 fails to disclose a collar; right? 13 A Correct. 14 Q And my question earlier is that's the only 15 claim element that you identify is missing in the 16 independent claims that are challenged; is that 17 right? 18 A Same thing, it's certainly true that I 19 address collar in 41 and 42 and 43. You're asking 20 whether I identify anything else. 21 Q That's right. 22 A Well, it's related, but 51 talks about	139 1 Q Well, this is we're strictly talking about 2 your -- the obviousness ground 5, if Hardesty has 3 everything except a separate support member, and 4 Yonghong has everything except a collar, then the 5 combination of the two have every element; right? 6 MR. STEIN: Objection. Form. 7 A No, I don't think that's right. Neither 8 satisfies the anticipation requirements and I don't 9 see how combining them can satisfy an obviousness 10 argument. 11 Q Why can't you see it? 12 MR. STEIN: Objection. Form. 13 A I guess I don't understand your question 14 why can't I see it. It's -- I don't know the legal 15 issues at all, if that's what you're questioning. 16 But it seems to me if neither Yonghong and 17 Hardesty anticipates, it doesn't have the needed 18 components, I don't see how you're going to combine 19 them to get there. They both have the same defect 20 from the inherent -- excuse me -- from the 21 anticipation argument. 22 Q Well, isn't that what we just talked about,
138 1 disclosing a bushing or bearing seat that is annular, 2 but that's related to it. 3 Q Related to whether a collar is disclosed? 4 A Correct. And then it gets into 5 combinations there. 6 Q Right, that's right. So then you get into 7 obviousness analysis. So for an anticipation 8 analysis you say Yonghong is missing a collar, 9 Hardesty is missing a separate support member; is 10 that right? 11 A Generally I think that's correct. There 12 may be some other references to both those, but those 13 are the primary comments about each one of them. 14 Q And so we were originally discussing the 15 final ground where you put those two together, 16 Yonghong and Hardesty. You don't point to any 17 specific claim element that would be missing from 18 that combination; right? 19 MR. STEIN: Objection. Form. 20 A I don't think that's accurate. I mean, 21 it's clearly referring to the claim elements. You 22 want to go back through where the claim elements are?	140 1 it's two different? You don't say the collar is 2 missing in Hardesty; right? 3 MR. STEIN: Objection. Form. 4 A Well, I don't separately address it there. 5 Q Do you offer an opinion that Hardesty fails 6 to disclose a collar? 7 MR. STEIN: Objection. Form. 8 A I would have to go look at that. I would 9 refer you to my report. But if you want me to go 10 through my report looking for that, I can. 11 Q Would it surprise you if there is -- you 12 did not render an opinion that Hardesty fails to 13 disclose a collar? 14 A Well, it's certainly -- I recall part of 15 the report referencing a collar, but in the context 16 of having to be a separate component. 17 Q So if you had a claim for A, B and C, you 18 had one reference with A and B and another with B and 19 C, would you acknowledge that all of the claimed 20 elements are found in the two prior art pieces? 21 MR. STEIN: Objection. Form. 22 A I can't answer that.

141 1 Q Why can you not? 2 A Just too hypothetical. 3 Q Well, then going -- 4 (Simultaneous speaking.) 5 A -- specifics. 6 Q The specifics of paragraph 99, you don't 7 point to anything in specific -- in particular that 8 is missing from both references. 9 A Yeah, I think 99 makes it pretty clear that 10 there's -- that there's no -- that Petitioners failed 11 to suggest that one of ordinary skill would have been 12 motivated by Yonghong to modify Hardesty such that it 13 includes a separate support member. And then, of 14 course, it says even if they were combined, such 15 combination would not render obvious. 16 Q Right. It doesn't say that Yonghong is 17 also missing a separate support member; right? 18 MR. STEIN: Objection. Form. 19 A I don't think it says that. Doesn't have 20 those words. 21 Q And it doesn't say and Hardesty is missing 22 a collar; right?	143 1 Q On what basis? 2 A Just the challenge that all the elements of 3 the challenged claims are not met. 4 Q But we just established they're all there 5 in one or the other reference; right? 6 A No. No. That's what you said. 7 (Simultaneous speaking.) 8 Q Go ahead. Go ahead. 9 A I hadn't tried to evaluate all the others. 10 My report addresses directly the collar in Yonghong 11 and the support member in Hardesty. 12 Q Right. You never apply an anticipation 13 standard against the collar in Hardesty; right? You 14 never say Hardesty doesn't anticipate because there 15 is no collar; correct? 16 MR. STEIN: Objection. Form. 17 A Well, I don't do that. Again, I don't know 18 the legal standard, but it seems to me you have to 19 have all the elements to anticipate. And what I've 20 done is picked out one that shows clearly it does not 21 anticipate because it doesn't have that element. 22 Q Right.
142 1 A It doesn't say that in there. 2 Q That's not something -- you don't say if 3 these were put together it wouldn't meet all of the 4 claim limitations. You're just -- you're challenging 5 whether one of skill would include the support member 6 of Yonghong into Hardesty; right? 7 MR. STEIN: Objection. Form. 8 A Yeah, I don't think that's accurate. I 9 think the statement is pretty clear. 10 Q How is my -- how is my question inaccurate? 11 A First, there's a lack of motivation, 12 Petitioner failed to suggest that one of ordinary 13 skill in the art would have been motivated by 14 Yonghong to modify Hardesty such that it includes a 15 separate support member. And then it says even if 16 the two references were combined, I do not believe 17 such combination would render obvious the challenged 18 claims. 19 Q What's the factual basis on that? That's 20 just a general statement. Why would it not render 21 obvious if they were combined? 22 A That's my opinion.	144 1 (Simultaneous speaking.) 2 A You're using that to assume all the 3 elements must be there. 4 Q Right. And then for Yonghong, you focused 5 on a different one element; right? 6 A Yes. 7 Q Okay. And so what is your basis for saying 8 that if you put the two together, one is missing one 9 element, one is missing a different element, you put 10 the two together in a combination, what's your basis 11 for saying it would not render obvious the challenged 12 claims? 13 MR. STEIN: Objection. Form. 14 A The report declares two; one is there is no 15 motivation to put them together, and the other is 16 you're presuming that if there's one element that 17 precludes it from anticipating, that must mean all 18 the other elements are there, and there is nowhere in 19 my report that states that. 20 Q Are you offering an opinion to the Board 21 that other elements are missing? 22 MR. STEIN: Objection. Form.

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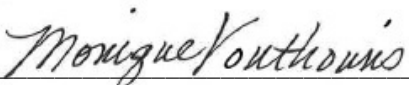
145 1 A No. All I addressed in the anticipation, 2 as I understand it, all you need to address is one 3 that's missing. It cannot anticipate if one of the 4 elements is missing. 5 Q Did you consider secondary considerations 6 when you performed the obviousness analysis? 7 A Which part of my report are you referring 8 to? 9 Q It's not in your report and so I'm 10 confirming that you did not -- 11 (Simultaneous speaking.) 12 Q What's that? 13 A You're asking is secondary considerations 14 not in my report. 15 Q I'm telling you it's not and asking for 16 confirmation that you didn't consider secondary 17 considerations of non-obviousness in performing your 18 analysis? 19 A I did not write a separate section on it, 20 that's correct. 21 Q Is it included in your analysis in any way? 22 A I don't have an opinion expressed in the	147 1 A It's common to have a protection on the 2 detonating cord. And for those that have the 3 rotating capability, I haven't checked to see which 4 ones use that cord protection to -- and have it 5 rotate, I can't give you a number on how many. I 6 didn't anticipate you asking that question, so I 7 haven't checked. 8 Q Does the protection of the detonation cord 9 go through the tandem? 10 MR. STEIN: Objection. Form. 11 A And what about that protection? 12 Q Does the detonation cord proceed through a 13 tandem in between perforating guns? 14 A Sometimes, yes. 15 Q And how is the detonation cord protected in 16 that instance? 17 A Sometimes it's inside a sleeve of some 18 sort. 19 Q And if it's a rotatable gun stream, 20 internally rotating system, how do you protect the 21 detonating cord? 22 A Well, you could use the same setup, which
146 1 report about that. 2 Q Okay. Why doesn't the oil and gas industry 3 utilize the Yonghong detonation cord protection tube 4 configuration? 5 MR. STEIN: Objection. Foundation. Form. 6 A Ask that again. You're asking why doesn't 7 the industry use it? 8 Q Yeah, the system that's described in 9 Yonghong that you've, you know, discussed and taken 10 issue with, would you agree it's not widely used in 11 the industry? 12 MR. STEIN: Objection. Foundation. Form. 13 A Which part are you talking about? Are you 14 talking about the weight that orients the perforating 15 charges? 16 Q Specifically the detonation cord protecting 17 sleeve. 18 A I'm not sure your statement is accurate 19 that there's nobody that uses that. 20 Q That's what I'm asking you, is it a 21 common -- is it common to employ that where you have 22 a separately rotating detonating cord sleeve?	148 1 would be similar to Yonghong's, but there are other 2 ways that that can be done. 3 Q Is another way that you wouldn't carry the 4 detonation cord from gun to gun, but would use 5 boosters in some way to pass the signal? 6 A Right, you could pass the signal through 7 the connection between the guns in a different 8 manner. 9 Q What about the Hardesty limited -- limited 10 rotation approach, do you know whether that's 11 commonly used in the industry? 12 A Yeah, I don't know for sure what the 13 numbers are how many of them were used. I would not 14 be surprised if GEODynamics does that. 15 Q What are some advantages that you could see 16 for using the limited rotation approach? 17 A Well, that's a question John Hardesty would 18 answer best. But I would think the answer would be 19 just controlling the rotation, much like we were 20 talking about with Yonghong, it's not intended to 21 rotate continuously. 22 Q We talked about earlier you're not aware of

149 1 a structure in Yonghong that's intended to limit the 2 rotation; right? 3 A I don't recall seeing one. I haven't 4 evaluated that. It could be there is something in 5 there that stops it. 6 Q Are there any drawbacks to using a limited 7 rotation approach like described in Hardesty? 8 A Well, you certainly have to have it 9 properly limit. You don't want to limit it so that 10 it doesn't function the way it's intended to 11 function, that is, to orient the shape charges 12 properly. So that's a possible drawback if it 13 doesn't, if it's not designed properly. 14 Q And even in the limited rotation approach 15 of Hardesty, you still use a full annular radial 16 bearing; right? 17 A You could. You don't have to. 18 Q I mean, that's what Hardesty describes, 19 right, a bearing that's supported within a collar; 20 right? 21 MR. STEIN: Objection. Foundation. Form. 22 A Yeah, I haven't looked at that part in	151 1 Q And in passing -- in the instance in which 2 you pass the signal through a tandem, for example, 3 does that mean that there would be a ballistic 4 coupling? 5 A Ask that again, please. 6 Q When we were discussing the alternative to 7 having the detonation cord continue from gun to gun 8 is to pass the signal through, for example, a tandem 9 sub; right? 10 A Well, you can do it either way through a 11 tandem sub. 12 Q Right. Right. In the event that you're -- 13 that the detonation cord end terminates within the 14 gun, would there be a ballistic coupling in order for 15 that signal to pass? 16 A Or some other device, yes, you've got to 17 pass it through somehow. So you either do it through 18 a ballistic coupling or some other device, electrical 19 signal that does not require a wire through the sub. 20 MR. HEARD: Okay. Let's go off the record. 21 Just give me two minutes, Alex. I don't want to 22 waste the time with the break if we don't need it,
150 1 Hardesty closely. There's no need for it to be a 2 full circle, but it may be it uses that for 3 convenience. 4 Q Would the full rotation, so unlimited 5 rotation, be simpler or less complex than Hardesty's 6 limited rotation approach? 7 A Yeah, I'm not sure what you're getting 8 into. I mean, there are -- they're different. I 9 don't know which one would be less complex in your 10 mind. 11 Q Are there any advantages to an unlimited 12 rotation above the Hardesty limited rotation 13 approach? 14 A I mean, they're different. The limited 15 rotation is intended to control the rotation. The 16 unlimited rotation, you don't have to worry about 17 designing it properly. So they're just different. 18 Q How would unlimited rotation impact where 19 the shape charges fire? 20 A Well, presumably they all end up in the 21 same place, that is, orienting the shape charges so 22 that they are most effective direction.	152 1 but we might be finished. 2 MR. STEIN: Okay. 3 (Recess 2:30 p.m. - 2:34 p.m.) 4 MR. HEARD: All right. Nothing further at 5 this time. Thanks, Dr. Wooley. 6 MR. STEIN: Okay. Let's take a 10-minute 7 break just to give me a chance to look at my notes 8 and see if there's any redirect. Thanks. 9 (Recess 2:34 p.m. - 2:46 p.m.) 10 REDIRECT EXAMINATION 11 BY MR. STEIN: 12 Q Okay. Dr. Wooley, so we're going to have 13 just a few redirect questions here. 14 So first, do you recall discussing 15 Petitioner's ground 5 related to the combination of 16 Hardesty and Yonghong with Mr. Heard? 17 A Yes. 18 Q And I want to direct your attention, and 19 I'll share my screen here, to the declaration 20 submitted by Dr. Rodgers, which is Exhibit 1003, so 21 I'm going to share my screen here. 22 MR. HEARD: While you're bringing it up,

153 1 I'll object to scope. 2 Q Are you able to see my screen, Dr. Wooley? 3 A Yes. If you would expand it just a little 4 bit. Maybe take that sidebar off, that would help. 5 Q Let me see if I can get it a little bigger. 6 A That's great. Yeah, that's great. 7 Q Are you able to see here in Dr. Rodgers' 8 Exhibit 1003 that he has a discussion of the same 9 ground 5 that you were discussing with Mr. Heard? 10 A Correct, yes. 11 Q And if we look through these paragraphs, 12 and you can take your time looking at these, does 13 Dr. Rodgers ever provide an explanation as to why a 14 POSA, person of skill in the art, would have had a 15 motivation to modify Hardesty to incorporate any 16 alleged collar from Yonghong? 17 MR. HEARD: Object to form. Leading. 18 Scope. Foundation. 19 Q Let me -- let me rephrase to address the 20 objections. 21 Dr. Wooley, are you familiar with the 22 opinions that Dr. Rodgers has offered concerning the	155 1 discussing here? 2 MR. HEARD: Object to form. Leading. 3 Scope. Foundation. 4 A Certainly not in that sentence, and I don't 5 think he does anywhere. 6 Q Does he provide any particularity at all in 7 this sentence or otherwise in his discussion of 8 ground 5 concerning what the proposed combination of 9 Hardesty and Yonghong is? 10 MR. HEARD: Same objections. 11 A No. I think the only thing you could infer 12 is to go back to what he's discussed previously and 13 maybe get that he was talking about certain 14 components or elements. 15 Q But, again, based on your recollection of 16 Dr. Rodgers' discussion of ground 5, he never 17 provides a motivation to modify Hardesty to 18 incorporate any alleged collar from Yonghong? 19 MR. HEARD: Object to form. Scope. 20 A As I recall, he discusses motivation, but 21 doesn't say what it is. 22 Q And maybe that's a good time we're going to
154 1 ground 5 you discussed with Mr. Heard? 2 A Yes, I've read them. 3 Q And based on your reading and your 4 understanding of his opinions, did he ever provide a 5 reason why a person of skill in the art would have 6 been motivated to modify Hardesty to incorporate any 7 alleged collar from Yonghong? 8 MR. HEARD: Object to Form. Scope. 9 Leading. 10 A As I recall, I don't recall him addressing 11 the motivation issue. 12 Q Let's look -- so, for instance, if we go to 13 page 181 of Dr. Rodgers Exhibit 1003, do you see this 14 sentence at the end of paragraph 181 that I've 15 highlighted on the shared screen here? 16 A Yes. 17 Q So in reading that sentence, which says, 18 "The combination of Hardesty and Yonghong would 19 require only a simple substitution of one known 20 element for another to obtain predictable results," 21 does Dr. Rodgers ever identify what element is being 22 substituted for another in the combination he's	156 1 look now at the institution decision, which you 2 discussed with Mr. Heard during cross-examination, 3 and I will put it into the shared window here. 4 Are you able to see what's on my screen, 5 Dr. Wooley? 6 A Yes. 7 Q And we'll just go to the front page. Is 8 this the institution decision in the IPR that we have 9 been discussing today? 10 A Yes, that's what it is. 11 Q And now we're going to go to page 39 of the 12 institution decision. So on page 39 sort of in the 13 middle of the page of the institution decision, do 14 you see this paragraph that I've highlighted on the 15 shared screen here? 16 A Great. Thanks for expanding that. Yes. 17 Q And do you see where the Board opines that 18 "Petitioner discusses similarity of the references 19 and reasons for substituting a combined ballistic and 20 electric transfer for a ballistic transfer"? 21 A Yes. 22 Q Does that have anything to do with

157 1 potentially modifying Hardesty to incorporate any 2 alleged collar from Yonghong? 3 MR. HEARD: Object to form. Scope. 4 Leading. 5 A Well, it's certainly -- that's a different 6 subject matter there. Ballistic transfer is not a 7 collar or a support member. 8 Q And the first sentence in the same 9 paragraph that we were looking at on page 39 of the 10 institution decision, do you see that first sentence, 11 again, that I've highlighted on the shared screen 12 here? 13 A Yes. 14 Q Do you agree with what the Board has stated 15 there? 16 MR. HEARD: Object to form. 17 A Yes, it appears to be correct. 18 Q And going back to Dr. Rodgers' declaration 19 in the portions that relate to ground 5, based on 20 your review and understanding of his positions, 21 those -- does Dr. Rodgers ever explain why a person 22 of skill in the art would have had a motivation to	159 1 the lines of saying that Hardesty has separate 2 components for the weight and the support member? 3 A I remember we talked about that. I don't 4 remember if I said that about Hardesty. 5 Q If you did say that about Hardesty, would 6 that -- would that have been a misstatement; you 7 spoke incorrectly? 8 MR. HEARD: Object to form. 9 A I was visualizing the figure in the patent 10 that shows the separate components. So I was 11 referring to that figure in the patent. 12 Q Okay. Let me bring up the patent so we can 13 try to find the figure that you would have been 14 referring to. 15 So here is the patent, I'll blow it up. 16 This is Exhibit 1001, already marked in the 17 proceedings. So, Dr. Wooley, do you see the '762 18 patent on my shared screen here? 19 A Yes, that's it. 20 Q And you were referring to a figure in the 21 '762 patent that shows the weight and the support 22 member as separate physical structures; is that
158 1 modify Yonghong to incorporate any alleged -- any 2 alleged collar from Hardesty? 3 MR. HEARD: Object to form. Scope. And 4 leading. 5 A Again, he addresses motivation, but doesn't 6 provide that motivation, doesn't say what it is. 7 Q And I want to rephrase the question that I 8 asked earlier because I misspoke. 9 But speaking of these same paragraphs where 10 Dr. Rodgers discusses his opinions as to ground 5 in 11 Exhibit 1003, does Dr. Rodgers ever explain why a 12 person of skill in the art would have had a 13 motivation to modify Hardesty to incorporate any 14 alleged support member from Yonghong? 15 MR. HEARD: Same objections. 16 A Yeah, same answer, I don't think he 17 provides what that motivation is. 18 Q And now I want to ask -- so you had a 19 discussion with Mr. Heard concerning the Hardesty 20 reference. Do you recall that? 21 A I do, yes. 22 Q And do you recall stating something along	160 1 correct? 2 A Yes. 3 Q And let's look at the figures and just let 4 me know which figure you were referring to. 5 A It's around 13. Maybe 12. No. It's 11. 6 Q Okay. Figure 11. Is that the one I have 7 on the screen here? 8 A Yes, that's it. 9 Q And the component labeled as 124B, do you 10 see that on the lower left-hand side in Figure 11? 11 A Yes, that's the weight. 12 Q And the component labeled as 28 sort of in 13 the middle left side of Figure 11 of the '762 patent, 14 do you see that? 15 A Yes. 16 Q And are those depicted in the patent as 17 being separate structural components? 18 MR. HEARD: Objection. 19 A Yes, they are two clearly separate. 20 There's a space between them. 21 Q And let's just look at your declaration for 22 one second, Exhibit 2007, the second, second

161 1 declaration. And I would like to draw your attention 2 to paragraph 81, and I can either share my screen or 3 you can bring it up on the hard copy. So Exhibit 4 2007, paragraph 81 on numbered page 39. 5 Are you able to see paragraph 81, 6 Dr. Wooley? 7 A Yes, I have 81 in front of me. 8 Q And you state in paragraph 81, "the portion 9 of Figure 7," you're referring to Hardesty, 10 "arbitrarily highlighted in purple by Petitioners is 11 either part of the charge holder tube or part of the 12 weight. There is simply no disclosure in Hardesty 13 suggesting that this is a separate structural 14 element." 15 Is that still your opinion even after the 16 cross-examination by Mr. Heard earlier? 17 MR. HEARD: Object to form. 18 A Yes, that's clearly a description of what 19 you see on page 38, the figure from Dr. Rodgers' 20 report. 21 Q And based on what you saw in the example 22 from Figure 11 of the '762 patent, that's pretty	163 1 not be. That's part of the ambiguity that I 2 mentioned. 3 Q And if the structure had a bushing that was 4 not fully annular, could the charge to assembly in 5 Yonghong still rotate 360 degrees? 6 (Simultaneous speaking.) 7 MR. HEARD: Objection to form. Hold on. 8 Hypothetical. Object to form. Hypothetical. Scope. 9 Go ahead. 10 A Sorry. Yes, there's nothing that would 11 keep it from rotating. It's certainly possible to 12 not have a full 360-degree ring in order to allow 13 rotation throughout the 360 degrees. 14 MR. STEIN: Thank you, Dr. Wooley. That's 15 all the questions I had. 16 THE WITNESS: You're welcome. 17 RECROSS-EXAMINATION 18 BY MR. HEARD: 19 Q Dr. Wooley, did you review Dr. Rodgers' 20 declaration in the break we had in between my 21 questioning and Mr. Stein's questioning? 22 A No.
162 1 different from what we're dealing with in terms of 2 your understanding of the claims at issue here? 3 MR. HEARD: Object to form. Leading. 4 Scope. 5 A Yeah, one merely needs to compare Figure 7 6 on page 38 that's colored purple and yellow with the 7 two separate and distinct pieces that are shown in 8 Figure 11 of the '762 patent. 9 Q Okay. Now I wanted to look at the Yonghong 10 reference, that's Exhibit 1004. Do you recall 11 discussing Yonghong with Mr. Heard? 12 A Yes. 13 Q And do you recall discussing a statement 14 that appears near the end of Yonghong concerning the 15 ability to rotate continuously? 16 A Yes, I remember that was brought up. 17 Q And you've expressed opinions in your 18 declaration that there's a possibility that the 19 bushing in Yonghong might not be fully annular; is 20 that correct? 21 A That's correct, it's not disclosed as being 22 fully annular. It's possible it could be, but it may	164 1 Q How did you have such a good recollection 2 of what was or was not in Dr. Rodgers' declaration? 3 A Well, I was looking at it. Mr. Stein put 4 it on the screen, I was able to read what he 5 highlighted. 6 Q So you were basing your answers on what 7 Mr. Stein pointed us to a few moments ago? 8 A And my memory of the fact that I think the 9 questions were about motivation and I recall that 10 being an issue that was addressed, but I recall there 11 was no actual description of the motivation. 12 Q When did you last read, fully read 13 Dr. Rodgers' declaration? 14 MR. STEIN: Objection. Form. 15 A I don't know what you mean by "fully." I 16 looked at parts of it yesterday. 17 Q Did you read it cover to cover? 18 A Yesterday? 19 Q Yes. 20 A Not -- no, probably didn't read it cover to 21 cover yesterday. I tend to skip a lot of the legal 22 principles and that sort of thing.

165 1 Q And is there a reason why you could 2 remember his -- parts of his declaration well, but 3 not the one you submitted for GR Energy a few weeks 4 ago? 5 MR. STEIN: Objection. Form. 6 A Yeah, two good reasons for that. One is 7 the previous one I haven't looked at since then. And 8 the second good reason is I looked yesterday at 9 Dr. Rodgers' declaration and mine. That was the 10 testimony. 11 Q Did you read all of Dr. Rodgers' testimony 12 as it relates to ground 5 on motivation to combine? 13 A I don't remember if I read all of it. 14 Probably not using the word "all," but I did read 15 some of his testimony. 16 Q Okay. 17 MR. HEARD: That's all for now. Thanks, 18 Dr. Wooley. 19 THE WITNESS: You're welcome. 20 MR. STEIN: No further questions. Thanks, 21 Dr. Wooley, for your time today, and hopefully you 22 get to make it to your engagements tonight and do	167 1 CERTIFICATE OF CERTIFIED SHORTHAND REPORTER 2 NOTARY PUBLIC 3 I, MONIQUE VOUTHOURIS, Certified Court Reporter 4 and Notary Public within and for the State of New 5 Jersey, do hereby certify: 6 That GARY WOOLEY, PH.D., the witness whose 7 remote deposition is hereinbefore set forth, was duly 8 sworn by me before the commencement of such 9 deposition, and that such deposition was taken before 10 me and is a true record of the testimony given by 11 such witness. 12 I further certify that the adverse party, SWM 13 INTERNATIONAL, LLC, was represented by counsel 14 at the deposition. 15 I further certify that the deposition of GARY 16 WOOLEY, PH.D. occurred remotely on Thursday, August 17 3, 2023, commencing at 10:06 a.m. EDT to 3:02 p.m. 18 EDT. 19 I further certify that I am not related to any 20 of the parties to this action by blood or marriage, I 21 am not employed by or an attorney to any of the 22 parties to this action, and that I am in no way
166 1 something more fun than this. 2 THE WITNESS: I will. Thank you both for 3 watching the clock. 4 (Ending time 3:02 p.m.) 5 ***** 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22	168 1 interested, financially or otherwise, in the outcome 2 of this matter. 3 IN WITNESS WHEREOF, I have hereunto set my hand 4 this 15th day of August 2023. 5 6 7  8 9 Monique Vouthouris, CCR, RPR, CRR 10 Notary Public of the State of New Jersey 11 My commission expires: April 8, 2024 12 13 14 15 16 17 18 19 20 21 22

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