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UNITED STATES DISTRICT COURT  
EASTERN DISTRICT OF LOUISIANA

IN RE: OIL SPILL BY THE OIL RIG	*	Docket 10-MD-2179
DEEPWATER HORIZON IN THE	*	
GULF OF MEXICO ON APRIL 20, 2010	*	Section J
	*	
Applies to:	*	New Orleans, Louisiana
	*	
Docket 10-CV-02771,	*	March 20, 2013
IN RE: THE COMPLAINT AND	*	
PETITION OF TRITON ASSET	*	
LEASING GmbH, et al	*	
	*	
Docket 10-CV-4536,	*	
UNITED STATES OF AMERICA v.	*	
BP EXPLORATION & PRODUCTION,	*	
INC., et al	*	
	*	
* * * * *		

DAY 15, AFTERNOON SESSION  
TRANSCRIPT OF NONJURY TRIAL  
BEFORE THE HONORABLE CARL J. BARBIER  
UNITED STATES DISTRICT JUDGE

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1 AFTERNOON SESSION

2 (March 20, 2013)

3 \* \* \* \* \*

4 THE DEPUTY CLERK: All rise.

5 THE COURT: All right. Please be seated, everyone.  
6 Good afternoon.

7 MR. BRIAN: Your Honor, Brad Brian on behalf of  
8 Transocean.

9 I've given your clerk a revised list of exhibits  
10 for Mr. Newman. We added one in response to what the PSC was  
11 offering and subtracted one because I had not used it. So we  
12 would offer those.

13 We have no objection to the list we received  
14 from the PSC, subject to the motion in limine we had filed  
15 earlier, which Your Honor had granted in part and denied in  
16 part. We're preserving that objection and offered some  
17 evidence in response to that.

18 But subject to that --

19 THE COURT: Wait, wait, wait. Remind me. Motion in  
20 limine pertaining to --

21 MR. BRIAN: To the prior well control logs,  
22 Your Honor.

23 THE COURT: Oh, that one. Okay. I understand.

24 MR. BRIAN: So there are some exhibits that were  
25 offered, and we introduced some contrary exhibits that we would



13:17 1 not have offered. But subject to that, we would have no  
13:17 2 further objections.

13:17 3 **THE COURT:** I thought you were talking about a  
13:17 4 *Daubert* motion instead of --

13:17 5 **MR. BRIAN:** No. No, Your Honor.

13:17 6 **THE COURT:** All right. Thank you.

13:17 7 Any objection to Transocean's exhibits?

13:17 8 Without objection, those are admitted,  
13:17 9 pertaining to Mr. Newman.

13:17 10 **MR. ROY:** Jim Roy for the PSC, Your Honor.

13:17 11 Subject to our offering of the Quirk exhibits,  
13:17 12 exhibits associated with his cross-exam, the plaintiffs do  
13:17 13 rest.

13:17 14 **THE COURT:** Okay.

13:17 15 **MR. TANNER:** Your Honor, Hugh Tanner for M-I.

13:17 16 Now that the plaintiffs have rest, we are here  
13:17 17 to reurge our Rule 52(c) motion. You had asked plaintiffs  
13:17 18 their position in opposition. I think Mr. Roy said he wanted  
13:17 19 to confer with his group, and I believe he's done that at this  
13:17 20 point.

13:17 21 **MR. ROY:** Your Honor, the PSC, while not agreeing to  
13:18 22 the motion of M-I to dismiss the punitive damage claims against  
13:18 23 it and the underlying regular negligence claims, nevertheless  
13:18 24 believes the matter can be taken up orally. We trust the sound  
13:18 25 discretion of the Court to rule on their motion.

13:18 1           **THE COURT:** All right. Does anybody else have any  
13:18 2 response to M-I's motion?

13:18 3           **MR. KANNER:** Your Honor, Allan Kanner for the State  
13:18 4 of Louisiana.

13:18 5           The only point I would make is one that  
13:18 6 Your Honor made yesterday. Strictly speaking, I don't think  
13:18 7 it's appropriate until Transocean rests its case. But subject  
13:18 8 to that, we agree with Mr. Roy.

13:18 9           **MR. TANNER:** Your Honor, I do believe under 52(c)  
13:18 10 that it's a -- once an issue has been thoroughly heard, that  
13:18 11 it's -- and we're only moving against the party that has now  
13:19 12 rested.

13:19 13           **THE COURT:** You're only moving as to the plaintiff?

13:19 14           **MR. TANNER:** Well, the plaintiffs State of Alabama,  
13:19 15 State of Louisiana plaintiffs, yes.

13:19 16           **THE COURT:** That would include the United States?

13:19 17           **MR. TANNER:** The United States did not bring an  
13:19 18 action against us, Your Honor.

13:19 19           **THE COURT:** Did not bring it. That's right. Okay.

13:19 20           **MR. UNDERHILL:** We did not sue M-I, Your Honor.

13:19 21           **THE COURT:** So it would be the private plaintiffs,  
13:19 22 private claimants, Alabama and Louisiana?

13:19 23           **MR. TANNER:** That's correct, Your Honor.

13:19 24           **THE COURT:** Okay.

13:19 25           **MR. ROBERTS:** Your Honor, Steve Roberts for

13:19 1 Transocean.

13:19 2 Transocean has also brought a claim against M-I  
13:19 3 under Rule 14. Transocean does not object to M-I's motion.

13:19 4 **THE COURT:** Okay.

13:19 5 **MR. GODWIN:** Your Honor, Don Godwin for Halliburton.

13:19 6 Halliburton does not object to M-I's motion  
13:19 7 either.

13:19 8 **THE COURT:** All right. Very well.

13:19 9 Anybody else have anything to say?

13:20 10 **MR. BROCK:** Your Honor, sorry about that. BP has --

13:20 11 **THE COURT:** You might want to get near a microphone  
13:20 12 so we can hear you.

13:20 13 **MR. BROCK:** I'm sorry.

13:20 14 We have a single M-I witness on our will-call  
13:20 15 list, Leo Lindner. And if the Court were inclined to dismiss  
13:20 16 them from the case, we'd still like to have the option to call  
13:20 17 him in our case.

13:20 18 **THE COURT:** All right. But you don't -- you'd like  
13:20 19 to use him in your case, but that doesn't necessarily -- you're  
13:20 20 not necessarily objecting to their motion?

13:20 21 **MR. BROCK:** No, sir. I'm just making this point.

13:20 22 **THE COURT:** I see.

13:20 23 **MR. BROCK:** To be very honest, we haven't made that  
13:20 24 decision yet. We would like to reserve.

13:20 25 **MR. LANGAN:** Your Honor, we actually dismissed our

13:20 1 claims against M-I, and they dismissed their claims against us  
13:20 2 some time ago.

13:20 3 **THE COURT:** All right. Very well. Thank you for  
13:20 4 reminding me of that.

13:20 5 All right. Rule 52(c) of the Federal Rules of  
13:20 6 Civil Procedure provide as follows. It's called "Judgment on  
13:21 7 Partial Findings."

13:21 8 This particularly applies in a bench trial. It  
13:21 9 says: "If a party has been fully heard on an issue during a  
13:21 10 nonjury trial and the Court finds against the party on that  
13:21 11 issue, the Court may enter judgment against the party on the  
13:21 12 claim or defense that, under the controlling law, can be  
13:21 13 maintained or defeated only with a favorable finding on that  
13:21 14 issue.

13:21 15 "The Court may, however, decline to render any  
13:21 16 judgment until the close of the evidence. A judgment of  
13:21 17 partial findings must be supported by findings of fact and  
13:21 18 conclusions of law as required by Rule 52(a)."

13:21 19 The difference in this and a so-called directed  
13:22 20 verdict in a -- for example, in a jury trial is that once the  
13:22 21 Court has heard all the evidence as to a particular claim --  
13:22 22 claim or defense, a claim in this case -- the Court -- it's not  
13:22 23 simply a question of whether there's any evidence; it's a  
13:22 24 question if the Court can make even a factual finding and can  
13:22 25 make credibility calls and so forth, although I don't think

13:22 1 there's really any to be made in this particular instance.

13:22 2 M-I has moved for a judgment on partial findings  
13:22 3 under Rule 52(c), and they have -- it's Record Document 8919.  
13:22 4 They have supported their motion with a memorandum or brief,  
13:22 5 and also with proposed findings of fact and conclusions of law  
13:22 6 which, as I appreciate it, largely rely on stipulated facts.

13:23 7 Is that right, Mr. Tanner?

13:23 8 **MR. TANNER:** That's right, Your Honor.

13:23 9 **THE COURT:** And those essential facts are as follows:  
13:23 10 That M-I and BP had entered into a contract related to the  
13:23 11 Macondo well that governed the scope of M-I's work on the  
13:23 12 Macondo well.

13:23 13 I'm not going to cite these stipulations that  
13:23 14 support this. They're set forth in the documents submitted by  
13:23 15 M-I.

13:23 16 M-I had -- M-I recommended a drilling fluids  
13:23 17 program for the Macondo well to BP. And BP reviewed, revised,  
13:23 18 and approved the drilling fluids program for the Macondo well.

13:24 19 Again, I'm just giving the bare essentials, I  
13:24 20 think, here.

13:24 21 The deepwater -- there was a displacement  
13:24 22 procedure that was based upon information provided by BP and  
13:24 23 the M-I drilling fluid specialists for the *Deepwater Horizon*,  
13:24 24 and that procedure was approved by BP.

13:24 25 The original procedure -- displacement

13:24 1 procedure -- a first draft, that is, did not include a step in  
13:24 2 the middle of the displacement providing for the conduct of a  
13:25 3 negative pressure test.

13:25 4 The step requiring the displacement to stop for  
13:25 5 BP to conduct this negative pressure test was added to the  
13:25 6 procedure based on instructions provided by BP.

13:25 7 M-I had no responsibility for determining  
13:25 8 whether BP would conduct a negative pressure test during the --  
13:25 9 during displacement.

13:25 10 M-I had no responsibility for determining the  
13:25 11 depth to which the well would be displaced to seawater.

13:25 12 BP and M-I had discussed using two lost  
13:25 13 circulation material pills available on the rig in the spacer  
13:25 14 used during the displacement of the well to seawater.

13:25 15 BP approved the using of the two lost  
13:25 16 circulation material pills in the spacer.

13:25 17 No M-I personnel were involved in developing the  
13:25 18 basis of the design of the well.

13:26 19 No M-I personnel were responsible for monitoring  
13:26 20 the well or well -- for well control purposes.

13:26 21 No M-I personnel were responsible for decisions  
13:26 22 as to when or how to set the surface cement plug for the  
13:26 23 temporary abandonment procedure.

13:26 24 No M-I personnel were responsible for the  
13:26 25 cementing.

13:26 1 No M-I personnel were responsible for conducting  
13:26 2 or interpreting the negative pressure test on April 20th.

13:26 3 And the reason for the zero pressure reading on  
13:26 4 the kill line during the negative pressure test has not been  
13:26 5 definitively established.

13:26 6 So based on those findings of fact, the Court  
13:26 7 can reach legal conclusions that there is no basis on which to  
13:26 8 find that any act or omission of M-I caused or contributed to  
13:27 9 the explosion or blowout which occurred on April 20th, 2010.

13:27 10 I guess I should add -- before I finish this, I  
13:27 11 should ask one question.

13:27 12 Is there any argument or allegation that M-I was  
13:27 13 somehow involved in the -- or had any role in the -- that will  
13:27 14 be tried in Phase Two?

13:27 15 **MR. TANNER:** I'm not aware of any, Your Honor.

13:27 16 **THE COURT:** Okay. All right.

13:27 17 So based on those essential findings of fact and  
13:27 18 conclusions of law, I am going to grant M-I -- it's M-I, LLC;  
13:28 19 is that right?

13:28 20 **MR. TANNER:** That's the legal name, yes, sir.

13:28 21 **THE COURT:** -- M-I, LLC's motion for judgment --  
13:28 22 judgment of partial findings.

13:28 23 **MR. TANNER:** Thank you very much, Your Honor. I  
13:28 24 appreciate that.

13:28 25 **THE COURT:** All right.

13:28 1 MR. TANNER: Thank you.

13:28 2 THE COURT: What are you going to do with the rest of  
13:28 3 your time now, Mr. Tanner?

13:28 4 MR. TANNER: Well, I've got to stay here and listen  
13:28 5 to Mr. -- to the next two parties, I guess, because you have  
13:28 6 causes of action against us.

13:28 7 MR. ROBERTS: Your Honor, unless that was unclear, I  
13:28 8 indicated that on behalf of Transocean, we dismiss any claims  
13:28 9 that we have pending against M-I, subject to M-I giving us one  
13:28 10 of the chairs in the top row.

13:28 11 MR. LANGAN: Your Honor, I thought that was my  
13:28 12 department.

13:28 13 MR. TANNER: Andy said he had the map.

13:28 14 THE COURT: Yeah. Mr. Langan's been our negotiator  
13:28 15 on space.

13:28 16 MR. TANNER: And then Halliburton as well. Right?  
13:28 17 Yeah. Yeah.

13:28 18 MR. GODWIN: I thought I said, Judge --

13:29 19 THE COURT: You've already said that. I want to make  
13:29 20 it clear.

13:29 21 There are no remaining claims -- I've dismissed  
13:29 22 the claims by the plaintiffs. And what was said before, as I  
13:29 23 appreciate it, all -- to the extent there were or are any  
13:29 24 remaining third-party cross-claims, anything of that nature,  
13:29 25 counterclaims against -- well, it wouldn't be a counterclaim, I



13:29 1 guess, against M-I; those are dismissed.

13:29 2 Correct? Everybody agree with that?

13:29 3 **MR. TANNER:** Thank you very much, Your Honor.

13:29 4 **THE COURT:** You're home free, Mr. Tanner.

13:29 5 **MR. TANNER:** Thank you, sir. I'll be out in the  
13:29 6 hallway about these chairs.

13:29 7 **THE COURT:** It was your persuasive examination that  
13:29 8 carried the day.

13:29 9 **MR. TANNER:** Well -- and I knew it would be. Thank  
13:29 10 you, Your Honor.

13:29 11 **THE COURT:** All right. Go ahead. I'm listening.  
13:29 12 I'm looking for something, but I'm listening.

13:29 13 **MR. BECK:** On behalf of Cameron, we move, pursuant to  
13:29 14 Rule 52(c), for a motion for judgment based on partial findings  
13:29 15 related to the claims for punitive damages against Cameron.

13:30 16 Our position is, Your Honor, that based on all  
13:30 17 the evidence that's been introduced after the plaintiffs have  
13:30 18 been fully heard, that there's no evidence of sufficient  
13:30 19 blameworthy conduct as required by the Fifth Circuit, which  
13:30 20 would be willful and wanton conduct. And, therefore, our  
13:30 21 position is that based upon Rule 52(c), after the plaintiffs  
13:30 22 have had an opportunity to be fully heard, that we -- that  
13:30 23 Cameron, respectfully, should be entitled to a motion for  
13:30 24 judgment on the punitive damages claim.

13:30 25 And Mr. Roy has agreed that this can be taken up

1 orally subject to Your Honor's permission.

2 **THE COURT:** All right.

3 Mr. Roy?

4 **MR. ROY:** Yes, sir, Your Honor. On behalf of the  
5 PSC, just to be absolutely clear -- and I think Mr. Beck has  
6 been clear. But just to belt and suspenders it, the PSC would  
7 object and does oppose granting any motion to dismiss of the  
8 underlying negligence and marine strict liability claims.

9 As to the punitive damage claim, which is the  
10 subject of his motion, and the limited subject of it, we do  
11 agree it can be taken up orally.

12 While we do not agree to the motion, we do  
13 believe that it is within the sound discretion of the Court to  
14 view the evidence and make a ruling at this time.

15 **THE COURT:** Anybody else want to be heard on this?  
16 No one else? Okay.

17 So you're moving only to dismiss the punitive  
18 damage claims -- let me refresh my recollection -- of the --  
19 you're not sued by the United States, first of all?

20 **MR. BECK:** That is correct.

21 **THE COURT:** So no Clean Water Act claims or anything  
22 like that?

23 **MR. BECK:** Correct.

24 **THE COURT:** Okay. I'm -- I am -- obviously, I've sat  
25 through this trial, I've listened to all of the evidence

13:31 1 relating to Cameron, and I'm not prepared to issue any kind of  
13:32 2 findings or conclusions of law right now except to say that I  
13:32 3 have not heard or seen evidence that would support -- in any  
13:32 4 way support a finding of gross negligence or willful misconduct  
13:32 5 on the part of Cameron.

13:32 6 So I'm going to grant your motion, with the  
13:32 7 understanding I may have to issue something. If you want to  
13:32 8 submit some proposed findings and conclusions, I would invite  
13:32 9 that. Okay?

13:32 10 **MR. BECK:** Thank you, Your Honor.

13:32 11 One additional point. Mr. Roy is absolutely  
13:32 12 right that we're not moving at this time with respect to  
13:32 13 anything other than the punitive damages claim.

13:32 14 **THE COURT:** Right.

13:32 15 **MR. BECK:** We do intend, however, to file a similar  
13:32 16 motion, but not to take up the Court's time, because that's  
13:32 17 going to be opposed. We'll just file something in writing,  
13:32 18 with the Court's permission.

13:32 19 **THE COURT:** That will be good.

13:32 20 **MR. BECK:** Thank you, sir.

13:32 21 **MR. ROBERTS:** Your Honor, Steve Roberts on behalf of  
13:33 22 Transocean.

13:33 23 I've got the honor of having been preceded by  
13:33 24 two former law partners of mine, Mr. Tanner and Mr. Beck.

13:33 25 Our status as a limitation petitioner makes the

13:33 1 timing of this a bit questionable, I admit that. But just out  
13:33 2 of an abundance of caution, we again move for a directed  
13:33 3 verdict under 52(c) on factual insufficiency on all claims  
13:33 4 against us.

13:33 5 Again, we would reurge so that dare not waive  
13:33 6 the three partial -- motions for partial summary judgment that  
13:33 7 the Court has under advisement. That would be Docket Entry  
13:33 8 Nos. 8105, 8106, and 8120.

13:33 9 Thank you, Your Honor.

13:33 10 **THE COURT:** Thank you.

13:33 11 And I'll just state for the record with respect  
13:33 12 to Transocean, obviously Transocean is the petitioner in  
13:33 13 limitation. I think it's clear, in fact, as I appreciate it,  
13:33 14 that it's been admitted by Transocean that there was at least  
13:33 15 negligence on the part of certain people employed by Transocean  
13:34 16 with respect to what occurred on the rig that night.

13:34 17 So the issue then becomes, as I view it, we now  
13:34 18 switch to Transocean not only defending itself against the  
13:34 19 plaintiffs' claims, but being a petitioner in limitation,  
13:34 20 Transocean has the burden of going forward to prove lack of  
13:34 21 privity or knowledge. So I don't think I could act on your  
13:34 22 motion until we've heard all of that.

13:34 23 And then, of course, the other side gets a  
13:34 24 chance to defend against your lack of privity or knowledge  
13:34 25 claims.

13:34 1 So I'm going to deny your motion at this time  
13:34 2 without prejudice. Okay. It can be reurged.

13:34 3 **MR. ROBERTS:** Thank you, Judge.

13:34 4 **THE COURT:** Thank you.

13:34 5 **MR. GODWIN:** Hello, Judge. Don Godwin for  
13:34 6 Halliburton, Judge.

13:34 7 On behalf of Halliburton, Your Honor, we would  
13:34 8 file -- we would make this oral motion for 52(c) on partial  
13:34 9 findings regarding the PSC, state's and local government's  
13:35 10 claims for gross negligence, willful misconduct, and punitive  
13:35 11 damages. We do not believe there's any facts to support a  
13:35 12 gross negligence finding against Halliburton based on either of  
13:35 13 those causes of action.

13:35 14 But, Your Honor, we will be filing today, as we  
13:35 15 said yesterday, our written motion. But we wanted to bring  
13:35 16 this oral motion at this time, as you allowed us to do so.

13:35 17 **THE COURT:** Okay.

13:35 18 **MR. GODWIN:** For which we're most appreciative.

13:35 19 Anyway, that Rule 52 motion is granted -- not  
13:35 20 granted but is being made, Judge.

13:35 21 **THE COURT:** You can't grant your own motion.

13:35 22 **MR. GODWIN:** I know. I wish I could, Judge. I liked  
13:35 23 it when you were granting those motions when we got up there,  
13:35 24 so maybe you'll stay in that pattern.

13:35 25 **THE COURT:** Well, the pattern kind of changed,

13:35 1 though. You were in the wrong place in line, Mr. Godwin.

13:35 2 **MR. GODWIN:** I understand, Judge.

13:35 3 **THE COURT:** I want you to go ahead and file it in  
13:35 4 writing, but I'm going to -- again, I've heard enough evidence  
13:35 5 so that I'm not going to -- I'm not going to grant your motion.  
13:35 6 I'm going to deny your motion.

13:36 7 **MR. GODWIN:** Okay, sir.

13:36 8 **THE COURT:** Okay.

13:36 9 **MR. GODWIN:** Thank you.

13:36 10 Judge, is this an appropriate time now to ask to  
13:36 11 admit the documents from Calvin Barnhill's testimony?

13:36 12 **THE COURT:** If you'd like to.

13:36 13 **MR. GODWIN:** We have circulated those documents, I  
13:36 14 believe it was, last evening, Your Honor, that we used in our  
13:36 15 examination. To my knowledge, there are no objections. We'd  
13:36 16 offer them at this time.

13:36 17 **THE COURT:** Okay. Without objection, those are  
13:36 18 admitted.

13:36 19 **MR. GODWIN:** Thank you, Judge.

13:36 20 **MR. LANGAN:** Your Honor, Andy Langan for BP.

13:36 21 On Monday we raised 52(c) orally. The  
13:36 22 plaintiffs have now rested. So we just want to make sure for  
13:36 23 the record we do that again. You've already said you were  
13:36 24 going to defer on that, but just for the record, we want to --

13:36 25 **THE COURT:** I'll just -- I don't know if I was clear

13:36 1 whether I was deferring or denying or whatever. As a practical  
13:36 2 matter, particularly in a bench trial, I don't think it makes  
13:36 3 much difference, but I'm just going to say I'll deny your  
13:36 4 motion, but obviously you can reurge it at the conclusion of  
13:36 5 all the evidence. Okay?

13:36 6 **MR. LANGAN:** Thank you, Your Honor.

13:36 7 **THE COURT:** Thank you.

13:36 8 **MR. IRPINO:** Your Honor, Anthony Irpino for the PSC.  
13:37 9 We have our list of exhibits from Mr. Barnhill's testimony that  
13:37 10 have been sent around and approved by the parties. We'd like  
13:37 11 to offer, file, and introduce that.

13:37 12 **THE COURT:** Any objection to the private plaintiffs'  
13:37 13 exhibits relating to Mr. Barnhill?

13:37 14 **MR. BRIAN:** Your Honor, Brad Brian for Transocean.  
13:37 15 Mr. Hymel went back to the office. So we're going to submit  
13:37 16 our exhibits for Mr. Barnhill maybe tomorrow. And I guess I  
13:37 17 would ask the -- Mr. Hymel to look at this list before we -- we  
13:37 18 may not have any objections, but I don't know.

13:37 19 **THE COURT:** Okay. We can take that up tomorrow.

13:37 20 By the way, tomorrow you'll all be pleased to  
13:37 21 know, I get to play Judge Shushan tomorrow to do the exhibit  
13:37 22 marshaling.

13:37 23 **MR. IRPINO:** How does that work?

13:37 24 **THE COURT:** We'll see. She left me detailed  
13:37 25 instructions as to what I'm supposed to do, you know. So I

13:37 1 hope I don't screw it up.

13:37 2 **MR. IRPINO:** Judge, one other --

13:37 3 **THE COURT:** Anyway, I was just going to mention that  
13:38 4 we'll have the regular marshaling conference even though she's  
13:38 5 not here. I guess we'll do it around -- when did we break last  
13:38 6 time, 5:30 or so?

13:38 7 **MR. UNDERHILL:** 3:00.

13:38 8 **THE COURT:** 3:00? I don't think so. No, 5:30.

13:38 9 **MR. IRPINO:** One final thing, Brad alluded to it  
13:38 10 earlier. We've sent around or list for exhibits and  
13:38 11 demonstratives used and offered in connection with Steve  
13:38 12 Newman's testimony. We've received no objection. Transocean  
13:38 13 specifically looked at it and said they didn't have any  
13:38 14 objection.

13:38 15 **THE COURT:** Any remaining objection to the  
13:38 16 plaintiff's motion -- I mean, exhibit list related to  
13:38 17 Mr. Newman?

13:38 18 Hearing none, those are admitted.

13:38 19 **MR. STERBCOW:** Your Honor, good afternoon. Paul  
13:38 20 Sterbcow for the PSC. It's a new matter, but the PSC feel like  
13:38 21 we need to raise it with Your Honor now.

13:38 22 We've been notified by Transocean and  
13:38 23 Halliburton that it is their intent between the two of them to  
13:38 24 play up to 27 video clips in their cases, their defense cases.  
13:39 25 We think it's an abuse and a violation of the rule.



13:39 1 Our understanding was video clips would be  
13:39 2 played in court for witness testimony context, for credibility  
13:39 3 purposes, but it was to be on a very limited basis, which we  
13:39 4 did.

13:39 5 We played two. The only reason we played a  
13:39 6 third, it was Mike Williams who we were going to bring live and  
13:39 7 we lost control of him.

13:39 8 I think at least two of the witnesses, Murry  
13:39 9 Sepulvado and John Gisclair, have been listed as will-call  
13:39 10 witnesses by the parties, one of whom at least was subpoenaed.  
13:39 11 We see it, Your Honor, as -- the PSC sees this as an attempt to  
13:39 12 play video clips and avoid putting witnesses live on the stand  
13:39 13 and subjecting them to cross-examination; and we would object.

13:39 14 I don't have a magic number as to how many video  
13:39 15 clips are appropriate; but 11 by Halliburton and up to 16 by  
13:39 16 Transocean, we feel, is wholly inappropriate.

13:40 17 **THE COURT:** All right. Let me hear from them.

13:40 18 **MR. BRIAN:** Your Honor, Brad Brian for Transocean.

13:40 19 I guess my first response is I'd like to take a  
13:40 20 look at this and maybe confer with Mr. Sterbcow and take this  
13:40 21 up at a different time.

13:40 22 With respect to the two that we wanted to play  
13:40 23 today, and actually now, one is Leo Lindner, who was on the  
13:40 24 plaintiff's list. And we were prepared to cross-examine him  
13:40 25 and was notified that he was not going to be called. So we

13:40 1 would like to play --

13:40 2 **THE COURT:** How long of one is that?

13:40 3 **MR. BRIAN:** About 15 minutes, I believe.

13:40 4 **THE COURT:** The other one is Murry Sepulvado?

13:40 5 **MR. BRIAN:** The other one is Murry Sepulvado, who was  
13:40 6 on our will-call list. We looked at it and thought, frankly,  
13:40 7 it would be just easier and shorter to do with -- it's about a  
13:40 8 15-minute video clip.

13:40 9 **THE COURT:** I'm sure that would be shorter.

13:40 10 **MR. BRIAN:** It will be shorter. If -- we're not --  
13:40 11 if Your Honor would prefer we bring him live, we'll do that,  
13:40 12 but we actually thought --

13:40 13 **THE COURT:** No. I don't see any problem with those  
13:40 14 two.

13:40 15 I tend to agree, if we're talking about 20  
13:40 16 something total, that sounds maybe a little excessive.

13:41 17 **MR. BRIAN:** The only other ones we have that are more  
13:41 18 significant are Mr. Woelfel, our expert who unfortunately died.  
13:41 19 I think that's --

13:41 20 **THE COURT:** That's different, yeah.

13:41 21 **MR. BRIAN:** -- understandable. And then Paul Johnson  
13:41 22 is a more significant one.

13:41 23 The other ones are very, very short clips,  
13:41 24 most -- many of which go to this question that Mr. Webster  
13:41 25 testified to about the audits and things --

13:41 1           **THE COURT:** Why don't we do this: Why don't I ask  
13:41 2 you and Mr. Godwin, who's standing right behind you, to confer  
13:41 3 sometime today or this evening with the PSC and plaintiffs and  
13:41 4 see if we can work this out to reduce that number.

13:41 5           **MR. BRIAN:** We'll do that.

13:41 6           **THE COURT:** Okay.

13:41 7           **MR. BRIAN:** Then I would propose that -- before we do  
13:41 8 that, I would propose just to play Mr. Lindner's first and  
13:41 9 we'll talk about Mr. Sepulvado, unless they withdraw their  
13:41 10 objection to Mr. Sepulvado.

13:41 11           **MR. STERBCOW:** No, that's fine.

13:41 12           **THE COURT:** I said those two are okay. We can go  
13:41 13 ahead with those two.

13:41 14           **MR. BRIAN:** Okay. And one other --

13:41 15           **THE COURT:** I was talking about the remainder of them  
13:41 16 going forward.

13:41 17           **MR. BRIAN:** Will do, Your Honor.

13:41 18           The other thing I would mention, it was brought  
13:42 19 to my attention that the deponents in their depositions, when  
13:42 20 they're asked to introduce themselves, they gave their  
13:42 21 addresses. My mistake, we did not splice that from the  
13:42 22 videotape. I will take it out of the transcript when I give it  
13:42 23 to the -- it's in there right now, but I will blacken that out,  
13:42 24 if that's acceptable. Because I understand it's the Court's  
13:42 25 desire not to have that in the record.

13:42 1 THE COURT: Okay.

13:42 2 MR. WILLIAMSON: One last thing, Judge, we had told  
13:42 3 you we would redact the Perkin report, and we have two  
13:42 4 exhibits. I talked to BP. We're in the process of reaching --  
13:42 5 trying to reach an agreement. We have reached partial  
13:42 6 agreement. I've talked to TO. I think I'll reach agreement.

13:42 7 I just wanted to make sure the Court knew that.  
13:42 8 I think it's appropriate to bring it up tomorrow at 5:30,  
13:42 9 assuming that's acceptable to the judge.

13:42 10 THE COURT: That's fine. That makes sense.

13:42 11 All right. So we're going to play Mr. Lindner's  
13:42 12 depo clips?

13:42 13 MR. BRIAN: Yes, Your Honor. I have copies of the --  
13:42 14 of the actual transcript delivered to your clerk and the court  
13:42 15 reporter. I actually have copies for the parties if they want  
13:43 16 them.

13:43 17 We're going to play Mr. Lindner, Your Honor.

13:44 18 THE COURT: Okay.

09:20 19 (WHEREUPON, the videotaped deposition of **Leo Thomas**  
09:20 20 **Lindner** was played.)

13:59 21 MR. BRIAN: That completes Mr. Lindner, Your Honor.

13:59 22 THE COURT: All right.

13:59 23 MR. BRIAN: I've had further discussions with the  
13:59 24 PSC. I propose to go ahead with Mr. Childs at this time.

13:59 25 THE COURT: Okay. Very well.

13:59 1 Stephanie, turn the lights back on.

13:59 2 **THE DEPUTY CLERK:** Okay.

13:59 3 (WHEREUPON, **GREG CHILDS**, having been duly sworn,  
13:59 4 testified as follows.)

14:00 5 **THE DEPUTY CLERK:** Please state your full name and  
14:00 6 correct spelling for the record.

14:00 7 **THE WITNESS:** Eric Gregory Childs, E-R-I-C,  
14:00 8 G-R-E-G-O-R-Y --

14:00 9 **THE COURT:** You need to pull that microphone up.  
14:00 10 No, it's -- oh, you have --

14:01 11 **THE WITNESS:** Is that better?

14:01 12 **THE COURT:** No. It must not be on.

14:01 13 **THE WITNESS:** Green light.

14:01 14 **THE COURT:** Can't hear you. Is that yours or ours?  
14:01 15 Did you bring your own?

14:01 16 **THE WITNESS:** It's the Court's. Is that any better?

14:01 17 **MR. BAAY:** It's the Court's.

14:01 18 **THE WITNESS:** I have to hold it up to my mouth for it  
14:01 19 to work.

14:01 20 **THE COURT:** Give that back to her. Why don't you  
14:01 21 just use the microphone that's there. When you have to get up,  
14:01 22 we'll give you one of these hand-held mics, and you can take it  
14:01 23 with you.

14:01 24 Make sure the battery's good, Stephanie.  
14:01 25 Does it work?

14:01 1 THE DEPUTY CLERK: Give it a try.

14:01 2 THE WITNESS: Is this working?

14:02 3 THE DEPUTY CLERK: I think only one mic can --

14:02 4 THE COURT: I have no idea.

14:02 5 THE DEPUTY CLERK: And the battery's full.

14:02 6 THE COURT: Use that microphone there.

14:02 7 Why don't you call Steve and figure out what's

14:02 8 going on.

14:02 9 THE WITNESS: This one works.

14:02 10 MS. KARIS: Your Honor, before we get started, with

14:02 11 the Court's permission, if I could just move forward if he's

14:02 12 going to be going to the board.

14:02 13 THE COURT: That's fine.

14:02 14 MS. KARIS: Thank you.

14:02 15 THE COURT: Swing the microphone toward you.

14:02 16 THE WITNESS: Is this working?

14:02 17 THE COURT: That's better. Yeah.

14:02 18 She may be able to adjust the volume when she

14:02 19 gets back.

14:02 20 MR. BAAY: It will be a while before we go to the

14:02 21 board.

14:02 22 Good afternoon, Your Honor. David Baay,

14:02 23 Transocean. I have Greg Childs on direct examination.

24

25

## GREG CHILDS - DIRECT

## 1 DIRECT EXAMINATION

14:02 2 BY MR. BAAY:

14:02 3 Q. Tell the Court where you're currently working.

14:02 4 A. WEST Engineering Services.

14:02 5 Q. How long have you worked for WEST?

14:02 6 A. About 17 years.

14:02 7 Q. Is WEST located in Houston?

14:03 8 A. Houston area, yes, sir.

14:03 9 Q. Tell us about your training and education.

14:03 10 A. Bachelor of science, mechanical engineering, University of  
14:03 11 Houston, 1971; then Advanced Management Institute at Rice  
14:03 12 University in 1992.

14:03 13 MR. BAAY: Dennis, could we bring up D-6682, please.

14:03 14 BY MR. BAAY:

14:03 15 Q. Mr. Childs, when did you first become involved with  
14:03 16 blowout preventers?14:03 17 A. After my joining of Cameron Iron Works. I started there  
14:03 18 as a design engineer II, graduated up through III, and then  
14:03 19 senior.14:03 20 Q. Tell us what your responsibilities were as a design  
14:03 21 engineer for Cameron.14:03 22 A. Design of all drill-through related equipment that Cameron  
14:03 23 sold: the BOPs, rams, connectors, riser -- drilling riser,  
14:03 24 ball joints/flex joints, anything involved with drill-through  
14:03 25 equipment.

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14:03 1 Q. As you've marked on D-6682, you made a series of  
14:03 2 promotions through design engineer?

14:03 3 A. Those series, yes, sir.

14:03 4 Q. And that was II, III, and then senior?

14:03 5 A. Yes.

14:03 6 Q. And in that role of design engineer, did you have the  
14:04 7 opportunity to design any BOP or blowout preventer components  
14:04 8 for Cameron?

14:04 9 A. Complete BOPs and components around BOPs.

14:04 10 Q. After your time as design engineer, what was your next  
14:04 11 promotion within Cameron?

14:04 12 A. I became engineering manager for that same group.

14:04 13 Q. What were your responsibilities as engineering manager?

14:04 14 A. Manage design engineers designing the same equipment we  
14:04 15 just discussed.

14:04 16 Q. Through your time at Cameron, did you develop or become  
14:04 17 the primary author for patents related to components designed  
14:04 18 while at Cameron?

14:04 19 A. Yes, I'm the named inventor on five patents for Cameron.

14:04 20 MR. BAAY: Let's go to the second page of this  
14:04 21 exhibit, please, this demonstrative.

14:04 22 BY MR. BAAY:

14:04 23 Q. Tell us briefly what those patents involve, what  
14:04 24 components those patents involve.

14:04 25 A. The first one was on the super shear or casing shear ram.



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14:05 1 Two or three others were on flex packers, which are a form of  
14:05 2 variable bore ram. The other over on ram B0- -- rams for ram  
14:05 3 BOPs.

14:05 4 **THE COURT:** Excuse me, one second.

14:05 5 Steve, is it possible to use two microphones at  
14:05 6 the same time?

14:05 7 **MR. MUNSTER:** Yes.

14:05 8 **THE COURT:** Because the witness was trying to use it  
14:05 9 and it didn't work.

14:05 10 **THE WITNESS:** I had to put it right at my mouth.

14:05 11 **THE COURT:** And also the hand-held mic wasn't working  
14:06 12 either.

14:06 13 **MR. MUNSTER:** When you use the lavaliers, the  
14:06 14 hand-held ones are disabled.

14:06 15 **THE WITNESS:** How's that?

14:06 16 **THE COURT:** That's better.

14:06 17 **THE WITNESS:** Is that working?

14:06 18 **(OFF THE RECORD)**

14:06 19 **THE WITNESS:** Is everybody hearing me?

14:06 20 **MR. BAAY:** Push the other one back. We're getting a  
14:06 21 little bit of an echo.

14:06 22 **MR. MUNSTER:** Hit mute on the witness mic.

14:06 23 **THE WITNESS:** I did not turn up the mic.

14:06 24 **MR. BAAY:** Try that.

14:06 25 **THE WITNESS:** How's that. Is everybody hearing me?

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14:07 1 THE COURT: I can hear you, but I don't know if  
14:07 2 anybody else can.

14:07 3 Is that better or worse for everybody?

14:07 4 THE WITNESS: Is this acceptable in the back?

14:07 5 THE COURT: Can you hear in the back?

14:07 6 Yes. They can hear in the back.

14:07 7 MR. BAAY: Let's give it a go, and we'll readjust if  
14:07 8 need be.

14:07 9 THE COURT: Turn up the volume a little bit.

14:07 10 MR. BAAY: Try that, Greg.

14:07 11 THE WITNESS: Is that better? Are we there yet?

14:07 12 MR. BAAY: There you go.

14:07 13 THE COURT: Okay.

14:07 14 MR. BAAY: May I proceed, Your Honor?

14:07 15 THE COURT: Go ahead.

14:07 16 BY MR. BAAY:

14:07 17 Q. In sum total, how long were you with Cameron?

14:07 18 You said you started in 1974. When did you leave  
14:07 19 Cameron?

14:07 20 A. In 1996, 21 1/2 years.

14:07 21 Q. As you left, you were in the role of manager for design  
14:07 22 engineers?

14:07 23 A. My actual last role was responsibility for worldwide  
14:07 24 repair for all ram BOPs that Cameron produced.

14:08 25 Q. When you left Cameron, did you join WEST Engineering?

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14:08 1 A. Yes, I went directly there.

14:08 2 Q. And in what capacity did you join WEST?

14:08 3 A. Vice president of drill-through equipment.

14:08 4 Q. At the time you joined WEST, were you one of two main  
14:08 5 principals of WEST Engineering?

14:08 6 A. Yes. The owner and myself were the principals.

14:08 7 Q. Now, describe for us what kind of work WEST Engineering  
14:08 8 does.

14:08 9 A. It started as a training company, moved into consulting,  
14:08 10 and branched out into assessments of rig equipment,  
14:08 11 drill-through equipment, mainly at the first on drilling rigs  
14:08 12 worldwide.

14:08 13 Q. When you say "drill-through equipment," you're talking  
14:08 14 about blowout prevention equipment?

14:08 15 A. That is the more generic term, blowout prevention  
14:08 16 equipment. So everything that you would drill --

14:08 17 Q. Would you consider WEST to be one of the leading experts  
14:08 18 in the industry when it comes consulting on blowout prevention  
14:08 19 equipment?

14:08 20 A. Yes, I would.

14:08 21 Q. Tell us about your role with WEST. What were your  
14:08 22 responsibilities when you joined WEST?

14:08 23 A. I've done training. I was the principal trainer or leader  
14:09 24 for both the basic and the advanced seminars.

14:09 25 I run the crew at the end that work across the world

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14:09 1 doing rig assessments. Currently I have close to 90 surveyors  
14:09 2 or assessors that go around the world assessing equipment on  
14:09 3 drilling rigs around the world. We do troubleshooting. We do  
14:09 4 risk assessments.

14:09 5           Again, we're still basically a consulting company.  
14:09 6 So as our customers have issues, they request us for  
14:09 7 assistance.

14:09 8 Q. In your role with WEST -- you teach seminars, I believe  
14:09 9 you mentioned?

14:09 10 A. Yes, the basic and the advanced.

14:09 11 Q. And we're talking about the basic and advanced in blowout  
14:09 12 prevention equipment?

14:09 13 A. Yes, drill-through equipment. In fact, it's called DTE,  
14:09 14 drill-through equipment, and advanced offshore deepwater  
14:09 15 drilling-type advancements.

14:09 16 Q. Does WEST's work with blowout prevention equipment also  
14:09 17 involve maintenance work with blowout prevention equipment?

14:10 18 A. Yes. When we have our guys go on the rig, the idea is to  
14:10 19 assist them with their equipment, learning how to lower  
14:10 20 downtime. That would include, of course, better maintenance,  
14:10 21 possibly better procedures, and make recommendations where the  
14:10 22 operator or a contractor can lower downtime and have a more  
14:10 23 efficient operation, safer operation, and drill a cheaper and  
14:10 24 better well.

14:10 25 Q. Now, do operators like BP come and hire WEST for WEST to

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14:10 1 consult on their blowout prevention equipment on their rigs?

14:10 2 A. Yes. We're currently working for all the major operators,  
14:10 3 including BP.

14:10 4 Q. Tell us briefly what type of work you do for companies  
14:10 5 like BP and other operators.

14:10 6 A. For BP, Chevron and a few others, we have a man on board  
14:10 7 full-time. We rotate men 28 and 28 days. They're there to  
14:10 8 assist with all aspects of drill-through equipment on the rig,  
14:10 9 full-time.

14:10 10 Q. Does WEST's work with operators involve consulting these  
14:11 11 companies on how to make sure their blowout prevention  
14:11 12 equipment complies with industry standards?

14:11 13 A. Yes. Part of assessments these gentlemen make are for  
14:11 14 regulatory requirements and API requirements; the OEM, or  
14:11 15 original equipment manufacturer, requirements; and good oil  
14:11 16 field practice and lessons learned in the oil field.

14:11 17 Q. And does WEST's work with these operators also involve  
14:11 18 making sure their blowout prevention equipment complies with  
14:11 19 applicable regulations?

14:11 20 A. Of course. Yes, sir.

14:11 21 Q. Now, were you and WEST hired to be a part of Transocean's  
14:11 22 internal investigation team following the Macondo incident?

14:11 23 A. Yes. I joined the team in May of '10.

14:11 24 Q. Describe for Judge Barbier what your role was on that  
14:11 25 team.

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14:11 1 A. I was the leader of the WEST contingent of personnel  
14:11 2 assisting with blowout prevention equipment and controls or  
14:11 3 drill-through equipment.

14:11 4 Q. Did your role on that team also involve examining the  
14:12 5 forensic evidence and examination that occurred with DNV's  
14:12 6 review of the blowout preventer and the related equipment?

14:12 7 A. Yes. From the beginning each bit of information that was  
14:12 8 received was analyzed and reviewed by the drill-through  
14:12 9 equipment team.

14:12 10 Q. Did you have others from WEST with you on Transocean's  
14:12 11 internal team?

14:12 12 A. Yes. Initially, I brought over two of my other experts in  
14:12 13 drill-through equipment, hydraulics and mechanical types; and  
14:12 14 as we learned that there were more electrical questions or  
14:12 15 software questions, I brought in an electrical software  
14:12 16 specialist.

14:12 17 Q. Was the focus of your team, as you were housed on the  
14:12 18 Transocean internal team, to help understand why the blowout  
14:12 19 preventer did not seal the well on April 20th, 2010?

14:12 20 A. Of course. Again, as we gathered any data that would come  
14:12 21 from the field, we reviewed that and tried to understand  
14:12 22 exactly what happened.

14:12 23 Q. How long were you a member of Transocean's internal team?

14:13 24 A. About a year, through the time they issued their report.

14:13 25 Q. Now, I want to talk for a minute about experience with

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14:13 1 control systems. Mr. Childs, do you have experience with  
14:13 2 blowout prevention control systems?

14:13 3 A. Yes, sir.

14:13 4 Q. And let's start with your time at Cameron. What work did  
14:13 5 you do with control systems while at Cameron?

14:13 6 A. While at Cameron, any new BOP equipment design, mocking  
14:13 7 system design, connector had to have a proper circuit to  
14:13 8 control it. So we worked directly with the control systems  
14:13 9 group to devise the proper circuitry and controls that would  
14:13 10 handle proper operation of a piece of equipment.

14:13 11 Q. And in your time at WEST, did WEST have experience and do  
14:13 12 you have experience in performing risk assessments and  
14:13 13 troubleshooting control systems?

14:13 14 A. Yes. Troubleshooting is basically a weekly occurrence,  
14:13 15 maybe even more often. And we gather as a group and do --  
14:13 16 assist our operators, our customers on troubleshooting of that  
14:13 17 piece of equipment.

14:14 18 Q. All right. Mr. Childs, it's been reported that the folks  
14:14 19 upstairs who are listening can't hear you. So try to lift your  
14:14 20 voice. If that doesn't work --

14:14 21 A. I think this is a high as I can get.

14:14 22 THE COURT: I think, with all due respect, you're  
14:14 23 very, very soft-spoken and that's part of the problem. These  
14:14 24 guys know how to talk loudly.

14:14 25 THE WITNESS: Well, I'll have to learn how to talk

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14:14 1 Louder.

14:14 2 How's that, everybody?

14:14 3 **THE COURT:** That's better.

14:14 4 **BY MR. BAAY:**

14:14 5 **Q.** Keep it up.

14:14 6 **A.** Yes.

14:14 7 **Q.** I won't be shy to remind you.

14:14 8 **MR. BAAY:** We can pull down D-6682. Thank you.

14:14 9 **THE WITNESS:** Mr. Baay, we haven't got into the risk  
14:14 10 assessment part that we were going into. I was interrupted  
14:14 11 there.

14:14 12 **Q.** Okay. My fault.

14:14 13 **MR. BAAY:** Pull it back up, D-6682.

14:14 14 **BY MR. BAAY:**

14:14 15 **Q.** We were talking about control systems and your time at  
14:14 16 WEST and you were describing for us what these risk assessments  
14:14 17 involved when you were looking at control systems?

14:14 18 **A.** Right. I was involved in at least ten risk assessments,  
14:15 19 two of which I led myself. These risk assessments assess the  
14:15 20 control system from the point where the fluid enters the BOP or  
14:15 21 connector or valve all the way through the pod.

14:15 22 I assessed each line, hose, connection, valve, and  
14:15 23 the entire circuit to see if there were any issues, rank those  
14:15 24 issues, and then if they were high ranking, they had to have  
14:15 25 mitigations to know how to correct those issues.



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14:15 1 Q. Now, is it fair to say your time looking at control  
14:15 2 systems involved time spent with solenoids and batteries in  
14:15 3 those control systems?

14:15 4 A. Yes, including the batteries and including the solenoids,  
14:15 5 of course, from the -15s that gave some problems in the field  
14:15 6 years ago until they were all replaced with the -63s we're  
14:15 7 talking about here. Yes, sir.

14:15 8 Q. Is it fair to say that your -- the majority of your risk  
14:15 9 assessments and troubleshooting activities involved Cameron  
14:16 10 control systems?

14:16 11 A. Yes, the majority were Cameron. And they have the  
14:16 12 majority of the equipment in the field.

14:16 13 Q. Did you spend time with Mark II control systems, the same  
14:16 14 system that we know was on the *Deepwater Horizon* BOP?

14:16 15 A. Yes, sir.

14:16 16 Q. Now, Mr. Childs, given the fact that this case involves  
14:16 17 examination of a Cameron BOP, do you feel qualified to serve as  
14:16 18 an expert in this litigation?

14:16 19 A. I do.

14:16 20 Q. And have you served as an expert consultant in other  
14:16 21 litigation matters involving the review of blowout prevention  
14:16 22 equipment?

14:16 23 A. I have.

14:16 24 Q. And have you given expert depositions in those matters  
14:16 25 where you were hired related to your review of blowout

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14:16 1 prevention equipment?

14:16 2 A. I have.

14:16 3 MR. BAAY: Your Honor, at this time, we'd like to  
14:16 4 tender Mr. Childs as a qualified expert in blowout preventers.

14:16 5 MS. KARIS: Hariklia Karis on behalf of BP. We have  
14:16 6 filed a *Daubert* motion with respect to certain aspects of  
14:16 7 Mr. Childs' opinions. I'm happy to raise that now with the  
14:16 8 Court.

14:16 9 THE COURT: As I recall -- I read the motions; and as  
14:17 10 I recall, your motion is directed towards his opinion regarding  
14:17 11 the battery and the solenoids; correct?

14:17 12 MS. KARIS: That's correct. And included in that is  
14:17 13 Mr. Childs' reliance on some work done by Mr. Tolleson and some  
14:17 14 handwritten notes that apparently have never been produced and  
14:17 15 we've never had an opportunity to see the text of which  
14:17 16 Mr. Childs relies on.

14:17 17 THE COURT: All right. Well, I'm going to let him  
14:17 18 testify; and, you know, you can object to either certain  
14:17 19 questions or use that in cross-examination. And I will have to  
14:17 20 decide how much weight to give to his testimony, okay?

14:17 21 MS. KARIS: Thank you, Your Honor.

14:17 22 MS. HANKEY: Rachel Hankey for the United States.  
14:17 23 Just for the record, the United States also filed a motion on  
14:17 24 the same subject.

14:17 25 THE COURT: All right. Okay. Thank you.

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14:17 1 MR. BAAY: May I proceed, Your Honor?

14:18 2 THE COURT: Yes.

14:18 3 MR. BAAY: Thank you very much.

14:18 4 Yes. Let's pull up D-6686.

14:18 5 BY MR. BAAY:

14:18 6 Q. Mr. Childs, let's turn to your opinions in connection with

14:18 7 the Macondo incident, okay?

14:18 8 A. Yes, sir.

14:18 9 Q. Do you have an opinion, sir, as to whether the BOP did

14:18 10 function on April 20th?

14:18 11 A. I do.

14:18 12 Q. What is your opinion?

14:18 13 A. That the BOP did function on April 20th.

14:18 14 Q. Now, explain to us what you mean by the fact that it did

14:18 15 function.

14:18 16 A. The annular BOP was operated and functioned; the variable

14:18 17 bore rams were operated and functioned; and the shear ram

14:18 18 operated and functioned.

14:18 19 Q. According to your second opinion, if the BOP did operate

14:18 20 on April 20th, do you have an opinion as to why it did not shut

14:18 21 in the well on April 20th?

14:18 22 A. Yes.

14:18 23 Q. What is your opinion?

14:18 24 A. The extreme flow from the well created a lift on the drill

14:18 25 pipe, which helically buckled drill pipe, forcing it to the

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1 side of the bore and the shear rams operated a -- contacted  
2 drill pipe on the side of bore outside the shearing area and --  
3 disabling the ability for the ram to fully close, seal, and  
4 seal the well.

5 Q. As you've read the reports of other experts who have been  
6 hired to review the BOP in this matter, as you've sat and heard  
7 the testimony in this case, is there any dispute that the pipe  
8 was off-center at the time that the blind shear ram activated?

9 A. No, sir.

10 Q. In your opinion and based on your review of the forensic  
11 evidence, was it possible for the pipe to have been off-center  
12 on April 22nd, at the time of the autoshear activation?

13 A. Not in my opinion.

14 Q. We'll explore that in detail in a minute.

15 Turning to your third opinion, do you have an opinion  
16 as to whether maintenance played a role in the blind shear  
17 rams' ability to shut in the well?

18 A. I do.

19 Q. What is that opinion?

20 A. There's no maintenance issue that played any role in the  
21 ability for the shear rams to close and seal on that off-center  
22 pipe.

23 Q. Now, we've heard quite a bit of testimony in the case that  
24 a dead 27-volt battery in the blue pod and faulty solenoid in  
25 the yellow pod could have prevented the blind shear ram from

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1 functioning on April 20th; and we'll get into more detail on  
2 that in a minute.

3 For right now, let me ask you: Do you have an  
4 opinion as to whether any maintenance issues with the blue  
5 pod's 27-volt battery or the yellow pod's solenoid 103 affected  
6 those pods' ability to operate the blind shear ram?

7 A. They did not.

8 Q. And does the forensic evidence support your opinion that  
9 the blue pod 27-volt and the yellow pod solenoid functioned the  
10 blind shear ram on April 20th, 2010?

11 A. Yes, it does.

12 Q. In your fourth opinion and final opinion, do you have an  
13 opinion as to whether the configuration of the BOP stack on the  
14 *Deepwater Horizon* at the time of the incident complied with  
15 industry practice?

16 A. Yes, I do.

17 Q. Please tell the Court that opinion.

18 A. The configuration of the BOP stack did comply with  
19 industry standard.

20 Q. Okay. So that we understand your opinions as we get into  
21 them, let's first talk about how the BOP operates.

22 MR. BAAY: If you'll pull up D-6667.

23 BY MR. BAAY:

24 Q. This is a schematic I think the Court has seen quite a  
25 bit, but just orient us to the key components of the *Deepwater*

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14:21 1 *Horizon* blowout preventer.

14:21 2 A. We'll be talking about the upper annular and the LMRP, the  
14:21 3 blind shear ram, the very top of the main BOP stack, and the  
14:21 4 variable bore rams below the casing shear rams.

14:21 5 Q. Remind us, what is the purpose of the blowout preventer?

14:21 6 A. The BOP, blowout preventer, is there when there is any  
14:21 7 abnormal pressure incurred, sometimes called a kick, to be able  
14:21 8 to close these, hold in that pressure, give you time to decide  
14:21 9 what to do next, and take care of that kick.

14:21 10 Q. Okay. Let's first talk about the upper annular.

14:21 11 **MR. BAAY:** Gary, if you'll pull up D-6668.

14:21 12 **BY MR. BAAY:**

14:21 13 Q. Mr. Childs, as we look at this animation, describe for us  
14:22 14 how the upper annular operates.

14:22 15 A. The green portion we see is actually an annular piston.  
14:22 16 The pressure below the annular piston pushes up through this  
14:22 17 T-shape called the annular blue piece, which is called a pusher  
14:22 18 plate.

14:22 19 This part is a solid rubber doughnut. As the pusher  
14:22 20 plate pushes it up, since this rubber is incompressible, it  
14:22 21 then forces this, which is the packer, inward until it contacts  
14:22 22 the pipe and seals against it.

14:22 23 The packer is rubber and steel inserts. The darker  
14:22 24 gray we see here, top and bottom, are parts of a segment that  
14:22 25 run completely through the height of the packer and strengthen

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14:22 1 the packer so that it can hold the pressure. The rubber itself  
14:22 2 is not sufficient for holding 10,000 psi, and it requires the  
14:22 3 help of these metal inserts.

14:22 4 Q. If the upper annular operates correctly in a well control  
14:22 5 event, what is the effect?

14:22 6 A. You get a seal between the wellbore, which is the  
14:22 7 18 3/4 wellbore we're seeing here, and the pipe that's within  
14:23 8 the packer.

14:23 9 Q. You mentioned this dark gray material that we see in  
14:23 10 D-6668.

14:23 11 MR. BAAY: Gary, if you'll pull up D-6751.

14:23 12 BY MR. BAAY:

14:23 13 Q. Is this a picture of one of those inserts you were  
14:23 14 describing?

14:23 15 A. Yes. The top view is a top view of one of the several  
14:23 16 inserts within the annular packer. This portion right here is  
14:23 17 basically T-shaped. You'll see another photograph, and you'll  
14:23 18 notice it.

14:23 19 The bottom piece, this would be this -- the top end  
14:23 20 that we're seeing here, the top end flange and there's another  
14:23 21 bottom end flange here and then there's a web of steel  
14:23 22 connecting these two.

14:23 23 Now, in this case, rubber is still -- it's still  
14:23 24 encased by some rubber from the packer and then the packing  
14:23 25 element -- it is fully encased in rubber on the right, as we'll

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14:23 1 see here in just a minute.

14:23 2 Q. So in operation, these are standing right side up through  
14:23 3 the upper length of the upper annular?

14:24 4 A. Yes. This would be up, this end. So it would be up this  
14:24 5 way.

14:24 6 Q. Let's go to D-6669, which would be the bird's-eye view of  
14:24 7 the upper annular.

14:24 8 A. You can see the triangular-shaped metal inserts we're  
14:24 9 seeing here. As the annular closes, you see the inserts move  
14:24 10 much like the iris of a camera. We'll watch them again as they  
14:24 11 close around the pipe.

14:24 12 The rubber contacts the pipe, seals against the pipe,  
14:24 13 and this steel array of inserts contains that rubber. Again,  
14:24 14 the rubber cannot contain the pressure by itself. That is used  
14:24 15 to help contain the 10,000-psi rating of the upper annular.

14:24 16 Q. And these steel irises you were talking about, that's what  
14:24 17 we just viewed in D-6751?

14:24 18 A. Right. These are the top flanges of that segment, which  
14:24 19 are solid steel.

14:24 20 Q. All right. Let's turn now to the variable bore rams. How  
14:24 21 many variable bore rams did the *Deepwater Horizon* stack have?

14:25 22 A. There were three sets of variable bore rams.

14:25 23 MR. BAAY: Let's pull up D-6670.

14:25 24 BY MR. BAAY:

14:25 25 Q. Mr. Childs, I'll have you describe for us how these



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14:25 1 components work.

14:25 2 A. We're seeing the right-hand and left-hand VBR ram and  
14:25 3 packer. They're identical units. They're just rotated to the  
14:25 4 opposite sides.

14:25 5 The operators are outside of this. The yellow  
14:25 6 portion is the operators. We've already seen it be actuated to  
14:25 7 the fully-closed position.

14:25 8 Within these rams is a packer that's much like your  
14:25 9 annular packer we just saw that contains these inserts, the  
14:25 10 iris like the camera lens. We have the side of the packer that  
14:25 11 seals against the side of the bore, the top seal, sealing  
14:25 12 around the floor wellbore.

14:25 13 Within here, as soon as we contact the pipe, it packs  
14:25 14 off around the pipe. The inserts help to form this metal ring  
14:25 15 that in this case hold 15,000 psi.

14:25 16 **MR. BAAY:** Let's look at D-6671.

14:25 17 **BY MR. BAAY**

14:25 18 **Q.** Does the variable bore ram seal the wellbore around the  
14:25 19 drill pipe just as the annular does?

14:25 20 **A.** The same basic way, except it's in two halves with the two  
14:26 21 rams. You'll see it's closed around the pipe. These metal  
14:26 22 inserts, we see the tips of the fingers here that form this  
14:26 23 nice metal ring around the pipe and help the ram have the  
14:26 24 ability to hold a full 15,000 psi.

14:26 25 **Q.** Let's talk now about the blind shear rams.

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14:26 1 MR. BAAY: We can pull up D-6672.

14:26 2 BY MR. BAAY

14:26 3 Q. Describe for us how the blind shear rams function.

14:26 4 A. Very similar. We have the operators left and right. We  
14:26 5 have a lower shear ram on our right and an upper shear ram on  
14:26 6 our left.

14:26 7 The lower, of course, has the lower blade; and the  
14:26 8 upper has the upper blade. And contained within the upper ram  
14:26 9 block is a seal we cannot see running side to side that will  
14:26 10 allow sealing of this blade against it to form a complete seal  
14:26 11 when it's closed.

14:26 12 Q. Now, the upper BSR has the V-blade?

14:26 13 A. Yes. The upper blade is "V" shaped, as we can see here.  
14:27 14 The lower blade is straight or flat.

14:27 15 Q. And you've been involved in the design of blind shear rams  
14:27 16 throughout your career?

14:27 17 A. I have.

14:27 18 Q. In fact, did you give the name to Cameron's shearing blind  
14:27 19 ram?

14:27 20 A. My boss and I were in the office one day contemplating its  
14:27 21 name and we both came up with "shearing blind ram," as it's  
14:27 22 named.

14:27 23 Q. Now, is this the only component that severs the pipe and  
14:27 24 shuts in the well?

14:27 25 A. This is the only one that will, as you say, sever and seal

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14:27 1 the well. That's the blind portion of the name. The blind  
14:27 2 portion of the name of the ram is the ability to seal the bore.

14:27 3 **MR. BAAY:** Let's look quickly at D-6673.

14:27 4 **BY MR. BAAY**

14:27 5 **Q.** This is, again, a bird's-eye view. Tell us what we see  
14:27 6 here.

14:27 7 **A.** As the rams close, we see the straight blade on the lower  
14:27 8 and the "V" shaped on the upper. It first collapses the pipe.  
14:27 9 Then it shears through the pipe. The upper piece is housed in  
14:28 10 this cavity as we see right here.

14:28 11 Below this, the lower piece has a cavity. It is also  
14:28 12 housed within. And that lower blade, the straight one, has  
14:28 13 gone across to that packer that's housed inside the upper ram  
14:28 14 block and seals across there, again, achieving a complete  
14:28 15 wellbore seal of up to 15,000 psi.

14:28 16 **Q.** Okay. I now want to talk about a component that I don't  
14:28 17 believe the Court has heard discussion of yet. So we go to our  
14:28 18 cutaway of a stack at D-6667.

14:28 19 Describe for the Court, or point out, where the  
14:28 20 ST locks are on the *Deepwater Horizon* -- excuse me -- BOP.

14:28 21 **A.** The upper shear ram and all three sets of variable bore  
14:28 22 rams, the ST lock on each end of the operators.

14:28 23 **Q.** So each of the variable bore rams and the blind shear rams  
14:28 24 have an ST lock?

14:28 25 **A.** Two locks per cavity. And there's one, two, three -- four

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14:29 1 cavities with locks.

14:29 2 Q. If we look at D-6674, describe for us how these locks  
14:29 3 operate.

14:29 4 A. We're going to have -- the rams go to the closed position.  
14:29 5 The locks are used to lock them in the closed position. They  
14:29 6 are a hydraulically actuated lock that mechanically holds the  
14:29 7 rams in the locked or closed position.

14:29 8 We have colored the tail rod, in this case, yellow  
14:29 9 and black to see it better. It is part of the operating piston  
14:29 10 that's connected to the ram way to the left. Once it's in the  
14:29 11 fully closed position, you see there's an angle on the end of  
14:29 12 the tail rod.

14:29 13 This blue portion, this wedge, in the lock is forced  
14:29 14 hydraulically across until it contacts that same angle; and  
14:29 15 this mechanism we see up here is used to lock that wedge in  
14:29 16 that final position.

14:29 17 So now even if hydraulic pressure is lost from the  
14:29 18 lock or lost from the operator, it will stay in the closed and  
14:29 19 locked position.

14:29 20 Q. Now, why would you want to function your ST locks?

14:30 21 A. When you have the need to pull the LMRP, let's say, for a  
14:30 22 repair of a pod -- a pod's gone bad, you pull the LMRP to  
14:30 23 repair that, you have the BOP stack left on the ocean floor.  
14:30 24 You want to keep your well, of course, very safe.

14:30 25 So you would close the rams, to seal; and you would

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1 lock the locks behind those rams. Just in the very slight case  
2 we lose hydraulic pressure from any type of leak, if there's  
3 any leak occurring and you lose the hydraulic pressure and you  
4 didn't have a lock, the rams could come back open.

5 So we mechanically lock them closed through -- what's  
6 involved in here requires another hydraulic action to unlock  
7 this to allow this to move back. So it is locked in the  
8 position much like the deadbolt lock on your door.

9 **MR. BAAY:** All right. Gary, play that back to the  
10 open position, please.

11 **BY MR. BAAY:**

12 **Q.** If your ram comes open and this tail rod slides back, will  
13 your ST locks close?

14 **A.** No. You have to have the ram in a fully-closed position;  
15 otherwise, it will interfere with this hold that's running  
16 through this blue wedge piece. It will not be able to lock.

17 **Q.** So if your ram comes open, what's to prevent the ST lock  
18 from fully shutting it?

19 **A.** The mechanical interference of this tail rod with the  
20 wedge itself.

21 **Q.** Thank you, Mr. Childs. We can pull that down.

22 I want to talk now a minute about the blowout  
23 preventer's backup systems for *the Deepwater Horizon*.

24 To your knowledge, what systems were in place to  
25 control the BOP in the event of an emergency?

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14:31 1 A. The AMF -- sometimes called the deadman system -- and the  
14:31 2 autoshear system.

14:31 3 Q. Did the *Deepwater Horizon* also have an EDS system that  
14:31 4 we've heard about, emergency disconnect system?

14:31 5 A. Yes. EDS system can be emergency only, but it can also be  
14:31 6 manually activated. That's why I meant it as a separate  
14:31 7 entity.

14:31 8 Q. If the rig loses power, is the EDS able to operate the  
14:31 9 BOP?

14:31 10 A. If you've lost communication down the MUX cable to the  
14:32 11 stack, the EDS will not operate.

14:32 12 Q. Mr. Childs, you were here last week when Mr. Perkin and  
14:32 13 Dr. Davis testified?

14:32 14 A. I was.

14:32 15 Q. Mr. Perkin testified that the rig crew should have chosen  
14:32 16 a different sequence for the EDS functioning in this case.

14:32 17 Do you recall that testimony?

14:32 18 A. I do.

14:32 19 Q. Now, what is the difference between the two possible  
14:32 20 sequences related to your EDS?

14:32 21 A. Most of the time we've been calling them EDS-1 and EDS-2.  
14:32 22 But if you look at the panel, they're called normal and casing.

14:32 23 I think we saw a view of that on screen. I think we  
14:32 24 saw that on screen. Normal would be EDS-1. Casing would be  
14:32 25 EDS-2. EDS-1 closes only the sealing shear rams, the blind

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14:32 1 shear rams.

14:32 2 EDS-2 would close the casing shear rams first and  
14:32 3 then close the sealing shear rams.

14:32 4 Q. Are there tradeoffs between the two sequences?

14:32 5 A. Yes. There's a great difference in timing here.

14:33 6 The shearing blind shear rams have about -- can close  
14:33 7 in 30 seconds in an emergency. They can close in less than  
14:33 8 that, in as little as 16 seconds. Whereas, the super shear  
14:33 9 rams have double the volume at least and they require double  
14:33 10 the time to close. They have to complete closure, and then the  
14:33 11 shear ram has to, then, have its own 16 to 30 seconds to close.

14:33 12 Q. So if there were an EDS-2 and the casing shear rams were  
14:33 13 designed to operate first, that sequence takes longer?

14:33 14 A. The entire EDS-2 sequence does take longer. The quickest  
14:33 15 close-in would be EDS-1.

14:33 16 Q. Is there anything that the crew could have done in the  
14:33 17 case of the *Deepwater Horizon* -- anything they could have done  
14:33 18 differently with respect to the EDS system that would have  
14:33 19 impacted the blowout preventer's ability to shut in the well on  
14:33 20 April the 20th?

14:33 21 A. Since we had no connection anymore through the MUX cable,  
14:33 22 it wouldn't matter which EDS, 1 or 2, it was in.

14:34 23 Q. Now, describe for us how the automatic mode function  
14:34 24 works.

14:34 25 A. Automatic mode function originally came up with -- was

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1 originally come up with if we had complete loss of the drilling  
2 riser. So if the drilling riser fails, we've lost hydraulics.  
3 We've lost communication. We've lost power with the surface.

4 So it would automatically close the shear rams and  
5 protect the well. That's why it's called a deadman system, all  
6 systems are gone, and it would achieve a safe condition.

7 Q. So once the AMF perceives those conditions, it activates  
8 the blind shear ram?

9 A. That's correct.

10 Q. Mr. Perkin also testified that the -- let me first ask  
11 you: Does the AMF system trigger the ST locks that you just  
12 described for us?

13 A. After it triggers the shearing blind shear rams, it also  
14 activates all ST locks on the stack.

15 Q. Now, Mr. Perkin also testified that the AMF on the *Horizon*  
16 could have/should have been able to activate the casing shear  
17 rams first, followed by the blind shear rams.

18 Do you recall him saying that?

19 A. I recall that.

20 Q. Do you agree with that testimony?

21 A. No.

22 Q. Why not?

23 A. First off, the crew had no chance to change that. This is  
24 something programmed in from the original concept of the rig  
25 and the stack. They could have made no change to it.



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14:35 1 Q. And like the EDS, would that second sequence of a  
14:35 2 different sequence that functions the casing shear ram first,  
14:35 3 would that take longer to shut in the well?

14:35 4 A. Same scenario as we listed before. The additional time  
14:35 5 for closing the shearing -- the casing shear rams and then  
14:35 6 closing the shearing blind rams.

14:35 7 Q. Mr. Childs, was it consistent with industry practice, at  
14:35 8 the time of the incident, to use an AMF system that was  
14:35 9 programmed to immediately activate the blind shear rams and  
14:35 10 shut in the well?

14:35 11 A. The majority I've seen close the sealing shear ram.

14:36 12 Q. And the autoshear is another system we've heard about in  
14:36 13 that case. Just tell us very briefly how that works.

14:36 14 A. A slightly different system in that it is built around the  
14:36 15 possibility that inadvertent disconnect of that LMRP from a BOP  
14:36 16 stack if, for some reason, it becomes disconnected. Again, you  
14:36 17 want to protect your well, you want to close in the shear rams.

14:36 18 If that lifts up, there's a mechanical device that  
14:36 19 says, "Okay. This is not here anymore. Close the shear rams."

14:36 20 MR. BAAY: D-6573.

14:42 21 BY MR. BAAY:

14:42 22 Q. So if your LMRP separates from your lower marine riser  
14:36 23 pack, will that trigger the autoshear?

14:36 24 A. That will directly trigger the autoshear.

14:36 25 Q. And it's a plunger-activated system?

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14:36 1 A. The plunger is mechanically operated. As soon as that  
14:36 2 lift-up occurs it senses that, sets off the system, and would  
14:36 3 close your sealing shear rams.

14:36 4 Q. Same sequence as the AMF. It functions or activates your  
14:36 5 blind shear rams?

14:36 6 A. Correct.

14:36 7 Q. Let's turn to your opinions, Mr. Childs.

14:37 8 MR. BAAY: If we can put back up D-6686 and talk  
14:37 9 about your first -- beginning with the BOP function on  
14:37 10 April 20th.

14:37 11 And we can pull up TREN-43093.41.1.T0.

14:42 12 BY MR. BAAY:

14:42 13 Q. Do you recognize this table, Mr. Childs?

14:37 14 A. Yes. It's out of the DNV report.

14:37 15 Q. Is this a table summarizing the observations of the BOP  
14:37 16 components as received -- as the BOP was received at Michoud?

14:37 17 A. Yes, it does.

14:37 18 Q. What did DNV do to determine the position of these  
14:37 19 components when they recovered the blowout preventer?

14:37 20 A. These were -- in the original examinations they were able  
14:37 21 to look first at the annular, look down in it and see that it  
14:37 22 was closed.

14:37 23 Q. Were there also x-rays taken in the month following the  
14:37 24 Macondo incident confirming the position of the  
14:37 25 *Deepwater Horizon* BOP components?

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14:37 1 A. Yes, sir. Prior to this, BP had x-rays taken showing that  
14:37 2 the rams were in the closed position.

14:37 3 Q. All right. So looking at 43093, what did DNV state --  
14:38 4 what data did they collect about the position of the upper  
14:38 5 annular?

14:38 6 A. The upper annular was in the closed position.

14:38 7 Q. What do they state about the position of the upper  
14:38 8 variable bore rams?

14:38 9 A. They were in the closed position.

14:38 10 Q. Now, did the x-rays taken in May of 2010 agree with the  
14:38 11 data we see here from DNV's table?

14:38 12 A. Yes, the data did.

14:38 13 Q. Now, the table indicates that the blind shear ram was --  
14:38 14 has starboard closed, port open.

14:38 15 Explain to us why that was the data collected.

14:38 16 A. In any ram BOP operation or hydraulic system, one's going  
14:38 17 to reach fully closed first; the other's going to come up to  
14:38 18 meet it.

14:38 19 As we know here, since the pipe is off-center, one  
14:38 20 could not complete a closure. So actually, I believe that  
14:38 21 "open" should say "partially open."

14:38 22 It definitely was not fully closed. It could not  
14:38 23 have fully closed. The pipe was in the way, so it was  
14:39 24 partially open. But that's listed as open in this chart.

14:39 25 Q. So it's your opinion, as you've stated, that the blind

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14:39 1 shear ram didn't fully close because of the off-center pipe?

14:39 2 A. Precisely.

14:39 3 Q. And that's supported by the evidence that we see here as  
14:39 4 collected by DNV.

14:39 5 A. Yes. There's no dispute that the pipe was on the side of  
14:39 6 the bore, keeping the rams from fully closing.

14:39 7 MR. BAAY: Dennis, let's look at D-6703.

14:42 8 BY MR. BAAY:

14:42 9 Q. Mr. Childs, if we highlight those top three categories,  
14:39 10 does this chart accurately reflect the agreement by the experts  
14:39 11 in this case that the upper annular, the variable bore rams,  
14:39 12 and the blind shear rams all functioned?

14:39 13 A. Yes, it does.

14:39 14 Q. Have you read any dispute from those positions?

14:39 15 A. I have not.

14:39 16 MR. BAAY: You can pull that down.

14:39 17 Let's put up D-6661. I believe this is a  
14:39 18 demonstrative that Mr. Doyen showed to Mr. Perkin.

14:42 19 BY MR. BAAY:

14:42 20 Q. Were you in the courtroom for that, and do you recall this  
14:39 21 demonstrative?

14:39 22 A. I do.

14:40 23 Q. Now, is there a dispute among the experts in this case as  
14:40 24 to when the blind shear ram functioned?

14:40 25 A. There is.

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14:40 1 Q. And is there a dispute among the experts in this case as  
14:40 2 to why the pipe was off-center when the blind shear rams  
14:40 3 functioned?

14:40 4 A. There is.

14:40 5 Q. Do you believe that the why and how of how the pipe was  
14:40 6 forced off-center helps us to answer this question as to when  
14:40 7 the blind shear ram might have activated?

14:40 8 A. Yes, it does.

14:40 9 Q. And does that help us to understand when it might have  
14:40 10 closed on this off-center pipe?

14:40 11 A. Yes, that as well.

14:40 12 Q. I'm going to ask you now --

14:40 13 MR. BAAY: You can pull that down. Thank you,  
14:40 14 Dennis.

14:42 15 BY MR. BAAY:

14:42 16 Q. If your microphone's working, we'll step to D-6635. And  
14:40 17 going to your second opinion that the blind shear ram failed to  
14:40 18 shut in the well, please just describe for the Court, using the  
14:40 19 sponge pipe as our drill pipe, why you believe the pipe came  
14:41 20 off-center and why the blind shear rams were unable to seal it.

14:41 21 A. Yes. As Mr. Doyen also did, I'm using this so I don't  
14:41 22 hurt myself with real pipe. This is foam pipe.

14:41 23 The pipe was in the bore, stream flow from the well  
14:41 24 is creating a lift on the pipe, forcing the pipe into a  
14:41 25 helically-bowed position.

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14:41 1 Q. Where did that helical buckling take place?

14:41 2 A. It occurred between the bottom of the well, pushing up,  
14:41 3 and the pipe tool joint against the upper annular.

14:41 4 And we have both the weight of the drill pipe above,  
14:41 5 which is in excess of 100,000 pounds, and we have also --

14:41 6 **THE COURT:** I don't know if you can hold it in your  
14:41 7 hand. Whenever you turn your head, you're away from the  
14:42 8 microphone.

14:42 9 **THE WITNESS:** I thought I heard it going. So...

14:42 10 Well, I need three hands right now.

14:42 11 **THE COURT:** Well, maybe somebody can loan you one.

14:42 12 **BY MR. BAAY:**

14:42 13 Q. Use the microphone.

14:42 14 What force bent the pipe at the level of the blind  
14:42 15 shear ram?

14:42 16 A. The helical buckling from the extreme flow from the bottom  
14:42 17 buckled the pipe, put it in a bowed position. The tool joint  
14:42 18 went up against the annular. Once it's in the bowed position,  
14:42 19 it's at the side of the wellbore.

14:42 20 Q. Thank you. You can take your seat.

14:42 21 Now, when do you believe the lifting and the buckling  
14:42 22 of the drill pipe occurred?

14:42 23 A. There was sufficient lift to buckle the drill pipe right  
14:42 24 prior to annular closure.

14:43 25 Q. You have to speak up.

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1 Based on your review of the forensic evidence, do you  
2 believe that this is the only plausible explanation for how the  
3 pipe was moved off-center when the blind shear rams activated?

4 A. When I look at the entirety of the evidence, everything  
5 learned forensically, yes, this is the only time.

6 Q. Did you find any plausible explanation for how the pipe  
7 could have been still off-center on April 22nd, at the time of  
8 the bottom shear activation?

9 A. No. Nothing, again, that matched all the evidence.

10 Q. Now, let's go through the series of events that occur as  
11 relates to the blowout preventer from the *Deepwater Horizon* and  
12 have you explain those events to us.

13 A. Yes.

14 MR. BAAY: If we could pull up D-6679.

15 BY MR. BAAY:

16 Q. Describe for the Court what was happening in the BOP as  
17 the well was flowing and the crew closed the upper annular.

18 A. We're showing here the extreme flow in the well, again,  
19 creating the lift on the pipe. As it's creating lift on the  
20 pipe, of course, the tool joint is moving up. It was placed  
21 below the annular. The action of the extreme flow pushed the  
22 tool joint partially into the upper annular BOP, which we've  
23 already seen we closed.

24 The effect of that, of course, is that since the tool  
25 joint's partially in the packer, it kept it from achieving a

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1 complete seal, because the lower segments were not able to  
2 close all the way as compared to the top segments.

3 Q. Okay. If we go back to the start of the sequence, when  
4 did you believe that the crew operated the upper annular?

5 A. It was closed by 9:47, right in that range.

6 Q. The upper annular?

7 A. The upper annular, yeah. I'm sorry. I'm a few minutes  
8 off. Excuse me. 9:43.

9 Q. So your opinion is the upper annular was activated by the  
10 crew at 9:43?

11 A. Actually, it was slightly earlier, and fully closed by  
12 9:43.

13 Q. I believe you testified that the tool joint, which we see  
14 here, was below the upper annular at the time the crew closed  
15 in the upper annular?

16 A. Right. It started below, and the force from the lift,  
17 from the extreme flow of the well, lifted the tool joint up  
18 into the annular, as we've depicted here, again, interfering  
19 with the ability of the packer to close completely.

20 As Mr. Barnhill mentioned earlier this packer could  
21 close on a tool joint if the tool joint was in -- in its  
22 entirety was in the packer. But the fact it's partially on a  
23 tool joint here and partially on plain pipe did not allow it to  
24 have full closure, and we know it did not get a complete seal.

25 Q. Now, as you've described and others have described, the



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1 tool joint is a slightly wider diameter than the rest of the  
2 drill pipe.

3 A. Yes. It's approximately 6 1/4, 6 3/8-inch in diameter,  
4 where the pipe is 5 1/2.

5 Q. What's the basis for your opinion that the tool joint was  
6 below the level of the upper annular before the crew activated  
7 the upper annular at 9:43?

8 A. We have both the fact that -- as we've heard earlier  
9 today -- that you place the tool joints out of the sealing  
10 elements, out of the BOP, so that when you close the BOPs, they  
11 can close on slick or plain pipe.

12 We have also the forensic evidence of the Sperry-Sun  
13 data showing continued lift on the drill pipe.

14 Q. Now, did you consider hook load data in forming your  
15 opinion that the well -- excuse me -- the flow from the well  
16 lifted the tool joint into the upper annular as it was closing?

17 A. Yes. The Sperry-Sun data I mentioned was -- and the hook  
18 load data are the same.

19 **MR. BAAY:** Let's look at D-6683.

20 **BY MR. BAAY:**

21 Q. Describe for the Court what hook load data is.

22 A. Hook load is, of course, in the derrick. The drill pipe's  
23 connected to the hook, and you have an indication of weight.  
24 So you know how much weight, the string, is exerted on this  
25 hook at the top in the derrick.

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14:47 1 In this graph, the orange line is our hook load.

14:47 2 Q. Now, does the hook load serve as a type of scale to  
14:47 3 measure the weight of your drill string?

14:47 4 A. It measures continually the weight of the drill string.

14:47 5 Q. As we look at this ascending measurement here of hook  
14:47 6 load, which you pointed out was the orange line, why at 2140 do  
14:47 7 we have ascending hook load weight?

14:47 8 A. At this point in time, the riser is being filled more and  
14:47 9 more with gas. As we fill it with the gas, the bouyant force  
14:47 10 on the drill pipe is going down. So, in effect, the hook load  
14:47 11 is seeing a heavier load because the pipe is getting heavier  
14:47 12 because of lack of buoyancy.

14:48 13 Q. So as the well fills up with gas, the pipe feels heavier  
14:48 14 to the hook, the weight goes up, as measured by the hook load?

14:48 15 A. That is correct.

14:48 16 Q. Now, under normal operating conditions, with the drill  
14:48 17 pipe in the hole, what would you expect to see if you were  
14:48 18 monitoring the hook load?

14:48 19 A. A relatively constant number. Not exactly constant, but  
14:48 20 more constant than this.

14:48 21 Q. You don't expect to see these ups and downs in normal  
14:48 22 conditions?

14:48 23 A. No. You would not be having a change in buoyancy. Your  
14:48 24 only change would be maybe weight on bit and your penetration  
14:48 25 into the hole as you're drilling.

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14:48 1 Q. What happens to the hook load when the crew closes the  
14:48 2 annular at 9:43?

14:48 3 A. Two things are happening here. Eventually, the loss of  
14:48 4 buoyancy gets overrun by the lift being caused by this extreme  
14:48 5 flow. Because as we're losing this gas and it's expanding out  
14:48 6 of the well, we're getting more and more flow at the surface,  
14:49 7 getting more and more flow at the bottom of the well, as well,  
14:49 8 lifting on this pipe.

14:49 9 So that overruns the loss of buoyancy, and you start  
14:49 10 getting a continued lifting of the drill pipe, which is  
14:49 11 lessening the load on the hook.

14:49 12 Q. And you believe that's caused by the flow of hydrocarbons  
14:49 13 entering the wellbore?

14:49 14 A. Yes.

14:49 15 Q. So what does this lightening of the hook load tell you, as  
14:49 16 it relates to your opinion that the tool joint rose to the  
14:49 17 level of the upper annular?

14:49 18 A. That it started rising, as we showed in our animation  
14:49 19 earlier, and that it continued rising up into the packer.

14:49 20 Q. Now, are there other experts in this case who agree with  
14:49 21 your opinion that the flow of the well lifted the tool joint?

14:49 22 A. Yes.

14:49 23 Q. Who do you recall agrees with you on that opinion?

14:49 24 A. Dr. Neil Thompson and Mr. Stevick.

14:49 25 Q. So if we look at this line here and highlight that.

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14:50 1 So plaintiffs' Mr. Perkin, and Mr. Stevick from  
14:50 2 Halliburton?

14:50 3 A. I'm sorry. I left out Mr. Perkin. That's correct.

14:50 4 Q. All right.

14:50 5 MR. BAAY: We can pull that down.

14:50 6 BY MR. BAAY:

14:50 7 Q. You've mentioned this already, but tell me again.

14:50 8 Was the upper annular able to seal around the drill  
14:50 9 pipe, and if not, why not?

14:50 10 A. No. From the data we have, forensic data we have, we see  
14:50 11 that it does not complete a complete seal. That's due to the  
14:50 12 tool joint partially being within the packer.

14:50 13 Q. Okay.

14:50 14 MR. BAAY: Gary, will you pull up D-6681 and just  
14:50 15 freeze it on the initial frame, please.

14:50 16 BY MR. BAAY:

14:50 17 Q. I'm going to approach, Mr. Childs, and show you a model  
14:50 18 that's already been marked as D-6659. I believe you'll  
14:50 19 remember this one.

14:50 20 A. Yes, I remember that one.

14:50 21 Q. And as you heard described last week, this was created  
14:50 22 from the laser scan data from DNV.

14:51 23 A. Yes. 3D laser scan, and then printed from that laser scan  
14:51 24 information.

14:51 25 Q. And you've been out to Michoud, and you've inspected the

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14:51 1 real tool joint, and you've seen the erosion patterns.

14:51 2 Does it accurately represent the tool joint as  
14:51 3 recovered from the *Deepwater Horizon* BOP?

14:51 4 A. Yes, it does.

14:51 5 Q. All right. Now, I want you to tell us what these erosion  
14:51 6 patterns at the top of the tool joint, and higher up on the  
14:51 7 pipe, what do they tell us about the position of the tool  
14:51 8 joint?

14:51 9 A. You can see, of course, massive erosion at this level.  
14:51 10 And 18 inches higher, we have more massive erosion at this  
14:51 11 location. As we're seeing in the graphic here, this is where  
14:51 12 the tool joint started within the packer.

14:51 13 What's opposed to this are those metal inserts we  
14:51 14 were looking at. The metal inserts here created a much, much  
14:51 15 higher velocity through that neck-down area which, again,  
14:51 16 increased the erosion. You'll see I'm sticking my finger in  
14:51 17 the erosion here that's over an inch deep.

14:52 18 The same basic thing was happening up here. This  
14:52 19 erosion was occurring at the top of the packer. The packer is  
14:52 20 15 inches -- or 18 inches tall, thus, the dimension between  
14:52 21 these massive erosion areas. So the upper inserts form the  
14:52 22 basic same thing. We have them close. The velocity had to  
14:52 23 increase.

14:52 24 The amount of fluid that's trying to come out of this  
14:52 25 well in an 18 3/4 bore is now going through a very -- a much

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14:52 1 smaller area. As the velocity increases, the erosion  
14:52 2 increases, and erosion creations here as well.

14:52 3 Q. So our most pronounced areas of erosion are at the bottom  
14:52 4 of the upper annular and at the top of the upper annular?

14:52 5 A. Yes.

14:52 6 Q. And just one more time. Tell me why those become our  
14:52 7 pinch points.

14:52 8 A. Because that's the area with the most velocity due to the  
14:52 9 restriction caused by the inserts here and the inserts here,  
14:52 10 the metal inserts.

14:52 11 Q. So does the forensic evidence, as collected by DNV,  
14:52 12 support your opinion that the tool joint was at the level -- or  
14:52 13 at the bottom of the upper annular at the time the well came  
14:53 14 in?

14:53 15 A. Yes.

14:53 16 Q. Mr. Childs, if the -- just play this through, this D-6681,  
14:53 17 and describe for us what you were describing as we looked at  
14:53 18 the tool joint model just a minute ago.

14:53 19 A. We're showing how this -- all this flow is coming out of  
14:53 20 this larger bore, as being necked down through this annular.

14:53 21 The velocity increases considerably, to be able to  
14:53 22 get that same amount of fluid through. We get that erosion.

14:53 23 This is the 3D scan printed here on the 2D. We see  
14:53 24 the massive erosion here, which matches the piece we just  
14:53 25 looked at.

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1 This is the bottom of the packer. Here are those  
2 inserts. You see the inserts are right opposing that massive  
3 erosion.

4 Q. If the flow was pushing the drill pipe and the tool joint  
5 up into the upper annular with great force, why did this tool  
6 joint not go all the way through the level of the upper  
7 annular?

8 A. Not only do we have the restriction of the annular, we  
9 have the 100,000 pounds or more weight of all the drill pipe  
10 above that's pushing down on this. So it reached this point --  
11 it was restricted at this point and pinned at this point.

12 MR. BAAY: Let's pull up D-6679.

13 BY MR. BAAY:

14 Q. Mr. Childs. I'm going to ask you to describe for us what  
15 happens to the remainder of the drill pipe once the tool joint  
16 is trapped in the upper annular.

17 A. Of course, we're pushing up from the bottom of this  
18 massive erosion and it helically buckles that drill pipe, as  
19 we're depicting here, which is a standard phenomenon. The  
20 natural deflection of this drill pipe, it wouldn't just deflect  
21 to the side, it actually takes a helical shape within its  
22 constraints, which in this case is the 18 3/4 wellbore.

23 Q. Does the upper annular serve as a pinpoint once the pipe  
24 buckles in the level of the BOP?

25 A. Yes. As we just discussed, it stopped here, pinned at the

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14:55 1 packer, and we also have the assistance of the weight of all  
14:55 2 the pipe above.

14:55 3 Q. Does the fact that it's pinned by the upper annular assist  
14:55 4 with the buckle or contribute to the buckle?

14:55 5 A. It absolutely helps, yes.

14:55 6 MR. BAAY: Let's pull up D-6678, please.

14:55 7 BY MR. BAAY:

14:55 8 Q. Once the crew closed the upper annular, what was the next  
14:55 9 action they took as it relates to the blowout preventer?

14:55 10 A. Of course, we -- excuse me -- we did not get a good seal.  
14:55 11 So at 9:46, and probably full closure by 9:47, the VBRs were  
14:55 12 closed.

14:55 13 MR. BAAY: And we'll play D-6684.

14:55 14 BY MR. BAAY:

14:55 15 Q. Describe for Judge Barbier what happens to the drill pipe  
14:55 16 inside the BOP when the VBRs are closed -- or variable bore  
14:55 17 rams are closed.

14:55 18 A. We're depicting closing of the VBRs on this flowing well.  
14:55 19 And once we start achieving a seal, we turn the drill pipe red  
14:56 20 on purpose because we now have achieved a seal on the pipe and  
14:56 21 around the wellbore, meaning that the pressure that's in the  
14:56 22 wellbore below is now contained with -- within the drill pipe.

14:56 23 So the drill pipe pressure started going up rapidly.

14:56 24 MR. BAAY: If we play D-6685.

25



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14:56 1 BY MR. BAAY:

14:56 2 Q. What does the closing of the variable bore rams do to the  
14:56 3 buckling of the pipe?

14:56 4 A. It slightly centers it at the bottom but also traps this  
14:56 5 buckle in between. Now that we have the pressure below, we  
14:56 6 have the assistance of the pressure end load below the VBRs  
14:56 7 pushing up on the pipe to hold it in the buckled position. We  
14:56 8 have it pinned at the top.

14:56 9 And with the pinning here and a pinning here, just  
14:56 10 the increase in pressure in this pipe will also buckle it. If  
14:56 11 you have fixed ends on a pipe and you increase its pressure, it  
14:56 12 will buckle just from that increased pressure.

14:57 13 Q. So like the pinning of the upper annular, did the pinning  
14:57 14 at the level of the variable bore ram contribute to the buckle  
14:57 15 at the level of the blind shear rams?

14:57 16 A. It contributed to it and helped hold it in position.

14:57 17 Q. Now, there's been others in this case -- I believe a  
14:57 18 Mr. Shanks. Are you familiar with Mr. Shanks?

14:57 19 MR. BAAY: Can we put that back up.

14:57 20 THE WITNESS: Yes, I'm familiar with Mr. Shanks.

14:57 21 MR. BAAY: Can we put up D-6685.

14:57 22 BY MR. BAAY:

14:57 23 Q. Mr. Shanks has testified that the closing of these  
14:57 24 variable bore rams short-circuited the flow up and would have  
14:57 25 reduced the buckle. Do you agree with that opinion?

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14:57 1 A. Well, at this point in time, the flow -- the buckle is not  
14:57 2 really there -- continuing to be there because of the flow.  
14:57 3 We've already trapped the buckle in place. We have the  
14:57 4 pressure end load pushing up on the end of the pipe and the  
14:57 5 other phenomenon I just mentioned where trapped pipe on either  
14:58 6 end, when you increase the pressure, also buckles.

14:58 7 Q. You talked about pressure end load. What do you mean?

14:58 8 A. Below the rams -- we have a differential pressure between  
14:58 9 the top of the rams and the bottom. There's more pressure  
14:58 10 below. So this pressure is trying to push that pipe up through  
14:58 11 the VBRs as well.

14:58 12 Q. So the difference in pressure below the variable rams  
14:58 13 versus above contributes to the buckle?

14:58 14 A. It's all three were involved. It was helically buckled  
14:58 15 prior to VBR closure, slightly centered. But we have the  
14:58 16 trapped buckle that increases from the pressure end load, and  
14:58 17 just the fact that the pressure in the pipe is increasing.

14:58 18 Q. Mr. Childs, were you the first expert in this case to  
14:58 19 offer an explanation as to how the drill pipe between the upper  
14:58 20 annular and the variable bore rams was forced off-center?

14:58 21 A. No, I was not.

14:58 22 Q. Other than your work, did any other experts in this case  
14:58 23 conclude that the flow from the well pushed the drill pipe  
14:58 24 off-center on April 20th?

14:58 25 A. Yes, they did.

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14:58 1 Q. And who was that?

14:58 2 A. We had Dr. Neil Thompson again and he --

14:59 3 MS. HANKEY: Objection, Your Honor. He's referencing  
14:59 4 an analysis by DNV, which has been excluded by the Court.

14:59 5 MS. KARIS: I join that.

14:59 6 THE COURT: We can't talk about DNV's --

14:59 7 MS. KARIS: We would move to strike any prior  
14:59 8 opinions that relied on Mr. Thompson's work in connection with  
14:59 9 DNV which he's previously referenced.

14:59 10 THE COURT: I'll sustain that.

14:59 11 BY MR. BAAY:

14:59 12 Q. Mr. Childs, I'll ask you to focus on the experts who have  
14:59 13 been identified by the parties in this litigation.

14:59 14 A. I will. I'm sorry.

14:59 15 Q. Who other than you has come to the conclusion that the  
14:59 16 flow from the well pushed the drill pipe off-center on  
14:59 17 April 20th?

14:59 18 A. Mr. Stevick, which is working for Halliburton.

14:59 19 MR. BAAY: If we can go to D-6687 -- excuse me --  
14:59 20 6678.

14:59 21 BY MR. BAAY:

14:59 22 Q. All right. So the crew has closed the upper annular at  
14:59 23 9:43. They closed the variable bore rams at 9:47.

15:00 24 What happens next on the rig during the sequence of  
15:00 25 the events?

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15:00 1 A. Explosion's at 9:47.

15:00 2 Q. And once the explosion occurred, did the rig lose power?

15:00 3 A. It lost all power. The rig is now adrift, no longer held  
15:00 4 in location. It is drifting out around due to wind, currents,  
15:00 5 and other effects.

15:00 6 MR. BAAY: Let's pull up, please, D-6687.

15:00 7 BY MR. BAAY:

15:00 8 Q. Going back to the level of the upper annular or the top  
15:00 9 section of the upper annular, what was the condition of the  
15:00 10 drill pipe at that point? And I'm talking about the level just  
15:00 11 here above these metal inserts you've been talking about.

15:00 12 A. Right. Again, severe erosion that continued still.  
15:00 13 Getting very thin walls in this area.

15:00 14 Q. Okay. And if you'll -- let's try one more time to step  
15:00 15 over towards the board.

15:00 16 I'd like for you to demonstrate for the Court what  
15:01 17 happens to the drill pipe as the rig drifts off location and  
15:01 18 loses power and drifts off location.

15:01 19 Keep your mouth to your microphone, or try to.

15:01 20 A. I'll look down.

15:01 21 We have the tool joint trapped here. This is  
15:01 22 depicting the tool joint right here. We have a tool joint  
15:01 23 here. And as erosion, of course, continued, we have erosion  
15:01 24 here and here. And as the rig drifts off location, of course,  
15:01 25 added tension is being added to the drill pipe.

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1 As the rig is going further away, naturally, it's  
2 pulling on the drill pipe. As it pulls on the drill pipe, it  
3 reached the tensile capacity of this pipe and breaks the pipe  
4 at Location E, right above the upper annular.

5 Q. So if we're looking at D-6636, where do you believe the  
6 separation occurred?

7 A. Top of 1-B-1, right here at the top of the annular, which  
8 is the bottom of 39 E.

9 **THE COURT:** Between the purple and green sections?

10 **THE WITNESS:** Between these two sections, yes. The  
11 very top of the annular, which we're seeing up here. We're  
12 going to depict it in the video in just a minute. It  
13 eventually separated at this location.

14 **BY MR. BAAY:**

15 Q. Just for everyone's reference, who recorded these pipe  
16 conditions in the BOP?

17 A. These are all as found at Michoud. The locations, the  
18 numbers, the separation points were all named at Michoud.

19 Q. And so DNV identified the pipe -- conditions of the  
20 pipe -- locations of the pipe, excuse me, and assigned each  
21 section of pipe a number and a color?

22 A. Right. They determined which joint connects to which  
23 joint both by appearance and forensically.

24 If we go on to C, this is where all the pipes were  
25 found at the end, where the pipe is found in the riser kink.

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15:03 1 So we know they ended up here.

15:03 2 So right prior to the kink, they had to be in this  
15:03 3 position, as we showed, at Position B. Not everybody can see  
15:03 4 the bottom of the board.

15:03 5 Q. We'll get to that.

15:03 6 A. This is A, B, and C.

15:03 7 Q. We'll get to that in one minute. Let's go look at the  
15:03 8 animation of the rupture you just described at D-6687.

15:03 9 We can play this forward.

15:03 10 Why do we see a rupture at this point in the drill  
15:03 11 pipe?

15:03 12 A. As its pressure is increasing -- we've already talked  
15:03 13 about this massive erosion. The pipe wall has gotten very  
15:03 14 thin. Pressure increases. We blow out -- what we call a  
15:03 15 rupture, blow out a hole in the side of the riser.

15:03 16 MR. BAAY: Let's go to D-6668.

15:03 17 BY MR. BAAY:

15:03 18 Q. Describe for us what happens after the rupture, as you  
15:04 19 just demonstrated with the pipe at the board, at D-6636.

15:04 20 A. This is our animation. As the rig is drifting off  
15:04 21 location, it continually pulls on the drill pipe until it  
15:04 22 exceeds the tensile capacity of the drill pipe, and we  
15:04 23 separate, as we've just shown here.

15:04 24 Q. All right. Mr. Childs, when do you believe the separation  
15:04 25 occurs between 1-B-1 E and 39 E?

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15:04 1 A. Within about 10 minutes of the explosions.

15:04 2 Q. 10 minutes following explosion on April 20th, 2010?

15:04 3 A. On April 20th, yes, sir.

15:04 4 Q. And does the -- did the pipe tensilely fail at the point  
15:04 5 of 1-B-1 E?

15:04 6 A. Yes, it did.

15:04 7 Q. What do you mean by "tensile failure"?

15:04 8 A. It's where you're going to keep pulling on a part until we  
15:04 9 reach its ultimate strength and it fails in tension, just like  
15:04 10 I showed with our foam piece, where it suddenly pops apart.

15:04 11 MR. BAAY: Let's put up on the screen D-6704, please.

15:05 12 BY MR. BAAY:

15:05 13 Q. Are these accurate photos of the sections of pipe we've  
15:05 14 just been discussing, both 1-B-1 E and 39 E?

15:05 15 A. Yes. These are the two pieces. I'm talking, of course,  
15:05 16 1-B-1 E and 39 E in these two pieces we're seeing up on the  
15:05 17 screen.

15:05 18 Q. Now, like we did for the tool joint, we've created a 3D  
15:05 19 model from DNV's laser scan data of 1-B-1 E.

15:05 20 My question for you is: Do the erosion patterns and  
15:05 21 the break at 1-B-1 E support your opinion that the pipe  
15:05 22 tensilely failed?

15:05 23 A. Yes.

15:05 24 It shows us several other things. It shows the  
15:05 25 massive erosion that occurred on this piece. You can see --

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1 I'll hand this to you, if you wish. This is almost a knife  
2 edge in this area where the blowout occurred, the rupture  
3 occurred. Very, very thin wall here, very thin wall here, loss  
4 of lots of material here.

5 We had some good wall thickness left here, but it's  
6 only about a third of what we originally had as far as its  
7 strength.

8 As the tension increased, we had a tensile failure  
9 across this section here. And this is a classic tensile  
10 failure. I agreed that it was. I had another metallurgical  
11 gentleman look at it and agree this was a classic tensile  
12 failure.

13 Q. And the patterns we see both in your model and from  
14 D-6704, do they support your opinion that it failed when the  
15 pipe was pulled in tension?

16 A. Yes. On the view up there, the actual photograph on the  
17 upper right is this view, and the actual photograph on the  
18 lower left is this view.

19 Q. Hand that over to Judge Barbier, if he'd like to look at  
20 that one.

21 Do other experts in this case, putting aside anyone  
22 from DNV who looked at this, do they agree with you that the  
23 pipe separated due to the tensile failure?

24 A. Yes, there's agreement.

25 Q. Do they agree that the pipe separated at the level of



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1 1-B-1 E and the 39 E because of the erosion that occurred at  
2 that spot?

3 A. Right. There's no dispute about that.

4 MR. BAAY: Let's look at D-6703 quickly.

5 BY MR. BAAY:

6 Q. So every expert who's been retained by the parties in this  
7 case to look at the blowout preventer has agreed that the pipe,  
8 in fact, does separate at that location?

9 A. Yes, sir.

10 Q. Have you read the Bly report that was prepared by BP in  
11 this case, Mr. Childs?

12 A. I have.

13 MR. BAAY: Let's put up TREG-1.148.1.T0.

14 BY MR. BAAY:

15 Q. Did BP agree with your conclusion that the flow of the  
16 hydrocarbons was sufficient to cause the pipe to erode and  
17 break within minutes of the explosion?

18 A. Yes, they agreed.

19 Q. In fact, what do they say here in the highlighting we have  
20 pulled up in Exhibit 1.148?

21 A. According to OLGA, which is a modeling program for well  
22 control -- according to OLGA well flow modeling, the fluid  
23 velocity through a leaking annular preventer could have reached  
24 levels that were orders of magnitude greater than drill pipe  
25 steel erosion velocity.

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15:08 1 Q. What is meant by "orders of magnitude"?

15:08 2 A. At least ten times more than necessary.

15:08 3 Q. And you agree with that opinion as stated in the Bly  
15:08 4 report?

15:08 5 A. Yes. There was massive flow.

15:08 6 Q. How soon do you believe the erosion occurred at the level  
15:08 7 of the upper annular in the section of pipe we've been  
15:08 8 discussing?

15:08 9 A. It did not take very long. The erosion was occurring  
15:08 10 within minutes.

15:08 11 Q. Now, Mr. Childs, what did the separation of the pipe at  
15:08 12 the level of the upper annular at Section E, as we've  
15:09 13 identified on D-6636 -- what did that mean as far as any effect  
15:09 14 it could have on the drill pipe below that breaking point?

15:09 15 **MR. BAAY:** If we put D-6636 on the big board.

15:09 16 **THE WITNESS:** I'll wait for it to come up.

15:09 17 Well, we've had separation at this point, Judge,  
15:09 18 right above the annular, full separation. So this pipe above  
15:09 19 is no longer connected to the pipe below. There's no  
15:09 20 connection here.

15:09 21 We've lost 100,000 pounds of load pushing down.  
15:09 22 Again, that's approximate load. I didn't get it exact, but  
15:09 23 approximate load pushing down.

15:09 24 We have continued erosion at the level of the  
15:09 25 annular packer. So without this load pushing down and with the

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15:09 1 erosion here, this elastic buckling that we have was allowed to  
15:10 2 relax. Elastic buckling, of course, is like the ruler you saw  
15:10 3 the other day where you push down on it -- the elastic ruler we  
15:10 4 still have. You push down and you let go; it comes back.

15:10 5 The same thing here. As soon as the  
15:10 6 100,000 pounds of load was gone and more erosion occurs here  
15:10 7 and the pinning is released a little bit, this pipe went back  
15:10 8 straight just like our ruler.

15:10 9 **BY MR. BAAY:**

15:10 10 **Q.** We'll get into that in a minute.

15:10 11 My question went more to the fact of what effect  
15:10 12 could this section of pipe running from the BOP up to the  
15:10 13 rig -- what could that pipe -- how could that pipe impart any  
15:10 14 force upon this section of pipe in the BOP after the time of  
15:10 15 separation?

15:10 16 **A.** Well, there's no longer any connection. The pipe above,  
15:10 17 at the E section, anything that happens with this piece above  
15:10 18 can have no effect on this piece below.

15:10 19 **Q.** And you believe the pipe separated on April 20th; is that  
15:10 20 right?

15:11 21 **A.** April 20th, fairly soon after the explosions.

15:11 22 **Q.** So if our rig drifts off and pulls this section of pipe on  
15:11 23 April 21st or 22nd, what is your opinion as to whether that  
15:11 24 would bow or bend the pipe at the level of the blind shear ram?

15:11 25 **A.** It's no longer connected to it. It would have no effect

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15:11 1 on the pipe below the annular.

15:11 2 Q. I want to now talk about the activation of the blind shear  
15:11 3 rams.

15:11 4 MR. BAAY: If we could pull up D-6689.

15:11 5 THE WITNESS: I want to make sure I got what you  
15:11 6 said -- there was a cough there. Could you repeat, please.

15:11 7 BY MR. BAAY:

15:11 8 Q. We're going to look at the blind shear ram.

15:11 9 A. Fine.

15:11 10 Q. I want to first start by having you describe for us why  
15:11 11 the blind shear ram can't close on off-center pipe.

15:11 12 A. Here we're looking at the upper shear ram below. The  
15:11 13 lower shear ram would be above us. Here's our drill pipe  
15:11 14 forced to the side of the bore rams.

15:11 15 If we close the shear rams -- and stop right there --

15:11 16 MR. BAAY: Pause it right there.

15:11 17 THE WITNESS: Very good.

15:11 18 -- you can see the upper shear ram blade does  
15:12 19 not extend the full width of the bore, and the pipe is  
15:12 20 partially outside of that shear surface.

15:12 21 So as you complete as much of a closure as you  
15:12 22 can get, this pipe that's outside gets trapped between the two  
15:12 23 ram blocks. This holds the two ram blocks apart, 2.2 to  
15:12 24 2.8 inches, depending on where you take the measurement, but  
15:12 25 considerably apart, enough that considerable flow continues

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1 through the shear ram.

2 **BY MR. BAAY:**

3 **Q.** Now, I'm going to use another model that we've taken from  
4 DNV's laser scan data. This one is marked D-6700, and the  
5 sections of pipe are D-6701.

6 I'd like for you just to demonstrate for the Court  
7 why the conditions of the blind shear ram and of these sections  
8 of pipe support your opinion that the blind shear ram closed on  
9 off-center pipe.

10 **A.** This is a quarter scale of the actual ram after all the  
11 erosion. We lost side packers on both sides, lost considerable  
12 metal.

13 The markings we've depicted are the same markings  
14 that were applied by DNV at Michoud. This section, marked with  
15 94, matches perfectly with this L-shaped section. This is  
16 called a foldover shoulder of the shear ram, upper shear ram  
17 block, and these match up perfectly, showing, just like we have  
18 in our animation, where the pipe is inside the bore, part of  
19 the pipe is well outside of the shear area, which is -- it's  
20 here. And the ram could not close completely.

21 **Q.** And how about Section 83, which is above the level of the  
22 blind shear --

23 **A.** This is the upper section, as Mr. Baay is saying.

24 Now, we have this .8 -- or area 83, the L-shaped edge  
25 of the upper blade. We have the corresponding marks on this

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1 pipe. We can also match them exactly to show that the pipe was  
2 at this location on the side of the bore, which happens to be  
3 the kill side, which is one -- you have a choke side and a kill  
4 side of the BOP. This is the kill side.

5 Q. What do you mean by "kill side"?

6 A. Just a designation for the sides of the bore. There's  
7 valving on each side of the bore. One side can be used for a  
8 killing operation, and one side can be used for choke  
9 operations. For us right now, this matters. It's one side or  
10 the other. This is kill side. We always know how to match  
11 this up, which is with its corresponding ram bore, and there's  
12 also the same level of erosion in the ram bore.

13 Q. So do the erosion patterns on the kill side support your  
14 opinion that the pipe was trapped off-center on the kill side  
15 of the blind shear ram?

16 A. Yes. You can see the massive erosion here on the side of  
17 ram block, Judge, and it was definitely placed on this side,  
18 plus the forensic examination shows that these match.

19 Q. Now, did you review these sections -- if you want to offer  
20 those to Judge Barbier to examine.

21 A. These two are probably the most compelling, if you want to  
22 look at them.

23 Q. Did you also review these sections of pipe when you went  
24 to Michoud?

25 A. Yes, I did.

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15:15 1 MR. BAAY: Let's pull up D-6234.

15:15 2 BY MR. BAAY:

15:15 3 Q. Describe for us what we're seeing here.

15:15 4 A. This is that same upper shear ram. Part of the marking  
15:15 5 for 83 has rubbed away over the months from the people looking  
15:15 6 at these and using these.

15:15 7 THE WITNESS: This is our lower fish that you have on  
15:15 8 your desk there now, Judge. This is that fish. This is placed  
15:15 9 in position, just like I did the two scan models; and it fits  
15:15 10 perfectly in this Section 94.

15:15 11 BY MR. BAAY:

15:15 12 Q. When you say "fish," you're talking about drill pipe; is  
15:15 13 that right?

15:15 14 A. That is the field terminology when you shear a piece of  
15:15 15 pipe. That's the lower fish, and the upper piece of pipe would  
15:15 16 be the upper fish.

15:15 17 Q. And the pipe you -- that's actually your hand there  
15:15 18 holding that section of pipe?

15:15 19 A. Yes, I'm holding this in position as the professional  
15:15 20 photographer takes the shot.

15:15 21 Q. And you're holding Section 94?

15:16 22 A. 94 against the foldover shoulder of the upper shear ram  
15:16 23 block.

15:16 24 MR. BAAY: Let's look at D-6241.

25

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15:16 1 BY MR. BAAY:

15:16 2 Q. Did you also examine a piece of pipe marked 83?

15:16 3 A. Yes. This is the actual 83, again, being positioned on  
15:16 4 the upper shear blade portion of the upper shear ram.

15:16 5 Q. Again, do we see erosion patterns on here that confirm the  
15:16 6 pipe was off-centered to the kill side of the blind shear ram?

15:16 7 A. Yes. You can see the patterns caused by the one pipe  
15:16 8 being here and the flow now coming from this pipe through this  
15:16 9 area, causing this massive erosion on the side of the ram  
15:16 10 block.

15:16 11 MR. BAAY: All right. Let's pull up D-6690.

15:16 12 BY MR. BAAY:

15:16 13 Q. And just go through the entire sequence of events as you  
15:16 14 just described with the blind shear ram cutting off-center  
15:16 15 pipe.

15:16 16 A. We'll start in the open position. The pipe's pinned to  
15:16 17 the side of the bore. It closes. Part of the pipe is on  
15:16 18 the -- outside the shearing surface gets trapped between the  
15:16 19 blocks, and you do not get full closure.

15:17 20 We're looking now at the side view. We see where  
15:17 21 some of that piece of pipe is trapped between the two blocks.  
15:17 22 There's a few pieces of these pipe that did fall away. They're  
15:17 23 down in the well. We'll never retrieve them. We only have the  
15:17 24 pieces you see there and the same pieces we see here on the  
15:17 25 screen.



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1           We transition now to the actual photographs of these  
2 models that you're seeing. You see the 83 matched L-shaped  
3 sections and the matched 94 L-shaped sections.

4 Q.   So again, what do the contours on the face of 94 and  
5 Section 83 tell us about the location of the drill pipe?

6 A.   They give us a precise position of that pipe at the side  
7 of the wellbore partially outside of the shearing surface of  
8 the ram and interfering with closure, plus interfering with the  
9 seals. They're called side packers, the side packers that are  
10 installed on the side of each of the rams.

11 Q.   So the forensic evidence supports your opinion that the  
12 pipe was off-center when the blind shear ram closed. And has  
13 there been any dispute in this case by any of the experts who  
14 reviewed this forensic evidence as to the location of pipe and  
15 the blind shear ram?

16 A.   No.

17 Q.   Now, all of the blind shear rams did not fully shear  
18 through the pipe.

19           Did the pipe eventually separate at the level of the  
20 blind shear ram?

21 A.   Yes, it did.

22 Q.   And had the pipe, as you've described, also broken or  
23 separated at the level above the upper annular at 1-B-1 E and  
24 39 E?

25 A.   Yes. All this time we've been looking at is right above

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15:18 1 this tool joint, Section E, that is right at the top of the  
15:18 2 upper annular BOP.

15:18 3 Q. Now, which portions of pipe -- Mr. Childs, I'm going to  
15:18 4 ask you again to walk to D-6636, the board. And if you will,  
15:18 5 there's some sections of drill pipe there. You can take those  
15:18 6 with you.

15:18 7 If we look to the middle section -- and be aware,  
15:19 8 Mr. Childs, speak into your microphone. I know it's tough to  
15:19 9 do both.

15:19 10 If you look at the middle section of D-6636, what  
15:19 11 sections of pipe ended above the upper annular? It's that  
15:19 12 middle B section that I'm looking at in particular.

15:19 13 MS. HANKEY: Objection, Your Honor. I'm sorry. This  
15:19 14 is -- in fact, the two pieces on the right of this are analysis  
15:19 15 by DNV. This does not represent the way the pipe was  
15:19 16 recovered.

15:19 17 MR. BAAY: Your Honor, this is simply a schematic  
15:19 18 that is recorded by DNV. This is the data of the pipe  
15:19 19 locations as they've included in their report.

15:19 20 THE COURT: Is it an analysis or a factual finding or  
15:19 21 is this an opinion by DNV?

15:19 22 MS. HANKEY: It's an opinion, Your Honor, because  
15:19 23 these are not the way the pipe pieces were found. This is  
15:19 24 DNV's opinion as to the -- as you see at the bottom, the  
15:19 25 sequence of the drill pipe, that's their description.

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15:19 1 THE COURT: Are we talking about this -- the middle  
15:20 2 depiction or the one on the right?

15:20 3 MS. HANKEY: Both the middle and the right.

15:20 4 THE COURT: Let me ask the witness.

15:20 5 Is that --

15:20 6 MS. HANKEY: Yeah, the one on the left is --

15:20 7 THE COURT: Wait, wait, wait. Let me ask the  
15:20 8 witness.

15:20 9 THE WITNESS: Well, I've often seen the drill pipe,  
15:20 10 and it was matched up. As we take these pieces, we see  
15:20 11 visually that, yes, these match and these match. And I know  
15:20 12 there was further metallurgical examinations performed that did  
15:20 13 some more assurance that these were the -- they were found.

15:20 14 Much of this you can match up the shapes; and  
15:20 15 you can see that, yes, these two came from each other. I've  
15:20 16 seen the pieces in person.

15:20 17 THE COURT: Okay. But is the issue whether you saw  
15:20 18 them -- whether they were in the position as depicted? That's,  
15:20 19 I think, the question.

15:20 20 THE WITNESS: Well, we can read -- we can see the  
15:20 21 pieces that came apart here.

15:20 22 We can see by the visual appearance of each of  
15:20 23 these sections that they came from each other. So you can  
15:21 24 reconstruct this. They weren't exactly in these positions.  
15:21 25 Because as we know, several pieces ended up in the riser.

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15:21 1           **THE COURT:** So that's what I was trying to  
15:21 2 understand. Where were -- these pieces of pipe that you're  
15:21 3 talking about, where were they found when the BOP was  
15:21 4 retrieved? I guess this occurred at Michoud, right?

15:21 5           **THE WITNESS:** At Michoud when they were taking them  
15:21 6 apart.

15:21 7           **THE COURT:** Where were they found at that point?

15:21 8           **THE WITNESS:** I was there when we were cutting into  
15:21 9 this riser joint and found these pieces.

15:21 10          **THE COURT:** As you're depicting on the right-hand  
15:21 11 side of this chart?

15:21 12          **THE WITNESS:** Yes. We'll show you a photograph later  
15:21 13 of looking -- excuse me -- looking into this piece of riser is  
15:21 14 showing these two joints in that riser.

15:21 15          **THE COURT:** So what you're saying is that depiction  
15:21 16 on the right isn't just somebody's opinion, that's what you  
15:21 17 actually observed?

15:21 18          **THE WITNESS:** They were found there, exactly.

15:21 19 **BY MR. BAAY:**

15:21 20 **Q.** Then that --

15:21 21          **THE WITNESS:** Now, this would be -- if we found them  
15:21 22 here, they had to have been here prior to the kink.

15:22 23          **THE COURT:** And that's your opinion or is that  
15:22 24 somebody else's opinion?

15:22 25          **THE WITNESS:** It's physically impossible to have

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15:22 1 been --

15:22 2 THE COURT: So you're making this connection?

15:22 3 THE WITNESS: Exactly.

15:22 4 THE COURT: Okay. All right. I'm going to let the  
15:22 5 witness testify.

15:22 6 Go ahead.

15:22 7 MR. BAAY: Thank you, Your Honor.

15:22 8 BY MR. BAAY:

15:22 9 Q. My question was, Mr. Childs, which portions of the pipe  
15:22 10 moved up above the upper annular?

15:22 11 A. We have this piece again. We know it's this piece because  
15:22 12 of the erosion on the tool joint.

15:22 13 Q. Let me interrupt you. Try to refer to them by numbers so  
15:22 14 that if someone's not watching us, they can later come back and  
15:22 15 see what you're talking about.

15:22 16 A. All right. The piece I'm holding up with the tool joint  
15:22 17 has 1-B-1. We left this joint in our model together with  
15:22 18 1-B-2, 84 and 83. So I have one full piece that goes from the  
15:22 19 shear ram up through the upper annular. It includes the tool  
15:22 20 joint, which has been proven to have been in this location.

15:22 21 Again, the evidence shows it there. We measured the  
15:23 22 distance. We know it was here. This piece, we already have  
15:23 23 above here Section 39 and 1-A-1, which we know were there  
15:23 24 because they ended up here. So we have their location set.

15:23 25 Then we had -- excuse me -- this section eventually

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15:23 1 be released from its pinning at the annular BOP. We've lost  
15:23 2 the load from the upper piece because we had the separating  
15:23 3 here. So the 100,000 pounds is not holding down on this piece  
15:23 4 anymore. More erosion occurs here. We still have all this  
15:23 5 massive flow.

15:23 6 This eventually erodes enough around the annular that  
15:23 7 the tool joint can go through. Now we have this very small  
15:23 8 area still with massive flow and this jetted -- this piece up  
15:24 9 and onto the top of the annular, which then put the original  
15:24 10 piece that was already there being 39 and 1-A-1 --

15:24 11 Q. Let me interrupt you.

15:24 12 Okay. So my question was: Which sections of pipe  
15:24 13 and -- above the upper annular?

15:24 14 And I believe your opinion is it was 83 and 1-B-1?

15:24 15 A. Yes. I was just placing them there. 83, 84, 1-B-2 and  
15:24 16 1-B-1 end up above the upper annular.

15:24 17 Q. And those are sections of drill pipe that were previously  
15:24 18 located below the upper annular?

15:24 19 A. Yes. They started with the top of that whole section, the  
15:24 20 top of 1-B-1 at the upper annular; and eventually, when they  
15:24 21 were allowed to go through, we lost all this load from the  
15:24 22 upper pipe. The flow continues, it shoots this up and puts it  
15:24 23 above the upper annular next to the pipe that was already  
15:24 24 there.

15:24 25 Q. Now, you've testified earlier that the tool joint is

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15:25 1 pinned at the level of the upper annular. How then is it  
15:25 2 possible for these sections of pipe to release from that and  
15:25 3 end up above the upper annular?

15:25 4 A. Two things did occur. Remember when I was talking about  
15:25 5 the massive flow pushing up, buckling the pipe, we had the  
15:25 6 force down from its own weight, which is the weight of the  
15:25 7 drill pipe above, plus we had the tool joint being trapped in  
15:25 8 the annular.

15:25 9 We lost all this weight pushing down, which is in  
15:25 10 excess of 100,000 pounds. We've had continued erosion through  
15:25 11 the packer, and it eventually eroded enough of that that this  
15:25 12 tool joint can go through the packer. We still have a very  
15:25 13 small area for this fluid to go through, so the velocity is  
15:25 14 very high.

15:25 15 So that's why I say it took this, shoots it through  
15:25 16 there and above and then lands it back on top of the annular  
15:26 17 packer. A nice, flat surface on the annular packer, and the  
15:26 18 bottom of that joint does show the kind of deformation caused  
15:26 19 by landing on top of a flat, metal surface.

15:26 20 Q. Now I'm going to ask you to stay right where you are.

15:26 21 MR. BAAY: I ask that D-6678 be pulled up.

15:26 22 BY MR. BAAY:

15:26 23 Q. In your opinion, Mr. Childs, when does the  
15:26 24 *Deepwater Horizon* sink, what date and time?

15:26 25 A. On the 22nd, a little after 10:00.

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15:26 1 Q. In your opinion, as you marked it on the far right of  
15:26 2 D-6636, where do the pieces of pipe go once the rig sinks?

15:26 3 A. Well, they were found within this kink, as we've shown  
15:26 4 here in this diagram. They were inside this kink, as we've  
15:26 5 shown here as well. The pipe was in this location. When the  
15:26 6 riser kinked, of course, it trapped that pipe in this location,  
15:27 7 as we see here.

15:27 8 Q. Okay. And we'll play D-6692.

15:27 9 Describe for us what happens as the rig sinks.

15:27 10 A. We're looking at the animation up on the board right now.  
15:27 11 The rig is sank. The riser is, of course, bending over,  
15:27 12 kinking this in there; and we did a shear and a saw cut through  
15:27 13 this section.

15:27 14 So on the screen is that end of the riser I was  
15:27 15 alluding to earlier, showing these two pieces of pipe. That  
15:27 16 would be 1-A-1-F and 1-B-2-D showing at the end of that cut.

15:27 17 So, again, we know exactly where that was because  
15:27 18 here it is in the actual piece. These were cut out of that  
15:27 19 riser joint so we could have them separately.

15:27 20 Q. Now, Mr. Childs, what does that -- the fact that these  
15:27 21 sections of pipe were located in the kinked section of the  
15:27 22 riser, what does that tell us, if we look at D-6678, about the  
15:28 23 possible times that -- the only possible times that the blind  
15:28 24 shear ram could have been activated?

15:28 25 A. Since we've had the separation here, we've had increased



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15:28 1 erosion here and eventually enough erosion that this pipe could  
15:28 2 come through the annular. The bow in this pipe is gone. So  
15:28 3 the bow is no longer holding the pipe to the edge of the bore.  
15:28 4 So if -- we know the shear ram closed on the pipe on this side  
15:28 5 of the bore. So it had to have been bowed here.

15:28 6 It was no longer bowed. By the time we get to this  
15:28 7 position, the pipe is no longer in a bowed position.

15:28 8 Q. Could those sections of pipe have been pushed up into the  
15:28 9 section of the riser kink after the rig sank?

15:28 10 A. No. It was a very severe kink. In fact, this break we  
15:28 11 see at 1-B-1 E-2 right here occurred from this severe bend at  
15:29 12 that position.

15:29 13 Q. Okay. Related question still standing there at D-6636:  
15:29 14 What sections of pipe were recovered between the blind shear  
15:29 15 ram and the variable bore rams?

15:29 16 A. That would be the Section 94 and 148.

15:29 17 Q. And were Sections 94 and 83 the sections of the pipe that  
15:29 18 were at the level of blind shear ram?

15:29 19 A. Yes. 94 was originally connected to 83. B would be the  
15:29 20 sheared or partially-sheared section.

15:29 21 Q. Okay. Mr. Childs, you testified earlier that those  
15:29 22 sections of pipe were in the bowed condition at the level of  
15:29 23 the blind shear ram.

15:29 24 What position were they recovered in, bowed or  
15:29 25 straight?

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15:29 1 A. They were found in the straight condition.

15:29 2 Q. And how do you account for that fact?

15:29 3 A. Back to our elastic buckling. Our simple ruler, they were  
15:30 4 buckled by all the forces and flow as soon. As they were  
15:30 5 released from that, the piece went straight and these pieces  
15:30 6 were found in the straight condition.

15:30 7 Q. Is this concept of --

15:30 8 THE COURT: Wait. Let me ask a question. You said  
15:30 9 this was a helical buckling. That is sort of twisted, too;  
15:30 10 right?

15:30 11 THE WITNESS: Not really twisted.

15:30 12 THE COURT: It looks like a spring, sort of?

15:30 13 THE WITNESS: Right. Well, in this case, of course  
15:30 14 it just goes in one plane.

15:30 15 THE COURT: Right.

15:30 16 THE WITNESS: When this pipe is being pushed up and  
15:30 17 buckled inside of a bore, it has to follow the bore. So it  
15:30 18 ends up going in a spiral or helical.

15:30 19 THE COURT: So when I say twisted --

15:30 20 THE WITNESS: Yes, twisted, helical.

15:30 21 THE COURT: It would still, in your opinion,  
15:30 22 straighten out once the pressure is released?

15:30 23 THE WITNESS: Yes. It was elastic buckling. This  
15:30 24 happens in drill pipe all the time. It goes into a helical or  
15:30 25 spiral condition, and it's not yielded. It's not bent that

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15:30 1 far. It only is deflected. Then it comes back to the straight  
15:30 2 condition.

15:30 3 **BY MR. BAAY:**

15:30 4 **Q.** Is this concept of elastic buckling something that you  
15:31 5 came up with just for this case and your analysis in this case?

15:31 6 **A.** No. Of course, the phenomena has existed forever. Euler  
15:31 7 came up with the equations we use today to analyze this. He  
15:31 8 came up with those in the mid-1700s.

15:31 9 **Q.** In fact, you think the pipe was buckled on April 20th but  
15:31 10 then was recovered in a straight condition. Is it possible  
15:31 11 that the drill pipe would have still been off-center until the  
15:31 12 time that the ROV activated the autoshear on April 22nd?

15:31 13 **A.** I do not believe so, no.

15:31 14 **Q.** And describe for us very clearly why you don't believe  
15:31 15 that.

15:31 16 **A.** Well, we went through a little of that -- I'm keeping my  
15:31 17 head down -- this was in a helically-buckled position, putting  
15:31 18 it to the side so that the shear ram closed on the side with  
15:31 19 the pipe on the side.

15:31 20 We had continued erosion. We have the separation,  
15:31 21 which nobody disagrees with. We have the separation at  
15:31 22 1-B-1 E, 39-E.

15:32 23 Once that separated, this 100,000 pounds of drill  
15:32 24 pipe load above has gone away. We don't have that force  
15:32 25 pushing down on this -- this part anymore. Continued erosion

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15:32 1 here.

15:32 2 Again, this erosion was eventually sufficient enough  
15:32 3 that this pipe shot through the annular packer. So with that  
15:32 4 releasing of the load, this pipe went back to its original  
15:32 5 condition of straight.

15:32 6 Q. So once you lose the weight of the drill string going from  
15:32 7 the BOP to the rig and once your annular opens up and your pipe  
15:32 8 moves up, is that when the pipe becomes straight in your  
15:32 9 opinion?

15:32 10 A. That's when it becomes straight, yes.

15:32 11 Q. When do you think that occurred?

15:32 12 A. It didn't take very long. Of course, this happened within  
15:32 13 10 minutes. So we've lost that load already. So a little bit  
15:32 14 more erosion here, and you would have lost it. So on the 20th,  
15:32 15 fairly soon after all these actions occurred.

15:32 16 Q. So you believe it buckled on the 20th at the time of the  
15:32 17 AMF activation, but sometime later on the 20th the pipe  
15:33 18 straightens?

15:33 19 A. Yes, after, again, the actions we've walked through,  
15:33 20 including this separation above the annular.

15:33 21 Q. Now, Mr. Stevick, who is Halliburton's BOP expert, also  
15:33 22 opines that the flow from the blowout may have buckled the pipe  
15:33 23 on April 20th. Do you recall that opinion?

15:33 24 A. I do.

15:33 25 Q. But he believes the buckle remained until April 22nd at

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15:33 1 the time of autoshear activation, at the time of blind shear  
15:33 2 activation.

15:33 3 Do you agree with that opinion?

15:33 4 A. No, I do not.

15:33 5 Q. For the reasons you just indicated?

15:33 6 A. For all those same reasons, that by that time it could not  
15:33 7 still be buckled.

15:33 8 Q. You can take a seat. Thank you, Mr. Childs.

15:33 9 MR. BAAY: Let's put up D-6678 one more time.

15:33 10 BY MR. BAAY:

15:33 11 Q. Can you recap for the Court, what does the unbuckling of  
15:33 12 the drill pipe mean with respect to possible closure time of  
15:33 13 the blind shear ram?

15:33 14 A. Well, since we know the pipe was sheared in an off-center  
15:33 15 condition, that leaves us only the AMF time on the 20th that  
15:34 16 the pipe was in that position, that the pipe could have been  
15:34 17 attempted to be sheared.

15:34 18 Q. So there's no dispute that the pipe was off-center at the  
15:34 19 time of the blind shear ram activation?

15:34 20 A. That's correct.

15:34 21 Q. And the only two times that the blind shear ram could  
15:34 22 possibly have been activated are AMF and autoshear prior to the  
15:34 23 rig sinking. Is that true?

15:34 24 A. That's also correct.

15:34 25 Q. Do you believe that the pipe would have been off-center by

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1 15:34 April 22nd at the time of autoshear activation?

2 15:34 A. No, sir.

3 15:34 MR. BAAY: You can pull that down. Thank you.

4 15:34 BY MR. BAAY:

5 15:34 Q. I want to now talk about -- go back to our discussion of  
6 15:34 ST locks.

7 15:34 Did the operation of ST locks factor into your  
8 15:34 opinion that it was the AMF that functioned or activated the  
9 15:34 blind shear ram?

10 15:34 A. Yes, they did.

11 15:34 MR. BAAY: Now, if we can pull up D-6674.

12 15:34 BY MR. BAAY:

13 15:34 Q. Explain to us why you believe the ST locks support your  
14 15:34 opinion that it was the AMF that activated the blind shear ram.

15 15:34 A. Once we have closed the VBRs, we found the locks activated  
16 15:35 on the VBRs when we were at Michoud. For them to be locked,  
17 15:35 the rams have to be in enough of a closed position, which we  
18 15:35 described earlier.

19 15:35 Once the explosion's occurred, there's no more  
20 15:35 hydraulic pressure holding the VBRs closed. So we would have  
21 15:35 33 hours for flow to be coming up in the well. We know the  
22 15:35 VBRs eventually did start leaking. They did get a very good  
23 15:35 seal initially, but they did start leaking.

24 15:35 So now we have this flow coming by the VBRs that  
25 15:35 would have tended to push them back, and the mechanical

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15:35 1 interference we discussed earlier between the tail rod and the  
15:35 2 wedge would have kept the locks from being able to be  
15:35 3 activated.

15:35 4 Q. What position were the ST locks found in when the  
15:35 5 *Deepwater Horizon* blowout preventer was pulled to surface?

15:35 6 A. They were found locked.

15:35 7 Q. And could the crew, in your opinion, have activated the  
15:35 8 ST locks at the time they functioned the variable bore rams?

15:36 9 A. It would have not been their policy. They do have a  
15:36 10 button they could have pushed, but it would not have been their  
15:36 11 policy. They were in well control, and they didn't know what  
15:36 12 next steps they might need to take.

15:36 13 Q. And it's your opinion that had the ST locks not been  
15:36 14 activated by AMF, the variable bore rams would not have  
15:36 15 remained in the closed position.

15:36 16 A. That's correct.

15:36 17 Q. Does the autoshear also -- and to be clear, the AMF does  
15:36 18 operate the ST locks?

15:36 19 A. Yes. That's the same thing. In fact, both of them  
15:36 20 activate all ST locks.

15:36 21 Q. And does the autoshear also activate the ST locks?

15:36 22 A. Yes. Autoshear and AMF activate all ST locks.

15:36 23 Q. If the variable bore rams had come open in the two days  
15:36 24 between April 20th and April 22nd, would it have been possible  
15:36 25 for the ST locks to fully close as -- if the autoshear

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15:36 1 operation had triggered them?

15:36 2 A. If we opened them up and we had the interference I talked  
15:36 3 about, you could not have locked the locks.

15:37 4 Q. Mr. Childs, did you do anything to determine whether the  
15:37 5 flow rate from the well was sufficient to buckle the pipe, as  
15:37 6 you've just described?

15:37 7 A. We did.

15:37 8 Q. And what did you do?

15:37 9 A. As part of the Transocean investigation team, we  
15:37 10 contracted with Stress Engineering to do the analysis of the  
15:37 11 flow and various other aspects of the incident.

15:37 12 Q. Okay. So you and the Transocean internal investigation  
15:37 13 team hired Stress to do these calculations?

15:37 14 A. Yes, sir.

15:37 15 Q. Now, why did you and the Transocean internal team look to  
15:37 16 Stress to perform these calculations?

15:37 17 A. They are experts in the field. They know more about  
15:37 18 blowouts, flow-through wells around tubulars, about the actions  
15:37 19 that happened to this, the helical buckling.

15:37 20 And Dr. Garrett is renowned for an understanding of  
15:37 21 this. He teaches on flow around tubulars and the effects on  
15:38 22 those tubulars.

15:38 23 Q. You mentioned Dr. Garrett. Is that Dave Garrett, with  
15:38 24 Stress Engineering?

15:38 25 A. Dr. David or Dave Garrett, yes, sir.



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15:38 1 Q. As you met Mr. Garrett and walked through these  
15:38 2 calculations with him, did you gain a lot of confidence that he  
15:38 3 knew exactly what he was doing as he performed these flow rate  
15:38 4 calculations?

15:38 5 A. Very much so. Of course, I started with confidence in  
15:38 6 Stress Engineering. My own company, when we work and need data  
15:38 7 that's beyond or capacity, we employ Stress Engineering.

15:38 8 Q. Is there any question that Stress is an expert in the  
15:38 9 field, in the oil and gas industry?

15:38 10 A. None at all.

15:38 11 Q. Now, what data did Stress rely on in performing its  
15:38 12 calculations?

15:38 13 A. Every bit of the data that we got from the well, that  
15:38 14 being "we," Transocean, got from the well was passed on to  
15:38 15 Stress Engineering.

15:38 16 Q. And what did Stress' calculations tell you about whether  
15:38 17 or not the flow rate was sufficient to buckle the drill pipe,  
15:38 18 as you've described for the Court?

15:38 19 A. As I've already stated, right prior to the time of annular  
15:38 20 closure at 9:43, there was sufficient force to begin lifting up  
15:39 21 the pipe and lifting up the tool joint.

15:39 22 Q. What did Stress' calculations tell you about as to when  
15:39 23 the flow rate was sufficient to lift the drill pipe?

15:39 24 A. 9:42, 9:43, right there, right prior to annular BOP  
15:39 25 closure.

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15:39 1 Q. In your opinion, was the flow rate enough to move the  
15:39 2 drill pipe off-center?

15:39 3 A. Yes, it was.

15:39 4 Q. Let's pull up -- excuse me. Strike that.

15:39 5 Now, I want to talk -- there's obviously -- as the  
15:39 6 Court is well aware, there's a dispute as to the timing of  
15:39 7 activation of the blind shear ram.

15:39 8 THE COURT: Let's -- maybe this is a good time to  
15:39 9 take a recess. It's 3:40. Let's take a 15-minute recess.

15:39 10 THE WITNESS: Thank you, Judge.

15:39 11 THE DEPUTY CLERK: All rise.

15:39 12 (WHEREUPON, the Court took a recess.)

15:56 13 THE DEPUTY CLERK: All rise.

15:56 14 THE COURT: Please be seated, everyone.

15:57 15 MR. BAAY: May I proceed, Your Honor?

15:57 16 THE COURT: Yes.

15:57 17 MR. BAAY: Thank you very much.

15:57 18 BY MR. BAAY:

15:57 19 Q. Mr. Childs, as we've described, your opinion is that the  
15:57 20 blind shear ram operated on April 20th. Is that true?

15:57 21 A. That's correct.

15:57 22 MR. BAAY: If we could pull up D-6661.

15:57 23 BY MR. BAAY:

15:57 24 Q. There are opinions from other experts that the blind shear  
15:57 25 ram activated on April 22nd. Are you aware of those opinions?

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15:57 1 A. Yes, I am.

15:57 2 Q. Are you familiar with the theory of one of BP's BOP  
15:57 3 experts, Mr. Shanks, as to how he believes the drill pipe was  
15:57 4 pushed off-center?

15:57 5 A. Yes, I am.

15:57 6 Q. Describe for the Court what you believe his theory to be.

15:57 7 A. That when the traveling block fell, it imparted a downward  
15:57 8 force on the drill pipe that helically buckled it, but  
15:57 9 plastically helically buckled the pipe in the bore.

15:58 10 Q. Do you believe this theory is possible?

15:58 11 A. No, sir.

15:58 12 Q. Why not?

15:58 13 A. We've discussed at length the separation that occurred at  
15:58 14 E on our board over here. When that separation occurred,  
15:58 15 anything that happens with the pipe above cannot have any  
15:58 16 effect on the pipe below the annular BOP.

15:58 17 Q. And your reference is Section E on D-6636?

15:58 18 A. Yes, this section here.

15:58 19 Q. And did Mr. Shanks agree that the drill pipe broke at that  
15:58 20 section?

15:58 21 A. Yes.

15:58 22 THE COURT: What do you mean by "classically  
15:58 23 helically buckled"?

15:58 24 THE WITNESS: Plastically.

15:58 25 THE COURT: Oh, plastically.

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15:58 1           **THE WITNESS:** The phenomenon we were discussing  
15:58 2 earlier. If I had taken that ruler and kept bending it, it  
15:58 3 would have taken a permanent bend. That would have been  
15:58 4 plastic. It wouldn't come back.

15:58 5           **THE COURT:** I gotcha.

15:58 6 **BY MR. BAAY:**

15:58 7 **Q.** So Mr. Shanks believes that the traveling block falls,  
15:58 8 imparts weight to the upper section of the drill pipe, which  
15:58 9 then puts a force into the drill pipe at the level of the BOP  
15:58 10 and buckles that drill pipe?

15:58 11 **A.** Yes, sir.

15:59 12 **Q.** How does Mr. Shanks explain his theory that the upper pipe  
15:59 13 could impart that pressure if there is no longer a connection  
15:59 14 between 39 E and 1-B-1 E?

15:59 15 **A.** That possibly the upper and lower sections could reconnect  
15:59 16 and still apply a downward force on the lower drill pipe.

15:59 17 **Q.** And do you have an animation that illustrates how he  
15:59 18 believes that might happen?

15:59 19 **A.** Yes.

15:59 20 **Q.** Okay. Describe for us what we see here in D-6696.

15:59 21 **A.** The traveling block is up in the derrick, a very large,  
15:59 22 heavy device. The drill pipe is connected to it. It falls,  
15:59 23 and as it's falling, the drill pipe is falling with it. So as  
15:59 24 we see, the pipe comes down and, as we know, lands on top of  
15:59 25 the upper annular, causing this massive deformation we have on

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15:59 1 this 39 E section.

16:00 2 THE COURT: When did the traveling block fall? Was  
16:00 3 that when the rig capsized?

16:00 4 THE WITNESS: About 30 minutes after the explosions  
16:00 5 or after --

16:00 6 THE COURT: 30 minutes after the explosion.

16:00 7 THE WITNESS: Eyewitnesses say about 30 minutes after  
16:00 8 the explosions.

16:00 9 BY MR. BAAY:

16:00 10 Q. And that would have been on April 20th?

16:00 11 A. On April 20th, of course, yes, sir.

16:00 12 MR. BAAY: Can I steal this section back, Your Honor?

16:00 13 THE COURT: You can have it all.

16:00 14 BY MR. BAAY:

16:00 15 Q. All right. So Mr. Shanks testified that if the pipe does  
16:00 16 separate at 39 E and 1-B-1 E, his theory is still somehow  
16:00 17 possible because the pipe could have come down and slammed into  
16:00 18 1-B-1 E. Is that how you understand it?

16:00 19 A. That's how I understand it.

16:00 20 MR. BAAY: Now, let's look at D-6637-B.

16:00 21 BY MR. BAAY:

16:00 22 Q. Is there anything about the forensic evidence related to  
16:00 23 that section of pipe in 1-B-1 E that supports Mr. Shanks'  
16:00 24 theory?

16:00 25 A. No. There is no indication of any kind of contact. This

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1 is a pristine tensile failure, no damage area here. So if the  
2 other pipe had landed on this and pushed down, we would have  
3 had some kind of rolling-over deformation of this piece.

4 It is pristine. That's the way it failed at tension.

5 Q. If 39 E had slammed into 1-B-1 E, would you see these  
6 spires that you see on 1-B-1 E from the original?

7 A. No. They all would have been folded over, broken off, or  
8 damaged in some other way.

9 Q. Looking at the model from 39 E, what do you believe this  
10 roll-under was caused from?

11 A. This is the bottom of the 39 E section. When it came  
12 down -- this part here would be what would have come from this  
13 lower area here on this section. This would have been  
14 connected somewhere similar to this.

15 This section would have matched more with this  
16 1-B-1 E. So when this fell, a very flat surface area landed on  
17 top of the metal part of the annular. We know the annular top  
18 is all those inserts we saw earlier, and it's all metal. It  
19 landed on that and did this deformation, as we saw here.

20 Q. Would it be in a position similar to what we see on the  
21 screen in D-6696?

22 A. Yes, somewhere to the side of the center. It would be on  
23 the metal inserts. We show it on the left and then on the  
24 right. It really doesn't matter.

25 MR. BAAY: If we could play D-6697, please.

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16:02 1 BY MR. BAAY:

16:02 2 Q. Describe for us what we see here.

16:02 3 A. These are the two sections we were just looking at. The  
16:02 4 laser scans of 1-B-1 E on the right and 39 E on the left.

16:02 5 Q. Are these actual photos of those sections of pipe, 39 E  
16:02 6 and 1-B-1 E?

16:02 7 A. We've transitioned from the scans to the actual photos  
16:02 8 now.

16:02 9 Q. Now, does the forensic evidence, as we've just reviewed  
16:02 10 it, support Mr. Shanks' theory that these two sections of pipe  
16:02 11 could have clashed into one another and imparted a force in the  
16:02 12 section of pipe below the upper annular?

16:03 13 A. No, they could not have come in contact.

16:03 14 Q. Let's assume for a minute that we don't have separation of  
16:03 15 pipe at 39 E and 1-B-1 E. Okay?

16:03 16 A. Okay.

16:03 17 Q. If the pipe remains intact, how long does Mr. Shanks need  
16:03 18 for the traveling block to have continued to exert the downward  
16:03 19 buckling force on the drill pipe for his theory to even be  
16:03 20 possible?

16:03 21 A. About 33 1/2 hours.

16:03 22 Q. And do you think that is possible?

16:03 23 A. No, sir.

16:03 24 Q. Why not?

16:03 25 A. Part of what would make his theory work is, when you're

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16:03 1 pushing down on this drill pipe, it's been -- being resisted by  
16:03 2 the VBRs below. The VBRs have lost closing pressure. They're  
16:03 3 not locked, lost closing pressure.

16:03 4 So I believe if this had remained intact and the  
16:03 5 force would have come down, the pipe would have been pushed  
16:03 6 through the VBRs, and our tool joint that was in the annular  
16:03 7 probably would have ended up very close or right on top of the  
16:04 8 VBRs.

16:04 9 Q. As the rig lost power on April 20th and began to drift  
16:04 10 over those two days, would it have been possible for the force  
16:04 11 of the falling traveling block to continue to impart a downward  
16:04 12 force on the drill pipe at the level of the blowout preventer?

16:04 13 A. Very unlikely.

16:04 14 Q. Now, are you also familiar with Mr. Shanks' testimony that  
16:04 15 he viewed the footage from the ROV cutting the autoshear pin  
16:04 16 and he somehow believes that was an indication of blind shear  
16:04 17 ram activation?

16:04 18 A. Yes, I've heard that.

16:04 19 Q. And you've seen that ROV footage?

16:04 20 A. Multiple times, yes, sir.

16:04 21 Q. I believe you saw it as they played it in court last week.

16:04 22 A. Yes. I did again.

16:04 23 Q. And you reviewed in preparation for your report?

16:04 24 A. That is correct.

16:04 25 Q. What does Mr. Shanks believe happens once the ROV cuts the



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16:04 1 autoshear pin?

16:04 2 A. He believes that there is shaking of the stack that  
16:05 3 indicates an action like closing the shear rams.

16:05 4 Q. You reviewed the video. Did you see anything that was  
16:05 5 indicative of the blind shear ram operation?

16:05 6 A. No, I did not.

16:05 7 Q. What would you expect to see once the ROV -- strike that.

16:05 8 Would you expect to see the ROV move once it made its  
16:05 9 cut through the autoshear pin?

16:05 10 A. Precisely. This is a very massive BOP stack.

16:05 11 750,000 pounds were connected to the wellhead. There's a small  
16:05 12 ROV. The camera's attached to the ROV. And as soon as this  
16:05 13 arm finally cut through that pin, there would have been a  
16:05 14 release of load and the ROV moved.

16:05 15 So the movement we see is not of the stack; it's of  
16:05 16 the camera on the ROV viewing the stack -- the stationary  
16:06 17 stack.

16:06 18 Q. So to be clear, you didn't see any movement related to the  
16:06 19 blowout preventer stack of the *Deepwater Horizon* during that  
16:06 20 footage of the ROV cut that would indicate to you that the  
16:06 21 blind shear ram might have activated at that time?

16:06 22 A. That's correct.

16:06 23 **THE COURT:** Let me ask a question. Where was the --  
16:06 24 do you know who decided and why were they cutting the pin at  
16:06 25 that time?

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16:06 1           **THE WITNESS:** I don't know who made the final  
16:06 2 decision, but it's one more way to activate the shear ram. At  
16:06 3 that point in time, we didn't know what had happened and why we  
16:06 4 hadn't sealed off. So we wanted one more try.

16:06 5           I'm speculating because I was not there. They  
16:06 6 wanted one more try. One way to activate the autoshear to  
16:06 7 simulate the LMRP being removed is to cut that pin  
16:06 8 mechanically. It then sets off autoshear.

16:06 9           **THE COURT:** Okay. Thank you.

16:06 10 **BY MR. BAAY:**

16:06 11 **Q.** I believe I asked you earlier, Mr. Childs, but let me do  
16:06 12 so again just to be sure.

16:06 13           If you have separation of the pipe on April 20th at  
16:07 14 the level of 39 E and 1-B-1 E, is it possible that rig drift  
16:07 15 would have imparted a force on the drill pipe at the level of  
16:07 16 the blind shear ram to bend the pipe on April 22nd?

16:07 17 **A.** No. Same reasoning, there's no connection between the  
16:07 18 pipe above and the pipe below. So anything that happens above  
16:07 19 does not affect the pipe below the annular.

16:07 20 **Q.** And just to summarize before we move into maintenance,  
16:07 21 does the forensic evidence support your opinion that the pipe  
16:07 22 could only have been off-center on April 20th?

16:07 23 **A.** Yes. Everything I've seen shows it had to be on the 20th.

16:07 24 **Q.** Is the forensic evidence consistent with any of the  
16:07 25 theories that put the pipe off-center on April 22?

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16:07 1 A. No, they're not.

16:07 2 Q. And in your opinion, the blind shear rams closed at the  
16:07 3 time of AMF activation on April 20th, 2010?

16:07 4 A. Yes, shortly after the explosions.

16:07 5 MR. BAAY: If we could put up D-6686.

16:08 6 BY MR. BAAY:

16:08 7 Q. We've been through your first two opinions. I now want to  
16:08 8 move to Opinion No. 3, which is maintenance played no role in  
16:08 9 the BOP's inability to shut in the well.

16:08 10 A. Okay.

16:08 11 Q. Why is that your opinion?

16:08 12 A. Nothing I found in any of the maintenance history had any  
16:08 13 effect on the inability of that shear ram to close on the  
16:08 14 off-center pipe.

16:08 15 Q. Let's first, before we get into a discussion of solenoids  
16:08 16 and batteries, get into a brief overview of the control systems  
16:08 17 and the control pods.

16:08 18 MR. BAAY: Pull up D-6675.

16:08 19 BY MR. BAAY:

16:08 20 Q. Describe for the Court where the control pods are located  
16:08 21 on the *Deepwater Horizon* stack.

16:08 22 A. On all BOP stacks they're located on the LMRP. In this  
16:08 23 view, we are seeing the -- all right -- I've just lost -- oh,  
16:08 24 is it showing? There it is -- the blue pod is showing in this  
16:08 25 view, and if Gary will rotate -- and on the other side of the

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16:09 1 stack is the yellow pod.

16:09 2 Q. What is the purpose of these control pods?

16:09 3 A. Redundancy. There's two pods for redundancy.

16:09 4 They receive the electrical signals from the surface  
16:09 5 through this MUX cable, electrical section then translates that  
16:09 6 into a hydraulic signal that the hydraulic signal then goes to  
16:09 7 the BOP stack and functions whatever function you're trying to  
16:09 8 operate.

16:09 9 Q. Do both pods perform identical functions?

16:09 10 A. They are identical. They're totally redundant, just  
16:09 11 separate.

16:09 12 Q. And as we'll discuss, are there redundant systems within  
16:09 13 the redundant pods?

16:09 14 A. Even within them, there are more redundancies.

16:09 15 Q. How did the crew send instructions to the pods from the  
16:09 16 rig in normal operation?

16:09 17 A. There are several control panels where they would have an  
16:09 18 enable button they would push first and then the function they  
16:09 19 want it to operate.

16:09 20 The enable button is there so that nobody can  
16:09 21 inadvertently come by and lean or push on a button and operate  
16:10 22 something. You have to have the awareness to push the enable  
16:10 23 button and then push the function button.

16:10 24 MR. BAAY: If we could look at D-6676.

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16:10 1 BY MR. BAAY:

16:10 2 Q. Are these MUX cables what connect the pod and allow it to  
16:10 3 communicate up to the rig?

16:10 4 A. Yes. As we're seeing here -- this is, in fact, the yellow  
16:10 5 pod we're looking at. And the MUX cable is connected up the  
16:10 6 side of the riser all the way to the surface.

16:10 7 Q. I'm going to give you my laser pointer.

16:10 8 A. This one has gotten weak. I have one more.

16:10 9 Q. Try this one. This one works.

16:10 10 THE WITNESS: That's a little better, isn't it,  
16:10 11 Judge? Let's see.

16:10 12 BY MR. BAAY:

16:10 13 Q. When we lose that connection to the rig, how does the  
16:10 14 blowout preventer operate?

16:10 15 A. Without MUX cable connection, you're saying, sir?

16:10 16 Q. Yes.

16:10 17 A. It would have to be automated functions, emergency  
16:11 18 functions only.

16:11 19 Q. As you described it, the AMF senses the loss of that  
16:11 20 connection, and that's when it triggers the activation of the  
16:11 21 blind shear ram?

16:11 22 A. AMF -- when you basically lose everything -- hydraulics,  
16:11 23 electrical connection, and communication -- AMF would then  
16:11 24 fire.

16:11 25 Q. On April 20th, 2010, do you have an opinion as to which

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16:11 1 particular pod activated the blind shear ram?

16:11 2 A. Either could have.

16:11 3 MR. BAAY: Let's pull up D-6698, please.

16:11 4 BY MR. BAAY:

16:11 5 Q. What are we looking at here, Mr. Childs?

16:11 6 A. Very basic parts within the pods, not all of them, of  
16:11 7 course; but we're seeing that within the pods, there are two  
16:11 8 SEMs in each pod. A SEM is a subsea electronic module.

16:11 9 There's an A and B in yellow and an A and B in blue.

16:11 10 Q. And can the blind shear ram be activated by any one of the  
16:11 11 four SEMs? That's my question.

16:12 12 A. Yes, yes. Sorry.

16:12 13 Within the SEM, there is an AMF for SEM A and an AMF  
16:12 14 for SEM B. The same for the other side. There's a 9-volt  
16:12 15 battery for each SEM as well. And then the two pods share a  
16:12 16 27-volt battery.

16:12 17 Q. In normal operating conditions, what powers the SEMs?

16:12 18 A. In normal operation condition, when they're drilling  
16:12 19 ahead, it's powered from the surface through to the MUX cable.

16:12 20 Q. When the SEMs sense the loss of power and communication  
16:12 21 from the rig, is that when they're triggered into the AMF mode  
16:12 22 of operation?

16:12 23 A. The AMF, and then the batteries take over.

16:12 24 Q. As you've testified -- or remind me, how many SEMs are  
16:12 25 required to function the blind shear ram?

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16:12 1 A. Only one.

16:12 2 Q. And how many solenoids are required to activate the blind  
16:12 3 shear ram?

16:12 4 A. One as well.

16:12 5 Q. And either pod, it's your testimony, could activate the  
16:12 6 blind shear ram, and it just takes one SEM to function it?

16:13 7 A. That is correct.

16:13 8 Q. There's been testimony that the AMF might not have  
16:13 9 functioned on April 20th because the wiring to the coils of the  
16:13 10 yellow pod Solenoid 103 were reversed.

16:13 11 Are you familiar with that testimony?

16:13 12 A. I am.

16:13 13 MR. BAAY: If we could pull that back up for one  
16:13 14 minute.

16:13 15 BY MR. BAAY:

16:13 16 Q. What is a solenoid coil?

16:13 17 A. First of all, the solenoids would exist between this point  
16:13 18 and the BOP.

16:13 19 Q. So as you've described, there's one solenoid per pod that  
16:13 20 could activate the blind shear ram?

16:13 21 A. Basically, in this area between the SEMs and the BOP.

16:13 22 And the solenoid is an electrical device. It has  
16:13 23 coils, in this case two coils, wound around a piece of metal.  
16:13 24 And you electrify -- when you send back current through the  
16:13 25 coil, that gets magni- -- magnetic effect --

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16:13 1 Q. Magnetic force?

16:13 2 A. Magnetic force. There you go -- magnetic force that would  
16:13 3 then move that valve.

16:14 4 **THE COURT:** So you only have one solenoid on each  
16:14 5 pod; correct?

16:14 6 **THE WITNESS:** One solenoid for 103 on blue and one on  
16:14 7 yellow, that is true.

16:14 8 **BY MR. BAAY:**

16:14 9 Q. And 103 is dedicated solely to the function of the blind  
16:14 10 shear ram?

16:14 11 A. Correct. And each solenoid has dual coils, one for the A  
16:14 12 and one for the B.

16:14 13 Q. Can the solenoid activate the blind shear ram with one  
16:14 14 coil energized?

16:14 15 A. Yes, it can.

16:14 16 Q. Can it activate it with two coils energized?

16:14 17 A. Yes, it can.

16:14 18 Q. Are the two coils just another example of redundancy  
16:14 19 within the system?

16:14 20 A. Yes.

16:14 21 Q. Can a solenoid, Mr. Childs, that is reverse-wired still  
16:14 22 function the blind shear ram?

16:14 23 A. In a SEM operation, yes.

16:14 24 Q. And now what is the basis for your opinion that a miswired  
16:14 25 solenoid can still be activated if one of those coils is



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16:14 1 reversed?

16:14 2 A. I've seen testing from Michoud on SEM-actuated testing.

16:15 3 And the Transocean investigation team also went out to a rig

16:15 4 and purposely miswired a solenoid and performed 15 tests. And

16:15 5 all 15 tests through the SEM, the solenoid did actuate.

16:15 6 Q. Let's first talk about the tests that were performed at

16:15 7 Michoud.

16:15 8 A. Yes, sir.

16:15 9 Q. We've heard testimony that there were many tests performed

16:15 10 on 103Y while the investigation was conducted at Michoud; is

16:15 11 that true?

16:15 12 A. That's correct.

16:15 13 Q. How many tests of those performed at Michoud did you rely

16:15 14 on for your opinion that the reverse-wired solenoid could still

16:15 15 properly function?

16:15 16 A. My reliance is on the tests that were operated through the

16:15 17 SEM, where the SEM actuated the solenoid -- or the AMF through

16:15 18 the SEM -- actuated the solenoid more like it would be used in

16:15 19 real life.

16:15 20 Q. You've anticipated my next question. Why did you select

16:15 21 those three tests?

16:15 22 A. Because my normal mode and my company's normal mode is

16:15 23 test it as you're going to use it. It's the only practical way

16:16 24 to do it. Many other tests you can do, but to use it as it

16:16 25 actually will be functioning in the field is the best way to

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16:16 1 check -- to verify.

16:16 2 Q. You've referred to those tests that mimic the subsea  
16:16 3 conditions as AMF tests.

16:16 4 A. AMF testing.

16:16 5 Q. And what about the test setup and procedure mimics subsea  
16:16 6 conditions?

16:16 7 A. You arm the AMF, you remove all power, which -- it's just  
16:16 8 like cutting the MUX cable. You already do not have  
16:16 9 connections to your transducers that read pressure. So you  
16:16 10 have no pressure, you have no communication, power's gone, AMF  
16:16 11 fires, because it's met all of the requirements.

16:16 12 Q. In those types of tests, the AMF test we're referring to,  
16:16 13 does it use software that is similar to what would be used on  
16:16 14 the pod?

16:16 15 A. It is, in this case, the software from the pod.

16:16 16 Q. And how many AMF tests were performed at Michoud?

16:17 17 A. Of the type I'm talking about, there were three done --  
16:17 18 three performed.

16:17 19 Q. And that was of the original 103Y; is that true?

16:17 20 A. Very true. Using 103Y, still miswired as it was found  
16:17 21 originally.

16:17 22 Q. Of these three AMF tests, how many were successful?

16:17 23 A. All three operated the solenoid.

16:17 24 Q. Now, the other tests that you referred to that were  
16:17 25 performed at Michoud, why is it that you did not rely on those

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16:17 1 results?

16:17 2 A. The other tests were run using the portable electronic  
16:17 3 test unit. We've already heard in here about some difficulties  
16:17 4 with the PETUs, that what you asked it to do wasn't necessarily  
16:17 5 what it did. So I discounted it for that, in the first place.

16:17 6 In the second place, I wanted to see how it would  
16:17 7 operate in field conditions being -- through the AMF.

16:17 8 Q. Have other experts who have examined the blowout preventer  
16:17 9 in this litigation agreed with your opinion that the PETU test,  
16:18 10 or the PETU units, had problems?

16:18 11 A. Yes. I think it's fully agreed.

16:18 12 Q. You also mentioned that Transocean did its own testing.  
16:18 13 Describe for the Court how Transocean performed its test of the  
16:18 14 solenoids.

16:18 15 A. Yes. I worked with my expert, Chris Tolleson, on the  
16:18 16 electronics and software. We devised a test. I sent him out  
16:18 17 to the *Enterprise*, Transocean *Enterprise*. It's a sister rig to  
16:18 18 the *Horizon*. It's a Mark II control system. It has a  
16:18 19 functioning equivalent AMF system, with the goal here being:  
16:18 20 Can we repeat this? Can we see this same thing? What will  
16:18 21 happen in real life, again?

16:18 22 Q. And you mentioned that you picked the *Enterprise* to  
16:18 23 perform these tests?

16:18 24 A. Yes, sir.

16:18 25 Q. And did your team do the necessary diligence to make sure

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16:18 1 the *Enterprise* was close in type to *Deepwater Horizon*?

16:18 2 A. Well, I think "close" is a little bit less than it is.  
16:19 3 It's almost exactly. It's the same manufacturer, of course,  
16:19 4 same design, same functionality of the AMF system. Same -- by  
16:19 5 the way, same solenoids, of course.

16:19 6 Q. Same type of solenoids as manufactured by the original  
16:19 7 equipment manufacturer?

16:19 8 A. Same -63 Solenoids.

16:19 9 MR. BAAY: Dennis, let's pull up TREN-7670.

16:32 10 BY MR. BAAY:

16:32 11 Q. Mr. Childs, do you recognize this document?

16:19 12 A. Yes. It's Mr. Tolleson's report on testing.

16:19 13 Q. So this is a document created as a result of the testing  
16:19 14 he performed on the *Enterprise*?

16:19 15 A. That is correct.

16:19 16 Q. And you may have mentioned, but let me ask you again.

16:19 17 How many tests did Transocean perform, in total, as  
16:19 18 are reflected in this agreement -- in this document?

16:19 19 A. While he was on the rig, he actually performed a total of  
16:19 20 18 tests. Three of those he performed with the solenoid  
16:19 21 properly wired.

16:19 22 Q. And we'll get into it. But of the 15 potentially miswired  
16:19 23 tests, how many successfully activated the solenoid?

16:20 24 A. In all 15 tests where he himself miswired the solenoid,  
16:20 25 all 15 operated the solenoid.

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16:20 1 MR. BAAY: Let's pull up TREN-7670.1.1.T0.

16:32 2 BY MR. BAAY:

16:32 3 Q. Describe for us how Transocean documented these tests and  
16:20 4 what we see here in this exhibit.

16:20 5 A. We'll go ahead and start with the top. In his report, he  
16:20 6 had to let us know that on the first day of his testing, for  
16:20 7 six tests he could not get the equipment to cooperate to  
16:20 8 capture the results. Not to perform the tests. The tests were  
16:20 9 performed, they were flawless, just like he wanted to perform  
16:20 10 them, but he could not get a hard copy printout.

16:20 11 Overnight, he was able to upload some new software on  
16:20 12 his personal computer, reconfigure such that for the second  
16:20 13 day, the tests we see listed here with the miswired solenoid  
16:20 14 all -- did also operate. He had backup data and was able to  
16:21 15 print out the test results.

16:21 16 Q. So the table we see here in 7670 records his testing  
16:21 17 activity and the results that the solenoid activated in each of  
16:21 18 those tests?

16:21 19 A. Yes. And there's more to this test report. There's  
16:21 20 actually printouts from the testing from the second-line tests,  
16:21 21 but not from the first.

16:21 22 The only problem with the first day, as we see on the  
16:21 23 six, is he could not capture the results to be able to put them  
16:21 24 in the report.

16:21 25 MR. BAAY: If we can pull up TREN-7670.2.1.T0.

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16:32 1 BY MR. BAAY:

16:32 2 Q. Just for the sake of completeness, what were the other  
16:21 3 three tests that you indicated Mr. Tolleson performed?

16:21 4 A. Carried out through his testing, we see his Tests 4, 7,  
16:21 5 and 11. He switched back periodically to correctly-wired  
16:21 6 solenoid. He got exactly the same results using the  
16:21 7 correctly-wired solenoid as he did a miswired solenoid.

16:21 8 Q. Mr. Childs, did the AMF testing performed at Michoud and  
16:22 9 by Transocean indicate that the yellow pod Solenoid 103Y could  
16:22 10 have functioned the AMF at the time of the incident?

16:22 11 A. Yes, sir.

16:22 12 Q. Other than Transocean, have any of the experts or parties  
16:22 13 in this case submitted any solenoid tests that they conducted  
16:22 14 to this Court?

16:22 15 A. No, sir.

16:22 16 Q. Now, when the tests were performed at Michoud on the  
16:22 17 solenoid, did they find that there was sufficient battery power  
16:22 18 in the yellow pod to operate the AMF?

16:22 19 A. Yes.

16:22 20 Q. Is there any reason, in your opinion, why the yellow pod  
16:22 21 would not have activated the blind shear ram on April 20th?

16:22 22 A. I'm sorry. I was coughing.

16:22 23 Would you say it over, please.

16:22 24 Q. Sure. Is there any reason, in your opinion, why the  
16:22 25 yellow pod would not have activated the blind shear ram on

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16:22 1 April 20th?

16:22 2 A. No.

16:22 3 Q. You were here last week, I believe, when Mr. Doyen asked  
16:22 4 Dr. Davis about the testing done by Mr. Guidry on Solenoid 103  
16:23 5 after its installation.

16:23 6 Do you remember that testimony?

16:23 7 A. I do.

16:23 8 MR. BAAY: Let's pull up 3797.2.1.T0.

16:23 9 And, Your Honor, this is an e-mail that we've  
16:23 10 seen quite a bit, so I'll cover it just very briefly. I won't  
16:23 11 go through all these bullet points.

16:32 12 BY MR. BAAY:

16:32 13 Q. Mr. Childs, just a few questions from this.

16:23 14 Have you reviewed this e-mail string?

16:23 15 A. I have.

16:23 16 Q. And was that what you've undertaken as part of your work  
16:23 17 on Transocean's internal investigation team?

16:23 18 A. It was.

16:23 19 Q. Who do you understand Mr. Guidry to be?

16:23 20 A. He is an electronics MUX expert that works for Transocean.

16:23 21 Q. What does this e-mail indicate that he completes?

16:23 22 A. He did travel to the *Horizon*. He did check out the pods.  
16:23 23 And in his testing, every time he found an issue, he repaired  
16:23 24 that issue, and he continued to test through all these issues  
16:23 25 replacing solenoids and parts as necessary until he came out

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16:24 1 with no issues at the end of all his testing.

16:24 2 Q. Now, if you know, did Mr. Guidry also keep a  
16:24 3 contemporaneous account of his testings in his tally book?

16:24 4 A. Yes. As is very typical for a rig worker, he keeps a  
16:24 5 tally book.

16:24 6 Q. Go ahead. You were about to do it. What is a tally book?

16:24 7 A. A tally book fits in their pocket. They carry it around  
16:24 8 on the rig with them. Obviously, they can't carry their  
16:24 9 computer around the rig with them. It's not a safe place for a  
16:24 10 computer.

16:24 11 They write everything in their tally book. And later  
16:24 12 they can take that information and insert it into the computer  
16:24 13 system.

16:24 14 MR. BAAY: Let's pull up TREN-4823.5.1.T0, please.

16:32 15 BY MR. BAAY:

16:32 16 Q. Now, do you recognize this document, Mr. Childs?

16:24 17 A. Very well.

16:24 18 Q. Would this be Mr. Guidry's tally book?

16:24 19 A. These are excerpts out of his tally book.

16:24 20 Q. Did you review the testing, as he sets it out in his tally  
16:24 21 book?

16:24 22 A. Yes. And this shows us that one of the solenoids that he  
16:25 23 replaced right prior to Macondo was Solenoid 103.

16:25 24 MR. BAAY: If we can go back to the e-mail quickly,  
16:25 25 which is TREN-3797.3.1.T0.



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16:32 1 BY MR. BAAY:

16:32 2 Q. You also have testified that you reviewed the testing that  
16:25 3 Mr. Guidry describes in this exhibit we're looking at.

16:25 4 A. I did.

16:25 5 Q. If you can just read for me the top call-out there, the  
16:25 6 first bullet, the highlighted language.

16:25 7 A. "We then moved the pod back onto the LMRP and performed  
16:25 8 another function test of all functions using the full  
16:25 9 system...tested again, with no coil breaks, no faults, and all  
16:25 10 corresponding functions operating as they should."

16:25 11 Q. Will you jump to the last call-out and read the  
16:25 12 highlighted language, please.

16:25 13 A. "They did do all of the normal pre-deployment function  
16:25 14 testing of the system and found no faults at all. No pod  
16:26 15 mismatches, no coil faults, system okay indication on the CCU  
16:26 16 screen, and all functions operating the correct component on  
16:26 17 the system as verified by sight."

16:26 18 I'd like to add that you know the CCU is a central  
16:26 19 control unit.

16:26 20 Q. Mr. Childs -- excuse me.

16:26 21 Based on your review of Mr. Guidry's e-mail and his  
16:26 22 tally book, did it appear to you that Mr. Guidry made proper  
16:26 23 efforts to test this solenoid after he installed it?

16:26 24 A. Yes. It appears he did every effort he could. He  
16:26 25 continued to test. As he saw any issue, he tested more,

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1 corrected that and tested again, until he ended up with what we  
2 just read.

3 Q. To be clear, he installed Solenoid 103 on the yellow pod  
4 at this time?

5 A. Yes, he did.

6 Q. And that was 90 days prior to the Macondo incident; is  
7 that true?

8 A. Correct.

9 Q. Now, some of the experts in this case have opined that  
10 there was debris found in Solenoid 103Y after the incident, and  
11 that indicates that Transocean did not properly maintain the  
12 solenoid.

13 Are you familiar with this opinion?

14 A. Yes, I am.

15 Q. Where do you think this debris might have come from?

16 A. I believe the problem would come -- does come from  
17 improper storage of the pods, as we were waiting to be able to  
18 work on them.

19 Q. And was that -- the conditions of storage -- acknowledged  
20 by DNV as one of the events that might have caused the debris?

21 A. The issue -- yes. This issue was seen there. And I know,  
22 by personal experience, many rigs try to flush through the pods  
23 weekly to ensure there's clean fluid and you don't get growth.

24 Q. Now, we've talked earlier about portable electronic  
25 testing units, sometimes referred to as PETUs.

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16:27 1 A. Yes.

16:27 2 Q. Remind us just exactly what those do.

16:27 3 A. It is a device supplied by Cameron that you can hook up to  
16:27 4 the pod to allow you to activate functions on the pod when  
16:27 5 you're not in the full stack condition where you can operate  
16:28 6 through the control panel.

16:28 7 Q. Are PETUs typically used on a drilling rig to test  
16:28 8 solenoids?

16:28 9 A. They use it -- during the installation test of the  
16:28 10 solenoid into the pod they're used, yes.

16:28 11 Q. And you testified earlier that there was a problem with  
16:28 12 the PETUs, or the PETUs, as used at Michoud.

16:28 13 A. Yes.

16:28 14 Q. Just briefly describe what the problem was.

16:28 15 A. There is a way on the PETU to ask it to supply electricity  
16:28 16 to either A or B or to both, three choices. One of the PETUs,  
16:28 17 when you said do it to A, let's say, it did it to both. We  
16:28 18 didn't know that at the time.

16:28 19 The other one, when you said do it do both, which is  
16:28 20 a good test to do, it sent the power to only one function.

16:28 21 Q. What would be the result, Mr. Childs, if a solenoid with  
16:28 22 reversed wiring was tested by a PETU with those same issues?

16:29 23 A. If you had a PETU that only sent the power to one coil  
16:29 24 when you were trying to check for miswiring, which wouldn't be  
16:29 25 when you were using both coils, you would miss that issue.

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16:29 1 Q. Now, Dr. Davis testified last week that Mr. Guidry might  
16:29 2 have experienced a problem, quote, because we don't know what  
16:29 3 variety PETU he was using, and it may not have done every  
16:29 4 single function.

16:29 5 Do you recall that testimony?

16:29 6 A. Yes, sir.

16:29 7 Q. Do you agree that the units can lead to results that  
16:29 8 have -- strike that.

16:29 9 Dr. Davis also testified that DNV initially tested  
16:29 10 the solenoid using the PETU and that the results were  
16:29 11 inexplicable because of the problems of WEST testing the units.

16:29 12 Do you recall that testimony?

16:29 13 A. Yes, I do.

16:29 14 Q. Do you agree that these units can lead to results that  
16:29 15 could have confused the experts in this case?

16:29 16 A. They did, yes, sir.

16:29 17 Q. You also agree with Dr. Davis that the unit Mr. Guidry  
16:29 18 used may not have done every single function, even though it  
16:30 19 appeared at the time to be a full-function test?

16:30 20 A. It appears we have a 50/50 chance, yes.

16:30 21 Q. Now, have there been changes in the industry awareness  
16:30 22 related to reverse polarity since the time of the Macondo  
16:30 23 incident?

16:30 24 A. Yes, there has.

16:30 25 Q. Tell the Court what you found in your review on that

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16:30 1 issue.

16:30 2 A. We found a Cameron field performance report, otherwise  
16:30 3 known as an FPR, where another rig, five -- I think five months  
16:30 4 later -- had an issue with solenoids.

16:30 5 A field performance report is used to document a  
16:30 6 problem, send the problem to the OEM -- in this case,  
16:30 7 Cameron -- get them to find the root cause of the problem, find  
16:30 8 a mitigation to the problem, and supply that back to the user  
16:30 9 or customer, so that they could fix that problem from there  
16:30 10 forth.

16:30 11 MR. BAAY: Let's look at TREX-5165.

16:32 12 BY MR. BAAY:

16:32 13 Q. Are you familiar with this document, Mr. Childs?

16:31 14 A. Yes. It's a letter that came out in response to that FPR.

16:31 15 Q. I believe this is document we saw with Mr. Perkin and  
16:31 16 Dr. Davis, I believe.

16:31 17 What is the purpose of this letter, as you understand  
16:31 18 it?

16:31 19 A. It describes what they found in their testing, and shows  
16:31 20 in their conclusions that there are -- there's an added test,  
16:31 21 an added table they want to add, an added test they want to add  
16:31 22 to their own procedures, to ensure they are finding all  
16:31 23 miswired solenoids.

16:31 24 Q. And just to be clear, this letter comes --

16:31 25 MR. BAAY: If you can call that out, Dennis, that

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16:31 1 date on the top there.

16:32 2 **BY MR. BAAY:**

16:32 3 **Q.** This comes some five months after the Macondo incident; is  
16:31 4 that correct?

16:31 5 **A.** Correct, and unrelated.

16:31 6 **Q.** And just clarify for me again. Cameron is doing this  
16:31 7 testing at the request of a customer. Is that your  
16:31 8 understanding?

16:31 9 **A.** Yes. Again, a field performance report, it comes from the  
16:31 10 field. You have an issue, you want the manufacturer to figure  
16:32 11 out the root cause and get you an answer.

16:32 12 So you send the equipment to them, they test it. In  
16:32 13 this case they did. They found miswired solenoids. And from  
16:32 14 this, they added something to their own procedures to try to  
16:32 15 avoid any more miswired solenoids.

16:32 16 **Q.** And was the letter and the testing -- the letter that  
16:32 17 Cameron produced and the testing that they did, all a result of  
16:32 18 the fact that a customer of theirs found miswired solenoids on  
16:32 19 their rig?

16:32 20 **MS. KARIS:** Objection, Your Honor, leading.

16:32 21 **THE COURT:** It is.

16:32 22 **MR. BAAY:** I can restate it, Your Honor.

16:32 23 **THE COURT:** Okay. Go ahead.

16:32 24 **BY MR. BAAY:**

16:32 25 **Q.** Mr. Childs, what is your understanding as to why Cameron

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1 issued this letter and why they conducted this testing?

2 A. It would be part of the answer to this FPR. I think I've  
3 described the process of the FPR fairly well.

4 And then this is alerting, in this case, to whom it  
5 may concern. Other people, obviously, are using solenoids. So  
6 this alerts others that we found an issue and we are fixing  
7 this by adding a better table to record all the information,  
8 and another check that you can add to make sure if you've got a  
9 miswired solenoid.

10 Q. And in your opinion, what was the underlying event that  
11 triggered the testing in the letter?

12 A. That on the rig out in the field the subsea engineer  
13 noticed an anomaly with his solenoids.

14 Q. And this is on a non-Transocean rig, different rig,  
15 submitted to Cameron?

16 A. Yeah. The name of the rig is in here. But, yes, it's not  
17 Transocean.

18 Q. Some experts in this case have opined that the clog  
19 filters for hydraulic fluid in the yellow pod indicate that  
20 Transocean did not properly maintain the yellow pod.

21 Are you familiar with these opinions?

22 A. I have heard that.

23 Q. Do you agree with them?

24 A. I do not.

25 MR. BAAY: Dennis, let's pull up TREG-51245.225.1.T0.

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16:32 1 BY MR. BAAY:

16:32 2 Q. Did you review this document, Mr. Childs?

16:34 3 A. I did.

16:34 4 Q. What is it?

16:34 5 A. That the pod filters were changed out on both pods  
16:34 6 January 31st, which is right prior to running the BOP stack on  
16:34 7 Macondo.

16:34 8 Q. Okay. And what is the underlying document where you  
16:34 9 reviewed this entry?

16:34 10 A. This all comes from what Transocean calls a departmental  
16:34 11 activity consolidation report -- consolidation report. And in  
16:34 12 this particular case, we have separated out all the subsea  
16:34 13 equipment report comments.

16:34 14 Q. And based on this entry, you have concluded that  
16:34 15 Transocean changed out their pod filters on the rig move prior  
16:34 16 to Macondo?

16:34 17 A. Yes, sir.

16:34 18 MR. BAAY: You can pull that down. Thank you.

16:32 19 BY MR. BAAY:

16:32 20 Q. Let's turn to batteries, Mr. Childs.

16:34 21 Did you review any records to determine when the blue  
16:34 22 pod battery was last changed?

16:34 23 A. Yes.

16:34 24 Q. When do you believe it was last changed?

16:34 25 A. It was changed by Cameron in a repair cycle that ended



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16:35 1 November 2007.

16:35 2 MR. BAAY: Let's pull TREN-50377, please.

16:35 3 BY MR. BAAY:

16:35 4 Q. Are you familiar with this document, Mr. Childs?

16:35 5 A. Yes, I am.

16:35 6 Q. And what is it?

16:35 7 A. It's a document the team put together to track all three  
16:35 8 SEMs and all three pods to understand where each one was  
16:35 9 located.

16:35 10 Q. Did you and your team create this document when you  
16:35 11 created your rebuttal report in an effort to determine the life  
16:35 12 of the blue pod battery?

16:35 13 A. Yes. We wanted to know more precisely about when the  
16:35 14 batteries went in and where they were located.

16:35 15 Q. Did you personally review all of the documents underlying  
16:35 16 this report and as cited as footnotes in this report?

16:35 17 A. I did.

16:35 18 MR. BAAY: Let's put the cover slide for TREN-33273,  
16:35 19 TREN-3299, and TREN-36711.

16:35 20 MS. KARIS: Your Honor, I'm going to renew my  
16:35 21 objection that I stated earlier, when we started, and the Court  
16:36 22 asked me at the appropriate time. The document we just saw --  
16:36 23 and Mr. Childs just testified that he reviewed all of the  
16:36 24 underlying documents.

16:36 25 Unfortunately, those underlying documents have

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1 not all been produced, and we have not had an opportunity to  
2 review those to confirm that what's in the handwritten notes of  
3 the folks who were actually at those tests, in fact, validate  
4 what's in the summary note that was prepared one year after the  
5 tests in conjunction with Mr. Childs' rebuttal report.

6 **MR. BAAY:** Your Honor, each of the documents cited in  
7 the footnotes are the TREX numbers we're about to go into. To  
8 the extent there are any non-produced, non-TREX documents in  
9 the summary document, we'll redact those.

10 **MS. KARIS:** I'm happy to look at what documents we're  
11 going into, but at least Mr. Childs established at his  
12 deposition that that summary document was prepared in part on  
13 his review of handwritten notes of the folks that were at those  
14 tests.

15 **THE COURT:** Those have not been produced? Never been  
16 produced?

17 **MS. KARIS:** Have not been produced.

18 **THE COURT:** And they were requested, I assume.

19 **MS. KARIS:** Correct.

20 **THE WITNESS:** Actually, these are not from  
21 handwritten notes. I'm sorry.

22 **THE COURT:** Wait, wait.

23 **MR. BAAY:** I think there's some confusion here. I  
24 may be misstating where you're going. But the handwritten  
25 notes related to our independent battery testing --

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16:37 1 MS. KARIS: Correct.

16:37 2 MR. BAAY: -- was not related to the summary  
16:37 3 document, I believe.

16:37 4 MS. KARIS: If it's not related to this document,  
16:37 5 then I'll withhold my objection until the appropriate time.  
16:37 6 But the summary document, the first one, is the one I was  
16:37 7 referencing. But if it's not in connection with the  
16:37 8 handwritten notes, I'll withhold my objection.

16:37 9 THE COURT: Let's see where he goes.

16:37 10 BY MR. BAAY:

16:37 11 Q. Take a step back. Were these documents made part of the  
16:37 12 summary document we just reviewed, TRES-50377?

16:37 13 A. Yes. All of these documents I noted in that document are  
16:37 14 as we see.

16:37 15 Q. And did you review each of these documents?

16:37 16 A. Each one of them.

16:37 17 Q. Do these documents, as shown in this demonstrative -- or  
16:37 18 excuse me, in these cover slides, do they support your report  
16:38 19 on the blue pod batteries?

16:38 20 A. They do.

16:38 21 Q. Was there anything in your summary document, TRES-50377,  
16:38 22 that you determined to be inaccurate?

16:38 23 A. There was one date that we stated as April, and it ended  
16:38 24 up being March. We were incorrect on one date.

16:38 25 Q. So in your summary document, you stated the opinion that

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16:38 1 the blue pod battery was put into service in April 2009?

16:38 2 A. Correct.

16:38 3 Q. And that was a mistake?

16:38 4 A. It was actually March. I was off a month.

16:38 5 MR. BAAY: We can pull that down. Thank you.

16:38 6 BY MR. BAAY:

16:38 7 Q. When, in your opinion, Mr. Childs, was the pod with the  
16:38 8 new batteries installed on the *Deepwater Horizon* BOP?

16:38 9 A. March 2009.

16:38 10 MR. BAAY: Let's pull TREN-4617.66.1.T0.

16:38 11 BY MR. BAAY:

16:38 12 Q. Are you familiar with this document, Mr. Childs?

16:38 13 A. Yes, I am.

16:38 14 Q. What is the underlying document, before we get to the  
16:39 15 entry.

16:39 16 A. This is the Transocean maintenance system document showing  
16:39 17 work done on various devices, components.

16:39 18 Q. If we read the highlighting in the entry, what does it  
16:39 19 say?

16:39 20 A. "This pod was just overhauled and put into service on  
16:39 21 March 14th, '09. Entire pod tested to maximum pressure."

16:39 22 Q. Did you come to an understanding that this entry referred  
16:39 23 to the blue pod battery?

16:39 24 A. Yes.

16:39 25 MR. BAAY: Let's also put up TREN-51245.199.2.T0.

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16:39 1 BY MR. BAAY:

16:39 2 Q. What is the underlying document here, Mr. Childs?

16:39 3 A. On the next -- I'm sorry. This is the departmental  
16:39 4 activity report, consolidation report for the subsea equipment.

16:39 5 Q. Is this another one of the documents you relied upon in  
16:39 6 forming your opinion that the battery was installed or that the  
16:39 7 pod was put in service in March of 2009?

16:40 8 A. It is.

16:40 9 Q. What does the entry say?

16:40 10 A. "Installed blue pod on BOP and did a complete function  
16:40 11 test."

16:40 12 MR. BAAY: Okay. You can pull that down. Thank you.

16:40 13 BY MR. BAAY:

16:40 14 Q. What was the status of the pod in the intervening time  
16:40 15 between the battery change in November of 2007 and the time the  
16:40 16 pod is put into service in March of 2009?

16:40 17 A. I'm sorry, I think I lost part of that. Would you restate  
16:40 18 it, please.

16:40 19 Q. Sure. Do you know the status of the pod in the  
16:40 20 intervening time, between the battery replacement in November  
16:40 21 of 2007 and the time the pod was put into service in March of  
16:40 22 2009?

16:40 23 A. In the entire intervening time, the pod was in a spare  
16:40 24 position, out of service.

16:40 25 Q. Did Mr. Zatarain, another BP BOP expert, agree that the

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16:40 1 Pod 3 was in the spare pod position since the time the battery  
16:40 2 was changed in 2007?

16:40 3 A. He did.

16:40 4 Q. Now, you've opined in your report that Transocean replaced  
16:40 5 AMF batteries in accordance with Cameron recommendations.

16:41 6 Do you recall that opinion?

16:41 7 A. Yes, I do.

16:41 8 Q. Is that still your opinion as you sit here today?

16:41 9 A. I still believe that. Yes, sir.

16:41 10 MR. BAAY: Let's pull up TREN-3605, please.

16:41 11 BY MR. BAAY:

16:41 12 Q. It's another document we've seen in evidence during this  
16:41 13 trial. Are you familiar with this document?

16:41 14 A. Yes. It's their EB -- or Cameron's EB 819D.

16:41 15 Q. And "EB" stands for "engineering bulletin"?

16:41 16 A. That's correct.

16:41 17 Q. What's the subject of this Cameron engineering bulletin?

16:41 18 A. This one is on AMF/deadman battery replacement.

16:41 19 Q. Does this contain Cameron's recommendations for battery  
16:41 20 replacement?

16:41 21 A. It does.

16:41 22 MR. BAAY: Let's turn to TREN-3605.2.1.T0.

16:41 23 BY MR. BAAY:

16:41 24 Q. As we see in this call-out -- Mr. Childs, remind us what  
16:41 25 Cameron's recommendations are on battery replacement.

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16:41 1 A. "It is recommended that the 9-volt DC and 27-volt DC  
16:42 2 battery packs be replaced after" -- and it lists several -- the  
16:42 3 first being "one year of on-time operation; when the number of  
16:42 4 actuations has been exceeded for that year" -- which is 33 --  
16:42 5 "five years after date of purchase" or "whichever of the above  
16:42 6 events happens first."

16:42 7 Q. Mr. Childs, do you have an opinion as to whether these  
16:42 8 battery recommendations as put forward by Cameron are  
16:42 9 conservative?

16:42 10 A. Yes, I believe they are conservative.

16:42 11 Q. What's your basis for saying that?

16:42 12 A. Testimony and -- deposition testimony of David McWhorter  
16:42 13 of Cameron.

16:42 14 Q. Remind us of who Mr. McWhorter is.

16:42 15 A. He's vice president of, I think, controls and quality.

16:42 16 Q. Let's take the third bullet first, five years after date  
16:42 17 of purchase. Maybe I asked you, but I might have forgotten.  
16:42 18 What does it mean for a battery recommendation to be  
16:42 19 conservative?

16:43 20 A. That the battery could last longer than the stated  
16:43 21 recommendations.

16:43 22 Q. Now, you just testified that the batteries for the blue  
16:43 23 pod for the *Deepwater Horizon* BOP were changed in November of  
16:43 24 2007; is that right?

16:43 25 A. That's correct.

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16:43 1 Q. So in April of 2010, do you have an opinion as to whether  
16:43 2 the blue pod batteries were still in their five-year  
16:43 3 shelf life?

16:43 4 A. They were still within their life.

16:43 5 Q. Now, there's been a suggestion in this case that the crew  
16:43 6 should have changed out the pod batteries again before  
16:43 7 installing the blue pod on the BOP.

16:43 8 Do you agree with that opinion?

16:43 9 A. I do not.

16:43 10 MR. BAAY: Let's turn now to TREG-3605.2.2.TO.

16:43 11 BY MR. BAAY:

16:43 12 Q. Just looking now at the second recommendation from  
16:43 13 Cameron, this one relating to number of actuations.

16:43 14 What is Cameron's recommendation as it relates to the  
16:44 15 number of actuations for battery life?

16:44 16 A. 33 in a year's period.

16:44 17 Q. Do you have an opinion as to whether the blue pod battery  
16:44 18 for the *Deepwater Horizon* was within the 33-actuation limit?

16:44 19 A. I do.

16:44 20 Q. What is your opinion?

16:44 21 A. It would be within. 33 actuations in a year is not  
16:44 22 realistic. And we test the AMF only on the surface. That  
16:44 23 means the stack would have had to have been on surface  
16:44 24 33 different times during a year.

16:44 25 If we look back at the records, we got only three --



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1 some people get four wells drilled in a year. So it would be  
2 impossible it get this many actuations.

3 Q. In your experience at WEST and Cameron, have you ever seen  
4 or heard about an AMF being actuated 33 times in a year?

5 A. No, sir.

6 Q. Now, let's look at that top bullet point, "one year of  
7 on-time operation."

8 MR. BAAY: If we could go to 3605.2.3.T0.

9 BY MR. BAAY:

10 Q. What is your opinion, Mr. Childs, as to when batteries  
11 begin on-time operation?

12 A. In my opinion, when they first began -- what we call  
13 "on-time operation" is when the battery is installed and the  
14 AMF is turned on.

15 Q. And you're aware, aren't you, Mr. Childs, that Cameron has  
16 taken the position that on-time operation, as used in this  
17 document, TRES-3605, begins when the batteries are installed in  
18 the SEM?

19 A. I have seen that and heard that, yes.

20 Q. Do you agree with that interpretation?

21 A. My engineering logic tells me that if the battery's not  
22 being used, on-time operation begins when you start using it.  
23 It's just like with a flashlight I keep in the kitchen drawer.  
24 If it's not being used, I take it out, I turn it on, it's being  
25 used, it's using up it's operational life. I turn it off, it

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16:45 1 goes back in the drawer, it's using up now its shelf life.

16:45 2 Q. So to use your analogy, when you arm an AMF, is that  
16:46 3 equivalent to turning on the flashlight?

16:46 4 A. Exactly.

16:46 5 Q. And when is the AMF typically armed?

16:46 6 A. After the BOP stack is on the bottom and latched up to the  
16:46 7 wellhead.

16:46 8 Q. Did you review the *Deepwater Horizon's* departmental  
16:46 9 activity reports to determine how many days the blue pod on the  
16:46 10 BOP had of on-time operation at the time of the incident?

16:46 11 A. Yes. After we had changed to the March date, I wanted to  
16:46 12 really understand how much use this battery had gone through.  
16:46 13 We went back and looked at the three wells, their starting  
16:46 14 times when the stack was on the bottom, when they were pulled,  
16:46 15 so the actual time the AMF was armed.

16:46 16 MR. BAAY: Let's pull up TREG-51245.1189.1.T0, which  
16:47 17 is another entry from the departmental activity report.

16:47 18 BY MR. BAAY:

16:47 19 Q. What did this report tell you, Mr. Childs?

16:47 20 A. This is one we used to know that that's when -- the date,  
16:47 21 March 20th, they latched up to the BOP stack on the ocean  
16:47 22 floor.

16:47 23 Q. Did you go on to examine the various times when the BOP  
16:47 24 was latched up and when it was pulled in the year preceding the  
16:47 25 Macondo incident?

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16:47 1 A. Yes. I looked at each time it was latched, unlatched,  
16:47 2 latched, relatched on each well.

16:47 3 MR. BAAY: Let's look at TREN-51245.216.1.T0.

16:47 4 BY MR. BAAY:

16:47 5 Q. Did you also examine these entries, Mr. Childs, in your  
16:47 6 review?

16:47 7 A. Very similar. We see we're pulling riser. That means  
16:47 8 we've unlatched the BOP stack. The stack is coming up off the  
16:47 9 surface. The second one, finished running the BOP back down  
16:47 10 and latched up on the wellhead.

16:47 11 MR. BAAY: Let's put up D-6716.

16:47 12 BY MR. BAAY:

16:47 13 Q. So just to understand this, you started the clock in March  
16:48 14 of 2009, when the SEM was armed?

16:48 15 A. The first time it was armed, yes, sir.

16:48 16 Q. You didn't count on-time operation for any days where the  
16:48 17 BOP was pulled and not latched up?

16:48 18 A. When the AMF was turned off, or disarmed.

16:48 19 Q. And in the -- from the time the pod was put on the BOP to  
16:48 20 the date of the incident, how many days did you determine of  
16:48 21 on-time operation related to the blue pod battery?

16:48 22 A. By doing it this way, we determined there were only  
16:48 23 349 days of actual use, or on-time.

16:48 24 Q. And does the slide we have in D-6716 accurately reflect  
16:48 25 your review of the departmental activity reports from

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16:48 1 Transocean?

16:48 2 A. Yes. Precisely.

16:48 3 Q. So in sum total, you found on-time operation of 349 days,  
16:48 4 or less than a year?

16:48 5 A. Less than a year's total use. That's correct.

16:48 6 Q. And it -- is that your opinion, Mr. Childs, even though  
16:48 7 the BOP was latched in March of 2009, some 13 months before the  
16:49 8 incident?

16:49 9 A. Again, I did this so I could know exactly what use it had.  
16:49 10 It was over a calendar year, yes, but it had less than a year's  
16:49 11 use.

16:49 12 MR. BAAY: All right. Let's look at  
16:49 13 TREX-22729.15.1.T0.

16:49 14 BY MR. BAAY:

16:49 15 Q. Have you seen this chart before, Mr. Childs?

16:49 16 A. Yes, I have.

16:49 17 Q. What is it?

16:49 18 A. It's out of Mr. Zatarain's report on some battery  
16:49 19 processes that he went through.

16:49 20 Q. As you've described, Mr. Zatarain is one of BP's BOP  
16:49 21 experts.

16:49 22 A. That's correct.

16:49 23 Q. I believe we saw this chart during Dr. Davis's  
16:49 24 examination. Do you recall that?

16:49 25 A. Yes. I saw it last week.

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16:49 1 Q. Describe for us -- describe for the Court what the column  
16:49 2 on the left is indicating.

16:49 3 A. Well, of course, the first column is on the case number,  
16:49 4 so we'll disregard that. But the first three main columns, as  
16:50 5 he's titled them, it's Starting Battery Condition, so it shows  
16:50 6 9-volt A and 9-volt B and 27-volt.

16:50 7 Q. And so this is starting battery condition.

16:50 8 What does the column on the right tell us?

16:50 9 A. On the far right, after he's gone through the scenario, it  
16:50 10 shows ending battery conditions. So if it started in the way  
16:50 11 he has on the left, this is, on the right -- the ending  
16:50 12 condition is the way it would end up.

16:50 13 Q. Do you have any criticisms, Mr. Childs, of the analysis  
16:50 14 that Mr. Zatarain lays out in his chart here?

16:50 15 A. No. No, I do not.

16:50 16 Q. What does this table in his analysis related to the  
16:50 17 batteries tell you?

16:50 18 A. Well, it shows me this. There has been a lot of talk  
16:50 19 about the yellow pod battery must -- or excuse me -- the blue  
16:50 20 pod battery must have been bad, very bad to start with. If it  
16:50 21 started bad, the only way you could end up, in his three  
16:51 22 scenarios here, is with the ending condition being all  
16:51 23 batteries bad. And that is not the ending condition we had.  
16:51 24 The 27-volt was bad, but the 9-volts were not.

16:51 25 Q. Does this analysis allow you to conclude that the blue pod

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1 27-volt battery had to be somewhere between good and weak on  
2 the date of the incident?

3 A. Precisely. It could not have been bad to start. It might  
4 have been weak; it could have been good.

5 Q. Is there any way to know what the range was between good  
6 and weak on that date?

7 A. No. We cannot have a reading on that.

8 Q. And what was the status of the 27-volt battery as tested  
9 at Michoud?

10 A. It was very weak.

11 Q. And that testing happened almost 10 months or 11 months  
12 following the Macondo incident?

13 A. Exactly.

14 Q. If the battery was dead when it was tested -- or very  
15 weak, or it was dead when it was tested at Michoud, can we  
16 conclude that it had to be somewhere between good and weak at  
17 the time of the incident?

18 A. It had to be much better, and the fact that it was so  
19 dead, there had to have been another mechanism that would have  
20 drawn it down this far.

21 Q. Now, we know that you had performed some testing to  
22 analyze those mechanisms. Have other experts in this  
23 litigation identified ways that the 27-volt battery might have  
24 drained itself?

25 A. Yes.

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16:52 1 Q. Who else undertook that evaluation?

16:52 2 A. InterLink did some work for BP that also determined other  
16:52 3 mechanisms by which it could be drawn down.

16:52 4 Q. Now, do you believe, because of this mechanism or the fact  
16:52 5 that the battery could drain -- is it your opinion that the  
16:52 6 blue pod 27-volt battery likely had sufficient charge at the  
16:52 7 time of the incident on April 20th, 2010?

16:52 8 A. That is my belief, yes.

16:52 9 Q. And that it drained itself somehow through one of the  
16:52 10 mechanisms, either through what Transocean discovered or  
16:52 11 through what the other testing identified as a possible  
16:53 12 draining mechanism?

16:53 13 A. That is correct.

16:53 14 Q. So just to summarize, Mr. Childs, based on your review of  
16:53 15 the evidence, when do you believe that the -- strike that.  
16:53 16 Excuse me.

16:53 17 In your opinion, if the blind shear rams closed on  
16:53 18 April 20th, with the AMF, does that mean that either the blue  
16:53 19 pod or the yellow pod successfully completed the AMF sequence?

16:53 20 A. Yes, it does.

16:53 21 Q. And it doesn't matter which pod actually completed the  
16:53 22 sequence; is that true?

16:53 23 A. That's true. Any of the four could have.

16:53 24 Q. Does the AMF testing performed by DNV and Transocean  
16:53 25 indicate to you that the yellow pod solenoid likely worked?

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16:53 1 A. Yes, it does.

16:53 2 MS. KARIS: Your Honor, I'm going to renew my motion  
16:53 3 with respect to the testing performed by Transocean. This goes  
16:53 4 to the same issue we addressed previously.

16:53 5 THE COURT: I will -- you can bring it out in  
16:53 6 cross-examination. I certainly will consider that when I have  
16:53 7 to make certain judgments in this case.

16:54 8 MS. KARIS: Thank you, Your Honor.

16:54 9 THE COURT: Okay.

16:54 10 BY MR. BAAY:

16:54 11 Q. Okay. Mr. Childs, I want to spend some time looking at  
16:54 12 Transocean's subsea maintenance responsibility -- maintenance  
16:54 13 related to the blowout preventer. Okay?

16:54 14 A. Yes, sir.

16:54 15 Q. Did you review the maintenance tasks for the blowout  
16:54 16 preventer that were outstanding at the time of the incident?

16:54 17 A. I did.

16:54 18 Q. Did you determine whether any of those outstanding tasks  
16:54 19 affected the BOP's ability to operate?

16:54 20 A. I did.

16:54 21 Q. Was that review part of your work done while you were on  
16:54 22 the Transocean internal investigation team?

16:54 23 A. It was.

16:54 24 Q. Do you recall, Mr. Childs, approximately how many  
16:54 25 preventative maintenance tasks were performed just on BOP



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16:54 1 components during the one year prior to the Macondo incident?

16:54 2 A. Probably about 750.

16:54 3 MR. BAAY: If we could pull up TREN-52665, which is a  
16:54 4 *Deepwater Horizon* well control preventive maintenance task  
16:54 5 summary chart.

16:54 6

16:54 7 BY MR. BAAY:

16:54 8 Q. Did you undertake a review of this chart and the  
16:55 9 underlying documents to determine whether it accurately  
16:55 10 reflects the 748 BOP-related preventative maintenance tasks  
16:55 11 that were completed in the year before the incident?

16:55 12 A. I did.

16:55 13 Q. And were there any outstanding preventative maintenance  
16:55 14 tasks at the time of the incident, by your review?

16:55 15 A. Yes. In this case we found five that were more than  
16:55 16 30 days overdue.

16:55 17 Q. Did you also find a few additional that were less than  
16:55 18 30 days overdue?

16:55 19 A. Yes, we did. They're not on this chart.

16:55 20 Q. Let's look at Exhibit 933.

16:55 21 Are you familiar with this document, Mr. Childs?

16:55 22 A. Yes.

16:55 23 Q. What is it?

16:55 24 A. It's an RMS report, which is Transocean's maintenance  
16:55 25 system report on activities.

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16:55 1 Q. Did you review it in preparation for your testimony here  
16:55 2 today?

16:55 3 A. I did.

16:55 4 Q. And does this document identify the overview of  
16:55 5 maintenance tasks that were outstanding at the time of the  
16:56 6 incident?

16:56 7 A. Yes, it does.

16:56 8 Q. Let's discuss a few of those.

16:56 9 MR. BAAY: Exhibit 933.23.1.T0.

16:56 10 BY MR. BAAY:

16:56 11 Q. What is "365-day riser tensioner NDT," Mr. Childs?

16:56 12 A. Let me start with NDT. That stands for nondestructive  
16:56 13 testing. So nonintrusive, we're not taking things and doing  
16:56 14 anything that would harm them. We're just visually inspecting  
16:56 15 or doing external measurements that we can do to determine the  
16:56 16 condition, in this case of the riser tensioner.

16:56 17 Q. What is the riser tensioner?

16:56 18 A. The riser tensioner applies tension to the drilling riser  
16:56 19 to hold it up during the drilling operations.

16:56 20 Q. Did the fact that this task was overdue by more than  
16:56 21 30 days in any way contribute to the incident on April 20th, in  
16:56 22 your opinion?

16:56 23 A. It did not.

16:56 24 MR. BAAY: Let's look to 933.24.1.T0.

25

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16:57 1 BY MR. BAAY:

16:57 2 Q. Entry labeled "RPM 1825 days - perform rated load test."

16:57 3 What is this task?

16:57 4 A. This is actually a load test on the bridge crane that  
16:57 5 moves the BOP stack around the rig when the stack is on the  
16:57 6 surface.

16:57 7 Q. And this is one of the BOP maintenance tasks related to  
16:57 8 the blowout preventer?

16:57 9 A. That's correct.

16:57 10 Q. And does the fact that this task was overdue in any way  
16:57 11 contribute to the incident on April 20th, in your opinion?

16:57 12 A. It did not. It was not in use.

16:57 13 MR. BAAY: Let's look at 933.25.1.T0.

16:57 14 BY MR. BAAY:

16:57 15 Q. We have three additional tasks here that are overdue,  
16:57 16 outstanding preventative maintenance tasks. Let's start at the  
16:57 17 top.

16:57 18 A. Okay.

16:57 19 Q. "RPM 730-day testing of relief valves."

16:57 20 Describe for us what that task is.

16:57 21 A. That would be a test to verify the relief valves did  
16:57 22 relieve at the proper pressure.

16:57 23 Q. And relief valves located on the blowout preventer?

16:57 24 A. These were on the control system for the blowout  
16:58 25 preventer.

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16:58 1 Q. Were these in any way involved at the time of the incident  
16:58 2 on April 20th?

16:58 3 MS. HANKEY: Your Honor, I'm going to object. This  
16:58 4 is part of the United States' motion; and this is not in  
16:58 5 Mr. Childs' considerative materials. And part of our motion  
16:58 6 was the fact that Mr. Childs testified at his deposition that  
16:58 7 he relied on a summary report prepared by Transocean employees.

16:58 8 And the materials that those Transocean  
16:58 9 employees were not identified in his report, including this  
16:58 10 one.

16:58 11 MR. BAAY: Your Honor, he has an entire section in  
16:58 12 his main report about maintenance; and as part of his work on  
16:58 13 the Transocean internal investigation team, they undertook a  
16:58 14 review of all outstanding maintenance items related to the  
16:58 15 blowout preventer. And it does identify overdue tasks in his  
16:58 16 report.

16:58 17 MS. HANKEY: And this document is not cited.

16:58 18 THE COURT: She's saying that he's now relying on  
16:58 19 documents and information that he previously didn't identify;  
16:58 20 is that correct?

16:58 21 MR. BAAY: I don't know, as I stand here, whether  
16:59 22 this is actually a reliance document. I'm going to have to  
16:59 23 check that.

16:59 24 THE COURT: Yeah. I'll sustain the objection.  
25

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16:59 1 BY MR. BAAY:

16:59 2 Q. Mr. Childs, as we just discussed, as part of your work on  
16:59 3 Transocean's internal investigation team, did you identify  
16:59 4 outstanding maintenance tasks -- preventative maintenance tasks  
16:59 5 related to the BOP?

16:59 6 A. I did.

16:59 7 Q. And did you include discussion of outstanding preventative  
16:59 8 maintenance tasks in your report?

16:59 9 A. I did.

16:59 10 MR. BAAY: Let's pull up TREX-22342.388.1.T0.

16:59 11 BY MR. BAAY

16:59 12 Q. And do you recognize this, Mr. Childs, as an entry from  
17:00 13 Transocean's internal investigation report?

17:00 14 A. I do.

17:00 15 Q. And is this overdue maintenance task something that you  
17:00 16 reference in your report, if you recall?

17:00 17 A. It is.

17:00 18 Q. What does the task relate to?

17:00 19 A. It relates to the LMRP connector and some testing and  
17:00 20 checking on the connector to verify its condition.

17:00 21 Q. And when did it become overdue?

17:00 22 A. It was scheduled for March 30th, 2010.

17:00 23 Q. So at the time of the incident, it was some 21 days  
17:00 24 overdue?

17:00 25 A. Precisely.

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17:00 1 Q. And the fact that this task was 20 days overdue, in your  
17:00 2 opinion, did that contribute to the incident?

17:00 3 A. No. There was no issue with the LMRP connector at all.

17:00 4 MR. BAAY: Let's look at TREN-22342.388.2.T0.

17:00 5 BY MR. BAAY:

17:00 6 Q. Another task identified in Transocean's internal  
17:00 7 investigation report and referenced in your report; is that  
17:00 8 true?

17:00 9 A. It is.

17:00 10 Q. What does this task involve?

17:01 11 A. It's on the BOP choke control unit, a weekly inspection,  
17:01 12 service check on that control unit.

17:01 13 Q. According to this entry, how many days overdue was it?

17:01 14 A. It was scheduled again for April 16th.

17:01 15 Q. So on the date of the incident, some four days overdue?

17:01 16 A. Four days overdue.

17:01 17 Q. The fact that this task was overdue, did that, in your  
17:01 18 opinion, contribute to the incident or the BOP not shutting in  
17:01 19 the well on April 20th, 2010?

17:01 20 A. No. It was not utilized in the incident.

17:01 21 MR. BAAY: Let's look at TREN-22342.389.1.T0.

17:01 22 BY MR. BAAY:

17:01 23 Q. What does this task involve, Mr. Childs?

17:01 24 A. This is inspection -- a visual inspection mainly of the  
17:01 25 choke and kill high-pressure pipe work on the rig itself.

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17:01 1 Q. Was this the final task that you and the Transocean  
17:01 2 internal investigation team identified as an overdue  
17:01 3 outstanding task?

17:01 4 A. Yes, it is.

17:01 5 Q. And according to this entry, how many days overdue was it?

17:02 6 A. One day.

17:02 7 Q. Now, the fact that this task is one day overdue, did that  
17:02 8 prevent the BOP, in your opinion, the blowout preventer from  
17:02 9 shutting in the well on April 20th, 2010?

17:02 10 A. It did not.

17:02 11 Q. I want to briefly discuss Transocean's overall maintenance  
17:02 12 philosophy.

17:02 13 A. Okay.

17:02 14 MR. BAAY: Pull up TREN-1469.

17:02 15 BY MR. BAAY

17:02 16 Q. Are you familiar with this document?

17:02 17 A. I am.

17:02 18 Q. And describe for us what it is.

17:02 19 A. It's Transocean's Subsea Maintenance Philosophy issued in  
17:02 20 May of '07.

17:02 21 Q. Did you review it in preparation for your testimony?

17:02 22 A. Yes, sir.

17:02 23 Q. Did you review it as part of your review of Transocean's  
17:02 24 maintenance on its blowout preventers?

17:02 25 A. I did.

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17:02 1 Q. From your view, what do you understand Transocean's  
17:02 2 maintenance philosophy to involve for their blowout preventers?

17:03 3 A. It encompasses many areas of maintenance: preventive  
17:03 4 maintenance; condition-based maintenance; corrective  
17:03 5 maintenance; between-well maintenance, of course; five yearly  
17:03 6 survey-type maintenance; API requirements; OEM requirements --  
17:03 7 that's original equipment manufacturer requirements; the  
17:03 8 regulatory requirements. The whole spectrum.

17:03 9 Q. So you're saying all of those aspects of maintenance were  
17:03 10 incorporated as part of Transocean's maintenance philosophy?

17:03 11 A. Yes, they utilized each part.

17:03 12 MR. BAAY: If we look at TREG-1469.4.1.T0.

17:03 13 BY MR. BAAY:

17:03 14 Q. This section is labeled, "Subsea Planned Maintenance  
17:03 15 Tasks." What does that involve?

17:03 16 A. Of course, most of your subsea equipment spends a lot of  
17:03 17 time on the ocean floor. So you do plan maintenance to do on  
17:03 18 these devices when they're available on deck.

17:03 19 Q. So is planned maintenance similar to preventative  
17:03 20 maintenance or calendared maintenance?

17:04 21 A. It would also be -- it could be calendar basis. Well, it  
17:04 22 happens when you have access, and it is preventative  
17:04 23 maintenance as well.

17:04 24 MR. BAAY: All right. Let's pull up, please,  
17:04 25 1469.7.1.T0.



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17:04 1 BY MR. BAAY

17:04 2 Q. What does this section discuss?

17:04 3 A. When any shortfalls are found or design issues are found,  
17:04 4 you schedule and do a corrective maintenance.

17:04 5 Q. What does that mean? If you find an out-of-service part  
17:04 6 or what? Describe for us what that means.

17:04 7 A. Not working at the level you wish it to or you'll possibly  
17:04 8 even issue an alert that shows there is a design issue.

17:04 9 MR. BAAY: Let's look at TREN-1469.4.2.T0.

17:04 10 BY MR. BAAY

17:04 11 Q. This section is labeled as -- or identified as "Planning  
17:04 12 Subsea Between Well Maintenance." What does that relate to?

17:04 13 A. The maintenance we were discussing on this equipment must  
17:04 14 be planned. We have -- between wells there's a set period of  
17:04 15 time, and each time a plan is made about all the maintenance  
17:04 16 that needs to be done. This plan is then reviewed by a  
17:04 17 contractor and operator.

17:05 18 BY MR. BAAY:

17:05 19 Q. Is between-well maintenance also referred to in the  
17:05 20 industry as "rig move maintenance"?

17:05 21 A. It can be.

17:05 22 Q. And did you review the rig move maintenance that was  
17:05 23 conducted on the *Deepwater Horizon* for their BOP prior to the  
17:05 24 splashing at Macondo?

17:05 25 A. Yes. I reviewed the plan.

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17:05 1 Q. In your experience, do operators like BP have involvement  
17:05 2 in rig move maintenance?

17:05 3 A. Yes. In between wells there's discussions on the  
17:05 4 maintenance that is scheduled and what we can do with each  
17:05 5 element of it.

17:05 6 Q. From your specific review related to the  
17:05 7 *Deepwater Horizon*, did BP have input on Transocean's rig move  
17:05 8 maintenance of its BOP?

17:05 9 A. Yes, they did.

17:05 10 MR. BAAY: Let's look at TREG-3338.1.1.T0.

17:05 11 BY MR. BAAY

17:05 12 Q. Are you familiar with this document, Mr. Childs?

17:05 13 A. Yes, I am.

17:05 14 Q. What is it?

17:05 15 A. A document where Transocean has sent their work list to BP  
17:05 16 and they're discussing this. They want to look at it and  
17:05 17 decide which way BP wants to go, about which way to go with the  
17:06 18 two plans that were sent by Transocean.

17:06 19 Q. Did you take it from the discussion in this e-mail that BP  
17:06 20 was commenting on the events or the maintenance that was going  
17:06 21 to be conducted for the rig move for the *Deepwater Horizon*?

17:06 22 A. Yes. Yes, trying to make a decision on which way to go.

17:06 23 MR. BAAY: Let's look also at 3338.1.2.T0.

17:06 24 BY MR. BAAY

17:06 25 Q. It's another e-mail chain. This one is involving Brett

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17:06 1 Cocalles. You know him to be a BP employee, don't you?

17:06 2 A. Yes.

17:06 3 Q. And he is discussing stack maintenance to be done before  
17:06 4 Macondo; is that true?

17:06 5 A. That is correct.

17:06 6 Q. Is this another -- or let me ask you: What does this  
17:06 7 e-mail string indicate to you in terms of BP's involvement in  
17:06 8 Transocean's rig move maintenance on its blowout preventer?

17:06 9 A. It shows that they were preferring to do a lot of the  
17:06 10 stack -- normal stack maintenance prior to Macondo so that it  
17:06 11 doesn't interfere with a later connector changeout they had  
17:07 12 scheduled.

17:07 13 MR. BAAY: Okay. We go back to the Subsea  
17:07 14 Maintenance Philosophy document, 1469.7.2.T0.

17:07 15 BY MR. BAAY:

17:07 16 Q. Are there also sections in Transocean's philosophy related  
17:07 17 to the testing on the BOP?

17:07 18 A. Yes. Function testing and pressure testing are both parts  
17:07 19 of the maintenance.

17:07 20 Q. Do you understand those tests to be required by  
17:07 21 regulation?

17:07 22 A. Yes.

17:07 23 Q. And the regulation is on the operator in most cases; is  
17:07 24 that true?

17:07 25 A. To properly function-test and pressure-test their

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17:07 1 equipment.

17:07 2 Q. We'll get to it in a minute, but did you review all the  
17:07 3 function testing and pressure testing related to the BOP for  
17:07 4 the *Deepwater Horizon*?

17:07 5 A. Yes, I did.

17:07 6 Q. And was -- were the series of function and pressure tests  
17:07 7 all successful for the *Deepwater Horizon* BOP?

17:07 8 A. Yes, they were.

17:07 9 Q. Is a function or -- a function in a pressure test the best  
17:07 10 indicator of a blowout preventer's health while the BOP is  
17:07 11 subsea?

17:08 12 A. Yes, sir. You have no other way to evaluate it except  
17:08 13 verifying that it does function as you requested and that it  
17:08 14 passes both low and high pressure tests when you pressure-test  
17:08 15 it.

17:08 16 MR. BAAY: All right. Two final entries from the  
17:08 17 maintenance philosophy. Go to 1469.8.1.T0.

17:08 18 BY MR. BAAY \*

17:08 19 Q. This section is headlined, 180 -- "1825-day major  
17:08 20 overhauls."

17:08 21 What -- were major overhauls a part of Transocean  
17:08 22 philosophy, and what did they involve?

17:08 23 A. Yes. Of course, they're a part of it. A five-yearly  
17:08 24 major overhaul might be possible. They will base this on the  
17:08 25 results of a full test and inspection of that device to

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17:08 1 determine if they will do a full overhaul.

17:08 2 MR. BAAY: Now, let's finally look at 1469.7.3.T0.

17:08 3 BY MR. BAAY:

17:08 4 Q. The header "Component Condition Evaluation," what does  
17:08 5 this involve?

17:08 6 A. It's basically the part we talked about before,  
17:09 7 condition-based maintenance. There's a number of ways you can  
17:09 8 determine the current condition of a piece of equipment by  
17:09 9 certain pressure tests, certain other inspections you can do,  
17:09 10 and you determine its condition.

17:09 11 If it's in perfectly good condition, there would be  
17:09 12 no reason to tear it apart and repair it.

17:09 13 Q. We've heard some testimony in this case that  
17:09 14 conditioned-based maintenance is nothing more than running it  
17:09 15 until it breaks.

17:09 16 Do you agree with that assessment or that testimony?

17:09 17 A. That is not what this is.

17:09 18 Q. In your experience, are you aware of other companies that  
17:09 19 use elements of condition-based maintenance?

17:09 20 A. Yes. We know the Air Force does, the Coast Guard, the  
17:09 21 aircraft industry all utilize these.

17:09 22 Q. In your time at WEST, are you familiar -- can you offer  
17:09 23 examples of operators or entities you're familiar with who  
17:09 24 perform conditioned-based maintenance on their blowout  
17:09 25 prevention equipment?

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17:09 1 A. Yes. WEST was requested by ExxonMobil several years ago  
17:10 2 to determine trend analysis, predictive tests, condition-based  
17:10 3 type tests performed on all of their major equipment so that  
17:10 4 they could determine when it actually needed repair rather than  
17:10 5 just doing a time-based maintenance where they might be  
17:10 6 repairing a perfectly good piece of equipment.

17:10 7 Q. If you do -- describe for us what the concept of "infant  
17:10 8 mortality" means.

17:10 9 A. Infant mortality is -- comes into play when you take a  
17:10 10 brand-new device off the shelf or maybe just a brand-new  
17:10 11 rebuilt device off the shelf, install it into the system and it  
17:10 12 has issues. Maybe an O-ring was cut on installation. Maybe a  
17:10 13 scratch was introduced when you reassembled.

17:10 14 So once it's installed, if you have a problem, you  
17:10 15 then have to fix that issue. So it's like teething problems.  
17:10 16 So we look at it as infant mortality. If it's brand-new, it  
17:10 17 has trouble, you have to get past all those issues before it's  
17:10 18 ready to use.

17:10 19 Q. How is that relevant to condition-based maintenance?

17:11 20 A. When you have a piece of equipment that is in perfectly  
17:11 21 good condition, it passes all predictive or trend analysis-type  
17:11 22 tests, there's no reason to replace it, because you might be  
17:11 23 introducing this infant mortality issue where the new part you  
17:11 24 pull off doesn't work.

17:11 25 I've seen a number of daily reports from my men in

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17:11 1 the field. They had a problem. They're repairing their stack  
17:11 2 or they're replacing a valve. They took a valve off the shelf.  
17:11 3 They ended up having to put the old valve back in because the  
17:11 4 other valve would not work properly.

17:11 5 Q. Mr. Childs, based on your review of Transocean's subsea  
17:11 6 maintenance philosophy and the maintenance program that they  
17:11 7 put in place for their BOPs, do you believe that their document  
17:11 8 and their philosophy was consistent with industry standards for  
17:11 9 BOP maintenance at the time of the incident?

17:11 10 A. I'm sorry?

17:11 11 Q. At the time of the incident?

17:11 12 A. Yes, I do believe so.

17:11 13 Q. Now, there's been opinions offered and testimony provided  
17:11 14 that Transocean should have been required to follow API RP 53  
17:12 15 in its BOP maintenance.

17:12 16 Are you familiar with that testimony?

17:12 17 A. I am.

17:12 18 Q. And are you familiar with the provisions of API RP 53?

17:12 19 A. I am.

17:12 20 MR. BAAY: Let's look quickly at TREN-7030. Can we  
17:12 21 blow up just that top header, Dennis?

17:12 22 BY MR. BAAY

17:12 23 Q. Are you familiar with this document, Mr. Childs?

17:12 24 A. I am.

17:12 25 Q. What is it?

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17:12 1 A. It's Cameron's Engineering Bulletin 902D concerning well  
17:12 2 control equipment and periodic -- excuse me -- periodic  
17:12 3 inspection/recertification.

17:12 4 Q. As we know well, Cameron was the manufacturer of the  
17:12 5 *Deepwater Horizon* BOP; is that right?

17:12 6 A. That's correct.

17:12 7 MR. BAAY: Let's turn to 7030.4.1.T0.

17:13 8 BY MR. BAAY

17:13 9 Q. Read for us Cameron's position statement in the  
17:13 10 highlighted language as to they how they viewed API RP 53 at  
17:13 11 the time of incident.

17:13 12 A. "API RP 53 is not considered to be an industry standard."

17:13 13 Q. And similar to Cameron, are you familiar with what BP's  
17:13 14 position was or how they viewed API RP 53 at the time of the  
17:13 15 incident?

17:13 16 A. Yes, I am.

17:13 17 Q. And what was their position?

17:13 18 A. Very close to Cameron's.

17:13 19 Q. Which was what?

17:13 20 A. That it was not an industry standard.

17:13 21 MR. BAAY: Can we also look at 7030.4.2.T0?

17:13 22 BY MR. BAAY

17:13 23 Q. According to this call-out and from Cameron's engineering  
17:13 24 bulletin, what is your opinion as to how Cameron viewed the  
17:13 25 idea of certification of major BOP components?



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17:13 1 A. Reading the highlighted sections: "It is a recommended  
17:13 2 practice and, as such, is intended to be a guideline . . . .  
17:13 3 It is not possible to 'certify' that any maintenance or  
17:14 4 inspection of any equipment can be 'in compliance' with API  
17:14 5 RP 53."

17:14 6 Q. Given these statements and given your experience in the  
17:14 7 industry and dealing with blowout prevention equipment, do you  
17:14 8 believe it was reasonable for Transocean to review API RP 53 as  
17:14 9 a recommended practice?

17:14 10 A. Yes, I do.

17:14 11 Q. Switching topics slightly, Mr. Childs -- I'm nearing the  
17:14 12 end -- I'd like to ask you about your opinions related to the  
17:14 13 *Deepwater Horizon* stack over the five years leading up to the  
17:14 14 Macondo incident. All right?

17:14 15 A. Yes, sir.

17:14 16 MR. BAAY: Let's look at TREN-526628, which is a  
17:14 17 summary chart of the *Deepwater Horizon* maintenance from 2005 to  
17:14 18 2010.

17:14 19 BY MR. BAAY

17:14 20 Q. Have you had a chance to review this document before your  
17:14 21 testimony here today?

17:14 22 A. I have.

17:14 23 Q. And have you had a chance to review the underlying  
17:14 24 maintenance records to determine whether this chart accurately  
17:15 25 summarizes the maintenance that was performed from 2005 to

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17:15 1 2010?

17:15 2 A. I have.

17:15 3 Q. And is this an accurate representation of those documents?

17:15 4 A. Yes, it is.

17:15 5 Q. Or an accurate summary, I should say.

17:15 6 MR. BAAY: Let's pull TREN-52662-A.3.1.T0.

16:32 7 BY MR. BAAY:

17:15 8 Q. Describe for the Court briefly what kind of maintenance  
17:15 9 was done on the *Deepwater Horizon's* rams prior to moving to  
17:15 10 Macondo.

17:15 11 A. As we're seeing here, we have functioning rams. They're  
17:15 12 doing operator tests; they're opening up the ram cavities,  
17:15 13 getting access to the ram cavities. They're replacing all the  
17:15 14 rubber goods on the rams; they're doing more operator testing.

17:15 15 They removed the blind shear ram blocks and pulled  
17:15 16 the seal carrier, as well. Moved various other parts, prepping  
17:15 17 these for more work. New ram packers installed.

17:15 18 By the way, I'm reading from the bottom up because  
17:16 19 that's the way the dates run.

17:16 20 Q. Let me jump in here.

17:16 21 If we call out those last two entries, what testing  
17:16 22 was performed on the *Deepwater Horizon* BOP's rams prior to  
17:16 23 splashing the Macondo?

17:16 24 A. On these two dates they functioned blind and super shear  
17:16 25 rams, and they performed operator testing on the bonnets.

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17:16 1 Q. Let's move to 52662A.1.1.T0.

17:16 2 And what is this -- what are these entries  
17:16 3 describing, Mr. Childs?

17:16 4 A. It shows that the -- both of the super shear bonnets  
17:16 5 received a recertification document.

17:16 6 Q. What does that mean?

17:16 7 A. That the super shear rams were disassembled, inspected,  
17:16 8 rebuilt, and recertified.

17:16 9 Q. And we know that the super shears would also be the casing  
17:16 10 shears?

17:16 11 A. That is the other name. Cameron's name for it is super  
17:17 12 shear. The generic name for the rest of the industry is casing  
17:17 13 shear rams.

17:17 14 Q. Why is it possible that we have an April 2010  
17:17 15 recertification date for these rams when we know that the BOP  
17:17 16 was in service in the Macondo on those dates?

17:17 17 A. I think this is just basically the date they got the  
17:17 18 recertification documents.

17:17 19 Q. In your experience, is it typical practice for Cameron to  
17:17 20 recertify a piece of equipment and then sign the certification  
17:17 21 at a later date?

17:17 22 A. I don't know that it's practice, but I know it happens.  
17:17 23 Paperwork, as we all can understand, is usually the last to  
17:17 24 occur.

17:17 25 MR. BAAY: Look to 52662A.9.1.T0.

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16:32 1 BY MR. BAAY:

17:15 2 Q. Did you also review, Mr. Childs, the rig move maintenance  
17:17 3 work that was performed on the *Deepwater Horizon* BOP prior to  
17:17 4 the Kodiak well?

17:17 5 A. I did.

17:17 6 Q. What did you find?

17:17 7 A. Generally, some of the same things we saw on the last,  
17:17 8 where they opened up the bonnets, replaced all the rubber goods  
17:17 9 and all the rams, retested and tested the operators again.

17:18 10 Q. And that was five months before the same -- the very same  
17:18 11 work was done at Macondo; is that right?

17:18 12 A. That is correct.

17:18 13 Q. Were there any regulatory requirements that you're  
17:18 14 familiar with that required Transocean to do this type of work  
17:18 15 with their rams and with their bonnets every six months?

17:18 16 A. No, sir.

17:18 17 MR. BAAY: Let's look at TREN-52662A.10.1.T0.

16:32 18 BY MR. BAAY:

17:15 19 Q. Same set of documents for the rig move prior to the Tiber  
17:18 20 well. Did you review those documents?

17:18 21 A. I did.

17:18 22 Q. Does it appear that the same ram maintenance was occurring  
17:18 23 on the rig move prior to Tiber?

17:18 24 A. Basically the same thing again. Rubber goods were changed  
17:18 25 and bonnet doors were closed. So they replaced the ram rubber

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17:18 1 goods again.

17:18 2 Q. In your opinion, based on these examples, did Transocean's  
17:18 3 maintenance of its rams and bonnets meet industry standards?

17:18 4 A. Yes.

17:19 5 Q. Have you also, Mr. Childs, reviewed the maintenance  
17:19 6 performed on other of the key BOP components of the *Deepwater*  
17:19 7 *Horizon*?

17:19 8 A. I did.

17:19 9 Q. And those are reflected in the chart we just saw?

17:19 10 A. They are.

17:19 11 Q. In your opinion, does the maintenance of these components  
17:19 12 comply with industry standards?

17:19 13 A. It does.

17:19 14 Q. And was there any maintenance that was not performed  
17:19 15 related to these major components that would have made a  
17:19 16 difference in the ability of the blind shear ram to shut in the  
17:19 17 well on April 20th, 2010?

17:19 18 A. No, sir.

17:19 19 Q. We just looked at Transocean subsea maintenance philosophy  
17:19 20 related to function and pressure testing.

17:19 21 Let me ask you, what does a successful subsea  
17:19 22 function test indicate?

17:19 23 A. It means that through your control system you can function  
17:19 24 each and every device that you've tested. They are -- they  
17:19 25 would be there for you when you hit the button.

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17:20 1 Q. Does a successful function test indicate that all the rams  
17:20 2 on the stack will open and close?

17:20 3 A. Exactly what it's testing: full function.

17:20 4 Q. Same question for a pressure test. What does a successful  
17:20 5 pressure test indicate to you?

17:20 6 A. It indicates that the device tested has full pressure  
17:20 7 capability. And as I mentioned before, we test them at low  
17:20 8 pressure and high pressure.

17:20 9 Q. And did you review the records, the maintenance records,  
17:20 10 to determine if the function of pressure tests were regularly  
17:20 11 performed while the BOP was on Macondo?

17:20 12 A. I did.

17:20 13 MR. BAAY: If we look at TREG-52664.1.1.T0.

16:32 14 BY MR. BAAY:

17:15 15 Q. Mr. Childs, does this chart accurately reflect the dates  
17:20 16 on which, according to your review, the *Deepwater Horizon* BOP  
17:20 17 was function- and pressure-tested?

17:20 18 A. Yes, it does.

17:20 19 Q. If we look at --

17:20 20 MR. BAAY: Can we call out, Dennis, that entry from  
17:20 21 4-17-2010 -- let me back that up.

17:21 22 Let's call out 52664.2.1.T0.

16:32 23 BY MR. BAAY:

17:21 24 Q. I'll ask you, as it's coming up, did the *Horizon's*  
17:21 25 function testing include a function test of the BOP on

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17:21 1 April 17th, three days prior to the Macondo incident?

17:21 2 A. Yes. It was listed on 4-17-2010.

17:21 3 Q. Was there a separate function test of the blind shear ram,  
17:21 4 according to your review, on April 17th, 2010?

17:21 5 A. Yes, it was separate.

17:21 6 Q. Why would you have a separate test of your blind shear  
17:21 7 ram?

17:21 8 A. You must remove the drill pipe before you close and test  
17:21 9 the shear ram against pressure.

17:21 10 Q. So based on these tests, what can you conclude about the  
17:21 11 functionality of the *Deepwater Horizon* BOP as of April 17th,  
17:21 12 2010?

17:21 13 A. It was fully functional.

17:21 14 Q. Okay. Switching topics. I want to talk about  
17:22 15 configuration, which brings us to the last of your four  
17:22 16 opinions.

17:22 17 MR. BAAY: Go to Slide D-6686.

16:32 18 BY MR. BAAY:

17:15 19 Q. Your opinion is that the BOP was configured in accordance  
17:22 20 with industry practice at the time of the incident; is that  
17:22 21 right?

17:22 22 A. Yes, sir.

17:22 23 Q. If we could pull up -- well, let me back up.

17:22 24 Did you make a determination as to who decided on the  
17:22 25 initial configuration of the *Deepwater Horizon* BOP?

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17:22 1 A. Yes.

17:22 2 Q. By "configuration," we mean which components you're going  
17:22 3 to have and how many cavities you're going to have on your  
17:22 4 blowout preventer; is that true?

17:22 5 A. That's correct.

17:22 6 MR. BAAY: If we could go to TREN-7687.25.1.T0.

16:32 7 BY MR. BAAY:

17:15 8 Q. While that's coming up, I'll ask you the question, is it  
17:22 9 typical, in your experience, for the operator to decide and  
17:22 10 specify blowout preventer configuration?

17:22 11 A. Yes. As I've stated here, of course, the operator knows  
17:23 12 where they're going to drill, knows what they might encounter.  
17:23 13 They know the geology, they know -- if not exactly that  
17:23 14 formation, but related formations in area. So they know the  
17:23 15 pressure capability, the temperature capability, etc., of the  
17:23 16 BOP stack that they would need.

17:23 17 Q. And the exhibit we've just called out is a section from  
17:23 18 your report?

17:23 19 A. Yes, it is.

17:23 20 Q. And does the highlighting language basically say what you  
17:23 21 just testified to?

17:23 22 A. Yes. I paraphrased and added to that.

17:23 23 Q. And the summary there is that BP had the unique access to  
17:23 24 the well data to determine the proper configuration?

17:23 25 A. Yes.



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17:23 1 MR. BAAY: Turn to TREN-7691.

16:32 2 BY MR. BAAY:

17:15 3 Q. Which is a report prepared by WEST Engineering, which is  
17:23 4 your operation. Is that true, Mr. Childs?

17:23 5 A. My company, yes, sir.

17:23 6 Q. Dated April 26th, 2001, entitled "Acceptance of Well  
17:24 7 Control Equipment."

17:24 8 Were you involved in the preparation of this report?

17:24 9 A. I was. I performed the technical review.

17:24 10 Q. And who else was involved in preparing this report with  
17:24 11 you?

17:24 12 A. The gentleman that went on the actual survey was Gary  
17:24 13 Eastveld.

17:24 14 Q. Tell the Court what the purpose of this report was.

17:24 15 A. Transocean called us out to the rig to review a couple  
17:24 16 anomalies on the rig and do a general check of the rig.

17:24 17 Q. Did the review by WEST include a review of the  
17:24 18 configuration and design of the BOP?

17:24 19 A. Yes. When you're on the rig, you're verifying the  
17:24 20 configuration of the stack.

17:24 21 Q. And you might have said it, but to be clear, this was the  
17:24 22 *Deepwater Horizon* BOP stack?

17:24 23 A. Yes. It says so on the top. The subject line is  
17:24 24 *Deepwater Horizon*.

17:24 25 MR. BAAY: If we could call that out, Dennis, the

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17:24 1 subject line.

17:25 2 And if we could go to 7691.10.1.T0.

16:32 3 **BY MR. BAAY:**

17:15 4 **Q.** And as a result of your review and preparation of this  
17:25 5 report, did you conclude that the stack configuration on the  
17:25 6 *Deepwater Horizon* was consistent with industry practice at the  
17:25 7 time?

17:25 8 **A.** Yes.

17:25 9 **Q.** And what do you say -- what is the language that we have  
17:25 10 pulled out in the highlighting that's called out?

17:25 11 **A.** What Mr. Eastveld said, and I agreed with, that "*Deepwater*  
17:25 12 *Horizon* should have a very reliable subsea BOP stack and  
17:25 13 control system."

17:25 14 **Q.** Why do you use "should have"? Is this a looking-forward  
17:25 15 report?

17:25 16 **A.** Yes. This is a brand-new rig. We're looking to its  
17:25 17 future.

17:25 18 **Q.** So you're doing a review and you're making a forecast as  
17:25 19 to what your conclusion is after reviewing the systems?

17:25 20 **A.** Right. It is a forecast. Because, again, it was  
17:25 21 brand-new.

17:25 22 **MR. BAAY:** Let's turn to 7691.10.2.T0.

16:32 23 **BY MR. BAAY:**

17:15 24 **Q.** Read for us what Mr. Eastveld concludes in the WEST  
17:26 25 report.

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17:26 1 A. "The rig is one of the best setups and problem-free  
17:26 2 startups this surveyor has seen."

17:26 3 Q. Do you agree with those conclusions?

17:26 4 A. Yes. I know Mr. Eastveld very well. He's worked for me  
17:26 5 for years. He worked with me at Cameron. He's an ex-Cameron  
17:26 6 service hand. He put several rigs together in the field at the  
17:26 7 shipyards, and he understands. And that's why he saw how good  
17:26 8 the startup was here, meaning the beginning of this rig going  
17:26 9 into service.

17:26 10 Q. Thank you, Mr. Childs.

17:26 11 MR. BAAY: We can pull that down.

16:32 12 BY MR. BAAY:

17:15 13 Q. Now, there's been some testimony or suggestion by some of  
17:26 14 the parties that the BOP for the *Deepwater Horizon* should have  
17:26 15 been modified at some point to add another blind shearing ram.

17:26 16 Are you familiar with that opinion?

17:26 17 A. I'm familiar with it.

17:26 18 Q. Are you familiar with the regulatory requirements  
17:26 19 regarding best available and safest technology, or BAST?

17:27 20 A. Yes, I am.

17:27 21 Q. In your opinion, did BAST require the addition of a second  
17:27 22 blind shear ram on the *Deepwater Horizon* stack?

17:27 23 A. No.

17:27 24 Q. Why not?

17:27 25 A. Every time a new possibility occurs doesn't mean you have

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17:27 1 to do that possibility. You must do a complete risk  
17:27 2 assessment, management of change, to determine if this is the  
17:27 3 best thing to change and why.

17:27 4 Q. In preparing your report, did you look to see if other  
17:27 5 rigs had the same BOP configuration as the *Deepwater Horizon*  
17:27 6 BOP configuration?

17:27 7 A. Yes. I actually limited my search to equivalent Cameron  
17:27 8 rigs, and we found 36 other rigs so configured.

17:27 9 Q. In your opinion, did compliance with the industry practice  
17:27 10 at the time require the addition of a second blind shear ram?

17:27 11 A. No. Standard at the time was five cavities, and not  
17:28 12 multiple sealing shear rams. We did have a sealing shear ram  
17:28 13 and a casing shear ram.

17:28 14 Q. Have you seen any analysis from any expert in this case to  
17:28 15 determine whether a second blind shearing ram would have made a  
17:28 16 difference on April 20, 2010, to shut in the well?

17:28 17 A. No, I have not.

17:28 18 Q. Are you aware that other experts have pointed out that  
17:28 19 Transocean operates other rigs with BOPs having six cavities in  
17:28 20 their stacks?

17:28 21 A. Yes, I've seen that.

17:28 22 Q. Is it your opinion that BOPs with five ram cavities still  
17:28 23 remain in use and are still industry standard and were industry  
17:28 24 standard at the time of the incident?

17:28 25 A. That is correct.

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17:28 1 Q. When a BOP has six ram cavities, are there enough cavities  
17:28 2 to have two blind shear rams and one casing shear ram?

17:28 3 A. Yes. If you go from five to six cavities, it's very easy,  
17:28 4 then, to have two sealing shear rams or casing shear rams and  
17:29 5 still have three of your VBRs, or variable bore rams.

17:29 6 Q. But again, are there practicality considerations in  
17:29 7 reconfiguring your BOP stack to add a sixth cavity?

17:29 8 A. You must have room for it on the rig. Some rigs are built  
17:29 9 around the height of the BOP stack. And if you add 3 feet or  
17:29 10 more to the height, you may not be able to store your stack.

17:29 11 You would have to add accumulators which, of course,  
17:29 12 are possible, so that you could operate one more cavity. You  
17:29 13 would have to have control functions available. You would have  
17:29 14 to reconfigure controls, etc.

17:29 15 It takes a lot of planning, and it may not fit in  
17:29 16 your area on the rig.

17:29 17 Q. Mr. Childs, just a few more topics.

17:29 18 What kind of blade configuration did the *Deepwater*  
17:29 19 *Horizon* blind shear ram have?

17:29 20 A. As we've seen before, we have the shearing blind ram that  
17:29 21 had the upper blade with a V-shape and the lower blade with a  
17:29 22 straight shape.

17:30 23 Q. And tell us the difference between a shearing blind ram  
17:30 24 and what's been referred to as a DVS, or a double-V shearing  
17:30 25 ram.

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17:30 1 A. Double-V, both the upper and the lower blade have a  
17:30 2 V-shape.

17:30 3 Q. Now, there's been testimony that the DVS ram requires less  
17:30 4 shear force. Do you agree with that assessment?

17:30 5 A. That is correct.

17:30 6 Q. Why is it your opinion that the DVS rams are better than  
17:30 7 the SBR rams?

17:30 8 A. Well, the DVS rams were not required in this case because  
17:30 9 we could shear the 5 1/2-inch drill pipe that we were needing  
17:30 10 to shear.

17:30 11 The SBRs are shown in Cameron's EB to have good  
17:30 12 fatigue life. The DVSSs are not listed, so that they have  
17:30 13 better fatigue life. So it again is a place where you do an  
17:30 14 MOC, or management of change, and determine if that new device  
17:30 15 really is required or needed.

17:31 16 Q. As between the SBR and the DVS ram design, which Cameron  
17:31 17 design was most common in the industry at the time of the  
17:31 18 incident?

17:31 19 A. The SBR.

17:31 20 Q. Is the SBR still in use on rigs today?

17:31 21 A. And it's still in use.

17:31 22 Q. There's been also some talk about CDVS blades. You're  
17:31 23 familiar with that design?

17:31 24 A. I am.

17:31 25 Q. Tell us the difference between those and the single-bore

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17:31 1 ram.

17:31 2 A. We go to the derivation from the SBR to the DVS; then the  
17:31 3 next derivation is the CDVS, the C standing for cable.

17:31 4 They were devised for completions use, not  
17:31 5 necessarily drilling use, so that they had a capacity to shear  
17:31 6 cable or wireline, where this is made out of small strands of  
17:31 7 wire.

17:31 8 This necessitated having the blades be held in very  
17:31 9 intimate contact so that they could cut even 30,000ths-diameter  
17:32 10 wire.

17:32 11 Q. In your opinion, would CDVS blades have been appropriate  
17:32 12 on the -- to use on the *Deepwater Horizon* BOP stack?

17:32 13 A. No, sir.

17:32 14 Q. Was there a safety alert issued by Cameron, that we've  
17:32 15 seen put up on the big board here, at the time of the incident?

17:32 16 A. Yes. And that points out one of my thoughts about it.  
17:32 17 Just because this comes out doesn't mean you need to use it.  
17:32 18 First, it was mainly for completion; second, it had a sealing  
17:32 19 issue and a pressure issue.

17:32 20 Q. I want to talk to you about tandem boosters for a minute.  
17:32 21 What is a tandem booster?

17:32 22 A. A tandem booster is, as an operator, you can add to your  
17:32 23 BOP to basically double your shearing capacity or shearing  
17:32 24 force.

17:32 25 Q. Did BAST, as you understand it, require the installation

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17:32 1 or the addition of tandem boosters at the time of the incident?

17:32 2 A. No, it did not.

17:32 3 Q. Would you have been -- what would have been required to  
17:32 4 install a tandem booster on the *Deepwater Horizon*?

17:33 5 A. It fits in the same place as the standard bonnet, so it  
17:33 6 could have gone in that place. But then we have an issue on  
17:33 7 the rig because of the width that's made -- or created in the  
17:33 8 full BOP stack.

17:33 9 It was so wide that you could not do maintenance on  
17:33 10 the tandem boosters when the stack was in the storage position.  
17:33 11 To do any maintenance on the tandem boosters, you would have to  
17:33 12 move the stack into the moon pool area, hanging in the moon  
17:33 13 pool, which makes it a dangerous place to work. Plus, that  
17:33 14 meant no other activities could occur in the moon pool, so  
17:33 15 you've stopped critical path work. So it would have created  
17:33 16 many more issues.

17:33 17 And it wasn't needed to shear the piece of pipe -- or  
17:33 18 the pipe, the 5 1/2-inch drill pipe we're talking about.

17:33 19 Q. Would the additional shearing force, in your opinion, made  
17:33 20 available by the tandem booster, have made any difference at  
17:33 21 all on April 20th, 2010?

17:34 22 A. No, sir.

17:34 23 Q. Why do you say that?

17:34 24 A. I've seen studies where they applied equivalent to 52- or  
17:34 25 5300 psi instead of the 4000 psi that we were were limited, and



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17:34 1 made no difference.

17:34 2           You still had solid pieces of pipe between the two  
17:34 3 ram blocks keeping the blocks from being able to come together  
17:34 4 and complete a shear or a seal.

17:34 5 Q. Now, I want to ask you about control pod systems. Okay?

17:34 6           What is the Mark III control pod system?

17:34 7 A. It's one of the later versions of Cameron's system. The  
17:34 8 *Horizon* had the Mark II system.

17:34 9 Q. At the time of the incident, did BAST require the switch  
17:34 10 to a Mark III control system?

17:34 11 A. No, it did not.

17:34 12 Q. Did any regulation at the time of the incident require a  
17:34 13 change from the Mark II to the Mark III?

17:34 14 A. No, it did not.

17:34 15 Q. Did industry practice require that change?

17:34 16 A. No, sir.

17:34 17 Q. Would you have -- you, as WEST, advising a client, have  
17:34 18 recommended that change?

17:35 19 A. No. They would have gone through the same process we've  
17:35 20 mentioned. You do a full MOC, full risk evaluation.

17:35 21           In this case, there were single-wound coils instead  
17:35 22 of dual, and so you've lost some redundancy in your coils.

17:35 23 Q. So is what you're saying, there are tradeoffs between the  
17:35 24 Mark II and the Mark III system?

17:35 25 A. Again, that's why you never take something on face. Just

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17:35 1 because it's new doesn't mean I want to go and start using it.

17:35 2 Q. And were you also aware that there was a safety alert  
17:35 3 issued for the Mark III control pod system?

17:35 4 A. Yes, sir.

17:35 5 Q. MUX cables. There's been some testimony offered in this  
17:35 6 case regarding the routing of the MUX cables. Are you familiar  
17:35 7 with those opinions?

17:35 8 A. I am.

17:35 9 Q. Where were the MUX cables located on the *Deepwater*  
17:35 10 *Horizon*?

17:35 11 A. In the moon pool area. From right beside the moon pool  
17:35 12 area, down onto the riser, down the riser to the BOP stack, as  
17:36 13 we saw on our graphic earlier.

17:36 14 Q. As you've testified, the MUX cables -- the purpose of the  
17:36 15 MUX cables is to provide power and communications to your BOP?

17:36 16 A. To the pods on the BOP stack, yes, sir.

17:36 17 Q. And what was the industry practice at the time of the  
17:36 18 incident as to where you would route your MUX cables?

17:36 19 A. Exactly as I just mentioned, through the moon pool.

17:36 20 Q. In your 38 years of dealing with blowout preventers, have  
17:36 21 you ever seen MUX cables located anywhere else but the moon  
17:36 22 pool of a rig?

17:36 23 A. I have not.

17:36 24 Q. Acoustic control systems.

17:36 25 A. Yes, sir.

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17:36 1 Q. What is an acoustic control system?

17:36 2 A. It is a tertiary control system that utilizes acoustic  
17:36 3 waves to provide a chance to operate a function acoustically.

17:36 4 Q. Are they common? Are they in frequent use in the Gulf of  
17:36 5 Mexico on rigs?

17:36 6 A. They are not.

17:36 7 MR. BAAY: If we could look at TREN-3298.

17:40 8 BY MR. BAAY:

17:40 9 Q. Are you familiar with this document from WEST Engineering?

17:36 10 A. I am.

17:37 11 Q. What is this document?

17:37 12 A. Evaluations we were requested to make by the MMS service  
17:37 13 on secondary intervention methods in well control.

17:37 14 Q. And does part of this evaluation include a review of  
17:37 15 acoustic control systems?

17:37 16 A. Yes, being a secondary intervention system in this case.

17:37 17 MR. BAAY: Let's look at 3298.60.1.T0.

17:40 18 BY MR. BAAY:

17:40 19 Q. Just read that highlighted language there for me, please.

17:37 20 A. "Even with widely-spaced dual-stacked mounted  
17:37 21 transceivers, communication cannot be relied upon in the  
17:37 22 presence of mud clouds or gas plumes."

17:37 23 MR. BAAY: Go to TREN-3298.61.2.T0.

17:40 24 BY MR. BAAY:

17:40 25 Q. Read the highlighting there for me, please, Mr. Childs.

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17:37 1 A. "Operating in a wide range of water depths has caused  
17:38 2 problems in the GOM," or Gulf of Mexico . . . . The  
17:38 3 transmitted commands would reverberate between the surface and  
17:38 4 seafloor - a condition known as 'multipath.' The  
17:38 5 BOP-mounted" -- excuse me, misread -- "The BOP-mounted  
17:38 6 receivers could not decode the commands and thus did not  
17:38 7 function . . . ."

17:38 8 Q. In your opinion, Mr. Childs, do acoustic control systems  
17:38 9 have reliability issues?

17:38 10 A. Yes, they do.

17:38 11 Q. Is the language we've read from one of your WEST  
17:38 12 Engineering reports consistent with that opinion?

17:38 13 A. It is.

17:38 14 MR. BAAY: You can pull that down.

17:40 15 BY MR. BAAY:

17:40 16 Q. Now, we -- at the beginning of your examination, we pulled  
17:38 17 up many animations, and the speed of those animations I want to  
17:38 18 ask you about.

17:38 19 Were those sped up for our purpose here, or was  
17:38 20 that actual operation time for a closure of, say, a blind shear  
17:39 21 and a VBR?

17:39 22 A. They were very much speeded up. Ram BOP on the *Horizon*,  
17:39 23 by our own literature we got from the testing, is about  
17:39 24 16 seconds. It doesn't sound like a lot, but if you were  
17:39 25 sitting here watching it, it would barely move across the

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17:39 1 screen.

17:39 2 For the annular BOP it was closer to 26 seconds.

17:39 3 Again, to watch that close in 26 seconds would be rather

17:39 4 boring.

17:39 5 Q. So if we look back at D-6686, Mr. Childs, just the summary

17:39 6 slide of your opinions in this case. I'll take them in reverse

17:39 7 order.

17:39 8 Was the design and configuration of the BOP in

17:39 9 compliance with industry standards, in your opinion?

17:39 10 A. Yes, it was.

17:39 11 Q. And did the maintenance contribute in any way to the

17:39 12 incident, in your opinion?

17:39 13 A. It did not.

17:39 14 Q. And under that category, did either the blue pod 27

17:39 15 battery or the yellow pod Solenoid 103 successfully function

17:39 16 the AMF on April 20th, 2010?

17:39 17 A. If either one did, we don't know which one.

17:40 18 Q. Do you believe, after reviewing the forensic evidence as

17:40 19 collected by DNV, that it's possible that the pipe could have

17:40 20 been off-center on April 22nd?

17:40 21 A. I do not believe that.

17:40 22 MS. KARIS: Your Honor, I'm going to object. Asked

17:40 23 and answered. This has all been gone over before.

17:40 24 MR. BAAY: I'm almost done.

17:40 25 THE COURT: Well, it is. This is where we started.

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17:40 1 MR. BAAY: It is, but we're bringing it to a close.

17:40 2 THE COURT: Okay. Go ahead.

17:40 3 BY MR. BAAY:

17:40 4 Q. Just the final two questions.

17:40 5 Is there any dispute that the blind shear ram closes  
17:40 6 an off-center pipe?

17:40 7 A. No, sir.

17:40 8 Q. And does the forensic evidence, in your opinion, support  
17:40 9 your conclusion that the AMF operated on April 20th, 2010?

17:40 10 A. Yes, it does.

17:40 11 MR. BAAY: I'll pass the witness.

17:40 12 Thank you, Your Honor.

17:40 13 THE COURT: All right. I think we're going to quit a  
17:40 14 little early today.

17:40 15 MS. KARIS: You have a lot of upset people in this  
17:41 16 room, Your Honor.

17:41 17 THE COURT: I can tell.

17:41 18 All right. We'll recess until 8:00 a.m.  
17:41 19 tomorrow morning. Okay?

17:41 20 THE DEPUTY CLERK: All rise.

17:41 21 (WHEREUPON, the proceedings were concluded.)  
22  
23  
24  
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CERTIFICATE

I, Jodi Simcox, RMR, FCRR, Official Court Reporter for the United States District Court, Eastern District of Louisiana, do hereby certify that the foregoing is a true and correct transcript, to the best of my ability and understanding, from the record of the proceedings in the above-entitled and numbered matter.

*s/Jodi Simcox, RMR, FCRR*  
Jodi Simcox, RMR, FCRR  
Official Court Reporter

OFFICIAL TRANSCRIPT

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