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UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF LOUISIANA

IN RE: OIL SPILL BY THE OIL RIG	*	Docket 10-MD-2179
<i>DEEPWATER HORIZON</i> IN THE	*	
GULF OF MEXICO ON APRIL 20, 2010	*	Section J
	*	
Applies to:	*	New Orleans, Louisiana
	*	
Docket 10-CV-02771,	*	April 8, 2013
<i>IN RE: THE COMPLAINT AND</i>	*	
<i>PETITION OF TRITON ASSET</i>	*	
<i>LEASING GmbH, et al</i>	*	
	*	
Docket 10-CV-4536,	*	
<i>UNITED STATES OF AMERICA v.</i>	*	
<i>BP EXPLORATION & PRODUCTION,</i>	*	
<i>INC., et al</i>	*	
	*	
* * * * *		

DAY 23, AFTERNOON SESSION
TRANSCRIPT OF NONJURY TRIAL
BEFORE THE HONORABLE CARL J. BARBIER
UNITED STATES DISTRICT JUDGE

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1 AFTERNOON SESSION

2 (April 8, 2013)

13:31 3 **THE COURT:** Please be seated everyone.

13:04 4 Any preliminary matters?

13:18 5 **MR. IRPINO:** Yes, Your Honor. Anthony Irpino for the
13:18 6 PSC.

13:18 7 We have our final list of exhibits and
13:18 8 demonstratives that were used in connection with our
13:18 9 cross-examination of Dr. Beck on April 3. We have sent those
13:19 10 around. Transocean wanted until this afternoon. We haven't
13:19 11 heard any objections from any parties, and so we offer, file,
13:19 12 and introduce those exhibits and demonstratives into the
13:19 13 record.

13:19 14 **MR. BRIAN:** I'm sorry, Your Honor. I still need
13:19 15 until this afternoon. I just sent an e-mail out to get an
13:19 16 answer, and I haven't gotten an answer yet. But I promise we
13:19 17 will have it by the break.

13:19 18 **THE COURT:** All right. Try again, Mr. Irpino.

13:19 19 **MR. IRPINO:** In lieu of the "Women's Final Four,"
13:19 20 it's a 20-second timeout, and then --

13:19 21 (Discussion off the record.)

13:19 22 **MR. BREIT:** No list, Judge. Jeffrey Breit for the
13:19 23 PSC.

13:19 24 This morning, when Mr. Brock was going through
13:19 25 his witness list, he listed as one of their witnesses Brent

1 Lirette, and he listed Brent Lirette as both a factual and an
2 expert witness. The PSC, together with the United States, are
3 asking the Court to limit his testimony just to his factual
4 testimony, not expert. He was a Weatherford expert. BP asked
5 to put him on their factual witness list, which Judge Shushan
6 approved.

7 The Court might remember, with Calvert, who was
8 the Weatherford expert who testified in this case as an expert,
9 BP and the PSC had made a motion to add him as an expert on
10 both of our witness lists, which was approved. There has not
11 been a motion made to add Lirette as an expert. There are a
12 number of comments and court orders, if the Court wishes me to
13 go through them and give you the docket numbers, but Mr. Langan
14 was the first one to say he would like --

15 **THE COURT:** Let me hear from Mr. Brock on that.

16 **MR. BROCK:** We agree with that.

17 **MR. BREIT:** I didn't want you to read the report.

18 **THE COURT:** It was your passionate argument,
19 Mr. Breit.

20 **MR. GODWIN:** At least he is not focusing on me,
21 Your Honor.

22 **THE COURT:** Right.

23 All right. Mr. Roy, we are back.

24 **MR. ROY:** Thank you, Your Honor.
25

13 : 2 1 1 **ADAM BOURGOYNE,**
13 : 2 1 2 having been duly sworn, testified as follows:

13 : 2 1 3 **CROSS-EXAMINATION**

13 : 2 1 4 **BY MR. ROY:**

13 : 2 1 5 **Q.** Dr. Bourgoyne, I'm Jim Roy, representing the Plaintiffs'
13 : 2 1 6 Steering Committee. I have you under what's called
13 : 2 1 7 cross-examination.

13 : 2 1 8 **A.** Yes, sir.

13 : 2 1 9 **Q.** You know that, though, don't you?

13 : 2 1 10 **A.** I do.

13 : 2 1 11 **Q.** All right. Dr. Bourgoyne, would you agree that the two
13 : 2 1 12 basic phases of a successful oil or gas well are drilling and
13 : 2 1 13 completion?

13 : 2 1 14 **A.** Those are two of them, yes.

13 : 2 1 15 **Q.** Well, if it's successful, it's at least drilling and at
13 : 2 1 16 least completion, right?

13 : 2 1 17 **A.** Well, I said successfully drilled.

13 : 2 1 18 **Q.** If it's successfully drilled, the next step is completion,
13 : 2 1 19 right?

13 : 2 1 20 **A.** That would be the next step.

13 : 2 1 21 **Q.** Fair enough. Now, in the case of the *Deepwater Horizon*
13 : 2 2 22 and the Macondo well, the drilling phase was being finished
13 : 2 2 23 with the temporary abandonment procedure being done on
13 : 2 2 24 April 20. That's right, isn't it?

13 : 2 2 25 **A.** I envisioned the drilling phase being finished when they

ADAM BOURGOYNE - CROSS

13 : 2 2 1 got the cement in place on the bottom.

13 : 2 2 2 Q. So do you believe --

13 : 2 2 3 A. And then they moved into the temporary abandonment
13 : 2 2 4 procedure after that.

13 : 2 2 5 Q. That's not part of the drilling, not part of completion,
13 : 2 2 6 in your book?

13 : 2 2 7 A. It's part of temporary abandonment.

13 : 2 2 8 Q. Fair enough. In your book it's not part of drilling?

13 : 2 2 9 A. That's right.

13 : 2 2 10 Q. Would you agree the well operator, that's BP, has overall
13 : 2 2 11 responsibility for drilling, completion, production, and
13 : 2 2 12 reservoir management?

13 : 2 2 13 A. Yes, sir, I think they have overall responsibility. If
13 : 2 3 14 they are the ones with the lease, they are the operator.

13 : 2 3 15 Q. Is it your opinion the well operator, BP, has overall
13 : 2 3 16 responsibility for drilling, completion, production, and
13 : 2 3 17 reservoir management?

13 : 2 3 18 Don't you say that in your report?

13 : 2 3 19 A. Yes.

13 : 2 3 20 Q. The operator, BP, does transfer some of those
13 : 2 3 21 responsibilities, but BP is going to maintain overall
13 : 2 3 22 management and monitoring. That's true, isn't it?

13 : 2 3 23 A. That's true.

13 : 2 3 24 Q. On April 20 of 2010, the Macondo well was still on a
13 : 2 3 25 cost-per-day basis, correct?

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13:23 1 A. I didn't look at that.

13:23 2 Q. You don't know one way or another?

13:23 3 A. I suspect it was. Generally these rigs are always on a
13:23 4 cost-per-day basis.

13:23 5 Q. Are you assuming it was?

13:23 6 A. I just don't know.

13:23 7 Q. If, in fact, it was on a cost-per-day basis on April 20,
13:24 8 all right, then would you agree, as such, final authority rests
13:24 9 with the well operator, BP?

13:24 10 A. Yeah, I think that's right.

13:24 11 Q. You have written to that effect in your textbook, haven't
13:24 12 you?

13:24 13 A. I don't recall that.

13:24 14 MR. ROY: Pull up TREN-41559.10, please.

13:24 15 BY MR. ROY:

13:24 16 Q. Read the sentence that's highlighted. This is from
13:24 17 *Applied Drilling Engineering*, by you, SPE textbook -- I believe
13:24 18 it was shown to us by Mr. Brock during your direct -- 1984
13:24 19 edition entitled *Rotary Drilling Process*?

13:24 20 MR. BROCK: What page, please?

13:24 21 MR. ROY: Page 10, I believe, on the pdf.

13:24 22 BY MR. ROY:

13:24 23 Q. Would you read the highlighted sentence.

13:24 24 A. "Final authority rests either with the drilling contractor
13:25 25 when the rig is drilling on a cost-per-foot basis or with the

ADAM BOURGOYNE - CROSS

13 : 2 5 1 well operator when the rig is drilling on a cost-per-day
13 : 2 5 2 basis."

13 : 2 5 3 So I guess I put it in my book. I'm sorry. That
13 : 2 5 4 book was written a long time ago.

13 : 2 5 5 Q. I know, but that was a true statement then, and it's still
13 : 2 5 6 your opinion, right?

13 : 2 5 7 A. Yeah, uh-huh.

13 : 2 5 8 Q. So stated differently, assuming this well, the Macondo,
13 : 2 5 9 was being paid -- was on a cost-per-day basis, then by your
13 : 2 5 10 academic expertise and whatnot, final authority rests with BP,
13 : 2 5 11 right?

13 : 2 5 12 A. Yes. What --

13 : 2 5 13 Q. Let's move on. I'm sorry. I didn't mean to cut you off.

13 : 2 5 14 A. Final authority rests with BP.

13 : 2 5 15 But there are avenues, if Transocean disagrees, that
13 : 2 5 16 they can always stop work and take it up at a higher level.
13 : 2 5 17 Anybody can call for a stop work if they are getting into some
13 : 2 6 18 kind of situation. BP can't force anybody to do something
13 : 2 6 19 that's unsafe in the modern oil field.

13 : 2 6 20 Q. Final authority on what to do with the well rested with
13 : 2 6 21 BP, yes or no?

13 : 2 6 22 A. BP is --

13 : 2 6 23 Q. Yes or no, sir; then you can explain.

13 : 2 6 24 A. I guess I don't know. I guess that's kind of a legal
13 : 2 6 25 question.

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13:26 1 Q. Fair enough.

13:26 2 BP clearly had overall management responsibility on
13:26 3 the rig. Would you agree with that?

13:26 4 A. Yes, I would.

13:26 5 Q. BP had the final decision on the results of the negative
13:26 6 pressure test, although you believe TO then should concur or
13:26 7 not. That's true, isn't it?

13:26 8 A. I think, to go forward, they both have to agree.

13:26 9 Because this is such a critical safety issue that --
13:26 10 again, this is where stop work would come into play. If
13:26 11 anybody thought they needed to stop work, there's provisions
13:26 12 that all they have to do is say, "I think we need to stop."

13:27 13 Q. Thank you, sir.

13:27 14 MR. ROY: Pull up TREN-22657.121, please.

13:27 15 BY MR. ROY:

13:27 16 Q. This is your deposition, Volume 1, at page 122, lines 13
13:27 17 to 21.

13:27 18 MR. ROY: Let's go to line 13. Are we on the same
13:27 19 place? Not quite. 122.

13:27 20 121 in the pdf.

13:27 21 THE COURT: There are two numbers on that page,
13:27 22 Mr. Roy, 120 at the top and 121 at the bottom.

13:27 23 MR. ROY: Believe me, Your Honor, it has been
13:27 24 perplexing from the get-go because of that. I might add this
13:27 25 is not the first discussion we have had on this matter either.

ADAM BOURGOYNE - CROSS

13:28 1 THE COURT: In any event, neither one of those are
13:28 2 the page you asked for. You asked for page 122, as I recall.

13:28 3 MR. ROY: That's exactly right.

13:28 4 Now, that is the correct page. That's the
13:28 5 correct page, 122. TREN-22657.122.

13:28 6 BY MR. ROY:

13:28 7 Q. Do you see the question that was asked you in your
13:28 8 deposition:

13:28 9 "QUESTION: Now, with regard to the interpretation of
13:28 10 the negative test, who makes the final decision on whether
13:28 11 the negative test passes or fails?"

13:28 12 Do you see your answer at line 19? Read your answer
13:28 13 for the judge, please.

13:28 14 A. (Reading):

13:28 15 "ANSWER: I think BP makes the first final decision,
13:28 16 and then I think Transocean has to concur" --

13:28 17 Q. That was a true statement then, right?

13:28 18 A. Yes.

13:28 19 Q. Is it a true statement today?

13:28 20 A. Yes.

13:28 21 MR. BROCK: Your Honor, that's not the end of that
13:28 22 answer. We would just ask that the rest be put up so it can be
13:28 23 seen by the witness.

13:29 24 THE COURT: Where is the rest?

13:29 25 MR. BROCK: Line 24.

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13:29 1 MR. ROY: Go ahead, Carl, pull it up.

13:29 2 THE WITNESS: ". . . has to concur that it's safe to
13:29 3 go ahead."

13:29 4 BY MR. ROY:

13:29 5 Q. BP makes the first final decision.

13:29 6 Those are your words. Yes or no?

13:29 7 A. They are the ones that make the call, but BP -- but
13:29 8 Transocean has to concur that it's the correct call in a matter
13:29 9 like this.

13:29 10 Q. I understand.

13:29 11 THE COURT: Let me ask. I'm confused by "a first
13:29 12 final decision." It seems like if it's the first decision you
13:29 13 are suggesting, it's not final, but if it's a final decision,
13:29 14 it's final. I'm trying to understand when you use the phrase
13:29 15 "first final decision."

13:29 16 THE WITNESS: Maybe I should leave the word "final"
13:29 17 out. They make the first decision to go ahead, but Transocean
13:29 18 would have to concur.

13:30 19 I don't think that we can -- I don't think that
13:30 20 anybody can go ahead if they think there's something unsafe. I
13:30 21 think that everyone has the responsibility of safety. And if
13:30 22 they think something is going to be done that's unsafe, they
13:30 23 need to stop work and get the supervisors involved; go up the
13:30 24 chain of command of Transocean, go up the chain of command of
13:30 25 BP, get it resolved. Stop work until you get it resolved.

ADAM BOURGOYNE - CROSS

13:30 1 THE COURT: I'm assuming someone would ultimately
13:30 2 have to make the final decision if there's some disagreement at
13:30 3 some level. How would that work?

13:30 4 THE WITNESS: Well, the final decision might be
13:30 5 Transocean that says, "Well, we are getting our rig off of this
13:30 6 thing. We are not going to do that."

13:30 7 Or, you know, if it's that serious that -- on
13:30 8 something of safety like this, that I think both BP and
13:30 9 Transocean has to concur before they go forward.

13:31 10 MR. ROY: May I proceed, Your Honor?

13:31 11 THE COURT: Go ahead.

13:31 12 MR. ROY: Thank you.

13:31 13 BY MR. ROY:

13:31 14 Q. Is it your understanding that that was industry practice,
13:31 15 industry standard on April 20?

13:31 16 A. What was?

13:31 17 Q. What you just described to the judge.

13:31 18 A. Yes.

13:31 19 Q. Now, it's your opinion that BP was absolutely free to
13:31 20 disregard the recommendations of its contractors. That's
13:31 21 absolutely true, isn't it?

13:31 22 A. Absolutely free to disregard the recommendations of its
13:31 23 contractors? I don't understand the question.

13:31 24 Q. Do you remember being asked the question in your
13:31 25 deposition:

ADAM BOURGOYNE - CROSS

13:31 1 "QUESTION: But BP is free to disregard the
13:31 2 recommendations of its contractors, right?"
13:31 3 Do you remember that?
13:31 4 MR. ROY: Let's pull it up, Carl. TREX-22657,
13:31 5 hopefully .185.
13:31 6 THE WITNESS: If it's a recommendation, I would think
13:31 7 I answered it yes.
13:31 8 MR. ROY: Show him the whole page, Carl, first.
13:32 9 BY MR. ROY:
13:32 10 Q. The question -- take a second to read. Can you see it?
13:32 11 A. Yes.
13:32 12 Q. Tell me when you are ready for me to ask the question.
13:32 13 A. Okay. Can I see the next page, too, what comes after the
13:32 14 "but."
13:32 15 Q. You want to see what?
13:32 16 MR. ROY: Pull up line 13. Well, let him finish.
13:32 17 THE WITNESS: Okay. I think I'm ready.
13:32 18 BY MR. ROY:
13:32 19 Q. Are we ready to proceed now, Dr. Bourgoyne?
13:32 20 A. Yes.
13:32 21 Q. Go back to the original page there. Line 13, do you see
13:33 22 the question:
13:33 23 "QUESTION: But BP is free to disregard the
13:33 24 recommendations of its contractors, right?"
13:33 25 Was that the question asked you?

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13:33 1 A. Yes.

13:33 2 Q. Do you see your answer? Line 17?

13:33 3 A. Yes. I say:

13:33 4 "ANSWER: Absolutely."

13:33 5 Q. Was that true?

13:33 6 A. Sure.

13:33 7 Q. Is it true today?

13:33 8 A. Yes.

13:33 9 Q. How do you reconcile that statement with what you just
13:33 10 told the judge?

13:33 11 A. Well, if it's a recommendation, it's a recommendation.

13:33 12 Q. That's your reconciliation of that exchange and your
13:33 13 belief that BP has the absolute right to disregard its
13:33 14 contractors. That's how you reconcile it with what you told
13:33 15 the judge a moment ago?

13:33 16 A. Well, they can't reconcile -- not on matters of safety. I
13:33 17 think that's all agreed in the contracts that they operate
13:33 18 under, that no one is forced to go ahead with an unsafe
13:33 19 operation.

13:33 20 But not running centralizers up above the pay sand,
13:34 21 to me, that has nothing to do with what we are talking about.
13:34 22 That's not a safety issue.

13:34 23 Q. I'm going to move on on this after asking this.

13:34 24 Bottom line is it's your opinion, for example, that
13:34 25 BP was free to disregard the recommendation from Halliburton on

ADAM BOURGOYNE - CROSS

13:34 1 how many centralizers to use, right?

13:34 2 A. That was a recommendation. It had to do with the cement
13:34 3 job. It did not have to do with the safety of the operation.

13:34 4 Q. The answer is: They were free to disregard that, correct?

13:34 5 A. Yes, it was, uh-huh. They were.

13:34 6 Q. BP was also free to disregard everything, true?

13:34 7 A. If it didn't involve safety, then they would be. But I
13:34 8 think if it was a safety-critical defect and somebody says, "I
13:34 9 want to exercise the stop work authority," then I think BP is
13:34 10 obligated to honor that under the working arrangements that
13:34 11 people have in today's oil field.

13:35 12 Q. BP was free, in your opinion, as the operator to disregard
13:35 13 Halliburton's "severe gas flow potential" report prior to
13:35 14 pumping the cement job, correct?

13:35 15 A. I think so. You know, I --

13:35 16 Q. Is that a yes?

13:35 17 A. That's a yes.

13:35 18 The gas flow potential calculation is a calculation.
13:35 19 It's a recommendation. I think they followed the
13:35 20 recommendation to use foam cement, and that's the purpose of
13:35 21 the gas flow potential calculation is to -- do you need the
13:35 22 special cement to reduce the gas flow potential? And they went
13:35 23 with that recommendation.

13:35 24 Q. It's your opinion the rig crew does not have to be told
13:35 25 how to run a negative pressure test?

ADAM BOURGOYNE - CROSS

13:35 1 A. That's correct.

13:35 2 Q. It's your opinion this should be a routine operation that
13:35 3 fits within their training, correct?

13:35 4 A. That's correct.

13:35 5 Q. The negative pressure test, by your own admission, is a
13:36 6 safety-critical test, right?

13:36 7 A. It is.

13:36 8 Q. No doubt about that?

13:36 9 A. No doubt about it. That's why everybody pays so much
13:36 10 attention to it.

13:36 11 Q. If you botch it, you can have a blowout; rigs can catch
13:36 12 fire; rigs can blow up. Yes?

13:36 13 A. Yes. Assuming there's some additional mistakes made along
13:36 14 the way, but that's one of the mistakes that, by itself, won't
13:36 15 cause that, but, you know, it could be a contributing --
13:36 16 without that, you wouldn't have the blowout. You know, it's a
13:36 17 proximate cause, I think is the word y'all use.

13:36 18 Q. "Proximate cause" isn't an engineering term, is it?

13:36 19 A. No, but it's been explained to me what it is.

13:36 20 Q. If the crew had not proceeded after the unsuccessful
13:36 21 negative pressure test, it's your opinion that it's unlikely
13:36 22 that the blowout would have occurred, correct?

13:36 23 A. Correct.

13:36 24 Q. If the blowout hadn't occurred, the explosion and fire
13:36 25 wouldn't have occurred, right?

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13:36 1 A. That's correct. If the kick had been caught after the
13:37 2 negative test was failed, then the blowout wouldn't have
13:37 3 occurred. And if the blowout preventers had worked after the
13:37 4 crew didn't catch the kick, then there's a good chance there
13:37 5 wouldn't have been a problem. And if the flow had been
13:37 6 diverted instead of sent into the mud-gas separator, there may
13:37 7 not have been -- there probably would not have been an
13:37 8 explosion and fire.

13:37 9 So, I mean, there's a lot of contributing causes to
13:37 10 this disaster.

13:37 11 Q. Are you through?

13:37 12 A. Yes.

13:37 13 Q. The most common way in the industry to conduct a negative
13:37 14 pressure test is to pump water down to a certain depth, stop
13:37 15 the pumps, make sure there's no pressure in either the drill
13:37 16 pipe or the annulus, and make sure there's no flow from the
13:37 17 drill pipe or the annulus, true?

13:37 18 I've tried to read that out of your report. I'll
13:37 19 bring up the report if you need it.

13:38 20 A. Yeah, that's generally true. You know, you may have to
13:38 21 have a downhole packer or something to --

13:38 22 Q. I don't want to spend a lot of time on this. I just want
13:38 23 to point out you spend 16 lines in TREG-8173.51 to 52
13:38 24 describing what you believe to be the most common way for a
13:38 25 negative pressure test to be properly done, right?

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13:38 1 A. It's generally done on the drill pipe because, you know,
13:38 2 the purpose of the negative test is usually to cut the mud
13:38 3 weight back and you want to check something at a deeper depth.

13:38 4 Q. My question is real simple. You spend a good bit of
13:38 5 time -- almost a half page in your report -- describing what
13:38 6 the most common way to conduct a negative pressure test is,
13:38 7 don't you?

13:38 8 A. I guess I spend several lines talking about it.

13:38 9 Q. I apologize for taking the time.

13:38 10 TREX-8173.51. Read what's up there, please. All of
13:39 11 it, not just the yellow. This is from your report.

13:39 12 A. Yes.

13:39 13 "I know of no industry standard regarding negative
13:39 14 pressure tests. The most common way to conduct a negative
13:39 15 pressure test is to pump water down the drill pipe to a depth
13:39 16 sufficient to cause the desired reduction in well hydrostatic
13:39 17 pressure. To do this, the needed depth and volume required to
13:39 18 fill the drill pipe to that depth is first calculated. The rig
13:39 19 crew then pumps the calculated water volume down the drill
13:39 20 pipe.

13:39 21 "When pumping is stopped, the surface drill pipe
13:39 22 pressure will be equal to the desired reduction in hydrostatic
13:39 23 pressure. The blowout preventers are then closed and the
13:39 24 surface drill pipe pressure is bled down to zero while the
13:39 25 volume of water bled back is measured. When the drill pipe

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13:39 1 pressure reaches zero, the volume bled back should be the
13:39 2 expansion volume of the fluids in the well corresponding to the
13:40 3 pressure decrease. The system is left static for the duration
13:40 4 of the test. For a 30-minute negative test, this period would
13:40 5 be 30 minutes.

13:40 6 "If no fluid flows from the drill pipe, the negative
13:40 7 test is passed and reported as good. If the drill pipe
13:40 8 pressure cannot be bled to zero or bleeds down and then
13:40 9 increases or water continues to flow from the drill pipe, the
13:40 10 negative test is said to have failed."

13:40 11 Where I've used the word "blowout preventers," in
13:40 12 many cases, it's going to be a downhole --

13:40 13 Q. Can you finish reading before you explain. There are
13:40 14 three more lines, I think.

13:40 15 A. "As shown in Figure 21 and as will be discussed in more
13:40 16 detail later in this report, the system is easily understood
13:40 17 using U-tube analogy with the drill pipe being the high
13:40 18 pressure side of the U-tube and the annulus being the low
13:40 19 pressure side of the U-tube."

13:40 20 Q. Do you agree, sir, that these are your words describing
13:41 21 the most common way to conduct a negative pressure test, in
13:41 22 your opinion?

13:41 23 A. Yes.

13:41 24 Q. Now, when you say the "most common way," do you mean the
13:41 25 most common way in the oil and gas industry?

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13:41 1 A. I meant it in general, in all situations, not just testing
13:41 2 for temporary abandonment in a subsea well, but doing negative
13:41 3 pressure tests in a well for any reason that you are going to
13:41 4 be cutting the mud weight back.

13:41 5 Q. That's not my question. Did you mean the most common way
13:41 6 to conduct a negative pressure test in the oil and gas
13:41 7 industry?

13:41 8 A. Not qualified with respect to temporary abandonment
13:41 9 operations on subsea vessels? Are you saying just in general?
13:41 10 I mean, that's the way --

13:41 11 Q. I don't see a qualification here by you. You say
13:41 12 "negative pressure test" and "the most common way."

13:42 13 All I want to know is: Most common way where? In
13:42 14 what industry? That's all I want to know.

13:42 15 A. In the oil industry. In the oil and gas drilling and
13:42 16 producing industry.

13:42 17 Q. Fair enough.

13:42 18 A. In wells.

13:42 19 Q. Among oil companies and the drilling contractors in the
13:42 20 Gulf that drill the wells, right?

13:42 21 A. Well, the most common way -- not just talking about the
13:42 22 Gulf but just talking about drilling in general.

13:42 23 Q. The world?

13:42 24 A. The world.

13:42 25 Q. The point is: It's the oil companies and their

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13 : 42 1 contractors who own and operate the vessels, right?

13 : 42 2 A. Not only vessels. Land rigs, we're talking -- you said
13 : 42 3 "general" and I meant "general." There's no industry standards
13 : 42 4 that --

13 : 42 5 Q. Oil and gas companies and the contractors that drill the
13 : 42 6 wells, wherever they may be, however they may do it, that's the
13 : 42 7 industry that you believe you're talking about here, right?

13 : 42 8 A. I didn't say it was the most common way for every
13 : 43 9 subcategory. I just said, in general, it's the most common way
13 : 43 10 that you do it. That's all I said.

13 : 43 11 Q. I know, but you did say "the most common way to conduct a
13 : 43 12 negative pressure test," and we had you read your own words
13 : 43 13 from your report.

13 : 43 14 All I want to know is -- it's a simple question.
13 : 43 15 This is the most common way in your opinion done within the oil
13 : 43 16 and gas industry?

13 : 43 17 A. Including all categories of negative tests and all
13 : 43 18 conditions.

13 : 43 19 Q. That's true, isn't it?

13 : 43 20 A. It is.

13 : 43 21 Q. Thank you. Let's move on.

13 : 43 22 In order to have a successful negative pressure test
13 : 43 23 while monitoring the drill pipe at the kill line, the pressures
13 : 43 24 in both those respective pipes should have been zero. Yes or
13 : 43 25 no?

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13 : 43 1 A. Yes.

13 : 43 2 Q. And you can't have flow-out of either side, correct?

13 : 43 3 A. And have a successful test, that's correct.

13 : 43 4 Q. That's correct, isn't it?

13 : 43 5 A. Yes.

13 : 43 6 Q. You agree with that?

13 : 43 7 A. I agree with that.

13 : 43 8 Q. To be a successful negative pressure test, you have to not
13 : 44 9 have flow and not have pressure, right?

13 : 44 10 A. That's correct.

13 : 44 11 Q. If you have either of them, the negative pressure test is
13 : 44 12 a failure, right?

13 : 44 13 A. That's correct.

13 : 44 14 Q. That's black and white?

13 : 44 15 A. I mean, there could be other reasons that would have to be
13 : 44 16 investigated; but if you're lined up properly and that's what
13 : 44 17 you see, then it's a failed test.

13 : 44 18 Q. No ambiguity there?

13 : 44 19 A. No ambiguity.

13 : 44 20 Q. A moron ought to know that?

13 : 44 21 A. (No audible response.)

13 : 44 22 Q. No comment?

13 : 44 23 A. No comment.

13 : 44 24 Q. On April 20, 2010, these fundamental negative pressure
13 : 44 25 test principles should have been understood and applied by any

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13:44 1 competent drill crew. Yes or no?

13:44 2 A. It should have been applied. It was a mistake not to do
13:44 3 it. But I do think the drill crew was generally competent.
13:44 4 Why they messed up on this, I don't --

13:44 5 MR. ROY: Your Honor, I object to the responsiveness.
13:44 6 I don't mind him explaining it, but I would ask that he please
13:45 7 be instructed to answer the question first.

13:45 8 THE COURT: If you can, try to answer his question;
13:45 9 and if you need to explain something, you can.

13:45 10 BY MR. ROY:

13:45 11 Q. I'll repeat the question for you, sir.

13:45 12 On April 20, 2010, these fundamental negative
13:45 13 pressure test principles we discussed a few moments ago should
13:45 14 have been understood and applied by any competent drill crew.
13:45 15 Yes or no?

13:45 16 A. Yes, it should have been. They should have been able to.

13:45 17 Q. Fair enough.

13:45 18 Now, do you want to explain your answer? I don't
13:45 19 want to stand on any interruption there.

13:45 20 A. I think in general this crew was competent, had the
13:45 21 appropriate training. Why they made this mistake, I find
13:45 22 very -- you can't explain it. It's --

13:45 23 Q. But you would expect a competent drill crew to have held
13:45 24 up the red flag and said, "We are not going further. This is a
13:45 25 failed test"?

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13 : 45 1 A. That's what I would have expected.

13 : 45 2 Q. Okay.

13 : 45 3 A. And I think this crew was trying to get to the right
13 : 45 4 answer. They were all working together. I think they suffered
13 : 46 5 maybe a little bit from "group think," that somebody suggested
13 : 46 6 something and they had enough confidence in one another that
13 : 46 7 they talked it through and then they all wound up being
13 : 46 8 convinced.

13 : 46 9 Q. But you are speculating. You weren't there, right?

13 : 46 10 A. I was not there.

13 : 46 11 Q. You are speculating, aren't you?

13 : 46 12 A. That's the impression that I got from reading all the
13 : 46 13 records.

13 : 46 14 Q. Okay. Fair enough.

13 : 46 15 No. 2, on April 20, 2010, these fundamental negative
13 : 46 16 pressure test principles that we discussed should have been
13 : 46 17 understood and applied by any competent petroleum engineer.
13 : 46 18 Yes or no?

13 : 46 19 A. Yes, that's right.

13 : 46 20 Q. On April 20, 2010, these fundamental negative pressure
13 : 46 21 test principles should have been understood and applied by any
13 : 46 22 minimally competent company man or well site leader. Yes or
13 : 46 23 no?

13 : 46 24 A. I think that's right. It should have been.

13 : 46 25 Q. The misinterpretation of the negative pressure tests is

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13 : 47 1 extremely hard for you to understand, right?

13 : 47 2 A. Right. I think I said so in my report.

13 : 47 3 Q. The decision by BP and Transocean to proceed with the
13 : 47 4 displacement after the failed negative pressure test was not
13 : 47 5 safe, was it?

13 : 47 6 A. No.

13 : 47 7 Q. Proceeding after the failed negative pressure test was not
13 : 47 8 in accord with industry practice, was it?

13 : 47 9 A. It was not.

13 : 47 10 Q. It's extremely hard for you to understand because the most
13 : 47 11 common way of interpreting the negative pressure test in the
13 : 47 12 industry requires that the test should have been deemed a
13 : 47 13 failure for the reasons you described, right?

13 : 47 14 A. That's correct.

13 : 47 15 Q. Therefore, Transocean and BP's people on the vessel on
13 : 47 16 April 20 disregarded industry practice for interpreting the
13 : 48 17 negative pressure test in proceeding ahead with the
13 : 48 18 displacement. Yes or no?

13 : 48 19 A. I don't think they did it intentionally --

13 : 48 20 Q. That's not my question, sir.

13 : 48 21 A. -- but that was the outcome, yes.

13 : 48 22 Q. Use of the lost circulation material spacer during the
13 : 48 23 temporary abandonment likely resulted, in your opinion, in
13 : 48 24 fluids being displaced in a manner that the rig crew did not
13 : 48 25 fully understand. You believe that, don't you?

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13:48 1 A. Yes.

13:48 2 Q. In your many years in this industry, you have never heard
13:48 3 of a bladder effect, have you?

13:48 4 A. Not in this context.

13:48 5 Q. There's no such thing, is there?

13:48 6 A. Not in this context. There are lots of bladders on
13:49 7 drilling rigs. There are bladders in pressure gauges. There's
13:49 8 bladders in pulsation dampeners.

13:49 9 Q. In the context of anything in the world to do with a
13:49 10 negative pressure test --

13:49 11 A. I have never heard of it.

13:49 12 Q. In your many years in this industry, have you never,
13:49 13 ever -- have you ever heard of such a thing as the bladder
13:49 14 effect until this incident?

13:49 15 A. I have never heard it applied to a negative test,
13:49 16 especially one where you had bled off fluid. That definitely
13:49 17 makes no sense.

13:49 18 Q. More importantly, in your decades of academic
13:49 19 experience -- learning, teaching, and whatnot -- you have never
13:49 20 seen such a thing, have you?

13:49 21 A. Not in the context that it was used, no.

13:49 22 Q. You have never heard of such a thing either in that
13:49 23 context?

13:49 24 A. I've heard of bladder effects, but I haven't heard of
13:50 25 bladder effects in this regard.

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13:50 1 MR. ROY: Pull up TREN-22657.200.

13:50 2 BY MR. ROY:

13:50 3 Q. I want to be clear.

13:50 4 Let's be sure I have the right page first.

13:50 5 MR. ROY: Line 14 -- highlight line 14 to 19. Excuse
13:50 6 me, 14 to 22. 14 to 22, Carl. There you go.

13:50 7 BY MR. ROY:

13:50 8 Q. The pertinent part of the question:

13:50 9 "QUESTION: In your many years in this industry, have
13:50 10 you never, ever heard of -- you have never heard of such a
13:50 11 thing, have you?"

13:50 12 What's your answer?

13:50 13 A. (Reading:)

13:50 14 "ANSWER: No, I have not.

13:50 15 "QUESTION: There is no such thing, is there?

13:50 16 "ANSWER: There is no such thing."

13:50 17 Then I said, "Well, there is such thing as a
13:50 18 bladder effect but not in this context.

13:50 19 Q. So when we are talking about anything to do with the
13:50 20 negative pressure test, the bladder effect is a fiction in your
13:51 21 mind, in your experience. Yes or no?

13:51 22 A. No. I think there is a bladder effect, but it doesn't
13:51 23 apply to this situation.

13:51 24 Q. As far as a justification that could have or should have
13:51 25 been used by a well site leader or a drill crew to justify the

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13:51 1 negative pressure test on this well on this rig on April 20, it
13:51 2 was not something that should have been considered?

13:51 3 A. That is correct.

13:51 4 Q. Any minimally competent, adequately trained drill crew,
13:51 5 well site leader, petroleum engineer, or pusher should have
13:51 6 known that. Yes or no, sir?

13:51 7 A. They should have known that, that's right.

13:52 8 Q. Now, were you aware that before the blowout occurred, Don
13:52 9 Vidrine was informed by Mark Hafle of BP onshore that the
13:52 10 results of the negative pressure test could not be considered a
13:52 11 successful test?

13:52 12 A. I looked at those notes that were collected, I guess, by
13:52 13 the Bly team right after the accident, when they were trying to
13:52 14 figure out what was going on. And I did see that comment that,
13:52 15 in the discussion and phone call that was made trying to get
13:52 16 information on how the cement plug was to be tested, that they
13:52 17 also talked about the negative test and that information
13:52 18 apparently was conveyed about drill pipe pressures. And then
13:52 19 the engineer told the well site adviser that, "If you are lined
13:53 20 up properly, you can't have pressure on the drill pipe."

13:53 21 **MR. ROY:** Let's pull up the actual TREN-4447.6.

13:53 22 **BY MR. ROY:**

13:53 23 Q. Now, if you want to come back and read this whole thing,
13:53 24 that's fine. In fact, you can read it right now so we can save
13:53 25 time later.

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13:53 1 A. "Later on" --

13:53 2 Q. You don't need to read it out loud. Just take your time
13:53 3 and read. I'm going to bring you into focus on the yellow in a
13:53 4 moment. Tell us when you are ready.

13:53 5 This is the BP incident investigation team of July 8,
13:53 6 2010, notes of interview with Mark Hafle. And we are going to
13:53 7 look in a moment to what I have highlighted, the second
13:53 8 paragraph under "Negative Test Procedures," part of it.

13:54 9 A. You know, these --

13:54 10 Q. Are you ready, sir? I haven't asked a question yet.

13:54 11 A. Yes, sir, I'm ready.

13:54 12 MR. ROY: Take the call-out forward, please, Carl,
13:54 13 the highlighted.

13:54 14 Sorry, Your Honor, we seem technically
13:54 15 challenged this afternoon.

13:54 16 Take the sentence up there then that starts --
13:54 17 fourth line -- there you go. Start with the word -- go to the
13:54 18 line "Mark noted that Don also talked about the negative test."
13:54 19 Start with "Vidrine told" and go down -- that's good enough.
13:54 20 Just highlight that.

13:54 21 THE COURT: Do you want to remove that arrow?

13:54 22 MR. ROY: Yes.

13:54 23 BY MR. ROY:

13:54 24 Q. Now we have got it. Dr. Bourgoyne, do you see the yellow
13:55 25 highlighting from that exhibit, the call-out?

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13:55 1 A. Yes.

13:55 2 Q. Would you read that sentence?

13:55 3 A. "Vidrine told Mark that the crew had zero pressure on the
13:55 4 kill line, but that they still had pressure on the drill pipe.
13:55 5 Mark said he told Don that you can't have pressure on the drill
13:55 6 pipe and zero pressure on the kill line in a test that's
13:55 7 properly lined up."

13:55 8 Q. You agree with that?

13:55 9 A. Yes.

13:55 10 Q. Do you interpret this as Mark telling Don that your
13:55 11 negative pressure test was a failure?

13:55 12 A. I think it speaks for itself. He is telling him you can't
13:55 13 have pressure on the drill pipe and zero pressure on the kill.
13:55 14 I mean, that's what he's telling him.

13:55 15 Q. Do you interpret that, from what you read, to be Mark
13:55 16 telling Don the negative pressure test is a failure as it's
13:55 17 being reported to him?

13:55 18 A. He is reporting that if that's what you saw, then you
13:56 19 can't have a successful test.

13:56 20 Q. That's a failure?

13:56 21 A. That that would be a failure if that's what you saw.

13:56 22 Now, what Don is thinking that, yes, we talked about
13:56 23 this, we considered it, we explained this drill pipe pressure
13:56 24 and everything is okay and we redid the test and it --

13:56 25 Q. You talked to Don?

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13:56 1 A. No. I'm just looking at --

13:56 2 Q. Well, how do you know that's what Don is thinking?

13:56 3 A. How do you know --

13:56 4 Q. I'm just reading you what's here.

13:56 5 All right. Let's move on.

13:56 6 If, in fact -- first of all, I didn't see in your
13:56 7 report consideration of this exchange from TREN-4447. Did you?

13:56 8 A. Did I consider it?

13:56 9 Q. Yes.

13:56 10 A. Yes.

13:56 11 Q. Is it listed in your report?

13:56 12 A. I don't know.

13:56 13 Q. If this exchange is true as reported in TREN-4447.6, then
13:56 14 if Don Vidrine, nevertheless, went forward and allowed the
13:57 15 displacement to proceed, in your opinion, didn't he do so
13:57 16 knowingly that the NPT was a failure?

13:57 17 A. Let me back up.

13:57 18 Q. Yes or no, sir, and then you can explain to your heart's
13:57 19 content.

13:57 20 A. But let me back up.

13:57 21 Q. No, sir. I asked the question. If you can answer it,
13:57 22 tell me.

13:57 23 A. I've lost my train of thought. Ask it again.

13:57 24 Q. Listen to my question.

13:57 25 A. I will.

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13:57 1 Q. If, indeed, Mark Hafle told Don Vidrine what is relayed in
13:57 2 TREN-4447.6 that we just looked at and, nevertheless,
13:57 3 Don Vidrine allowed the displacement to proceed, then he did so
13:57 4 knowingly that the negative pressure test was a failure. Yes
13:57 5 or no?

13:58 6 A. No.

13:58 7 Q. And why is that?

13:58 8 A. Because I think in his mind that he had already considered
13:58 9 that if they had pressure on the drill pipe, it was not a
13:58 10 successful test, but they came up with this bladder effect and
13:58 11 then they convinced each other that it was a valid explanation.
13:58 12 So they said, "Okay, we have an explanation," and he firmly
13:58 13 believed it to the point that when he heard this he said,
13:58 14 "Yeah, we talked about this for two hours and I have got it
13:58 15 explained."

13:58 16 And he told Mark, you know, "Don't worry about it, we
13:58 17 got it figured up. We did another test, and everything is
13:58 18 okay." I think that's the way -- that's the way I read this
13:58 19 conversation here.

13:58 20 Q. So if he was sopping wet and covered with gasoline and
13:58 21 Hafle had told him, "Don't light the match," and he did it
13:58 22 anyway, would you believe that, well, he just rationalized he
13:58 23 was wet and wouldn't catch on fire, or that he knowingly lit
13:59 24 the match? How is it different?

13:59 25 A. I'm sorry. I see a difference.

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13:59 1 Q. Fair enough.

13:59 2 You do agree the rig crew failed to properly monitor
13:59 3 the well and allowed a kick to go unnoticed until it turned
13:59 4 into a blowout, true?

13:59 5 A. Yes.

13:59 6 Q. You agree kick detection was the responsibility of
13:59 7 Transocean's rig crew and Halliburton's Sperry-Sun mud loggers,
13:59 8 correct?

13:59 9 A. I agree.

13:59 10 Q. The failure to shut in the well and investigate, as
13:59 11 opposed to investigating before shutting in, is inconsistent
13:59 12 with well control training and guidance as you have known it to
13:59 13 be prudently applied in the last 40-some-odd years?

13:59 14 A. That's correct.

13:59 15 Q. An adequately trained drill crew should have known that?

14:00 16 A. They should have known.

14:00 17 Q. An adequately trained well site leader should have known
14:00 18 that?

14:00 19 A. Should have.

14:00 20 Q. An adequately trained pusher should have known that?

14:00 21 A. He should have.

14:00 22 Q. Let's talk about diverter systems. You spent a good bit
14:00 23 of time in your career talking about and writing about diverter
14:00 24 systems on offshore rigs, haven't you?

14:00 25 A. I have, that, you know, shallow gas is a big problem in

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14:00 1 the Gulf and diverters are your main line of defense against
14:00 2 shallow gas on bottom-supported vessels.

14:00 3 Q. Diverter systems on offshore rigs are used primarily as a
14:00 4 contingency for handling gas that enters the marine riser in
14:00 5 large volumes and before the blowout preventers located at the
14:00 6 seafloor are closed, correct?

14:00 7 A. That's correct. On the floater, that's the way they are
14:01 8 used.

14:01 9 Q. That's what I'm talking about.

14:01 10 They also support contingency procedures for handling
14:01 11 a failure of the subsea blowout preventers, true?

14:01 12 A. True.

14:01 13 Q. That's you writing in TREG-21829.4.1, "Review of Recent
14:01 14 Diverter Performance during Well Control Emergencies," March 3,
14:01 15 1989.

14:01 16 MR. ROY: Do you want to pull it up, Carl?

14:01 17 BY MR. ROY:

14:01 18 Q. I just want you to verify they are your words. Can you
14:01 19 look up on the screen and see it?

14:01 20 A. Yeah. That's me.

14:01 21 Q. It was true then; it's true now?

14:01 22 A. That's correct.

14:01 23 Q. It was true on April 20, 2010?

14:01 24 A. Yes.

14:01 25 Q. Would you agree that this was a practice of the industry

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14:01 1 known throughout the oil and gas industry, certainly on
14:02 2 April 20, 2010?

14:02 3 A. Yes. This is a topic that I saw covered in the training
14:02 4 material at Transocean.

14:02 5 Q. It was not a standard or a practice through the industry
14:02 6 that was of recent origin?

14:02 7 A. No.

14:02 8 Q. That had been around for decades?

14:02 9 A. Been around for a long time.

14:02 10 Q. At least years?

14:02 11 A. Yeah. More than a decade anyway.

14:02 12 Q. In your report, if I read it correctly, you say
14:02 13 substantially: The diverter was closed, but the flow was not
14:02 14 directed away from the rig at the time of the blowout.

14:02 15 Is that correct?

14:02 16 A. That's correct.

14:02 17 Q. That the system should have been set up for automatic
14:02 18 routing to the overboard lines at an appropriately low
14:03 19 threshold of pressure, correct?

14:03 20 A. Correct.

14:03 21 Q. Emphasis on the word "automatic," correct?

14:03 22 A. Right. Correct.

14:03 23 Q. And emphasis on the phrase "low threshold pressure,"
14:03 24 correct?

14:03 25 A. That's correct. There have been accidents in the past

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14:03 1 because things weren't automatic.

14:03 2 Q. And back prior to 1999, would it be a fair statement that
14:03 3 the technology and equipment necessary to have such automatic
14:03 4 routing of diverter systems was available to the industry?

14:03 5 A. Yes.

14:03 6 Q. Feasible and practical to use?

14:03 7 A. Yes.

14:03 8 Q. Not cost prohibitive?

14:03 9 A. Not cost prohibitive.

14:03 10 Q. Out of curiosity, what would that low threshold of
14:03 11 pressure have been had the *Deepwater Horizon* been equipped with
14:04 12 automatic routing to the diverter? What would you have had the
14:04 13 threshold pressure setting at?

14:04 14 A. A pretty low pressure, you know, like 50 psi maybe.

14:04 15 Q. And explain to the Court what the functionality of that is
14:04 16 in the context of a well control event.

14:04 17 A. Well, really, the way I think it should have been set up,
14:04 18 if you are going into a displacement procedure like this, it
14:04 19 should have been set up so that if you hit the divert button,
14:04 20 you were already lined up to go overboard.

14:04 21 Q. I'm coming to that. I promise, I won't leave that out. I
14:04 22 just want to talk about the automatic part right now.

14:04 23 A. Okay.

14:04 24 Q. Could you tell the Court about how the automatic would
14:04 25 have worked on this evening.

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14:04 1 A. Well, if the separator pressure went up and overwhelmed
14:04 2 the ability of the separator's capacity, then it would
14:04 3 automatically have rerouted it to the overboard diverter lines
14:04 4 is the way it would have worked. So, essentially, almost
14:05 5 immediately it would have gone overboard.

14:05 6 Q. You take the human factor, the mistake factor out of it?

14:05 7 A. Right.

14:05 8 Q. The purpose of routing it through the diverter is to get
14:05 9 the gas overboard and away from ignition sources and personnel
14:05 10 and equipment, correct?

14:05 11 A. Well, get it away from the people and the equipment,
14:05 12 that's right.

14:05 13 Q. It's a safety thing, right?

14:05 14 A. Absolutely, yeah.

14:05 15 Q. Now, you would have expected that the diverter would have
14:05 16 been lined up to go overboard before starting displacement on
14:05 17 April 20, 2010, correct?

14:05 18 A. That's correct.

14:05 19 Q. Your best information and understanding is it was not,
14:05 20 correct?

14:05 21 A. You know, I don't know how it was lined up, but they
14:05 22 diverted to the mud-gas separators, so it probably was lined up
14:05 23 that way, or they chose to line it up that way when they
14:05 24 diverted, one or the other.

14:05 25 Q. Regardless, it was not, in your opinion, lined up to

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14:06 1 divert overboard?

14:06 2 A. That's correct.

14:06 3 Q. You believe from what you reviewed, that it was recognized
14:06 4 that the marine riser could unload quickly when gas begins
14:06 5 breaking out of the solution, correct?

14:06 6 A. That's correct.

14:06 7 Q. When you say "it was recognized," it was recognized by
14:06 8 Transocean from what you read?

14:06 9 A. Yes. It was in their training material.

14:06 10 Q. Was it recognized by BP?

14:06 11 A. Certainly it was recognized by BP.

14:06 12 Q. And, specifically, one of the references that you made is
14:06 13 to TREN-2188, page 10 and 199, the Transocean major accident
14:06 14 hazard risk assessment, correct?

14:06 15 A. I think that's probably correct. I'm having trouble
14:06 16 remembering that exact --

14:06 17 MR. ROY: Pull it up, please, Carl.

14:07 18 BY MR. ROY:

14:07 19 Q. Can you read that, Dr. Bourgoyne?

14:07 20 A. It's pretty fuzzy. There you go.

14:07 21 Q. This is the document I'm referring to. You referred to
14:07 22 this in your report, didn't you?

14:07 23 A. Yes, Uh-huh.

14:07 24 Q. One of the things you looked at and relied upon in
14:07 25 reaching the opinion that it was recognized that the marine

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1 riser could unload quickly when gas begins breaking out of
2 solution, right?

3 A. Right.

4 Q. That should not have been a surprise to anybody on or off
5 the *Deepwater Horizon* on April 20, 2010, right?

6 A. That's correct.

7 Q. A primary function of the --

8 MR. ROY: You can take it down, Carl. Thank you.

9 BY MR. ROY:

10 Q. A primary function of the diverter is to allow time,
11 before fire or explosion, for the rig crew to implement a rig
12 abandonment procedure in an orderly manner. That's true, isn't
13 it?

14 A. That's true. The idea is that once you get going through
15 the diverter, you know, the diverter may not last forever, but
16 you have got time to -- on a floater, to get disconnected and
17 get away from the well.

18 Q. Are you through?

19 A. Yes.

20 MR. ROY: Let's pull up TREX-8173.68. That's your
21 report, the top of page 68.

22 BY MR. ROY:

23 Q. All right. We have got a call-out. Will you read what is
24 shown up there starting with the highlighted portion continuing
25 to the end of the paragraph?

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- 14:08 1 A. It says: "The training material that I reviewed was
14:08 2 appropriate and of a high quality. What may have been lacking
14:08 3 were adequate emergency drills simulating high flow rate
14:08 4 conditions."
- 14:08 5 Q. Read to the end of that paragraph.
- 14:08 6 A. "Training intensity for dangerous but very rare events is
14:09 7 always hard to maintain. When an event does happen, the
14:09 8 response has to be automatic. There might not be time to think
14:09 9 about it."
- 14:09 10 Q. That's straight from your report, right?
- 14:09 11 A. Yes.
- 14:09 12 Q. And that's your opinion, right?
- 14:09 13 A. That's my opinion.
- 14:09 14 Q. It's also your opinion, if I understood the direct
14:09 15 examination of you, that Transocean failed to detect the kick
14:09 16 early enough. Is that right?
- 14:09 17 A. That's correct.
- 14:09 18 Q. And that you believe they could have and should have
14:09 19 detected it once it reached the 30-barrel range. Is that true?
- 14:09 20 A. Yeah. I would say certainly under 100 barrels, it should
14:09 21 have been caught.
- 14:10 22 Q. In the 30-to-100-barrel range?
- 14:10 23 A. Uh-huh.
- 14:10 24 Q. Right?
- 14:10 25 A. Right.

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14:10 1 Q. Certainly, then, is it fair to conclude that it would also
14:10 2 be your opinion that the *Deepwater Horizon* rig operator did not
14:10 3 maintain adequate training for these dangerous but very rare
14:10 4 events if, in fact, the crew did not react quickly enough to do
14:10 5 what it should have done?

14:10 6 A. Well, I think the equipment is the Transocean
14:10 7 responsibility.

14:10 8 Q. That's what I'm speaking of. When I use the word
14:10 9 "operator," I mean rig operator, Transocean.

14:10 10 A. When I think of operator, I think lease operator.

14:10 11 Q. Do you want me to try it again? Let me try it again.

14:10 12 A. Okay.

14:10 13 Q. I'll simplify it.

14:10 14 Is it fair to conclude from this that you believe the
14:10 15 *Deepwater Horizon's* owner/operator, Transocean, did not
14:11 16 maintain adequate training of its crew for these dangerous but
14:11 17 very rare events because if they had, this would have gotten
14:11 18 caught?

14:11 19 A. You know, I guess that's what the situation indicates.

14:11 20 Q. I'm asking is that your professional opinion of what the
14:11 21 situation indicates?

14:11 22 A. Yes, it is.

14:11 23 Q. Thank you, sir.

14:11 24 And the same would be true that Transocean did not
14:11 25 maintain adequate training of its crew to quickly shut in the

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1 well when it was supposed to have and in time to have saved
2 that rig and the people on it, true?

3 A. Well, I mean, they didn't get it done. So it implies that
4 they either were not trained or were disregarding their
5 training. I mean, that's the only two possibilities.

6 Q. They either weren't trained or they were disregarding the
7 consequences of what's likely to happen by not doing it --

8 A. Yeah.

9 Q. -- right?

10 That's true, isn't it?

11 A. I would think it's probably a matter of training, because
12 it looked to me like the crew was pretty competent in the
13 normal drilling operations. This unusual situation caught them
14 off guard.

15 Q. Rig crews are supposed to be trained to recognize a kick
16 early when signs are much less obvious and to close the blowout
17 preventer immediately. That's your opinion, right?

18 A. That's my opinion.

19 Q. Normally, the influx of fluid is detected quickly from
20 either a pit level increase or an increase from the flow
21 returning from the well and the well is shut in with only a
22 small pit gain, correct?

23 A. That's correct.

24 Q. Kick detection during drilling operations usually is
25 achieved by use of a pit volume indicator or a flow indicator,

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14:12 1 correct?

14:12 2 A. That's correct.

14:12 3 Q. You call unexpected pit gains or unexpected flow a red
14:13 4 light, don't you?

14:13 5 A. Yes, I do.

14:13 6 Q. And when there's a red light, the drill crew should
14:13 7 immediately shut in the well before doing anything else.
14:13 8 That's your opinion?

14:13 9 A. That's my opinion.

14:13 10 Q. That's the gold standard, isn't it?

14:13 11 A. I mean, that's what you are supposed to do, that's right.

14:13 12 Q. And that was true on April 20, 2010?

14:13 13 A. It's always true.

14:13 14 Q. As long as you have been in the business, right?

14:13 15 A. That's correct.

14:13 16 Q. Changing gears on you here.

14:13 17 You wrote two reports. They have been identified.
14:13 18 They have been offered. Correct me if I'm wrong, but I see no
14:13 19 reference anywhere in there to the deposition transcript of
14:13 20 BP's Bobby Bodek. Is that correct? If there is, just tell me.

14:14 21 A. It's probably correct. I just don't remember.

14:14 22 Q. Do you even know who Bobby Bodek is?

14:14 23 A. Not at the moment. I've heard the name. I can't
14:14 24 associate it with his job right now.

14:14 25 Q. Do you remember in your deposition telling us that you're

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14:14 1 not even curious as to what Bodek says? Exact words:

14:14 2 "QUESTION: Are you curious about what it says?"

14:14 3 "ANSWER: Not particularly."

14:14 4 Do you remember that?

14:14 5 A. Yeah. I think he is on the pore pressure frac gradient
14:14 6 prediction team then. Maybe the -- I'm not sure. I don't
14:14 7 remember.

14:14 8 MR. ROY: Pull up TREX-22657.585, please.

14:14 9 BY MR. ROY:

14:14 10 Q. This is Volume 2, page 209 of your deposition. Line 2.

14:14 11 MR. ROY: Highlight lines 2 through 11. No, 2
14:15 12 through 15. That's good.

14:15 13 BY MR. ROY:

14:15 14 Q. Do you the see the question at line 2:

14:15 15 "QUESTION: Have you read -- did you read the
14:15 16 deposition of Bobby Bodek -- the deposition transcript for
14:15 17 Bobby Bodek in this case?"

14:15 18 What's your answer?

14:15 19 A. I said:

14:15 20 "ANSWER: No."

14:15 21 Q. The next question:

14:15 22 "QUESTION: Did you ask to read it?

14:15 23 "ANSWER: I've got a copy of it, but I haven't read
14:15 24 it."

14:15 25 Correct?

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14:15 1 A. That's correct.

14:15 2 Q. Question at line 13:

14:15 3 "QUESTION: Are you curious about what it says?"

14:15 4 What's your answer at line 14?

14:15 5 A. I said:

14:15 6 "ANSWER: I'm not sure. I may not have a copy."

14:15 7 So I guess I'm trying to remember if I read Bobby
14:15 8 Bodek.

14:15 9 Q. Go to line 18. Do you see the question:

14:16 10 "QUESTION: Are you curious about what it says?"

14:16 11 What's your answer at line 19?

14:16 12 A. I said:

14:16 13 "ANSWER: Not particularly."

14:16 14 I think the reason for that is because the pore
14:16 15 pressure frac gradient team dealt with predictions, and I
14:16 16 was investigating an after-the-fact situation where I had
14:16 17 lots of actual data. I didn't need the expertise of the
14:16 18 pore pressure frac gradient prediction people.

14:16 19 Q. Are you through?

14:16 20 A. Yes.

14:16 21 Q. Let's move on.

14:16 22 You're not a cement expert. That's true, isn't it?

14:16 23 A. I know something about cementing, but I'm not -- I don't
14:16 24 consider myself a cementing expert. I know enough to be able
14:16 25 to check a cement design and run a cement job, but --

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14:16 1 Q. You're not holding yourself out to be a cement expert in
14:16 2 this case; is that correct?

14:16 3 A. That's correct.

14:17 4 Q. You're not an expert geologist, are you?

14:17 5 A. No.

14:17 6 Q. You're not an expert geophysicist, are you?

14:17 7 A. No, I'm not.

14:17 8 Q. You're not an expert petrophysicist, are you?

14:17 9 A. No.

14:17 10 Q. You have never designed a well that was then implemented
14:17 11 and drilled, correct?

14:17 12 A. That's not correct.

14:17 13 MR. ROY: Pull up TREG-22657.38. The whole page,
14:17 14 don't highlight.

14:17 15 Go back to the previous page, and let's get
14:17 16 whatever the question is. I don't think it's relevant.

14:17 17 Is that the previous page?

14:18 18 Lordy, Dr. Bourgoyne, you gave a long answer.

14:18 19 Go to the previous page.

14:18 20 Line 21, page 35 of your deposition, Volume 1.

14:18 21 Line 21, the question --

14:18 22 THE COURT: Mr. Roy, wait a second. I think I'm
14:18 23 right about this. I may be recalling this wrong. The last
14:18 24 time you were using a deposition, you were using the bottom
14:18 25 number, I thought. Now you are using the top number.

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14:18 1 MR. ROY: Which number would you like me to use?

14:18 2 THE COURT: It doesn't matter to me. I'm just trying
14:18 3 to get some consistency.

14:18 4 MR. ROY: Carl, for TRENCH purposes, which page? The
14:18 5 bottom?

14:18 6 THE COURT: The bottom number?

14:18 7 MR. ROY: Carl tells me the correct reference here
14:18 8 would be TRENCH-22657.36.

14:18 9 THE COURT: Which is the TRENCH number as opposed to
14:18 10 the number on the deposition transcript itself?

14:18 11 MR. ROY: Yes, sir.

14:18 12 THE COURT: Okay. I've got it.

14:18 13 BY MR. ROY:

14:19 14 Q. Line 21, the question to you, Dr. Bourgoyne:

14:19 15 "QUESTION: Okay. Have you ever designed a deepwater
14:19 16 well?"

14:19 17 Now, let's just let you read -- you don't need to
14:19 18 read it out loud. It's 2 1/2 pages.

14:19 19 A. Did you ask me this same question a minute ago, or did you
14:19 20 say, "Have you ever designed and implemented a well?"

14:19 21 Because if you leave the word "deepwater" out, then,
14:19 22 you know, it sort of changes the meaning of the question.

14:19 23 Q. Let's start with this, then. Have you ever designed a
14:19 24 deepwater well?

14:19 25 A. I have done some design work on deepwater wells but more

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14:19 1 from a training aspect and not a design that was then going to
14:19 2 actually be implemented. I did design a well for training for
14:19 3 deepwater on the LSU campus.

14:19 4 Q. Right. Which is, what, 50 miles north of the Gulf of
14:19 5 Mexico?

14:19 6 A. Right.

14:20 7 MR. ROY: Let's go to TREC-22657.38.

14:20 8 BY MR. ROY:

14:20 9 Q. Now go to lines 12 through 14.

14:20 10 A. (Reading):

14:20 11 "ANSWER: I have never designed a well that was then
14:20 12 implemented and drilled, but I worked closely with the
14:20 13 people who do that and, you know, as a result I was able
14:20 14 to know -- closely follow how that was done."

14:20 15 Is that far enough?

14:20 16 Q. Sure. Absolutely.

14:20 17 So I don't question that from an academic standpoint
14:20 18 you know how it's done. My only point is to reiterate that you
14:20 19 have not designed a well and then drilled it or implemented the
14:20 20 drilling of it.

14:20 21 A. In deep water?

14:20 22 Q. Yes.

14:20 23 A. Well, you left the "deep water" out.

14:21 24 Q. In deep water. Yes or no?

14:21 25 A. You're correct.

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14:21 1 Q. You have never supervised the drilling of a deepwater well
14:21 2 as an engineer. That's correct too, isn't it?

14:21 3 A. That's correct. Now, I don't see a lot of difference
14:21 4 between a deep high-temperature high-pressure well on land and
14:21 5 one offshore. But to answer your question, you're correct.

14:21 6 Q. Now, likewise, you have never supervised a temporary
14:21 7 abandonment offshore, have you?

14:21 8 A. No, I have not.

14:21 9 Q. You have never supervised the drilling of a deepwater well
14:21 10 as a well site leader. That's true, isn't it?

14:21 11 A. That's also true. Everybody can't have all experiences.
14:21 12 It's always got to be a team effort.

14:21 13 Q. When compared to land-based drilling operations, floating
14:21 14 drilling incurs more severe well control problems. That's
14:21 15 true, isn't it?

14:22 16 A. Well, you have a narrow window, but --

14:22 17 Q. Sir, can you answer my question yes or no and then explain
14:22 18 to your heart's content.

14:22 19 When compared to land-based drilling operations,
14:22 20 floating drilling incurs more severe well control problems,
14:22 21 period.

14:22 22 A. I would say yes.

14:22 23 Q. Now, do you want to explain?

14:22 24 A. You know, there's severe well control problems both on
14:22 25 land and in deep water, and they are very similar. You have

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14 : 2 2 1 some additional complications offshore, I guess.

14 : 2 2 2 Q. You have never supervised a negative pressure test on a
14 : 2 2 3 rig, have you?

14 : 2 2 4 A. I have on land.

14 : 2 2 5 Q. Not offshore?

14 : 2 2 6 A. Not offshore.

14 : 2 3 7 Q. Where have you supervised a negative pressure test on
14 : 2 3 8 land?

14 : 2 3 9 A. In the Tuscaloosa Trend north of Baton Rouge.

14 : 2 3 10 Q. Pointe Coupee Parish?

14 : 2 3 11 A. Pointe Coupee Parish.

14 : 2 3 12 Q. 17,000 feet, 18,000 feet?

14 : 2 3 13 A. 20,000 feet, 22,000 feet.

14 : 2 3 14 Q. Land-based?

14 : 2 3 15 A. Land-based.

14 : 2 3 16 Q. Those were Amoco, ARCO, and BP wells, weren't they?

14 : 2 3 17 A. No, they were all Pennington Oil and Gas interests. But
14 : 2 3 18 we watched what Amoco was doing when we did our work too.

14 : 2 3 19 Q. So you're telling the Court for Pennington's wells, you
14 : 2 3 20 directed and did the negative pressure test on their wells out
14 : 2 3 21 there?

14 : 2 3 22 A. I wrote up the procedures. I was -- our well site adviser
14 : 2 3 23 did the first level supervision, but I'm the one that sent him
14 : 2 3 24 the procedures to follow, and I followed what they were doing.

14 : 2 3 25 Q. But were you out there on the well --

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14:23 1 A. No.

14:23 2 Q. -- on those Pennington wells in Pointe Coupee Parish when
14:24 3 the negative pressure test was being done, looking at it to be
14:24 4 sure it was done right, supervising?

14:24 5 A. Looking at it to be sure it was done right? Yes, I did
14:24 6 check. I mean --

14:24 7 Q. On site?

14:24 8 A. Well . . .

14:24 9 Q. While it was being done?

14:24 10 A. On land you have data being transmitted to the office too,
14:24 11 and so, yes, I could observe sort of the equivalent of the
14:24 12 Sperry-Sun system on those wells from my computer.

14:24 13 Q. But I'm not asking you --

14:24 14 A. And on some of the negative tests, I did watch.

14:24 15 Q. When was that drilling done? Most of it was done in the
14:24 16 '70s, wasn't it?

14:24 17 A. No. It was all done after I retired from LSU in 2003,
14:24 18 2010.

14:24 19 Q. Just so we understand, are you telling the Court, without
14:24 20 looking at what was being done, that you supervised from a
14:24 21 remote location with no video the negative pressure test on the
14:25 22 Pennington wells in Pointe Coupee Parish? Is that what you're
14:25 23 telling me?

14:25 24 A. No, I'm not saying that.

14:25 25 I'm saying that I designed the test, I talked to

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14:25 1 the -- to our well site adviser and I was in close contact with
14:25 2 him during the test and he would call me back and we would
14:25 3 discuss it, with me looking at the computer. Then we would
14:25 4 decide, okay, it's good or it's not good and go forward.

14:25 5 Q. But to make no mistake about it, you did not physically do
14:25 6 the negative pressure test on the well?

14:25 7 A. Well, no. He didn't either. The rig crew are the ones
14:25 8 that did it.

14:25 9 Q. You weren't there when it was done?

14:25 10 A. I was not standing on the rig floor when it was done, for
14:25 11 whatever that means.

14:25 12 Q. To be clear, you never participated in the performing of a
14:25 13 negative pressure test on a rig; is that correct?

14:26 14 A. Was I ever on the rig when there was one done? I don't
14:26 15 know. I don't remember.

14:26 16 Q. That's not my question, sir.

14:26 17 MR. ROY: Pull up TREN-22657.86.

14:26 18 The question at line 2. The question is --
14:26 19 don't cut off the answer down there. Let's show all of it. Go
14:26 20 all the way down to 12.

14:26 21 Well, excuse me. Go all the way -- just leave
14:26 22 the whole page up.

14:26 23 BY MR. ROY:

14:26 24 Q. Line 2, do you see the question:

14:26 25 "QUESTION: Have you ever participated in performing

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- 14:26 1 or executing a negative pressure test on a rig?"
- 14:26 2 Do you see the question?
- 14:26 3 A. Yes.
- 14:26 4 Q. Your answer at line 5, read it for the Court.
- 14:26 5 A. (Reading):
- 14:26 6 "ANSWER: No. But, you know, again, I've had some
- 14:26 7 fairly detailed discussions at the rig site about how they
- 14:27 8 were going to do it. But, you know, it's always a team
- 14:27 9 effort whenever you drill wells. One person doesn't do
- 14:27 10 everything. You have to rely on the expertise of the
- 14:27 11 other people that's involved as well."
- 14:27 12 Q. And the question:
- 14:27 13 "QUESTION: Okay. So the answer to my question is
- 14:27 14 you've never participated in a negative pressure test on a
- 14:27 15 rig?"
- 14:27 16 What's your answer at line 16, Dr. Bourgoyne?
- 14:27 17 A. (Reading):
- 14:27 18 "ANSWER: I can't remember if I was there when they
- 14:27 19 ran it, but I have been on one or two. But participate,
- 14:27 20 you know, I'm not sure what you mean by 'participate.'"
- 14:27 21 Q. Was that a true answer then?
- 14:27 22 A. Yes.
- 14:27 23 MR. BROCK: Your Honor, that's not inconsistent with
- 14:27 24 anything that he has said.
- 14:27 25 MR. ROY: I think, to the contrary, Your Honor, it

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1 is, but we leave it to you to determine that.

2 THE COURT: Okay.

3 MR. BROCK: That's okay with us, but I don't think
4 that's inconsistent.

5 THE COURT: Okay.

6 BY MR. ROY:

7 Q. You have not worked as a full-time engineer since 1970; is
8 that correct?

9 A. Well, I'm not full time for Pennington, but they are my
10 primary client.

11 Q. 1970 to the current time, you have not worked full time as
12 an engineer. Is that a correct statement?

13 A. I guess if you put the word "full time" in there, that
14 makes it correct.

15 Q. You have never drafted a submission to the MMS. That's
16 true too, isn't it?

17 A. That's true.

18 Q. You have never drafted a submission to their successor,
19 BOEMRE, or however it's pronounced, B-O-E-M-R-E?

20 A. It depends on what you mean by "submission." If you mean
21 APD, no, I have not.

22 Q. What we are planning to do as a company, APD, you have
23 never done that, have you?

24 A. I have never done an APD submission to MMS or BSEE, but I
25 have served as a certified verification agent for another

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1 operator on some alternative drilling procedures and submitted
2 reports on that to BSEE. And I have submitted reports that
3 they have asked me to write, looking at past blowouts, and to
4 provide an opinion on what the causes or -- answer whatever
5 questions they had that they wanted me to look at with respect
6 to those blowouts.

7 Q. But as far as a submission on what we are planning to do
8 as a company, that kind of a submission --

9 A. No. I think generally that's done by the clerk who
10 handles those types of things --

11 Q. It wasn't done by you. That's my point. That's a true
12 statement?

13 A. That's true.

14 Q. You didn't prepare those. That's true, isn't it?

15 A. That's true.

16 Q. You have never worked as a drilling contractor. That's
17 true, isn't it?

18 A. I have never worked as a drilling contractor, no. I have
19 worked for drilling contractors.

20 Q. My question is: Have you ever worked as a drilling
21 contractor?

22 A. No. I don't own any rigs or any --

23 Q. Have you ever worked as a cementer?

24 A. No.

25 Q. You only have three months of experience as a full-time

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14:30 1 mud logger, and that's around '70 to '72?

14:30 2 A. I guess I don't have any experience at all, according to
14:30 3 you.

14:30 4 Q. You believe everyone involved in the Macondo well
14:30 5 drilling -- involved -- made mistakes. Everyone involved in it
14:30 6 made mistakes, right?

14:30 7 A. When you say "everyone," I'm not sure what you mean.

14:30 8 Q. Let's try it a different way.

14:30 9 This was a complex operation. You agree with that?

14:30 10 A. I do.

14:30 11 Q. On any complex operation there are always some mistakes
14:30 12 made, and in this case BP, Transocean, Halliburton, Sperry-Sun,
14:30 13 and others made mistakes that were part of a series of
14:30 14 breakdowns in well control that allowed the blowout to happen.

14:30 15 A. That's a true statement, and that's almost always true
14:31 16 when you have a blowout. You have to have a whole series of
14:31 17 breakdowns to get past all the redundancy.

14:31 18 Q. Mistakes can increase -- no. Mistakes will increase the
14:31 19 risk of loss of well control. That's true, isn't it?

14:31 20 A. In many cases that's true. Not all cases, I guess.

14:31 21 Q. Increased risk of well control increases the risk of
14:31 22 blowout, fire, and explosion, true?

14:31 23 A. Increased risk of well control -- I'm sorry. I don't
14:31 24 understand.

14:31 25 Q. Loss of well control.

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14:31 1 A. Loss of well control. Okay. Yes, that's true.

14:31 2 MR. ROY: Now, Carl, pull up D-3282.a.

14:32 3 BY MR. ROY:

14:32 4 Q. We're going to come to this. The predicate is, sir:

14:32 5 Blowout and resulting explosion are risks of drilling a

14:32 6 deepwater well from a vessel like the *Deepwater Horizon* into a

14:32 7 high-pressure high-temperature formation like Macondo.

14:32 8 That's true, isn't it?

14:32 9 A. I think so, yes.

14:32 10 Q. Let's discuss the things that might contribute to such a
14:32 11 blowout explosion.

14:32 12 MR. ROY: Pull up the first, which is 3282.b, D,
14:32 13 demonstrative.

14:32 14 BY MR. ROY:

14:32 15 Q. Does, in your opinion, the *Deepwater Horizon's* conversion
14:32 16 of the lower ram on the BOP to a test ram -- or stated
14:33 17 differently, did not having a second blind shear ram, in your
14:33 18 opinion, increase the risk of a blowout and explosion on the
14:33 19 *Deepwater Horizon*?

14:33 20 A. I don't know that I can tell from what I have looked at.

14:33 21 Was that lower ram a blind shear ram that they
14:33 22 converted or --

14:33 23 Q. Yes.

14:33 24 A. -- was that just a pipe ram?

14:33 25 Q. I believe it was a blind shear ram.

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14:33 1 Well, I defer to you. You're the expert.

14:33 2 A. You're getting into an area that I didn't look at, was the
14:33 3 BOPs.

14:33 4 Q. So is your answer you don't know?

14:33 5 A. I don't know.

14:33 6 Q. No. 1, don't know.

14:33 7 MR. ROY: No. 2. Let's pull up No. 2, which would be
14:33 8 demonstrative D-3282.c.

14:33 9 BY MR. ROY:

14:33 10 Q. We now have converting lower ram on BOP to a test ram.
14:33 11 Does the combination of No. 1 plus the use of a long-string
14:33 12 casing on the Macondo instead of a liner, in your opinion,
14:34 13 increase the risk of a blowout and explosion?

14:34 14 MR. BROCK: Objection, Your Honor. He has said that
14:34 15 he has not looked at No. 1. So putting that in combination
14:34 16 with No. 2, I think, is not an appropriate question.

14:34 17 MR. ROY: Your Honor, my purpose -- I'll do it any
14:34 18 way the Court wants me to, but the purpose is to fairly present
14:34 19 them all *ad seriatim*. I won't go back to it as long as it's
14:34 20 understood, every time I ask him the question, it's there even
14:34 21 though he says he doesn't know on No. 1.

14:34 22 THE COURT: Why don't you separate them out.

14:34 23 MR. HYMEL: Your Honor, Richard Hymel for Transocean.
14:34 24 We would join the objection or make a separate objection.

14:34 25 THE COURT: I just sustained it. You don't have to

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14:34 1 join it.

14:34 2 MR. ROY: Carl, can you write the words "don't know"
14:34 3 on No. 1?

14:34 4 I don't know if you can erase them is the point
14:34 5 but . . .

14:34 6 THE COURT: Well, he erased the other day.

14:35 7 MR. ROY: If you can erase it, Carl, take out No. 1,
14:35 8 make it go away.

14:35 9 BY MR. ROY:

14:35 10 Q. Here's the question then. Did use of a long string casing
14:35 11 instead of the liner increase the risk of the blowout or
14:35 12 explosion -- a blowout or explosion on the Macondo?

14:35 13 A. I don't think so, but this is the type of thing that's
14:35 14 hard to calculate because you can't really determine what the
14:35 15 statistics of failure are in both cases. There are risks to
14:35 16 liners and there are risks to long strings. They both have
14:35 17 risks and they both have advantages and they both fall within
14:35 18 the range of accepted practice. They are both widely used both
14:35 19 onshore and offshore.

14:35 20 Q. Did the use of the long string casing instead of the liner
14:35 21 in this case increase the risk of blowout and explosion?

14:36 22 A. I don't think so.

14:36 23 Q. Fair enough. No.

14:36 24 A. Like I said, it's the kind of thing that you don't have
14:36 25 the background statistics to be able to calculate with any kind

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1 of formal risk assessment.

2 **MR. ROY:** Pull up 3282.d and eliminate No. 1.

3 **BY MR. ROY:**

4 **Q.** So did the use of the long string casing instead of the
5 liner plus not using the recommended number of centralizers
6 increase the risk of a blowout and explosion at Macondo?

7 **MR. BROCK:** Your Honor, again, combining 2 with 3
8 when he said he doesn't think 2 increases --

9 **THE COURT:** I think the witness is capable of
10 answering. If he doesn't think 2 is a factor, he is being
11 asked a somewhat different question, whether 2 plus 3 equals 5,
12 I guess.

13 **BY MR. ROY:**

14 **Q.** Do you understand the question, Dr. Bourgoyne, or do you
15 want it repeated?

16 **A.** You're asking does 2 plus 3 change the risk?

17 **Q.** No, sir, that's not what I'm asking.

18 I'm asking you: Did the use of a long string casing
19 instead of a liner, together with not using the recommended
20 number of centralizers, increase the risk of a blowout and
21 explosion on Macondo? That's the question.

22 **A.** My opinion to that would be no.

23 **Q.** Fair enough.

24 **MR. ROY:** Let's pull up D-3282.e.

25

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14:38 1 BY MR. ROY:

14:38 2 Q. Did not circulating bottoms-up prior to the cement job, in
14:38 3 addition to not using the recommended number of centralizers,
14:38 4 in addition to using the long string casing instead of the
14:38 5 liner increase the risk of a blowout and explosion on the
14:38 6 Macondo?

14:38 7 A. I think they circulated enough. It was my conclusion that
14:38 8 additional circulation would not have made any difference, and
14:38 9 it was also my opinion that use of additional centralizers
14:38 10 would not have made any difference because they had the pay
14:38 11 zone thoroughly centralized.

14:38 12 Q. Can you answer my question yes or no?

14:38 13 A. I thought I just did.

14:38 14 Q. No, you explained. The question -- I will try to repeat
14:38 15 it as best I can.

14:38 16 Did not circulating the bottoms-up prior to the
14:38 17 cement job, plus not using the recommended number of
14:38 18 centralizers, plus using a long string casing instead of a
14:39 19 liner increase the risk of a blowout and explosion on Macondo
14:39 20 in your opinion?

14:39 21 A. Again, this is the kind of thing that you cannot
14:39 22 calculate; but my answer is no, I don't think it did.

14:39 23 Q. Fair enough.

14:39 24 MR. ROY: Pull up the next demonstrative, Carl.

25

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14:39 1 BY MR. ROY:

14:39 2 Q. Did not waiting for foam stability test, plus not
14:39 3 circulating bottoms-up prior to the cement job, plus not using
14:39 4 the recommended number of centralizers, plus using long string
14:39 5 casing instead of liner increase the risk of a blowout and
14:39 6 explosion on the *Deepwater Horizon*?

14:39 7 A. I think not waiting for the foam stabilizer test in
14:39 8 hindsight is something that BP probably regrets, but at the
14:39 9 time they were depending on Halliburton for doing the job. But
14:40 10 I would guess that not waiting for foam stabilizer test may
14:40 11 have increased the risk.

14:40 12 Q. Your answer is yes?

14:40 13 A. To No. 5, and adding that other stuff in I think is silly.

14:40 14 MR. ROY: Now, pull up the next one, Carl. I think
14:40 15 this is D-3282.g.

14:40 16 BY MR. ROY:

14:40 17 Q. Did not running a cement bond log, not waiting for foam
14:40 18 stability test, not circulating bottoms-up prior to the cement
14:40 19 job, not using the recommended number of centralizers, and
14:40 20 using long string casing instead of a liner increase the risk
14:40 21 of blowout and explosion on Macondo?

14:41 22 A. So the way --

14:41 23 Q. Yes or no, sir?

14:41 24 A. Let me see if I'm understanding the question. So the way
14:41 25 you are phrasing it, if any one of these increased the risk,

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1 then obviously if you add them all together, then the risk also
2 went up. Is that the way you are asking the question?

3 Q. I want to know if the combination -- if the combination
4 increased the risk. That's all I want to know.

5 We started with No. 1; you said don't know. No. 2;
6 you said no. So I'm just asking: As we add these additional
7 in together, does the combination increase the risk of a
8 blowout and explosion on Macondo?

9 A. Adding No. 6 does not increase the risk.

10 Q. Fair enough. So the answer is no, correct?

11 A. Well, I mean, I said yes to No. 5. The way you are asking
12 the question --

13 THE COURT: I think the witness has a point. I'm
14 confused, too, by your question, Mr. Roy. Do you mean by No. 6
15 does it incrementally add to what he said about No. 5, or do
16 you mean whether standing alone or --

17 MR. ROY: Perhaps the simplest thing, Judge, might
18 be --

19 THE COURT: Why don't you take each one separately --

20 MR. ROY: That's what I was going to do.

21 THE COURT: -- and not tie it into everything else.

22 MR. ROY: You got it.

23 BY MR. ROY:

24 Q. Let's go back to No. 2, which by itself you do not believe
25 using a long string casing instead of a liner increased the

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14:42 1 risk --

14:42 2 THE COURT: Wait, we don't have to go through every
14:42 3 one because he's already answered through 5. Let's start at 6.

14:42 4 MR. ROY: All right.

14:42 5 BY MR. ROY:

14:42 6 Q. Do you believe not running a cement bond log increased the
14:42 7 risk of a blowout and explosion on this well?

14:42 8 A. Not in this case.

14:42 9 Q. Even in combination with 2 through 5?

14:42 10 A. In combination with 2 through 5 has nothing to do with it.
14:42 11 It's just that the cement bond log could not have seen past the
14:42 12 float collar, would have verified the top of cement, but they
14:43 13 pretty much knew where that was because they didn't lose any
14:43 14 mud while they were cementing.

14:43 15 MR. ROY: Pull up the next one, Carl.

14:43 16 BY MR. ROY:

14:43 17 Q. No. 7, do you believe that using a spacer made from lost
14:43 18 circulation materials increased the risk of blowout and
14:43 19 explosion?

14:43 20 A. I think having the additional LCM in there did not
14:43 21 increase the risk. I think the risk was the Barite that was in
14:43 22 the spacer, and that was going to be in the spacer whether they
14:43 23 started from scratch or whether they reconstituted the LCM
14:43 24 spacer, the LCM pills, to make a spacer. So in either case it
14:43 25 would have been loaded with Barite, and my conclusion was that

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14:43 1 if plugging occurred, it was because of the Barite.

14:43 2 Q. So do you believe the use of the spacer made from this
14:43 3 spacer that was used increased the risk of blowout and
14:43 4 explosion?

14:44 5 A. I do think the spacer may have had something to do with
14:44 6 it. I'm not sure. But the LCM in the spacer had nothing to do
14:44 7 with it.

14:44 8 Q. So is that a maybe?

14:44 9 A. That's a maybe.

14:44 10 Q. No. 8, do you believe misinterpreting the negative
14:44 11 pressure test increased the risk of a blowout and explosion?

14:44 12 A. Yes.

14:44 13 Q. No. 9, do you believe displacing the riser before setting
14:44 14 the cement plug increased the risk of a blowout and explosion
14:44 15 in the Macondo well?

14:44 16 A. It's really hard to say. Again, you don't have good
14:44 17 statistics on the risk of doing A and B and then doing A but
14:44 18 not B. The procedure that they used fell within industry
14:45 19 practice. Now, whether setting the cement plug first may have
14:45 20 reduced the risk, it's possible.

14:45 21 Q. So that's a maybe?

14:45 22 A. That's a maybe.

14:45 23 Q. No. 10, do you believe displacing the well to over
14:45 24 3,000 feet below the mud line increased the risk of blowout and
14:45 25 explosion?

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1 A. Again, the procedure properly followed, it wouldn't have
2 increased the risk, but from the standpoint that you're going
3 to have a little more drawdown on the formation due to that
4 extra 2,000 feet of mud that's being displaced, that could have
5 something to do with it. So that's a maybe.

6 Q. Maybe?

7 A. These things are hard to calculate.

8 Q. No. 10 is maybe?

9 THE COURT: Let me go back for a second because I
10 want to make sure I understood the witness's answer to No. 9.

11 Did you say whether setting the cement plug
12 first may have reduced the risk or increased the risk?

13 THE WITNESS: It may have reduced the risk because
14 with an additional cement plug in there, you would have had an
15 additional barrier. Now, the risk you don't know is when you
16 came back in, if you hadn't tested below that cement barrier,
17 what you might find when you drill through that cement barrier
18 when you come back with your completion rig. There's some
19 risks there, too. It's just kind of hard to go through the
20 whole life cycle with a formal risk assessment --

21 THE COURT: That's fine. I just wanted to make sure
22 I understood what word you had used there.

23 Okay. Thank you.

24 BY MR. ROY:

25 Q. To be clear, Dr. Bourgoyne, the cement plug we are both

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14:46 1 referring to, you and I, in the discussion about No. 9 was one
14:46 2 that was never put in the well prior to April 20 or on
14:47 3 April 20, right?

14:47 4 A. That's correct.

14:47 5 Q. It's one we are talking about if it had been put in,
14:47 6 right?

14:47 7 A. That's right.

14:47 8 Q. You understood that, right?

14:47 9 A. I did.

14:47 10 Q. Your answer is still maybe?

14:47 11 A. That's correct.

14:47 12 Q. May increase the risk, but you don't know, right?

14:47 13 A. I'm thinking over the life cycle of the well.

14:47 14 MR. ROY: No. 11, pull that up, Carl.

14:47 15 BY MR. ROY:

14:47 16 Q. Did not installing additional physical barriers during
14:47 17 temporary abandonment increase the risk of blowout and
14:47 18 explosion on Macondo?

14:47 19 A. I guess that's basically the same thing as No. 9. You
14:47 20 could have set a bridge plug or something. That would have
14:47 21 probably reduced the risk the way it happened, yes.

14:47 22 Q. But my question is: Did not installing increase the risk
14:47 23 of a blowout and explosion?

14:47 24 A. It's possible.

14:47 25 Q. So your answer is maybe?

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14 : 47 1 A. Maybe.

14 : 48 2 Q. No. 11 is maybe.

14 : 48 3 No. 12, did performing simultaneous operations during
14 : 48 4 displacement increase the risk of a blowout and explosion on
14 : 48 5 Macondo?

14 : 48 6 A. The way it happened, no. I think it had the potential to
14 : 48 7 make a difference, but in this case all the simultaneous
14 : 48 8 operations were over before the well started flowing, before
14 : 48 9 they had a chance to detect.

14 : 48 10 And really going back, if I could, to No. 11, that's
14 : 48 11 basically the same thing as No. 9; it's just a different form
14 : 48 12 of setting an additional barrier.

14 : 48 13 Q. What is your answer for No. 12, sir? Did performing the
14 : 48 14 sim ops during displacement increase the risk of blowout and
14 : 48 15 explosion?

14 : 49 16 A. Not in this case because all the sim ops were over before
14 : 49 17 the well started flowing.

14 : 49 18 Q. That's go -- the answer is no?

14 : 49 19 A. No.

14 : 49 20 Q. No. 13, not automatically diverting overboard, did that
14 : 49 21 increase the risk of explosion?

14 : 49 22 A. Yes.

14 : 49 23 Q. If you had been asked to assume only the answers that you
14 : 49 24 gave a "yes" or a "maybe" to were decisions that were going to
14 : 49 25 be made on Macondo during the cementing and temporary

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14:49 1 abandonment stage, would you, as a competent petroleum
14:49 2 engineer, have wanted to analyze how these decisions together
14:49 3 could, would, or would not increase the risk of a blowout and
14:50 4 explosion?

14:50 5 A. I really don't think you can do that. I think you can do
14:50 6 some haz ops and group discussions and kick it around; but as
14:50 7 far as a formal risk assessment, we really don't have the
14:50 8 statistics to do that kind of detailed analysis for these types
14:50 9 of questions.

14:50 10 Q. Are you through?

14:50 11 A. I'm through.

14:50 12 Q. We can agree the well blew out, the rig exploded, burned,
14:50 13 and sank, right?

14:50 14 A. We can agree with that.

14:50 15 Q. Yet you believe and have testified in this court the well
14:50 16 was drilled safely and successfully, consistent with industry
14:50 17 practice. Do you remember that?

14:50 18 A. The drilling phase but not the temporary abandonment
14:50 19 phase.

14:50 20 Q. So is it your opinion that the temporary abandonment phase
14:50 21 of Macondo was not done safely and successfully, consistent
14:50 22 with industry practice?

14:51 23 A. Yes.

14:51 24 Q. That's a true statement?

14:51 25 A. That's a true statement.

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14:51 1 Q. Had it been done safely and successfully and according to
14:51 2 industry practice, the well would not have blown out, nor the
14:51 3 rig exploded and sunk, true?

14:51 4 A. I think the question is -- the answer is in the question,
14:51 5 yes, that's right.

14:51 6 Q. Wells like Macondo don't just blow out and then rigs blow
14:51 7 up without --

14:51 8 A. No. It takes a whole series of failures to line up for
14:51 9 something like that to happen.

14:51 10 Q. Failures of people, mistakes?

14:51 11 A. People and perhaps some equipment, too, but people are
14:51 12 generally involved.

14:51 13 Q. In this case there were failures on the part of
14:51 14 Transocean, BP, Halliburton, and Halliburton Sperry, in your
14:51 15 opinion, that contributed to the blowout and explosion of this
14:52 16 well on April 20. That's true, isn't it?

14:52 17 A. Yes.

14:52 18 Q. Thank you.

14:52 19 **THE COURT:** Let's take about a 15-minute recess. We
14:52 20 will come back.

14:52 21 **THE DEPUTY CLERK:** All rise.

14:52 22 (Recess.)

15:14 23 **THE COURT:** All right. Please be seated everyone.

15:16 24 **MR. BRIAN:** Your Honor, Brad Brian for Transocean.

15:16 25 We have finally worked out the Beck exhibits. I apologize for

15:16 1 the delay. We have circulated a list of exhibits for
15:16 2 Transocean, only three call-outs that we would offer,
15:16 3 introduce, and move to be admitted. They have been circulated
15:16 4 with no objections.

15:16 5 **THE COURT:** All right. Any objections? Hearing
15:16 6 none, those are admitted.

15:16 7 **MR. REGAN:** Good afternoon, Your Honor. Matt Regan
15:16 8 on behalf of BP also offering BP's exhibits used during its
15:16 9 examination of Dr. Beck on April 4.

15:16 10 **THE COURT:** Any objection to BP's exhibits?

15:16 11 **MR. BRIAN:** Your Honor, the only one I raised with
15:16 12 Mr. Regan was TREX-4026.1.4.BP. It's a C.F.R. regulation. I
15:17 13 think, Your Honor -- I think to be fair, I think Your Honor has
15:17 14 admitted two similar regulations. So to be consistent --

15:17 15 **THE COURT:** I don't know if it makes any difference.
15:17 16 Certainly I could look at them anyway.

15:17 17 **MR. BRIAN:** Correct.

15:17 18 **THE COURT:** Somebody could cite them without
15:17 19 introducing them into evidence. It makes no difference either
15:17 20 way to me.

15:17 21 **MR. BRIAN:** I just defer to Your Honor.

15:17 22 **THE COURT:** Well, if we have already done it, let's
15:17 23 let it in. Okay?

15:17 24 **MR. BRIAN:** That's fine, Your Honor.

15:17 25 **THE COURT:** Okay. So those are admitted.

15:17 1 MR. BRIAN: Thank you, Your Honor.

15:17 2 MR. IRPINO: Anthony Irpino.

15:17 3 THE COURT: Mr. Irpino, you are going to try again?

15:17 4 MR. IRPINO: Yes.

15:17 5 THE COURT: Okay.

15:17 6 MR. IRPINO: We are hoping the third time is a charm.

15:17 7 I have our list of exhibits and demonstratives
15:17 8 used in connection with Dr. Beck's testimony on April 3, 2013.
15:17 9 I feel safe in saying it's been well vetted by all the parties
15:17 10 at this point and we offer, file, and introduce those
15:17 11 demonstratives and exhibits into evidence.

15:17 12 THE COURT: Last call for objections? Hearing none,
15:17 13 you prevail.

15:18 14 MR. IRPINO: Thank you, Your Honor.

15:18 15 THE COURT: Let's resume testimony.

15:18 16 **CROSS-EXAMINATION**

15:18 17 **BY MR. SPIRO:**

15:18 18 **Q.** Good afternoon, Dr. Bourgoyne.

15:18 19 THE COURT: Is it on? It doesn't sound like you are
15:19 20 picking up. You have to turn it on.

15:19 21 MR. SPIRO: How is that?

15:19 22 THE COURT: Pull it up a little bit higher on you.
15:19 23 Is there a green light? There you go.

15:19 24 **BY MR. SPIRO:**

15:19 25 **Q.** Daniel Spiro on behalf of the United States. How are you?

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15:19 1 A. I'm good. Thank you.

15:19 2 Q. Let's go to -- first, a preliminary matter. I'm going to
15:19 3 use the word "MMS" to refer to the government agency to which
15:19 4 the applications are provided, even though now there's a new
15:19 5 name. Do you understand?

15:19 6 A. That would help me a lot.

15:19 7 Q. Okay. Let's go to TREX-4022.1.1. We have seen this
15:19 8 before. I'm just going to keep it up on the screen, but you
15:19 9 recognize this as the safe drilling margin regulation, do you
15:19 10 not?

15:19 11 A. Yes. That's Part B under pressure integrity test, what is
15:20 12 a pressure integrity test.

15:20 13 Q. Dr. Bourgoyne, under the safe drilling margin regulations,
15:20 14 is it the operator's responsibility to propose its safe
15:20 15 drilling margin in its Application for Permit to Drill,
15:20 16 correct?

15:20 17 A. That's correct.

15:20 18 Q. BP was the operator of the Macondo, correct?

15:20 19 A. That's correct.

15:20 20 Q. And the safe drilling margin it proposed was .5 ppg,
15:20 21 correct?

15:20 22 A. That's correct.

15:20 23 Q. It is also the operator's responsibility to make a case to
15:20 24 persuade MMS to approve a departure from the safe drilling
15:20 25 margin if it wants to drill a particular interval with a lower

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15:20 1 margin, correct?

15:20 2 A. They have to ask permission and generally they do.

15:20 3 Q. So if BP did not ask for that MMS approval for a
15:20 4 particular interval, then BP had no right to drill ahead with
15:20 5 less than the .5 margin; is that correct?

15:20 6 A. Well, I don't know about -- exactly what you mean, but
15:20 7 they would be in violation of the regulations, you know,
15:20 8 subject to incidents and noncompliance and all those things.

15:21 9 Q. Do they have a right to behave in a way that violates
15:21 10 regulations, in your view?

15:21 11 A. No.

15:21 12 Q. And is it your position that BP based its .5 margin on the
15:21 13 difference between the highest mud weight it would use in
15:21 14 drilling an interval and the result of the shoe test right
15:21 15 above that interval, correct?

15:21 16 A. That's correct. When they first submitted their APD, they
15:21 17 submitted what they thought the frac gradient would be and then
15:21 18 once they had a shoe test, then the shoe test would prevail.

15:21 19 Q. Now, you have testified, I think correctly, that
15:21 20 Dr. Huffman gave a different view of the meaning of the safe
15:21 21 drilling margin regulation, and he based his view on the
15:21 22 weakest fracture gradient in the interval rather than
15:21 23 invariably the shoe test, correct?

15:22 24 A. That's what he did and he, you know, based the calculation
15:22 25 of the weakest interval based on some observed breakdown

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15:22 1 pressure prior to wellbore strengthening and all of that.

15:22 2 Q. We are going to be here a long time if a question like
15:22 3 that gets more than a "yes" or "no" answer, but I will take
15:22 4 that as a yes?

15:22 5 A. That is a yes.

15:22 6 Q. So I thought I also heard you say that in your 45 or so
15:22 7 years of experience, he is the first one that had that
15:22 8 interpretation of the safe drilling margin regulation. Did I
15:22 9 hear you correctly?

15:22 10 A. That's the first time I have heard that.

15:22 11 MR. SPIRO: Let's go to Trocquet page 186, line 6
15:22 12 through 18.

15:22 13 BY MR. SPIRO:

15:22 14 Q. And while that's getting up on the screen, Dr. Bourgoyne,
15:22 15 am I correct that David Trocquet is an MMS employee who
15:23 16 oversees the work of drilling engineers?

15:23 17 A. Yeah. I don't recall exactly what his job is, but I know
15:23 18 he is with MMS. He is also a former student.

15:23 19 Q. So you don't know him to be a former MMS drilling engineer
15:23 20 who currently supervises drilling engineers in this region?

15:23 21 A. I'm not sure what his title is. Perhaps you can refresh
15:23 22 me.

15:23 23 Q. Well, I will just read this to you and you tell me if I'm
15:23 24 reading it correctly.

15:23 25 "QUESTION: So you don't have to change the mud

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1 weight if you don't know what the weakest formation is,
2 you can just drill ahead taking losses?"

3 There's an objection as to form.

4 "ANSWER: No. No. I don't -- I don't think we ever
5 allow drilling ahead taking losses. I think -- I think --
6 I think there's the assumption that the weakest formation
7 strength is at the shoe unless there's information to
8 indicate otherwise."

9 Did I read that correctly?

10 A. Yes, you read that correctly.

11 Q. And that is consistent with Dr. Huffman's statements that
12 the presumption is that the weakest fracture gradient is at the
13 shoe above the interval, correct?

14 A. That's correct.

15 Q. So let me go to Trocquet 183, line 23 to 184, line 8.
16 Tell me if I'm reading this correctly.

17 "QUESTION: Okay. And there is an MMS regulation
18 that says the mud weight has to be a half a pound less
19 than the formation integrity test or pressure integrity
20 test at the casing shoe, correct?

21 "ANSWER: There -- there's an MMS policy that -- that
22 requires when drilling a hole section, that the safe
23 margin between the -- I guess, the last known formation
24 integrity test or the -- the weakest fracture gradient,
25 that hole section and the mud weight is at least a half a

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1 pound."

2 Did I read that correctly?

3 A. You read that correctly.

4 Q. I just have one more from Trocquet. 257/20 to 258/14.

5 And I will not cover a whole litany of people. I just want to
6 cover a couple for MMS and BP. So -- well, let's start with
7 21.

8 "QUESTION: You would agree, sir, from reading this
9 text -- this, that it sure appears that in this section
10 that BP was attempting to drill and was drilling -- that
11 they were not drilling with a safe drilling margin?"

12 There's an objection to form.

13 "ANSWER: They -- they -- they -- they thought they
14 had minimum drilling margin, if any.

15 "QUESTION: Shouldn't they have sought a departure
16 from MMS before they continued to drill at this point,
17 sir?

18 "ANSWER: If they had reason to believe that that --
19 that they had less than a half a pound safe drilling
20 margin between what they thought was the minimum fracture
21 gradient in that hole section and -- and their mud weight,
22 their downhole mud weight, I would say, yes."

23 Did I read that correctly?

24 A. You read that correctly; but, you know, I don't agree with
25 what he is saying.

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15:26 1 Q. I fully understand that.

15:26 2 MR. SPIRO: Let's go to Saucier page 289, line 18 to
15:26 3 290, line 15.

15:26 4 THE COURT: Remind me again who is Mr. Saucier. Is
15:26 5 he with MMS?

15:26 6 MR. SPIRO: Oh. Thank you.

15:26 7 BY MR. SPIRO:

15:26 8 Q. Mr. Saucier, correct me if I'm wrong, Doctor, is an even
15:26 9 higher level supervisor in this region of the MMS, correct?

15:26 10 A. You know, I don't have the relative rank straight in my
15:26 11 head. I know both of them were former students that have been
15:26 12 with MMS a long time.

15:26 13 Q. Mr. Saucier -- correct me if I'm wrong -- was the highest
15:26 14 ranking MMS official who testified in deposition in this case.
15:26 15 Am I wrong?

15:26 16 A. I didn't have straight what their rank was, but yes, he
15:26 17 did testify at deposition.

15:26 18 Q. Do you know him to be a person of integrity, sir?

15:27 19 A. I do.

15:27 20 Q. (Reading):

15:27 21 "QUESTION: Okay. During the drilling of a hole
15:27 22 intervals, if losses occur indicating that the actual
15:27 23 fracture gradient is less than the FIT test at the
15:27 24 previous shoe, the operator must still maintain the
15:27 25 approved safe drilling margin between the mud weight and

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15:27 1 the actual fracture gradient in the hole, correct?"

15:27 2 There's an objection to form.

15:27 3 "ANSWER: If the hole indicates the fracture gradient
15:27 4 is different than what you got when you did your shoe
15:27 5 test, the operator should need to -- well, actually, needs
15:27 6 to refer to regulations to take into consideration the new
15:27 7 information they have.

15:27 8 "QUESTION: And so the safe drilling margin, assuming
15:27 9 it's .5 ppg, is not just going to be set from the FIT or
15:27 10 LOT value. If the -- if the actual hole conditions
15:27 11 dictate that the fracture gradient is less than the FIT or
15:27 12 LOT value, then that .5 ppg has to be maintained from that
15:27 13 actual fracture gradient, right?"

15:27 14 There's an objection to form.

15:27 15 "ANSWER: From the new information, yes."

15:27 16 So am I correct that he too agrees with
15:28 17 Dr. Huffman? I'm not asking whether you agree, I'm asking
15:28 18 whether he agrees.

15:28 19 A. Well, you know, it's not clear from this because you are
15:28 20 saying "actual" as though, you know, they had demonstrated it
15:28 21 to be actually, so perhaps with additional open hole formation
15:28 22 integrity tests or something like that.

15:28 23 Also, you know, the first part -- let's read again
15:28 24 the first part of his comment because I wanted to comment on
15:28 25 that, if I could --

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15:28 1 THE COURT: Put it back up.

15:28 2 THE WITNESS: -- as part of my answer.

15:28 3 BY MR. SPIRO:

15:28 4 Q. Yes.

15:28 5 A. You know, I think what he says is actually what the
15:28 6 regulations say. Operator needs to -- actually needs to refer
15:28 7 to regulation to take into consideration the new information
15:28 8 they had. And that's what the regulations say, that they have
15:29 9 to take into account all of the new regulations and if they
15:29 10 need to change their casing program, they do so and request an
15:29 11 MPD based on that.

15:29 12 Q. Let's go to Saucier --

15:29 13 A. I think that's what the regulations say.

15:29 14 Q. I'm sorry. I didn't mean to cut you off.

15:29 15 A. Yeah, I think he is saying there what the regulations say.

15:29 16 Q. Let's go to Saucier, page 306, line 23 to page 307,
15:29 17 line 12.

15:29 18 "QUESTION: All right. If BP knew that in the
15:29 19 Macondo production interval, the previous shoe FIT was not
15:29 20 indicative of the true fracture strength of the formation
15:29 21 to be drilled, you would expect BP to suspend operations
15:29 22 and notify MMS of that fact, right?"

15:29 23 There's an objection to form.

15:29 24 "ANSWER: Yes.

15:29 25 "QUESTION: If BP knew that the previous shoe FIT was

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15:29 1 not indicative of the true fracture strength of the
15:29 2 formation to be drilled, the failure to provide that
15:29 3 information to the MMS would be a regulatory violation,
15:29 4 correct?"

15:29 5 There's an objection to form.

15:30 6 "ANSWER: Yes."

15:30 7 Do you agree with this statement?

15:30 8 A. Well, I agree that's what he said, yes.

15:30 9 Q. Let's go to Albertin, page 74, lines 14 through 19. And
15:30 10 Martin Albertin, do you know him to be the single point of
15:30 11 accountability for pore pressure and fracture gradient
15:30 12 prediction and evaluation on the Macondo well?

15:30 13 A. Yes, I know he was on the pore pressure frac gradient
15:30 14 prediction team.

15:30 15 Q. He had a prominent role, did he not?

15:30 16 A. I think so, yes.

15:30 17 Q. And he is a BP employee?

15:30 18 A. That's correct.

15:30 19 Q. (Reading):

15:30 20 "QUESTION: The drilling -- how is the drilling
15:30 21 margin measured?

15:30 22 "ANSWER: I would define drilling margin and any hole
15:30 23 section to be the difference between the highest pore
15:30 24 pressure and the weakest formation."

15:30 25 Did I read that correctly?

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15:30 1 A. Yes. And I think in a general sense that's so. But from
15:30 2 a regulatory standpoint, I think we are talking about the shoe
15:30 3 test as being the test that's been verified with an actual
15:30 4 pressure test. And I think you would need to verify something
15:30 5 with an actual pressure test beyond that before you would
15:31 6 change, you would need another shoe test, perhaps an open hole
15:31 7 test, before you could make a decision like that.

15:31 8 Other than that, you take into account the
15:31 9 information that you get, all the information, all the
15:31 10 observations, and enter it into the record. And if you need to
15:31 11 change your casing program, you do so.

15:31 12 Q. I'll try to cut this short, Doctor. Do you recall that
15:31 13 Mark Alberty testified in a similar way to Martin Albertin?

15:31 14 A. I guess I would rather see what you are talking about.

15:31 15 Q. Let's go to Alberty, page 34, line 9 to 35, line 4. And
15:31 16 to cut to it, let's just go to line 15 up there.

15:31 17 "ANSWER: I don't think -- know the proper definition
15:31 18 for drilling margin. For me drilling margin would be the
15:31 19 difference between pore pressure and fracture gradient."

15:32 20 And then if you go to line 24.

15:32 21 "QUESTION: Okay. And when you see it, it means to
15:32 22 you the difference between pore pressure and fracture
15:32 23 gradient?

15:32 24 "ANSWER: In the well interval, the maximum pore
15:32 25 pressure and the minimum fracture gradient in that

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1 interval."

2 So that's sort of the same answer that

3 Mr. Albertin gave, correct?

4 A. Yeah. And, again, this is in a general sense. We are not
5 talking about the regulatory safe drilling margin.

6 Q. Sure. I assume that's --

7 A. We are talking about drilling margins and not the
8 regulatory safe drilling margins, which is defined in terms of
9 the pressure integrity test.

10 Q. But you would agree that the folks at MMS should know what
11 the "safe drilling margin" means?

12 A. Well, I'm not sure. You know, I have read conflicting
13 testimony to that effect. Before -- I guess early on in
14 Frank Patton's testimony, it seemed like they took one position
15 and then later, after Dr. Huffman's report, there was a
16 different position taken. So I'm not real sure, you know, what
17 their position is at this point.

18 Q. Do you recall that someone specifically asked Frank Patton
19 that if the fracture gradient dropped to below the shoe test,
20 the safe drilling margin would still be based on the shoe test
21 and not the weakest fracture gradient in the hole? Are you
22 saying that someone asked that question to Frank Patton?

23 A. I think they have asked him what it was based on and he
24 said the shoe test.

25 Q. And I think Mr. Trocquet would say the same thing if you

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1 just asked the question without qualification, correct?

2 **MR. BROCK:** Your Honor, that's argumentative. I
3 object to that. It's speculating as to what he would say.

4 **THE COURT:** I sustain the objection.

5 **BY MR. SPIRO:**

6 **Q.** Are you suggesting -- let's just move on.

7 You said in your report, correct me if I'm wrong,
8 that operators must keep their mud weight slightly higher than
9 their pore pressure while drilling, correct?

10 **A.** Yes.

11 **Q.** And you said in your report that this is done to avoid
12 kicks, correct?

13 **A.** If we are talking about a permeable formation, that's
14 true. I think -- I also said that if you are drilling through
15 rock that doesn't have significant permeability, then you often
16 would drill with mud weights less than the pore pressure.

17 **Q.** If you want to drill with a mud weight below your pore
18 pressure, you should seek MMS permission first, correct?

19 **A.** Well, if it's in a permeable zone, I think you would, yes.

20 **MR. SPIRO:** I want to show TRES-6217. And get to the
21 fly-out, 6217.1.1. Can you make that larger? Oh, there you
22 go.

23 **BY MR. SPIRO:**

24 **Q.** This is § 250.401. Do you recognize this, Doctor?

25 **A.** Yes.

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15:34 1 Q. Let's read this out loud since we didn't look at this one
15:35 2 before.

15:35 3 "What must I do to keep wells under control?

15:35 4 "You must take necessary precautions to keep wells
15:35 5 under control at all times.

15:35 6 "You must use the best available and safest drilling
15:35 7 technology to monitor and evaluate well conditions and to
15:35 8 minimize the potential for the well to flow or kick."

15:35 9 Did I read that correctly?

15:35 10 A. Yes.

15:35 11 Q. This is a fundamental regulation in drilling, is it not?

15:35 12 A. Yeah. I mean, that's the general idea.

15:35 13 Q. It is a fundamental principle of well control, is it not?
15:35 14 That if you can help it, you try to minimize incidents where
15:35 15 the well loses mud to the formation?

15:35 16 A. You never want that -- well, I guess -- there are
15:35 17 sometimes when you intentionally will break down, but most of
15:35 18 the time, you don't want that to happen.

15:35 19 Q. Section 401 implicitly requires an operator to honor that
15:35 20 principle, does it not?

15:35 21 A. Yes, uh-huh.

15:35 22 Q. So you try to keep wellbore fractures to a minimum?

15:36 23 A. Generally, you don't want the well to fracture.

15:36 24 Q. If you lose enough mud, your well can kick, correct?

15:36 25 A. If you lose mud to the point you can't maintain the mud

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1 weight you need, then the well can kick.

2 Q. It's also a basic principle of well control, is it not,
3 that if you do take a kick, you increase your mud weight in
4 order to overpower the pore pressure?

5 A. That's often true if the kick that you took was at a
6 higher pore pressure. Sometimes you take kicks at the same
7 pore pressure you have, for example, on trips and things like
8 that. But, yeah, if you run into a higher pore pressure zone,
9 you have to increase your mud weight when that happens.

10 Q. So correct me if I'm wrong, but a prudent operator strives
11 to maintain enough of a cushion between its mud weight and the
12 pressure at which the wellbore will begin to fracture so that
13 it can increase its mud weight in response to a kick without
14 fracturing the well?

15 A. That's a general principle that you use, especially in
16 well planning. But sometimes when you get into drilling a
17 well, then you get into situations where you know what the pore
18 pressure is, you know what's going down, and you are just
19 trying to drill to get through a sand that you know has -- you
20 know what the pore pressure of the sand is and you know it's
21 not increasing, so you know you won't take a kick. And under
22 those conditions, quite often, the operator will drill to the
23 bottom of the sand. That's standard operating procedure.

24 Q. The general principle that I stated you agree with, do you
25 not, that generally you try to maintain a cushion between the

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15:37 1 mud weight and the pressure at which the wellbore will begin to
15:37 2 fracture?

15:37 3 A. Yeah, when you are talking in terms of a general well
15:37 4 design and you're expecting the pore pressure and the frac
15:37 5 gradient to be increasing with depth, then you design your well
15:37 6 so that you will be able to maintain this cushion when you
15:38 7 decide where you are going to set pipe. That's part of the
15:38 8 design process.

15:38 9 Q. This is why you sometimes hear the term "kick margin" to
15:38 10 refer to the margin between the mud weight and the fracture
15:38 11 gradient, because you want that margin so you can respond to a
15:38 12 kick without fracturing the well and losing mud, correct?

15:38 13 A. Again, this is part of the well design process. When you
15:38 14 are talking about static mud weights and not dynamic mud
15:38 15 weights, that you are just doing the design, you're picking
15:38 16 where your casing points are going to be, and you pick them
15:38 17 such that you can maintain a margin. Because especially in
15:38 18 predrill, you're not going to know exactly what the pore
15:38 19 pressures are. So that margin allows for both dynamic effects
15:38 20 due to pumping and moving pipe and that sort of thing, and also
15:38 21 if you take a kick and allow the drill to increase the mud
15:38 22 weight.

15:38 23 Q. Well, let's look at D-3564 and in particular D-3564.2.1.
15:39 24 Here it is. This is from the BP tubular design manual. This
15:39 25 was a demonstrative used with Dr. Huffman. You may remember

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15:39 1 it.

15:39 2 A. Right.

15:39 3 Q. You notice that the curve to the left and the curve to the
15:39 4 right is separated by that margin. That's called the "kick and
15:39 5 cementing margin" in BP's terminology -- between the margin
15:39 6 that you have -- where you stop drilling when you are designing
15:39 7 the well and the fracture gradient, correct?

15:39 8 A. Right. This is the well design process that you're
15:39 9 looking at. That's kind of the standard process you go through
15:39 10 and you allow that -- if you want to call it "kick margin" or
15:39 11 "cementing margin" or "ECD" -- it allows for all those things.
15:39 12 It allows for dynamic effects.

15:39 13 And on the left, when you design a well, you also
15:39 14 allow a margin for pulling pipe because you're designing based
15:39 15 on static mud weight. Mud weight is in the tank, not dynamic
15:40 16 conditions. So this is the way you do it.

15:40 17 Q. "Kick margin," I guess, is used in different ways by
15:40 18 different people because I heard you use it this morning to
15:40 19 refer to the margin between the pore pressure and the mud
15:40 20 weight?

15:40 21 A. Yes, it can be used that way too. If you get within that
15:40 22 margin, you could take a kick.

15:40 23 Q. So I'm going to use it to mean the difference between the
15:40 24 highest mud weight in the interval and the weakest fracture
15:40 25 gradient. Whether you agree with that definition -- whether

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15:40 1 it's your definition or not, that's how I'm going to use it.

15:40 2 Do we understand each other?

15:40 3 A. Yes. And as we see in that plot, normally it's going to
15:40 4 be at the shoe.

15:40 5 Q. Agreed. I think everybody in the matter has said the same
15:40 6 thing in that regard.

15:40 7 A. Yes.

15:40 8 Q. Dr. Bourgoyne, it's your position that pore pressure is
15:40 9 difficult to predict precisely, is it not?

15:40 10 A. That's correct.

15:40 11 Q. Predictions are probably wrong as much as they are right
15:40 12 in terms of getting it precisely accurate, correct?

15:41 13 A. Yeah, I think I remember saying that. And it's true. I
15:41 14 worked as a pore pressure prophet at one time, so I have had
15:41 15 some experience at that.

15:41 16 Q. Your predicted pore pressures can be too low just as they
15:41 17 can be too high, correct?

15:41 18 A. That's correct.

15:41 19 Q. So the predicted pore pressure can underestimate the
15:41 20 conditions you encounter while drilling a well?

15:41 21 A. That's correct.

15:41 22 Q. When this happens, a well can take a kick?

15:41 23 A. That is correct.

15:41 24 Q. And you need to ramp up your mud weight to respond to that
15:41 25 kick?

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15:41 1 A. When you take a kick, quite often, if it's at a higher
15:41 2 pore pressure, you need to weight up the mud.

15:41 3 Q. This is why you'd want a kick margin at all times, right?
15:41 4 Because otherwise, if you ramp up your mud weight to respond to
15:41 5 that unexpected kick, you can fracture your well?

15:41 6 A. Again, we have been talking about well design and casing
15:41 7 design and picking the casing points initially. But once you
15:41 8 get into drilling and you have actual data, especially if you
15:41 9 have a downhole PWD data and you know where the permeable zones
15:42 10 are and you know where the impermeable zones are and you know
15:42 11 what the pore pressures are, there are conditions when you
15:42 12 would want to drill to the bottom of the sand in order to be
15:42 13 able to set pipe in a good, safe shoe spot to where, when you
15:42 14 do set pipe, you will have a good shoe.

15:42 15 Q. Are you saying you can always precisely predict the pore
15:42 16 pressure and the fracture gradient in sand?

15:42 17 A. I'm saying, if you measure it, then you know what it is.

15:42 18 Q. That's not what I'm asking. I'm not sure I understood
15:42 19 your answer.

15:42 20 Are you saying you can always precisely predict your
15:42 21 pore pressure and your fracture gradient in sand?

15:42 22 A. No, I'm not saying that. I'm not saying you can actually
15:42 23 accurately predict anything.

15:42 24 I'm saying if you measure it and you're still in the
15:42 25 same sand and you're still at the same pore pressure or a lower

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15:42 1 pore pressure -- we know that pore pressure goes down in a
15:43 2 hydrocarbon-bearing sand and would stay the same in a
15:43 3 water-bearing sand, as you drill deeper, because it's a
15:43 4 permeable zone and the pressures equalize throughout that zone.

15:43 5 Q. As a general matter, leaving aside some huge swath of sand
15:43 6 that is going to cover the entire area you are about to drill,
15:43 7 you can't ever know the precise pore pressure or the fracture
15:43 8 gradient that you're going to encounter in sand, correct?

15:43 9 A. If you're drilling ahead in a long interval -- I think
15:43 10 what you're saying is correct -- especially if you are going to
15:43 11 be drilling through a significant shale thickness, what's on
15:43 12 the other side of that shale thickness you might not know. So,
15:43 13 yes, under those conditions, you would want to allow some
15:43 14 margin for being able to weight up.

15:43 15 Q. I'm not even talking about a long interval. I'm just
15:43 16 saying: When you get past the particular sand you are talking
15:43 17 about, you are still in the realm of the unknown?

15:43 18 A. I think you have to move a significant distance before the
15:44 19 pore pressure could go up. I'm talking hundreds of feet or a
15:44 20 hundred feet or something like that.

15:44 21 Q. I assume you are familiar with the term "kick tolerance,"
15:44 22 correct?

15:44 23 A. I am familiar with kick tolerance, yes.

15:44 24 Q. This also refers to the ability to respond to a kick,
15:44 25 right?

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1 A. What "kick tolerance" refers to is the number of barrels
2 of gain that you could take without your casing pressure
3 increasing to the point that you would break down at the shoe,
4 generally, is the way you calculate it. If you look at a kick
5 tolerance calculation worksheet, you will see the shoe test is
6 one of the entries on that worksheet.

7 Q. Let's go to TRES-215.9.1. This is the BP well control
8 manual. Sorry, we showed that first page very quickly.

9 Do you recognize this document, or do we want to
10 go back to the first page?

11 A. I think I recognize it. Yes, okay, Group Practice. BP
12 Engineering Technical Practices.

13 Q. Let's go to .9.1. Sorry. This is talking about kick
14 tolerance and I will just read it.

15 "For conventional drilling operations, the kick
16 tolerance of the weakest known point of the hole section being
17 drilled shall be updated continuously while drilling and
18 reported on all BP daily drilling reports."

19 Did I read that correctly?

20 A. Yes.

21 Q. It goes on to say: "Kick tolerance is defined as the
22 maximum volume of kick influx that can be circulated out of the
23 well without breaking down the formation at the open hole weak
24 point."

25 Did I read that correctly?

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15:45 1 A. You did.

15:45 2 Q. So BP is saying that they calculate the kick tolerance
15:45 3 based on the weakest point of the hole section being drilled?

15:45 4 A. That's what it says there. I didn't see any of these
15:46 5 calculations in any of the records that I looked at, and I kind
15:46 6 of think it's normal for people to have these policies
15:46 7 developed that are not always followed in the field because
15:46 8 they are often not that practical.

15:46 9 Q. I'm just asking you if I read that right.

15:46 10 A. You read that correctly.

15:46 11 Q. This is talking about updating this continuously while
15:46 12 drilling, correct?

15:46 13 A. Yes.

15:46 14 Q. Now, I'm not saying it applied to this well or anything.
15:46 15 I'm just talking about the general well control manual, okay?
15:46 16 General principles.

15:46 17 A. That's what's in their manual.

15:46 18 Q. Let's talk about designing a little bit. I think you
15:46 19 said -- maybe we can do this quickly -- that you base your kick
15:46 20 margin on the weakest fracture gradient in the open hole when
15:46 21 designing a well, correct?

15:46 22 A. Yes. If you know when designing it where there's a weak
15:46 23 point, you would take that into account when designing the
15:46 24 well. And quite often this happens where you have depleted
15:47 25 zones that you have already produced, and this can really

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15:47 1 govern how you design your casing.

15:47 2 Q. Once your mud weight becomes so close to the interval's
15:47 3 weakest fracture gradient that you are about to encroach on
15:47 4 your desired kick margin, you set casing, correct? In
15:47 5 designing a well?

15:47 6 A. You plan to set casing at that point, that's correct.

15:47 7 Q. If your drilling fluid pressure exceeds the weakest
15:47 8 formation exposed in the borehole, you risk fracturing the
15:47 9 formation, correct?

15:47 10 A. Yes.

15:47 11 Q. You risk creating an underground blowout, correct?

15:47 12 A. In some cases, you could.

15:47 13 Q. That applies even if the weakest formation is below the
15:47 14 shoe, correct?

15:47 15 A. It could, but it's more unusual. Again, you would have to
15:47 16 know the specifics of the conditions as you find them and then
15:47 17 evaluate. You know, there are cases where you intentionally
15:47 18 will break down a weak zone during a kick in order to, say,
15:48 19 pump a poisonous gas into that zone and not bring it to the
15:48 20 surface. Sometimes you use weak zones to your advantage in
15:48 21 well control to use what they call the "sandwich method," where
15:48 22 you pump down the drill pipe and down the annulus and push the
15:48 23 poisonous gas into the fracture zone and then continue
15:48 24 circulation. So under certain conditions, the weak zone can be
15:48 25 a friend.

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15:48 1 Q. I just want to make sure I understood your answer to my
15:48 2 question, and then you went on -- but I thought I asked that
15:48 3 even if the weakest point in the interval is below the shoe, if
15:48 4 your drilling fluid pressure exceeds that, it can cause an
15:48 5 underground blowout?

15:48 6 And you answered: Yes, it can.

15:48 7 Correct?

15:48 8 A. It can under some circumstances, yes.

15:48 9 Q. And underground blowouts can, under some circumstances,
15:49 10 create safety concerns, can they not?

15:49 11 A. Right. You know, that's what the operator does is they
15:49 12 gather all the indicators that they can and try to make an
15:49 13 appropriate decision in regard to how they are going to change
15:49 14 their plan once they are into drilling, as opposed to planning.

15:49 15 Q. Normally, pressures increase when you drill deeper into a
15:49 16 well, right?

15:49 17 A. Normally, that's correct.

15:49 18 Q. But sometimes they can drop and that's known as a
15:49 19 "pressure regression," correct?

15:49 20 A. Yes.

15:49 21 Q. In the course of planning a well, when you detect the
15:49 22 likelihood of one of those, you set casing accordingly so that
15:49 23 you maintain what I call the kick margin?

15:49 24 A. Yes. You look at the pore pressure/frac gradient curves
15:49 25 and design your well accordingly, that's right.

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15:49 1 Q. So the bottom line -- and I would like to move on -- is
15:49 2 that a prudent operator strives to maintain a cushion between
15:49 3 the mud weight and the weakest fracture gradient in each
15:50 4 interval?

15:50 5 A. Strives to, yes. In some cases, that margin can be less
15:50 6 if the kick margin, which is based on the shoe test, would
15:50 7 confine things to the open hole. Again, you have to look at
15:50 8 the particular conditions of permeability, where the pressures
15:50 9 are measured, what the opportunities for the wellbore
15:50 10 strengthening are. You need to take all that into
15:50 11 consideration. It's not just a simple, what is the density of
15:50 12 the mud weight in the tank and what did somebody calculate for
15:50 13 a pore pressure or frac gradient somewhere? It's a lot more
15:50 14 complicated than that once you get past the design phase into
15:50 15 the actual drilling phase.

15:50 16 Q. Sure.

15:50 17 Doctor, I want us to look next at Saucier 921-17.
15:51 18 I'm going to try to kill two birds with one stone here to save
15:51 19 time.

15:51 20 A. Just so I'm not one of the birds.

15:51 21 Q. So the first bird is the actual regulation.

15:51 22 A. Okay.

15:51 23 Q. Let's take a look at C.F.R. 250.427(a). I want you to
15:51 24 tell me if the questioner gets the regulation wrong. I assume
15:51 25 you have this memorized. You can obviously look at it if you

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15:51 1 need.

15:51 2 The first sentence states: "You must use the
15:51 3 pressure integrity test and related hole-behavior observations,
15:51 4 such as pore pressure test results, gas-cut drilling fluids,
15:51 5 and well kicks to adjust the drilling fluid program and the
15:51 6 setting depth of the next casing string."

15:51 7 So much for two birds with one stone. Is that
15:51 8 correct, the way I read that?

15:51 9 A. That's correct, and that's what the operator has to do.
15:51 10 He has to use those observations and record all test results
15:51 11 and change their plans as appropriate for that.

15:51 12 Q. I actually want to go back to the deposition page. So can
15:52 13 we go back to the deposition?

15:52 14 "QUESTION: If losses are encountered while drilling
15:52 15 and an operator like BP determines that the fracture
15:52 16 gradient in the open hole is less than the FIT or LOT at
15:52 17 the previous shoe, that fracture gradient is a related
15:52 18 hole-behavior observation pursuant to the regulation,
15:52 19 correct?"

15:52 20 There's an objection to form.

15:52 21 "ANSWER: Yes."

15:52 22 Do you see that?

15:52 23 A. Yes. And, of course, it says "BP determines that," like
15:52 24 they know it for sure at that point, that maybe they have done
15:52 25 another open hole leak-off test or something. I'm not sure

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15:52 1 what that means, but go ahead.

15:52 2 Q. Correct me if I'm wrong that test results, pore pressure
15:52 3 test results is one example. Well kick is another example.
15:52 4 Those are the kind of results that can cause you to say, "Whoa,
15:53 5 our fracture gradient has dropped," correct?

15:53 6 A. Well, pore pressure is pore pressure. It doesn't tell you
15:53 7 what the frac gradient is. You are assuming you can calculate
15:53 8 frac gradient from pore pressure, and I don't think you can.

15:53 9 Q. We will get to that, won't we?

15:53 10 A. Yes.

15:53 11 Q. I know you are prepared for it.

15:53 12 Okay. Well, let me ask you this. Assume that you
15:53 13 were following the trial testimony of Dr. Huffman.

15:53 14 A. I did.

15:53 15 Q. The question was asked by the judge: Are you really
15:53 16 talking about the weakest link? You have to pay attention to
15:53 17 the weakest link and have a margin from your mud weight to the
15:53 18 weakest link in the fracture pressure?

15:53 19 Do you remember that?

15:53 20 A. I do.

15:53 21 Q. Is it your testimony that, no, it's not the weakest link,
15:53 22 it's not the weakest link at all. It's the shoe test, period?

15:53 23 A. It's the critical link. It's the link that's protecting
15:53 24 the weaker sands above. Those are the ones that are really
15:54 25 weak. The weaker zones and the open hole are not near as

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15:54 1 dangerous to you as going back behind the shoe and getting to
15:54 2 the -- having a cascading-type of failure to the others.

15:54 3 Q. Even though they can create underground blowouts and even
15:54 4 though underground blowouts can have safety concerns, according
15:54 5 to your own testimony. Would you agree with what I just said?

15:54 6 A. I would agree with what you just said, but it depends on
15:54 7 the conditions that you have. We have lost returns all the
15:54 8 time and it's -- we have standard procedures for dealing with
15:54 9 them and trying to strengthen them and generally they don't
15:54 10 lead to an underground blowout but, yes, they can and
15:54 11 occasionally they do. And if they do, the operator has to deal
15:54 12 with it. It's not really a safety concern; it's a concern
15:54 13 about losing the lower part of the well.

15:54 14 Q. Before I actually go interval by interval -- and I will
15:54 15 skip intervals. I don't want to be here all day -- I have a
15:54 16 couple of hypotheticals.

15:55 17 MR. SPIRO: First let's put up again 6217.1.1.

15:55 18 BY MR. SPIRO:

15:55 19 Q. This is the 401 that we just saw.

15:55 20 A. Thank you.

15:55 21 Q. Let me ask you about this hypothetical.

15:55 22 Let's say your well has a proposed .5 ppg safe
15:55 23 drilling margin and MMS has approved it.

15:55 24 So it's just like this well. Are you with me so far?

15:55 25 A. I'm with you, but 401 really doesn't have anything to do

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15:55 1 with .5 or drilling margins.

15:55 2 Q. I'm just giving you a hypothetical with a few facts.

15:55 3 Let's say the result of the shoe test above the
15:55 4 relevant interval was higher than 14.3. Okay.

15:55 5 A. Uh-huh.

15:55 6 Q. Let's say the whole well team believes that the weakest
15:55 7 fracture gradient in the interval, based on old behavior
15:55 8 observations, is 14.3. So it's lower than the shoe test.

15:55 9 Are you with me?

15:55 10 A. Yes.

15:55 11 Q. And let's say the whole well team believes that everything
15:55 12 that can be done to strengthen that wellbore has been done.
15:56 13 It's a 14.3. That's the weakest fracture gradient, the weakest
15:56 14 length.

15:56 15 Are you with me?

15:56 16 A. I'm with you. Since they agree and they all know that it
15:56 17 is, then it's assuming that they have done something to verify
15:56 18 it, you know, like perhaps another pressure test or another
15:56 19 shoe test.

15:56 20 Q. Let me just go on. Let's give those facts.

15:56 21 Would it violate 401, in your view, to drill ahead
15:56 22 with a mud weight above 13.8 -- that's .5 below -- and without
15:56 23 getting approval from MMS first?

15:56 24 **MR. BROCK:** I'm going to object to incomplete
15:56 25 hypothetical, assuming facts not in evidence.

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15:56 1 MR. SPIRO: Your Honor, it's a hypothetical. I'm not
15:56 2 saying it's the facts of this case.

15:56 3 MR. BROCK: It ought to relate to this case if he is
15:56 4 asking a hypothetical.

15:56 5 MR. SPIRO: Well, it does relate to --

15:56 6 THE COURT: Restate your question.

15:56 7 MR. SPIRO: Okay.

15:56 8 BY MR. SPIRO:

15:56 9 Q. If your well has a .5 drilling margin like this one did
15:56 10 and that you have a shoe test result that's higher than your
15:56 11 assessment of the weakest fracture gradient in the interval --
15:57 12 which in the bottom interval was 16, right? -- and you have
15:57 13 done your wellbore strengthening, but you don't have confidence
15:57 14 that it's higher than, let's say, 14.3 -- which some of the
15:57 15 testimony indicates it was at the bottom interval -- would it
15:57 16 violate 401 to drill ahead with a mud weight above 13.8 and
15:57 17 without getting approval first from MMS?

15:57 18 MR. BROCK: Same objection.

15:57 19 THE COURT: I sustain the objection.

15:57 20 BY MR. SPIRO:

15:57 21 Q. In October 2009, at the 22-inch shoe, BP conducted several
15:57 22 pressure integrity tests, did they not?

15:57 23 A. They did.

15:57 24 Q. I want to ask you about the question of which test should
15:58 25 be reported when you take multiple tests at a given shoe.

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15:58 1 Okay?

15:58 2 A. Okay.

15:58 3 Q. Scherie Douglas was BP's regulatory specialist for the
15:58 4 Macondo well, correct?

15:58 5 A. I think she's the clerk that handled the information
15:58 6 transfer between BP and MMS, yes.

15:58 7 Q. Do you recall that she was asked at her deposition about
15:58 8 whether, when you take multiple pressure integrity tests at a
15:58 9 shoe, the result that you should report to MMS is the result of
15:58 10 the final test that you took?

15:58 11 A. Yes.

15:58 12 Q. Do you recall she said that, yes, that is what she
15:58 13 understands MMS wants, the final test should be reported?

15:58 14 A. Yes, I remember that.

15:58 15 Q. She also said -- correct me if I'm wrong -- that that is
15:58 16 what she told her people at BP to report, the last test,
15:58 17 correct?

15:58 18 A. That's correct. I remember that too.

15:58 19 Q. Is it not your view that if that's what MMS wants you to
15:59 20 report, namely, the last test, then that's what you should
15:59 21 report?

15:59 22 A. I agree with that. I think they probably should look at
15:59 23 all the test results, but the one they are going to report is
15:59 24 going to be the last one, and I think that's appropriate.

15:59 25 That's the final conditions of the well as last tested.

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15:59 1 Q. I want to show Exhibit 3727, and let's -- I don't know if
15:59 2 you recognize this. This is a waiver request from Scherie
15:59 3 Douglas to MMS. Do you see that at the top?

15:59 4 MR. SPIRO: Let's just do the fly-out, .1.1. I think
15:59 5 it has everything in there. There you go.

15:59 6 BY MR. SPIRO:

15:59 7 Q. Do you remember this document?

15:59 8 A. Vaguely.

15:59 9 Q. Correct me if I'm wrong. It indicates that BP would not
15:59 10 drill with a mud weight of less than .3 below the shoe test.
15:59 11 And I'm focusing here on: The surface mud weight we will drill
15:59 12 is 9.95. See that?

15:59 13 And the max LOT, the surface mud weight equivalent,
16:00 14 shoe test is 10.25. Do you see that?

16:00 15 A. Right.

16:00 16 Q. So assume this was honored and BP in this case had a .3,
16:00 17 not a .5 margin for this interval, correct?

16:00 18 A. That would be a .3 margin. I think that's what they are
16:00 19 asking for, is to go to for approval to go from a .5 to a .3.

16:00 20 And this is on the 22-inch, right?

16:00 21 Q. Below the 22-inch shoe.

16:00 22 A. So what we are talking about is a very shallow zone,
16:00 23 right? Okay.

16:00 24 Q. Well, I don't --

16:00 25 A. I'm just trying to get in my head what --

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- 16:00 1 Q. 8970 is where they took the kick, if that helps.
- 16:00 2 A. Okay.
- 16:00 3 Q. BP was required by the regulation to honor that .3 safe
16:00 4 drilling margin, was it not?
- 16:00 5 A. Yes. Or get permission to do otherwise.
- 16:00 6 Q. If BP had reported the most recent shoe test, they would
16:00 7 have reported a 10.09 ppg result, correct?
- 16:01 8 A. Well, I think the 10.09 should have an -- 10.1 is what
16:01 9 they should have reported.
- 16:01 10 Q. The 10.09 is what they had; that was their last result.
- 16:01 11 A. That's what they calculated. With any significance it was
16:01 12 a 10.1.
- 16:01 13 Q. Let me stipulate, for the sake of discussion, it was a
16:01 14 10.1.
- 16:01 15 A. Good.
- 16:01 16 Q. In fact, they reported a 10.25, right?
- 16:01 17 A. Yes.
- 16:01 18 Q. Also, they said they wouldn't drill ahead with a mud
16:01 19 weight over 9.95; but, in fact, they drilled the last portion
16:01 20 of the interval with a mud weight of 10.1, did they not?
- 16:01 21 A. That's right. And I think the 10.25 should have an 10.3;
16:01 22 it should have been rounded to a 10.3.
- 16:01 23 So they drilled it with a 10, and I think they may
16:01 24 have even gotten up to a 10.1 before getting completely through
16:01 25 it.

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16:01 1 Q. Well, I could show you your deposition if that would help
16:02 2 refresh your recollection about whether it was a 10.1.

16:02 3 Do you recall it was a 10.1, the highest mud weight
16:02 4 they got in the interval?

16:02 5 A. That's kind of what I recall. A 10 heavy anyway.

16:02 6 MR. SPIRO: Let's go page to Volume 2, page 75,
16:02 7 lines 11 through 14.

16:02 8 BY MR. SPIRO:

16:02 9 Q. This was obviously some time ago, when you had your
16:02 10 deposition taken. I don't know if that refreshes your
16:02 11 recollection.

16:02 12 A. 10.1 surface mud weight, that's what I just said.

16:02 13 Q. I just wanted to make sure. You said, I thought, you
16:02 14 weren't sure.

16:02 15 So they had a 10.1 shoe test, and they drilled with a
16:02 16 10.1. That's a margin of zero, correct?

16:02 17 A. That's correct.

16:02 18 Q. They needed a positive .3 margin to drill the interval,
16:02 19 consistent with the safe drilling margin regulation, correct?

16:02 20 A. Without getting special permission, that's right.

16:02 21 Q. They did not get permission to drill this interval with
16:03 22 less than a .3, did they?

16:03 23 A. Not that I could tell.

16:03 24 Q. They didn't seek it either, did they?

16:03 25 A. I don't know.

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16:03 1 Q. So is it your -- well, tell me this. It is, in fact, your
16:03 2 view -- correct me if I'm wrong -- that BP failed to comply
16:03 3 with the safe drilling margin when it drilled the final portion
16:03 4 of the October interval?

16:03 5 A. I think that could be true. But I think what they did,
16:03 6 under the conditions that they were faced with, was appropriate
16:03 7 in that they were dealing with shallow water flow zones really
16:03 8 at a casing point that bordered on whether you would drill it
16:03 9 with a marine riser or whether you would do the pump-and-dump
16:03 10 and not have the riser and, you know, not even have a shoe test
16:03 11 at that point.

16:03 12 You're within sort of that transition between shallow
16:03 13 water flow practice and putting the riser on and controlling
16:04 14 with the blowout preventers and so forth. So looking at the
16:04 15 way they handled the case, I think they did the right thing,
16:04 16 but they should have gotten permission first if they didn't.

16:04 17 Q. They should have gotten permission from MMS before they
16:04 18 drilled the final portion of that interval. Is that what you
16:04 19 are saying?

16:04 20 A. Yes.

16:04 21 Q. By not seeking that permission, they violated the safe
16:04 22 drilling margin regulation, did they not?

16:04 23 A. You know, that's up to MMS to decide when they look at the
16:04 24 conditions. I think -- it's my opinion that had they asked MMS
16:04 25 for permission, it would have been granted. Now, it may have

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1 taken some discussion, but they were definitely in a shallow
2 water flow interval. And the drilling ahead they did was
3 within a sand of known pore pressure, and they stopped 50 feet
4 below where they thought the sand was.

5 **Q.** This is an important point, so let's go to your deposition
6 Volume 1, page 336 -- page 336, 13, through 337, 7. I thought
7 I heard your answer, but you said a lot.

8 **"QUESTION:** Are there any situations where you would
9 drill forward in order to -- in order to -- or during a
10 kick in order to control it?

11 **"ANSWER:** During a kick, while controlling a kick, I
12 can't think of any.

13 **"QUESTION:** Okay.

14 **"ANSWER:** Maybe -- you know, sometimes you get into
15 very unusual problems when you've got, you know, maybe a
16 well that's already in an underground blowout situation
17 and you're having to drill another well to correct the
18 underground blowout. Sometimes in those situations you
19 have to do some unusual things. But that's the only
20 exception I could think of."

21 **THE COURT:** That doesn't seem like --

22 **MR. SPIRO:** No, it sure doesn't.

23 **THE WITNESS:** That doesn't really apply --

24 **MR. SPIRO:** I'm sorry to take you down that memory
25 lane on that.

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1 Let's go to page 75 of Volume 2.

2 **BY MR. SPIRO:**

3 **Q.** But I read that right, didn't I?

4 **A.** You did. You're doing a good job.

5 **Q.** Thank you.

6 Line 18. We are talking about the October interval
7 here.

8 **"QUESTION:** So as you sit here today, based on that
9 information, would you agree that they did not maintain
10 the 'safe drilling margin,' even as you define those terms
11 in the regulation?"

12 There's an objection to form.

13 **"ANSWER:** It, you know -- and I didn't see where they
14 had talked with MMS anymore about the shallow water flow
15 zone. So, you know, as defined in the regulation, the
16 answer is yes."

17 So are you saying unequivocally, yes, they
18 violated the safe drilling margin in October?

19 **A.** As defined in the regulation.

20 But what I'm trying to say, in addition to that --
21 it's a yes. Okay.

22 **Q.** Okay.

23 **A.** What I'm trying to say is, in addition to that, what they
24 did was appropriate for the shallow water flow zone that they
25 were in. And had they gone to MMS, I think MMS would have

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16:07 1 agreed to let them get through that sand and set pipe below it.
16:07 2 And that's what they did. They just drilled ahead a little bit
16:07 3 to get through it and then set pipe.

16:07 4 Q. Dr. Bourgoyne, when they drilled ahead, in violation of
16:07 5 the safe drilling margin regulation, they did not need to do
16:07 6 that in order to control a kick, correct?

16:07 7 A. They controlled the kick before they drilled ahead, and
16:07 8 then they drilled ahead to get to a good shoe point to set pipe
16:07 9 because they were out of drilling margin. They needed to set
16:07 10 pipe.

16:07 11 Q. So they could have asked MMS for a waiver to drill ahead?

16:07 12 A. They should have asked MMS. And what I'm saying is I
16:07 13 believe, if they had asked, the answer would have been yes, at
16:07 14 least pre-Macondo. I'm not sure what the answer would be now,
16:08 15 but I think at that time the answer would have been yes.

16:08 16 Q. On page 11 of your report -- and I think you said it
16:08 17 earlier today -- you made the statement "the well was drilled
16:08 18 to a total depth safely and successfully and consistent with
16:08 19 industry practices."

16:08 20 That was your testimony, correct?

16:08 21 A. That's right.

16:08 22 Q. Yet you've now said that they drilled one interval in
16:08 23 violation of the safe drilling margin regulations, correct?

16:08 24 A. Yes. But what they actually did I thought was proper, and
16:08 25 they handled that shallow water flow zone as best they could

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16:08 1 and, you know, handled it safely, got through it, set pipe, and
16:08 2 got a better casing point.

16:08 3 So they were drilling in a known pore pressure
16:08 4 environment; they knew the pore pressure was going to go up;
16:08 5 they just drilled ahead a little bit to get through the sand.

16:08 6 Yes, they should have asked. They didn't, as best I
16:08 7 can tell; but had they asked, I think they would have been able
16:08 8 to get permission. Because again, this is right in that
16:09 9 transition where you drill wells even without a marine riser,
16:09 10 just pump down the drill pipe and let returns go out at the
16:09 11 seafloor. If they had proposed that in their APD, it probably
16:09 12 would have been approved.

16:09 13 So they are in that transition between where the
16:09 14 sediments are so weak that you can't even support a marine
16:09 15 riser in the mud and the riser; and then the deeper sands, if
16:09 16 you take a kick, you know that things will stay confined
16:09 17 underground.

16:09 18 **Q.** Dr. Bourgoyne, sitting here today, would you agree that
16:09 19 you cannot drill an entire well consistently with industry
16:09 20 practices if you violate the safe drilling margin regulation?

16:09 21 **MR. BROCK:** Your Honor, I'm just going to object to
16:09 22 further questions on this interval. I think this question has
16:09 23 been asked and answered several times now. I think we are just
16:09 24 going over --

16:09 25 **THE COURT:** I sustain the objection.

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16:10 1 BY MR. SPIRO:

16:10 2 Q. Let's move to March. Before they drilled ahead the second
16:10 3 of the three March intervals, BP took a pressure integrity test
16:10 4 at the 13 5/8 shoe, correct?

16:10 5 A. Yes.

16:10 6 Q. We will call that the second March shoe test. When that
16:10 7 second March shoe test was taken, the result that BP obtained,
16:10 8 according to the way it measured the PITs, was a 14.67 surface
16:10 9 mud weight equivalent, correct?

16:10 10 A. 14.7, yes.

16:10 11 Q. That was nearly a full pound per gallon above what BP had
16:10 12 been predicting, correct?

16:10 13 A. That's correct. But then later it was verified with
16:10 14 additional shoe tests in the relief wells that that was a
16:10 15 strong area.

16:10 16 Q. Dr. Huffman opined that the best way to explain this
16:10 17 particular PIT is if the mud was being lost through the shoe in
16:10 18 a cement channel or some other flaw was exposed during the
16:10 19 test, correct?

16:11 20 A. I couldn't tell exactly what he meant. It kind of sounded
16:11 21 like he thought they hadn't drilled out the cement, and then
16:11 22 they pressured up and the bottom part of the cement that they
16:11 23 hadn't drilled out broke down. I couldn't tell if that's what
16:11 24 he meant or if, when the formation began to take fluid, that
16:11 25 the path was through the open hole up on the cement on the

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16:11 1 outside casing. And that's kind of what I assumed he thought
16:11 2 he might -- that he might be thinking. But I'm not sure which
16:11 3 way.

16:11 4 Q. Would you agree that one possibility that could account
16:11 5 for the results of the test is that mud was being lost through
16:11 6 a cement channel at the casing shoe?

16:11 7 A. I think if you are talking about a cement channel on the
16:11 8 outside of the casing that was exposed because you drilled new
16:12 9 formation below the casing -- you know, when the pressure
16:12 10 leaks, you never know for sure whether it's the cement that's
16:12 11 leaking or a fracture that's opening up.

16:12 12 But in any event, you know you have tested it to a
16:12 13 certain pressure before it will start leaking. So that's the
16:12 14 important number, is how much can you increase it before either
16:12 15 the cement leaks or the formation breaks down.

16:12 16 So I guess -- I think it's possible it could have
16:12 17 leaked on the outside of the casing and not been a fracture. I
16:12 18 think it's possible, but I think it's way more likely that it
16:12 19 opened up a small fracture. In any event, it doesn't affect
16:12 20 the shoe test. It's still 14.7.

16:12 21 Q. Let's talk about the final shoe test. That was the 16.0
16:12 22 surface mud weight shoe test. Are you with me? The last one,
16:12 23 the one they took in the beginning of April.

16:12 24 That result also is nearly a full ppg higher than
16:12 25 what they expected when they began the test, correct?

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16:13 1 A. Yes, uh-huh.

16:13 2 Q. There was no sign of leak-off in this test, correct?

16:13 3 A. That's correct.

16:13 4 Q. So theoretically, if they had kept pumping and turned this
16:13 5 into a leak-off test, the result could have been even higher?

16:13 6 A. They would have had to go a little bit higher to get
16:13 7 leak-off, because they hadn't got leak-off yet. So yes.

16:13 8 Q. So the result of this test really is at least 16 and maybe
16:13 9 higher?

16:13 10 A. That's correct.

16:13 11 Q. You call this a FIT, or a formation integrity test, not a
16:13 12 leak-off test because there was no sign of leaking off,
16:13 13 correct?

16:13 14 A. That's the definition of the formation integrity test,
16:13 15 when you don't go to leak-off.

16:13 16 Q. It's fair to say that this result wasn't simply higher
16:13 17 than expected for a FIT; it was higher than expected to an
16:13 18 unusual degree. Correct?

16:13 19 A. Well, it was unusual in that it was over overburden, and I
16:13 20 talked about that a little bit in my direct. That does happen.
16:13 21 It's unusual, but it doesn't say it's a bad test. It just says
16:13 22 you got a strong shoe if you can demonstrate that, indeed, you
16:14 23 have pressurized below the shoe in new formation and it held
16:14 24 the pressure. That's the purpose of the shoe test, is how
16:14 25 strong is the shoe.

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16:14 1 Q. I gather from your report that getting pressure integrity
16:14 2 tests over the overburden pressure can happen when the well is
16:14 3 near salt. I think you said that in your report. Right?

16:14 4 A. I think that's one way you get increased stresses, is the
16:14 5 salt plugs coming up kind of push the sediments together and
16:14 6 increase the stresses.

16:14 7 Q. This well was not near salt, correct?

16:14 8 A. About 2 1/2 miles. They had salt domes all around it.

16:14 9 Q. You consider this well near salt?

16:14 10 A. Yeah. You know, if you look at the diameter of the dome
16:14 11 and you look at where the well was placed, it was well within a
16:14 12 salt dome diameter. So I think it could have been in the area
16:14 13 of influence of the salt dome.

16:14 14 MR. SPIRO: Let's go to 3733.2.1. I'm sorry. We
16:15 15 should probably go to the earlier page. This is TREX-3733.

16:15 16 BY MR. SPIRO:

16:15 17 Q. Now, you see this was taken from page 2 of this e-mail
16:15 18 from Martin Albertin dated March 23. Do you see that?

16:15 19 A. Yes, uh-huh.

16:15 20 Q. And, again, he was the chief -- the point person for pore
16:15 21 pressure and fracture gradient prediction detection on the
16:15 22 well, correct?

16:15 23 A. That's what you told me, yes.

16:15 24 Q. So let's go to the second page again, that same fly-out.
16:15 25 It says here this is one of the possible explanations for the

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16:15 1 high PIT result: "Tectonic effects. We are between salt
16:15 2 bodies, but they are far away (4-6 miles)."

16:15 3 Do you still have the same answer that this is
16:15 4 considered near salt?

16:15 5 A. Well, I think the statement is incorrect. I mean, I
16:15 6 looked at the predrill information and it's more like 2 miles.
16:16 7 You know, there's some graphics in the predrill that shows the
16:16 8 salt plugs and the position of the well and the 4 to 6 miles is
16:16 9 not correct.

16:16 10 **MR. SPIRO:** Let's look at D-7520.1.1 -- no, excuse
16:16 11 me. Let's look at D-3607.

16:16 12 **BY MR. SPIRO:**

16:16 13 Q. So this is a demonstrative that the government created
16:16 14 that's very similar to, I think, one that you put up earlier
16:16 15 today dealing with the first casing test, which we did not take
16:16 16 all the way to the top, right? This is when it actually
16:16 17 leveled off, correct? The test all the way to the left was the
16:16 18 first casing test?

16:16 19 A. The blue points were the first casing test.

16:16 20 Q. And then the one in the middle was the formation test?

16:16 21 A. Right.

16:16 22 Q. And then the one on the end was the second casing test?

16:16 23 A. Right. And they all have the same slope, so that's
16:17 24 interesting to note.

16:17 25 Q. They all have the same slope. And there's actually more

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1 bleed-off in the two casing tests, and even assuming that
2 there's 5 psi, like you said earlier today, there's still more
3 bleed-off in the two casing tests, right?

4 A. Well, I don't see a whole lot of bleed-off in that second
5 casing test. You get a little bit of drop when you shut the
6 pump off.

7 Q. A little bit. A little bit more than 5 psi, not a whole
8 lot?

9 A. Not a whole lot, you're right.

10 Q. But again, I mean, you would acknowledge the other FIT
11 that they did on this well was a lot more than any of these
12 casing tests, correct?

13 A. The bleed-off in the others were more than this one?

14 Q. Yes.

15 A. Yes. But I don't attach any significance to that.

16 Q. I understand. I understand.

17 A. It just says that this shale was really impermeable and
18 you didn't open up very much and it had no flaws at all. So,
19 you know, that's -- you know, once you demonstrate that you've
20 penetrated a brand-new formation under it and you have applied
21 the pressure there and you look at the pressure, you know, how
22 can you argue with the pressure test?

23 Q. Dr. Bourgoyne, you used as one of your examples the relief
24 well, right? You said that was an example of a well that was
25 in this area obviously -- even I would have to concede that,

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16:18 1 right -- and was above overburden, correct?

16:18 2 A. Yes.

16:18 3 MR. SPIRO: Why don't we go to 7520.1.1. Oh, I'm
16:18 4 sorry. That was the last one. There you go. So this is the
16:18 5 relief well. Can we maybe move that thing at the top higher up
16:18 6 so we don't block the curve. Okay. That's fine.

16:18 7 BY MR. SPIRO:

16:18 8 Q. Do you recognize this? I'm sorry. You may have to
16:18 9 squint. This is the relief well. Do you see that Macondo
16:19 10 relief well?

16:19 11 A. Yes.

16:19 12 MR. SPIRO: So why don't we get rid of that so we can
16:19 13 see the whole -- see the whole curve. Okay.

16:19 14 BY MR. SPIRO:

16:19 15 Q. And I want to point out here, if you can look to where I
16:19 16 am pointing, it actually started leaking off there, didn't it?

16:19 17 A. Yes.

16:19 18 Q. Pretty low? Actually, less than overburden, correct?

16:19 19 A. Probably so.

16:19 20 Q. So if you count this leak-off test, as you do in your own
16:19 21 textbook, as the place where the fracture begins, where it
16:19 22 leaks off, it's below overburden, correct?

16:19 23 A. The point that you pointed to is below overburden and that
16:19 24 is one of the techniques for interpreting leak-off test, to
16:19 25 look for a fracture initiation point, but that's not the BP

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16:19 1 protocol and that's not the way that spreadsheet is designed.
16:19 2 They go with the maximum pressure they see and, you know, that
16:19 3 had all been explained to MMS in some previous meetings that
16:20 4 they had over there. So, I mean, that's not news. And I've
16:20 5 seen other operators do it this way too.

16:20 6 So, again, that falls within what I would consider
16:20 7 normal industry practice, because I've seen several operators
16:20 8 interpret leak-off tests in that way.

16:20 9 Q. I only raised it because you used this as an example of
16:20 10 one of the many wells that were much higher than predicted and
16:20 11 that were over overburden. And am I correct the curve here is
16:20 12 very, very different from the curve in the final PIT in the
16:20 13 Macondo original well?

16:20 14 A. This one shows some departure from linearity earlier,
16:20 15 that's true.

16:20 16 Q. Now, they were expecting higher PIT results in October and
16:20 17 retested a total of eight times, correct?

16:20 18 A. Are you talking about the 22-inch shoe again?

16:21 19 Q. Yes.

16:21 20 A. Yes. Again, this was a different situation. That
16:21 21 borehole had been drilled with seawater, which is not a very
16:21 22 good drilling fluid. The wellbore walls are going to be soft
16:21 23 and in bad shape and you are in shallow sediments anyway. So
16:21 24 the whole thing just is kind of soft.

16:21 25 Q. In February, they retested it. I just forgot this is

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16:21 1 October, so I'll stay away from October.

16:21 2 In February they retested a total of six times?

16:21 3 A. Well, they retested. I don't remember exactly how many
16:21 4 times. A number of times because they didn't get what they
16:21 5 needed to proceed, at least they didn't get what they expected.
16:21 6 And then they squeezed cement, attempting to repair wherever it
16:21 7 was leaking. It probably was leaking up around the cement
16:21 8 because the sediments are so soft, you are not getting a good
16:21 9 bond between the cement and those shallow sediments that had
16:21 10 been drilled with this seawater.

16:21 11 Q. But they didn't retest in March and April when they got
16:22 12 results that were substantially higher than they expected?

16:22 13 A. But you always retest after you squeeze and then redrill
16:22 14 out. I mean, that's just standard procedure. You have to
16:22 15 retest under those conditions after a squeeze job.

16:22 16 Q. Dr. Bourgoyne, I heard you say earlier that you thought
16:22 17 the BP staff viewed the last PIT and the second March PIT as
16:22 18 valid tests. Did I hear you correctly?

16:22 19 A. The last test in March.

16:22 20 Q. The last test, which was in April, and the second March
16:22 21 test --

16:22 22 A. I'm saying that was the one they should have reported to
16:22 23 MMS as the valid test.

16:22 24 Q. So I ask you, did you -- is it your testimony that you
16:22 25 think the BP staff believed in those tests?

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16:22 1 A. Believed in?

16:22 2 Q. Those tests.

16:22 3 A. In the 10.1, yes, I think so.

16:22 4 Q. I'm talking about the -- let's just talk about the final
16:22 5 PIT. Are you saying they thought the final PIT was valid?

16:22 6 A. Yes.

16:22 7 Q. And they thought the second March shoe test was valid?

16:23 8 A. The second March . . .

16:23 9 Q. The 13 5/8?

16:23 10 A. Yes.

16:23 11 Q. If that were true, the BP well team couldn't help but view
16:23 12 the pressures in this well as highly unpredictable, right?

16:23 13 A. What pressures, the fracture pressures?

16:23 14 Q. Sure.

16:23 15 A. Yes, it's true that when you get a test that that's high
16:23 16 and over overburden, then you're pretty sure it's not going to
16:23 17 be representative of the rest of the whole section, that the
16:23 18 frac gradient is probably going to be less than what the shoe
16:23 19 test is. It's not going to keep getting stronger as you go
16:23 20 deeper under those conditions, that's right.

16:23 21 Q. Would you agree that when a prudent operator encounters a
16:23 22 well with pressures that are highly unpredictable and is about
16:23 23 to drill into a hydrocarbon zone, which they were about to
16:23 24 drill into in April, it's especially important to respect the
16:23 25 need for a kick margin?

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1 A. Well, they're drilling with a PWD and they are getting
2 data continuously while drilling and they are getting logs
3 while drilling, so they are getting a lot of additional
4 information. Even if they had done another pressure integrity
5 test and drilled ahead far enough that they encountered
6 naturally fractured rock and got a lower number, drilling ahead
7 they still wouldn't know what the next foot frac gradient is
8 going to be.

9 So you are always going to be that is my shoe
10 protective and my shoe is not going to go up behind casing and
11 get to some weak zones that I thought I had covered with steel
12 pipe and cement. You know, once you have got that question
13 answered and you know it's going to be confined to the open
14 borehole, then you take the data that you get as you go,
15 especially when you have got this high-quality logging type
16 information, and you make your decision based on that. And
17 that's what BP did. And what they did was entirely appropriate
18 and would be normal practice for handling this type of
19 situation.

20 Q. Are you saying that when they drill ahead, they know
21 precisely what the sand pressures are going to be because they
22 have a PWD instrument?

23 A. No, they don't know precisely, but they are measuring them
24 as they go and they know precisely they have a strong shoe. So
25 they don't have to worry about some kind of cascading figure

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16:25 1 that's going to get up behind pipe into some much weaker zones.
16:25 2 They know things are going to be confined to the open hole.
16:25 3 And that's a different situation once you have your shoe test
16:25 4 that you know is good.

16:25 5 Q. But you would agree with this, would you not, that you do
16:25 6 proceed with extra caution if you see red flags indicating your
16:25 7 PPFG window is narrowly tightening and you're about to drill
16:25 8 into a hydrocarbon zone?

16:25 9 A. You are always drilling with lots of red flags. You know,
16:25 10 that's why you have that PWD down there, to give you as much
16:25 11 information as you can get.

16:25 12 Q. By the way, you made the statement earlier Dr. Huffman
16:26 13 was -- did not have access to PWD information. You clarified
16:26 14 that, I think, at one point in his report. You're not saying
16:26 15 he didn't have it in his deposition?

16:26 16 A. I think he was asked in his report if he used it and he
16:26 17 said he didn't. I believe I recall that.

16:26 18 Q. But you're not saying he didn't have it by the time of his
16:26 19 deposition?

16:26 20 A. I don't know. I don't recall what he said in his
16:26 21 deposition.

16:26 22 Q. You made a statement earlier today about the fact that
16:26 23 they were not quote, INC'd. In other words, didn't get an
16:26 24 incident of noncompliance by the inspector at the beginning of
16:26 25 April. Did I hear you right?

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16:26 1 A. Right. The inspector landed on the rig, he looked at all
16:26 2 the records, and he didn't say anything. I'm sure if he wanted
16:26 3 to look at the pressure integrity test results, and quite often
16:26 4 they do, they have got a file that he can go and look at that.

16:26 5 Q. MMS has, to your knowledge, now issued them INCs for each
16:27 6 of the intervals we have been discussing, have they not?

16:27 7 A. Post-Macondo, that's right.

16:27 8 MR. BROCK: Your Honor, I'm going to object to that.
16:27 9 The INCs he is referring to, my understanding is, were not
16:27 10 issued until October of 2011. So they are post-incident.

16:27 11 THE COURT: I think we dealt with that in some
16:27 12 motion, didn't we?

16:27 13 MR. BROCK: Yes, sir.

16:27 14 THE COURT: I thought I excluded that.

16:27 15 MR. BROCK: Yes, sir.

16:27 16 THE COURT: I sustain the objection.

16:27 17 BY MR. SPIRO:

16:27 18 Q. So let's talk about the April interval and the drilling of
16:27 19 the April interval. Okay?

16:27 20 A. Yes, sir.

16:27 21 Q. That interval clearly had hydrocarbon zones and they knew
16:27 22 that going in, correct?

16:27 23 A. Yes, sir.

16:27 24 Q. And BP never got a waiver to drill in the interval with
16:27 25 less than a .5 ppg margin, correct?

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16:27 1 A. That's correct.

16:27 2 Q. And Scherie Douglas, at her deposition, said that she got
16:27 3 the impression from MMS, that MMS is less likely to give a
16:28 4 waiver of the .5 ppg safe drilling margin when you're drilling
16:28 5 in an interval with hydrocarbon zones, correct?

16:28 6 A. That's correct. And they also had a 16-pound shoe test
16:28 7 and they are well below that.

16:28 8 Q. You don't disagree with Ms. Douglas's statement that an
16:28 9 operator is less likely to get a waiver from MMS when drilling
16:28 10 an interval with a hydrocarbon zone, correct?

16:28 11 A. I don't dispute that, but I think, again, the conditions
16:28 12 of the particular well will govern. And the MMS people have
16:28 13 experience -- you know, they had some experienced people in the
16:28 14 staff. You may have to go to a pretty high level sometimes for
16:28 15 discussions, but you can generally get their attention on
16:28 16 something important if you need to do it. So just because they
16:28 17 normally don't, don't mean that you can't under certain
16:28 18 circumstances.

16:28 19 Q. You said they had a 16 shoe test. Now, at some point,
16:29 20 they fractured the wellbore at a 14.4 surface, correct, and
16:29 21 lost total returns, right?

16:29 22 A. They did, but then they did wellbore strengthening after
16:29 23 that and got it to recover considerably.

16:29 24 Q. Are you suggesting if they had drilled that interval after
16:29 25 they had used their wellbore strengthening at a 15.5 that they

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16:29 1 would have been within their safe drilling margin?

16:29 2 A. Their regulatory margin. I don't think they would have
16:29 3 wanted to do that. I don't think that would have been safe for
16:29 4 them to do that under those conditions, but that had nothing to
16:29 5 do with that regulatory safe margin. That's more under 401,
16:29 6 that you will drill the well in a safe condition and not have
16:29 7 blowouts and all those things that are in the -- in that
16:29 8 regulation.

16:29 9 So the operator is always concerned not only about
16:29 10 the regulations that are prescriptive and tell them what kind
16:30 11 of margins. And, of course, even those are not written down.
16:30 12 They are just policy.

16:30 13 They are also concerned about the regulations that
16:30 14 are goal oriented that tell them what they need to accomplish.
16:30 15 They pay attention to all that stuff and they write down what
16:30 16 they are supposed to write down and they change their casing
16:30 17 program when they need to. BP did all of those things in that
16:30 18 drilling interval.

16:30 19 Q. So that conduct, what I described, would have been unsafe
16:30 20 in your view if they drilled ahead to the 15.5, correct?

16:30 21 A. For the conditions that they were in at that time -- well,
16:30 22 I would have to study that. But, you know, definitely they
16:30 23 would have caused lost returns again and would have had to
16:30 24 re-repair what they just repaired. It may not have been
16:30 25 unsafe, but it would have been pretty dumb anyway.

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16:30 1 Q. And yet you say it would be technically within the, quote,
16:30 2 safe drilling margin? I just want to make sure.

16:31 3 A. Within that particular regulation. There are many other
16:31 4 things that have to be considered other than that one thing
16:31 5 that's based on static mud weights that are used to design the
16:31 6 casing program. That's just one factor. You can't say, if I
16:31 7 follow that regulation, I'm safe; if I don't follow it -- you
16:31 8 know, it's not that easy.

16:31 9 Q. So you recall that Dr. Huffman concluded in his report
16:31 10 that the downhole static mud weight when BP drilled ahead past
16:31 11 18,260 feet was roughly 14.24 ppg, correct?

16:31 12 A. Say it again.

16:31 13 Q. Do you recall that Dr. Huffman concluded in his report
16:31 14 that the downhole static mud weight when BP drilled past
16:31 15 18,260 feet, the downhole static mud weight was roughly
16:31 16 14.24 ppg?

16:31 17 A. You're talking about the fracture pressure?

16:31 18 Q. Yes.

16:31 19 A. Okay. Yeah, I think he calculated that from the pore
16:32 20 pressure in his equations.

16:32 21 Q. Do you recall that Dr. Huffman concluded in his report
16:32 22 that the weakest downhole fracture gradient of that interval
16:32 23 could best be estimated at 14.45 or less?

16:32 24 A. That's what he said.

16:32 25 Q. That's all I'm asking. Do you recall that he calculated

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16:32 1 or he included in his report that the drilling margin was no
16:32 2 more than roughly .2 ppg?

16:32 3 A. That's what he calculated or what he estimated. That's
16:32 4 what he said. But, you know, I disagree.

16:32 5 Q. I understand that. But when you issued your expert
16:32 6 report, you knew about those conclusions. And, in fact, you
16:32 7 said in your drilling margin section that you disagreed with
16:32 8 some of what he had to say about drilling margin issues, right?

16:32 9 A. Right.

16:32 10 Q. Let me focus a little bit on what you did not say. We are
16:33 11 going to talk about the Geo Taps in a moment, but let's talk
16:33 12 about the events that occurred after they took the Geo Taps.
16:33 13 This is late April 4 through the time the drilling stopped on
16:33 14 April 9?

16:33 15 A. After they know the pore pressure is 12.3 surface
16:33 16 equivalent on -- at the bottom of the pay zone.

16:33 17 Q. I'm going to use downhole 12.58. But, yes, you are
16:33 18 correct after that --

16:33 19 A. It depends on which zone you look at. Some of them are
16:33 20 around 12.6, yes.

16:33 21 Q. In neither of your reports did you estimate the Macondo's
16:33 22 weakest fracture gradient when the well's last couple of
16:33 23 hundred feet were drilled, correct?

16:33 24 A. Well, I estimated it within a range. I knew it was being
16:33 25 strengthened because looking at the PWD, they made several dip

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16:33 1 trips with the PWD tool that was recording what the dynamic mud
16:34 2 weights were. And they got up to 14.6, as I recall, without
16:34 3 breaking down, going in the hole. And so it was getting
16:34 4 stronger with time.

16:34 5 And we know they got cement in that Halliburton
16:34 6 calculated would require a fracture pressure of, I think,
16:34 7 14.8 equivalent surface mud weight. It was close to
16:34 8 15 downhole is what they estimated in the OptiCem that they
16:34 9 would get to during cementing. And we know we didn't lose any
16:34 10 mud during cementing. So, you know, it indicates the wellbore
16:34 11 strengthening was working and that the formations were getting
16:34 12 stronger.

16:34 13 Q. You said a lot there and I want to unpack it, but I want
16:34 14 to, first of all, begin with the question I asked, whether it
16:34 15 was in your report. And you're throwing out numbers of 14.6
16:34 16 and 14.8 and 15.0. None of those were in your report or in
16:34 17 your rebuttal report, correct?

16:35 18 A. Well, you know, these numbers are not known. These are
16:35 19 observations. I said I looked at all the observations and I
16:35 20 thought they had done -- had drilled ahead appropriately. I
16:35 21 think I concluded that.

16:35 22 Q. So you're basing your view, in part -- correct me if I'm
16:35 23 wrong -- on the OptiCem model that was used for the cementing
16:35 24 job; is that right? Is that what I heard you say?

16:35 25 A. In part, that's one of the observations is that they

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16:35 1 didn't lose returns during cementing. And some other
16:35 2 observations are PWD measurements made, you know, in those
16:35 3 additional bit runs that they made after they got to the bottom
16:35 4 of the hole.

16:35 5 **MR. SPIRO:** Can you show Exhibit -- or TREN-225.
16:35 6 Let's actually go to the bottom one first.

16:35 7 **BY MR. SPIRO:**

16:35 8 **Q.** I don't know if you have seen this document. This is
16:36 9 June 26, 2010. It's referring to issues regarding the cement
16:36 10 job. This is the final cement job they are talking about,
16:36 11 right? That's all I want to establish here.

16:36 12 **A.** Okay.

16:36 13 **Q.** Does that make sense? You look at it for yourself. I
16:36 14 don't really want to get into cementing. I just want to make
16:36 15 sure you understand what you are looking at on the top e-mail.

16:36 16 They wouldn't have been analyzing the earlier cement
16:36 17 jobs, would they?

16:36 18 **A.** You know, I'm not familiar with this. I really didn't
16:36 19 study the cement job from the standpoint of the failure. I
16:36 20 looked at it from what it indicated about the pressure and I
16:36 21 responded to the gas flow potential, but that's about all I did
16:36 22 on the cement work.

16:37 23 **Q.** Let's go to the upper e-mail, the fly-out there.

16:37 24 "The other big issue we have not been able to
16:37 25 understand is that the surface pressure continued to drop once

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16:37 1 the bottom plug entered the 7-inch casing."

16:37 2 That's definitely the final interval.

16:37 3 "The total circulating pressure was well below the
16:37 4 planned. It has been compared against OptiCem and we cannot
16:37 5 come close to a match."

16:37 6 Do you see that?

16:37 7 A. I see that, yes.

16:37 8 Q. So that would make sense that we would not pay attention
16:37 9 to some number in the OptiCem to conclude what the fracture
16:37 10 pressure was for the bottom of this well, correct?

16:37 11 A. It's one calculation versus another. In both cases, they
16:37 12 are calculations. So in that respect, it's an uncertain
16:37 13 number, yes.

16:37 14 Q. Well, OptiCem is a simulation, is it not? And in this
16:37 15 case, they are saying it was lower than what was in the
16:37 16 simulation?

16:37 17 A. Well, how much lower? I haven't reviewed this material,
16:38 18 so I can't really comment on it.

16:38 19 Q. Fair enough.

16:38 20 What it says is "well below," correct? I'm not
16:38 21 misreading that?

16:38 22 A. It could be -- it looks like they are talking about the
16:38 23 foam and the destabilizer and the pressure drop inside the
16:38 24 drill pipe, not up in the annulus.

16:38 25 **MR. BROCK:** I object to this, Your Honor. It refers

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16:38 1 to "total circulating pressure," so I think the document is
16:38 2 being --

16:38 3 **THE COURT:** I sustain the objection.

16:38 4 **BY MR. SPIRO:**

16:38 5 **Q.** You're not testifying as an expert on cementing, though,
16:38 6 correct?

16:38 7 **A.** That's correct.

16:38 8 **THE COURT:** Mr. Spiro, we seem to be retreading a lot
16:38 9 of ground we have been over before, and I'm not sure where you
16:38 10 are heading with this, but we need to move on. Let's focus
16:38 11 on --

16:38 12 **MR. SPIRO:** I'll move on. I'll move on.

16:39 13 **BY MR. SPIRO:**

16:39 14 **Q.** So we talked a bit about Mark Alberty already. He was the
16:39 15 person -- correct me if I'm wrong -- that BP put in charge of
16:39 16 PPFG prediction and detection for the whole company, correct?

16:39 17 **A.** Yes.

16:39 18 **Q.** That's all of BP, not just the Macondo well?

16:39 19 **A.** I'll take your word for it. I guess I didn't study that.

16:39 20 **Q.** Do you know him to be a respected expert in this area?

16:39 21 **A.** You're talking about Mark Alberty?

16:39 22 **Q.** Correct.

16:39 23 **A.** Yes, he has written a lot of papers and he is pretty well
16:39 24 respected.

16:39 25 **Q.** In the area of -- what area, specifically?

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16:39 1 A. Wellbore strengthening.

16:39 2 Q. How about fracture pressure and evaluation?

16:39 3 A. Probably that too.

16:39 4 Q. Am I correct that he said in his deposition that the
16:39 5 fracture gradient estimates that are calculated from Geo Taps
16:39 6 are more reliable than the pressure integrity test results from
16:40 7 2,000 feet up the hole?

16:40 8 A. If you are trying to estimate what the frac gradient of
16:40 9 the weak sand is, I think that's right. I would agree with
16:40 10 you.

16:40 11 Q. Okay.

16:40 12 A. But I think a -- PWD information taken at that depth is
16:40 13 more -- way more accurate than a calculation.

16:40 14 Q. Even before BP drilled to 18,260 feet, it had conducted
16:40 15 Geo Tap pressures in the sands above 18,000 and the sands a bit
16:40 16 below 18,000, correct?

16:40 17 A. Right. That's where they got into that pressure
16:40 18 regression and the pore pressures were measured like 12.8,
16:40 19 12.6, 12.4, 12.3, in terms of surface numbers.

16:40 20 Q. One set of the Geo Taps was at roughly 17,700 feet,
16:40 21 correct? The upper sand, if you will?

16:40 22 A. Except that that was mostly shale, and it turned out to
16:41 23 not be permeable. Because when they lost returns and cut their
16:41 24 mud weight back, they went all the way down to a 13.8 and never
16:41 25 experienced any flow. On some of the other runs that were

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16:41 1 made, that was redemonstrated.

16:41 2 So, again, we have some downhole PWD information that
16:41 3 you need to take into account that that 14.16, which is the
16:41 4 13.9 surface mud weight, is in a low permeability zone that
16:41 5 will not flow.

16:41 6 Q. Doctor, we will talk about that momentarily, but let's
16:41 7 just talk about, first of all, was there a Geo Tap taken at
16:41 8 roughly 17,700 feet?

16:41 9 A. I think that's well-established. We have talked about it
16:41 10 several times.

16:41 11 Q. The Macondo team treated that test as a valid test,
16:41 12 correct, at the time?

16:41 13 A. At the time because they thought the pore pressure was
16:41 14 going up and we got a high pore pressure. And if we hit a
16:41 15 permeable sand that can flow and the pressure is going to be
16:42 16 higher, you better believe it, they were paying attention to
16:42 17 that.

16:42 18 Q. And that resulted in -- we are going to confuse the Court
16:42 19 and each other if we talk surface and downhole interchangeably.
16:42 20 So can I ask that we just talk about downhole? Because most of
16:42 21 the documents are in the form of downhole.

16:42 22 A. Okay. Most of my work was converted to surface, but I
16:42 23 believe I can go either way.

16:42 24 Q. I can do it with you, I guess, but let's be clear what we
16:42 25 are talking about.

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16:42 1 How would you convert the difference? .23, is that
16:42 2 the way you convert the difference?

16:42 3 A. Yeah.

16:42 4 Q. Try to indulge me if you can, and we are going to try to
16:42 5 talk downhole.

16:42 6 A. We're going to talk downhole.

16:42 7 Q. Let's try.

16:42 8 They have a 14.15 Geo Tap at the 17,700 downhole,
16:42 9 correct?

16:42 10 A. That's correct.

16:42 11 Q. The team at the Macondo treated that as valid at the time?

16:42 12 A. They did.

16:42 13 Q. They wanted to stay above 14.15?

16:43 14 A. Because they are thinking they are in an increasing pore
16:43 15 pressure environment. So the next sand could be higher than
16:43 16 that.

16:43 17 Q. Okay.

16:43 18 A. That value or higher, and permeable too.

16:43 19 Q. In fact, they never drilled in the well -- drilled in the
16:43 20 well -- with less than a 14.2 downhole pressure?

16:43 21 A. Which pressure are you talking about?

16:43 22 Q. After they took that first Geo Tap, never again did they
16:43 23 drill forward with a pressure less than, to be specific, 14.23
16:43 24 downhole?

16:43 25 A. Not drilling ahead, but they did drop the mud weight below

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16:43 1 that when they were fighting the losses, yes.

16:43 2 Q. Is that something they did intentionally, or is that what
16:43 3 happened when they lost mud?

16:43 4 A. Well, that's what happened when they were fighting it, but
16:43 5 it's still an observation that taught them something.

16:43 6 Q. Fair enough. And we will talk about it.

16:43 7 A. Okay.

16:43 8 Q. I'd love to get into the weeds with you.

16:44 9 So you would agree they drilled ahead at, at least, a
16:44 10 14.23 downhole mud weight from the time they took that Geo Tap
16:44 11 until the final -- until they drilled the end of the well?

16:44 12 A. I think they drilled with a 14.3 all the way down to when
16:44 13 they lost returns, yes.

16:44 14 Q. That's a surface mud weight you are talking about; we are
16:44 15 trying to convert to downhole.

16:44 16 A. 14.5-something.

16:44 17 Q. So in the sand below 18,000 feet and around 18,100, they
16:44 18 had a Geo Tap pressure of 12.58, which is a drop of over 1.5
16:44 19 compared to the sand 400 feet above, correct?

16:44 20 A. Yes. And, you know, I think that was some very important
16:44 21 information to take into account as to what they were going to
16:44 22 do next.

16:44 23 Q. I agree.

16:44 24 It's a red flag that the fracture pressure has
16:44 25 dropped dramatically; you would agree with that, right?

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16:44 1 A. Well, fracture pressure is affected a little bit by pore
16:44 2 pressure, but it's not as much as we once thought. Some of the
16:45 3 more recent papers show that fracture pressure doesn't go down
16:45 4 near as much with pore pressure as we originally thought. The
16:45 5 coefficient that they multiply the effective matrix stress by,
16:45 6 they keep raising their estimate of that number. So you are
16:45 7 kind of getting into a fuzzy theoretical area here.

16:45 8 THE COURT: How much more do you have to go,
16:45 9 Mr. Spiro?

16:45 10 MR. SPIRO: Well, I --

16:45 11 THE COURT: You have a lot of pages there.

16:45 12 MR. SPIRO: No, no, no, no, no. I'm covering -- I'm
16:45 13 down to the final --

16:45 14 THE COURT: I have to tell you, I'm having a hard
16:45 15 time understanding what point you are trying to get to here.

16:45 16 MR. SPIRO: We are trying to figure out --

16:45 17 THE COURT: If I'm not following what point you are
16:45 18 trying to make, we may be spending a lot of time here
16:45 19 unnecessarily.

16:45 20 MR. SPIRO: I'm trying to get at what the fracture
16:45 21 gradient was at the bottom of the hole and the drilling with
16:45 22 the Geo Tap information that they had. I will cut to it.

16:45 23 THE COURT: Please cut to it.

16:45 24 MR. SPIRO: Okay.
25

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16:45 1 BY MR. SPIRO:

16:45 2 Q. So they had a model that said that the fracture gradient
16:46 3 was 14.34, correct, at the bottom?

16:46 4 A. The pore pressure fracture gradient team had a model that
16:46 5 calculated that, yes.

16:46 6 Q. That was the best assessment of the fracture gradient BP
16:46 7 had available to them at the time?

16:46 8 A. No, they had the PWD data that they knew what downhole
16:46 9 dynamic pressures the formation had been exposed to, both on
16:46 10 the high side and the low side.

16:46 11 MR. SPIRO: Let's go to deposition Volume 2,
16:46 12 page 192, line 25, to page 193, line 7.

16:46 13 Volume 2, page 192, line 25. There's just a
16:46 14 little cut off. What's the next page? Is that Volume 2?

16:47 15 BY MR. SPIRO:

16:47 16 Q. (Reading):

16:47 17 "QUESTION: I want to cut you off just because we'll
16:47 18 get to that, and I don't want to make this longer than we
16:47 19 have to. But I was asking now about the lower number, the
16:47 20 18,004 to 17,079. And I'm correct that, according to
16:47 21 Alberty, the downhole extrapolated estimate from that
16:47 22 Geo Tap is 14.34?

16:47 23 "ANSWER: They calculated, based on their model, the
16:48 24 frac gradient should be 14.34. They would expect their
16:48 25 best estimate is -- would be from their model."

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16:48 1 Is that what you said at your deposition?

16:48 2 A. Well, that's what the guy doing the calculation expected,

16:48 3 yeah.

16:48 4 MR. BROCK: Your Honor, he has answered that question

16:48 5 several times this afternoon.

16:48 6 THE COURT: Yes, he has.

16:48 7 MR. BROCK: And explained there was a lot of data he

16:48 8 looked at.

16:48 9 THE COURT: Is that an objection?

16:48 10 MR. BROCK: It is an objection, Your Honor.

16:48 11 MR. SPIRO: Your Honor, I have not heard the answer

16:48 12 to "That was the best model available?"

16:48 13 THE COURT: Move on to another question.

16:48 14 MR. GODWIN: Judge, in Alabama they call those

16:48 15 speaking objections.

16:48 16 BY MR. SPIRO:

16:48 17 Q. They drilled ahead with a 14.7 downhole mud weight after

16:48 18 they took that Geo Tap, did they not?

16:48 19 A. Yes.

16:48 20 Q. Even though their best estimate from their own model

16:49 21 calculated a fracture gradient of 14.34, correct?

16:49 22 A. But the 14.7 was the dynamic mud weight; it was not a

16:49 23 static. It's dynamic effects, you know, with the pump zone and

16:49 24 drilling ahead and so forth. That's where the 14.7 came from.

16:49 25 Q. But they --

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16:49 1 A. That's not a surface mud weight. They drilled ahead with
16:49 2 a surface mud weight of 14.3.

16:49 3 Q. We are converting downhole to downhole.

16:49 4 My point -- to cut to it -- is that they had greater
16:49 5 pressure than their estimate of the fracture gradient from
16:49 6 their best model available by .4, correct? That's all I'm
16:49 7 trying to establish.

16:49 8 A. Right, and -- okay. Yes, that's true.

16:49 9 Q. When they drilled ahead under those circumstances, they
16:49 10 lost total returns, did they not?

16:49 11 A. You know, they drilled through --

16:49 12 Q. Excuse me. I will withdraw the question.

16:49 13 When they drilled ahead under those circumstances,
16:50 14 stopped, and then at a similar pressure was pulling up pipe,
16:50 15 then they lost total returns?

16:50 16 A. Right. I don't know that they had started pulling up
16:50 17 pipe, but they were circulating the cuttings out and weighting
16:50 18 up the mud a little bit to compensate, getting ready to pull
16:50 19 the pipe to change the bit. And at a similar dynamic mud
16:50 20 weight that they had drilled it with, it broke down at that --
16:50 21 pretty much, the same mud weight at that point in time.

16:50 22 Q. Shouldn't they have stayed below a 14.34 roughly, or at
16:50 23 least drilled with less than a 14.7 pressure? Wouldn't that
16:50 24 have been prudent?

16:50 25 A. You know, they were drilling ahead with a 14.3 surface mud

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16:50 1 weight, which in downhole numbers is 14.5.

16:50 2 Q. Static.

16:50 3 A. You have a downhole shoe test of 16.2. They got a -- they
16:51 4 got eyes, they are logging -- I don't see anything wrong with
16:51 5 what they did. I'm sorry.

16:51 6 Q. So you're saying that you think it was prudent for them to
16:51 7 have downhole pressures of 14.7 when their best estimate of
16:51 8 their fracture gradient was 14.34?

16:51 9 And I'm going to move on after this question.

16:51 10 A. Yes.

16:51 11 MR. BROCK: Objection, asked and answered. That's
16:51 12 the question he just asked.

16:51 13 THE COURT: Sustained. Sustained.

16:51 14 BY MR. SPIRO:

16:51 15 Q. They drilled -- they last drilled on April 9, correct?

16:51 16 THE COURT: We have heard that a bunch of times.
16:51 17 Let's move this along. You need to bring this to a conclusion
16:51 18 soon, Mr. Spiro.

16:51 19 MR. SPIRO: Okay. Okay.

16:52 20 BY MR. SPIRO:

16:52 21 Q. Would you agree that Mark Alberty testified that you
16:52 22 cannot be sure that you're increasing your fracture gradient
16:52 23 with the use of Form-A-Set, which is what they used to increase
16:52 24 their fracture gradient after they lost total returns?

16:52 25 A. I would agree you're never sure until you try it and then

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16:52 1 maybe what happens afterwards.

16:52 2 Q. You would agree that the only way to be sure is to take an
16:52 3 open hole leak-off test and establish that you have increased
16:52 4 your fracture gradient?

16:52 5 A. But, of course, you may want to try a whole bunch of these
16:52 6 wellbore strengthening treatments because you do that, because
16:52 7 it often takes more than one before you are effective. So I
16:52 8 wouldn't do the open hole leak-off until after I have kind of
16:52 9 exhausted what I'm willing to do on formation strengthening.

16:53 10 Q. They did their formation strengthening. Then they could
16:53 11 have done an open hole leak-off test and then they could have
16:53 12 established their margin, but they didn't do an open hole
16:53 13 leak-off test, did they?

16:53 14 A. They had enough PWD data, in my opinion, that they knew
16:53 15 what they needed to know to proceed.

16:53 16 Q. You said their PWD data approached 14.6 downhole; is that
16:53 17 right?

16:53 18 A. No, that was surface. I'm sorry. I was talking surface.

16:53 19 MR. BROCK: Your Honor, objection. This is asked and
16:53 20 answered again. It's the --

16:53 21 THE COURT: We are retreading a lot of ground here.
16:53 22 Let's bring it to a conclusion right now. Come on.

16:53 23 MR. SPIRO: Okay.

16:53 24 Excuse me, Your Honor, I'm trying to look
16:53 25 through what I can cut out.

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16:53 1 BY MR. SPIRO:

16:54 2 Q. You would agree that the contemporaneous statements from
16:54 3 the folks on the team indicated that the fracture gradient was
16:54 4 downhole 14.5 or less, when they drilled the final 100 feet?

16:54 5 A. I saw some discussions where -- an e-mail or something
16:54 6 where that was mentioned; but, again, I don't know what the
16:54 7 team on the rig was thinking. I would assume they were looking
16:54 8 at the same data that I looked at after the fact. There are
16:54 9 all kind of memos and e-mails, and I focused mostly on the
16:54 10 data, on what actually happened. And there's a wealth of data.
16:54 11 It's really a quite well documented drilling program.

16:54 12 Q. To maintain a .5 margin when they were drilling ahead,
16:54 13 they would have needed a 14.73 downhole. We can agree on that?

16:55 14 A. No. Again, when you say "margin," I think in terms of the
16:55 15 safe drilling margin in the shoe. And you're talking about the
16:55 16 weakest zone, which we don't know what the weakest zone is. We
16:55 17 know where it broke down, and we know that it went down and now
16:55 18 it's going back up.

16:55 19 Q. Let's assume that hypothetically you needed to maintain a
16:55 20 .5 margin between your highest mud weight and weakest fracture
16:55 21 gradient.

16:55 22 Hypothetically, they would have needed, then, a 14.73
16:55 23 downhole, correct?

16:55 24 A. I'm having trouble following your hypothetical.

16:55 25 Q. 14.23 was the mud weight at which they drilled the final

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1 100 feet. 14.73 is .5 higher than that.

2 A. Under your hypothetical, if somehow they knew that's what
3 the frac gradient was and somehow they had concluded that no
4 more strengthening was possible and they had perhaps done
5 another open hole test to verify that's what it was, then yes,
6 under that hypothetical, you are right.

7 Q. You did not see any contemporaneous statements indicating
8 that they had a fracture gradient of 14.7 or higher, correct?

9 A. Again, I looked at the data. I didn't look at the e-mails
10 and the memos and so forth.

11 Q. You didn't look at charts --

12 A. I looked at them, but I relied on the data.

13 Q. Correct me if I'm wrong. You did not put in your
14 reports -- the data that you were relying on, the 14.6 or .7,
15 that was not anywhere in your reports?

16 A. No, I didn't show all the data, but I did talk about
17 looking at the data when I drew my conclusions.

18 Q. Is there any place in either of your reports where you
19 list what the fracture gradients were at the bottom of this
20 hole, the 14.6, the 14.8, or 15? Because we can't find it.

21 A. Well, we don't really know what it is for sure. We can
22 talk about a range.

23 But we do know what the shoe test is, and that's the
24 point. That's why, from a regulatory standpoint, you need to
25 depend on something that's verifiable and something that you

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16:57 1 actually have done a pressure test on that's been witnessed and
16:57 2 recorded. That's kind of the whole point of what we have been
16:57 3 talking about.

16:57 4 Q. With all due respect, Doctor, you keep talking about "from
16:57 5 a regulatory standpoint," going back to your interpretation of
16:57 6 this one regulation when you said earlier that 401 requires
16:57 7 even more, right, maintaining well control?

16:57 8 A. It requires maintaining well control, but it doesn't speak
16:57 9 of a .5 margin or anything like that. It says you need to do
16:57 10 what you need to do to keep it safe, and you need to follow
16:57 11 normal industry practice. And I'm telling you, in my opinion,
16:57 12 I think that's what they did.

16:58 13 Q. I would like to show you a statement from your deposition.

16:58 14 Is it not your view that if there is clarity as to
16:58 15 what the fracture gradient is, you keep a .5 from it at all
16:58 16 times, the weakest fracture gradient?

16:58 17 A. You know, at all times, I guess. If you are talking about
16:58 18 the weakest zone, I would say not necessarily. If you have got
16:58 19 a shoe test and you know you are going to have things confined
16:58 20 to the open borehole, I think you have more flexibility than
16:59 21 that. You can plan your well that way, but once you get into
16:59 22 trying to finish up the zone and get through a sand and set
16:59 23 pipe, I think that's a different situation.

16:59 24 Q. But if you are under the .5, am I correct that you at
16:59 25 least go to MMS and say, "Look, we are less than .5 from our

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1 weakest fracture gradient"?

2 MR. BROCK: Objection, asked and answered.

3 THE COURT: Sustained.

4 BY MR. SPIRO:

5 Q. Did you examine the post well report from the summer of
6 2010 for BP?

7 A. No, I don't think so.

8 Q. The chart where BP listed their pore pressures and frac
9 gradients for the Macondo, their own chart?

10 A. I may have seen something like that recently.

11 Q. Let's go to 3551. This was written by Marty Albertin,
12 among others. And let's go to --

13 A. This is the pore pressure frac gradient prediction team,
14 is it?

15 Q. I think it has -- it has other people than the pore
16 pressure fracture gradient prediction team.

17 MR. SPIRO: Let's go to 12.1, 3551.12.1.

18 BY MR. SPIRO:

19 Q. Do you see that in yellow they have their most likely sand
20 frac? Do you see that right there where the pointer is?

21 A. Yes.

22 Q. This was done -- notice that this was July 2010 when they
23 did this after the well was drilled, right?

24 And you notice the pore pressure zones here, the
25 highest pore pressure is here? Do you see that?

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17:01 1 A. I'm sorry.

17:01 2 Q. This curve is the pore pressure. Pore pressure on the
17:01 3 left, you notice that it goes to 12.6 when they did this
17:01 4 Geo Tap over here. Do you see that?

17:01 5 A. Well, they are showing the pore pressure falling off as a
17:01 6 sudden point and then coming right back up. That looks kind of
17:01 7 squirrely.

17:01 8 Q. Right. It goes back and forth depending on whether they
17:01 9 are in the sand or shale.

17:01 10 MR. BROCK: I'm going to object on foundation. I
17:01 11 don't know that he has said that he has looked at --

17:01 12 THE COURT: I sustain the objection.

17:02 13 BY MR. SPIRO:

17:02 14 Q. You said earlier that the pressure at the bottom of the
17:02 15 well dropped to 13.8 or .9. Is that what you said?

17:02 16 A. 12.3, the pore pressure?

17:02 17 Q. Yeah.

17:02 18 A. The lowest sand, I think -- well, 12.5 downhole mud weight
17:02 19 was the measured Geo Tap, that's right.

17:02 20 Q. No, no, no. I'm talking about at the -- I thought I heard
17:02 21 you say --

17:02 22 MR. SPIRO: And, Your Honor, I'm going to close this
17:02 23 right away. I just want to get through this one last issue.

17:02 24 BY MR. SPIRO:

17:02 25 Q. You said that the pressure dropped to below 14 --

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17:02 1 A. Yes.

17:02 2 Q. -- after they lost total returns?

17:02 3 A. Yes.

17:02 4 Q. Downhole they had less than a 14.15 --

17:02 5 A. Yes.

17:02 6 Q. -- when it dropped?

17:02 7 A. Yes.

17:02 8 Q. So they had a lower pore pressure -- excuse me -- yeah, a
17:03 9 lower fracture gradient than the 14.15 that they had above?

17:03 10 A. When the fracture ruptured, it ruptured -- if we are
17:03 11 talking downhole mud weights -- at like a 14.6 heavy; and
17:03 12 before they could get that fracture to close, they had to go
17:03 13 all the way down to like a 14 downhole mud weight -- we are
17:03 14 talking downhole mud weights -- before that fracture would
17:03 15 close.

17:03 16 So they had the well on the BOP, and they were
17:03 17 putting base oil down the kill line and watching how far that
17:03 18 fell until they got it equalized. And from that they figured
17:03 19 out, okay, how much mud weight can this thing sustain to get it
17:03 20 to close and begin to heal. Then once you get it to close,
17:03 21 then you go after it with your wellbore strengthening
17:03 22 treatment.

17:03 23 Q. So they lost so much mud that their pressure fell below
17:03 24 what the pore pressure was a few hundred feet above?

17:04 25 A. Right. And that's what showed that that zone couldn't

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17:04 1 flow, was because the pressure was lower than what the Geo Tap
17:04 2 showed it was, and they never took any kind of influx.

17:04 3 Q. But for all they knew at the time, that could have caused
17:04 4 the underground blowout?

17:04 5 A. Well, I don't think the data showed that. The data
17:04 6 clearly showed that they were in a very shaly sand. They had
17:04 7 well logging data. It looked like it was tight. And it turned
17:04 8 out, yes, it was tight.

17:04 9 MR. SPIRO: Your Honor, I may not take hints well,
17:04 10 but I'm going to end it now.

17:04 11 THE COURT: Okay. Thank you.

17:04 12 Alabama.

17:04 13 MR. MAZE: Alabama has no questions, Your Honor.

17:04 14 THE COURT: Louisiana.

17:04 15 MR. KANNER: Thank you. We have no questions.

17:04 16 THE COURT: Transocean.

17:05 17 THE WITNESS: Judge, I'm kind of having a little back
17:05 18 problem. If I could walk around a little bit, maybe a
17:05 19 five-minute break.

17:05 20 THE COURT: Let's take a five-minute recess.

17:05 21 (Recess.)

17:16 22 THE COURT: Please be seated.

17:16 23 Are we okay to keep going? We are going to quit
17:16 24 at 6:00. Okay?

17:16 25 I'm just guessing you will probably have to come

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17:16 1 back tomorrow.

17:16 2 THE WITNESS: That's fine.

17:16 3 THE COURT: Is that right?

17:16 4 THE WITNESS: That break helped a lot.

17:16 5 THE COURT: If you are really tired, you can just
17:16 6 come back tomorrow. It's up to you. Are you okay now?

17:16 7 THE WITNESS: I'm fine.

17:16 8 THE COURT: Let's go.

17:16 9 CROSS-EXAMINATION

17:16 10 BY MR. HYMEL:

17:16 11 Q. Good afternoon, Dr. Bourgoyne. Richard Hymel. I need to
17:16 12 say for that record that I have you on cross-examination.

17:16 13 You would agree with me, Dr. Bourgoyne, that BP is
17:16 14 interested in hiring drilling contractors that have
17:16 15 well-trained crews. You agree?

17:16 16 A. Absolutely.

17:16 17 Q. That's what I want to start talking about.

17:16 18 MR. HYMEL: Let's go to TREX-8173.13.1.T0.

17:16 19 BY MR. HYMEL:

17:17 20 Q. This is page 13 of your report, and you start on this page
17:17 21 of your report talking about the evolution of roles and
17:17 22 responsibilities for companies involved in drilling operations.

17:17 23 Do you recall that part of your report?

17:17 24 A. Yes, uh-huh.

17:17 25 MR. HYMEL: Rami, let's go to page 15. I want you to

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17:17 1 pull up this section here that ends with Footnote 2. Then
17:17 2 let's pull up Footnote 2.

17:17 3 **BY MR. HYMEL:**

17:17 4 **Q.** Dr. Bourgoyne, in your report you make this statement
17:17 5 about the roles and responsibilities of the drilling
17:17 6 contractor, and I want to read it.

17:17 7 "The drilling contractor is responsible for the
17:17 8 operation of the drilling vessel and the work done by the rig
17:17 9 crew. They have a responsibility for the safety of those
17:17 10 aboard the vessel. They too are trained in well control and
17:17 11 safety procedures appropriate for their level of job
17:17 12 responsibility."

17:17 13 Did I read that correctly?

17:17 14 **A.** Yes, sir.

17:17 15 **Q.** Then you drop a footnote there, and we are going to go
17:18 16 down to the footnote. And the first line of the footnote
17:18 17 states: "Transocean's policies and procedures are consistent
17:18 18 with this general industry standard."

17:18 19 Did I read that correctly?

17:18 20 **A.** Yes.

17:18 21 **Q.** Then you give examples of the Transocean policies and
17:18 22 procedures that are consistent with this industry standard,
17:18 23 don't you?

17:18 24 **A.** Yes, I do.

17:18 25 **Q.** Let's talk about those. The first one you quote is the

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17:18 1 *Transocean Well Control Handbook*. Do you see that?

17:18 2 A. Yes, uh-huh.

17:18 3 Q. The next one is the *Transocean Field Operations Handbook*?

17:18 4 A. Yes.

17:18 5 Q. And the next one is the *Transocean Deepwater Horizon*
17:18 6 *Emergency Response Manual*; is that correct?

17:18 7 A. Yes.

17:18 8 Q. Now, those Transocean manuals are consistent with industry
17:18 9 standard. That's your opinion?

17:18 10 A. That is my opinion.

17:18 11 **MR. HYMEL:** Rami, let's stay on page 15, but let's
17:18 12 get rid of that, and I want to go down to the next section
17:18 13 right below here, which includes Footnote 3, and then let's go
17:18 14 down to Footnote 3.

17:19 15 **BY MR. HYMEL:**

17:19 16 Q. Now, here you make the statement about well control
17:19 17 training, and I want to read it.

17:19 18 "The driller and his rig crew are highly trained in
17:19 19 recognizing the signs of a kick and closing the blowout
17:19 20 preventers to stop the flow with the influx near the well
17:19 21 bottom. They are also trained in the use of a diverter to
17:19 22 divert flow overboard and away from the rig when hydrocarbons
17:19 23 enter the marine riser above the blowout preventer at the
17:19 24 seafloor."

17:19 25 Did I read that correctly?

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17:19 1 A. Yes.

17:19 2 Q. Then you go down to Footnote 3 and you give examples of
17:19 3 Transocean's policy that are on this point, do you not?

17:19 4 A. I do, uh-huh.

17:19 5 Q. Let's look at that. The first example you give is:
17:19 6 "Currently accredited IADC well control programs are taught in
17:19 7 Transocean, Introductory, Fundamental, and Supervisory."

17:19 8 What you are talking about there is Transocean well
17:20 9 control schools, correct?

17:20 10 A. Yes.

17:20 11 Q. And so Transocean created its own well control schools
17:20 12 that are accredited by the IADC. Do you agree?

17:20 13 A. I agree.

17:20 14 Q. Now, you have a lot of experience with the IADC, don't
17:20 15 you?

17:20 16 A. I have some, yes.

17:20 17 Q. I think you were actually on some of their boards where
17:20 18 you talked about certification of well control schools and
17:20 19 things like that, correct?

17:20 20 A. Yes.

17:20 21 Q. Now, IADC well control training, is that good well control
17:20 22 training?

17:20 23 A. Yes. That's the industry standard.

17:20 24 Q. I wanted to ask you that, but I hadn't asked you that in
17:20 25 the deposition, so I didn't want to take a chance.

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- 17:20 1 So it is industry standard?
- 17:20 2 A. It is.
- 17:20 3 Q. Thank you for that.
- 17:20 4 Now, you testified in response to one of Mr. Roy's
- 17:20 5 questions that the concepts regarding negative pressure
- 17:20 6 tests -- those concepts are taught in well control school,
- 17:20 7 correct?
- 17:20 8 A. Yes.
- 17:20 9 Q. You would expect those to be taught in the Transocean well
- 17:21 10 control school. Do you agree?
- 17:21 11 A. I would, yes.
- 17:21 12 Q. Now, another example that you cite in Footnote 3 with
- 17:21 13 regard to this training is the OJT models, correct?
- 17:21 14 A. Yes.
- 17:21 15 Q. You state here that the driller and assistant driller
- 17:21 16 on-the-job training modules list a number of tasks that have to
- 17:21 17 do with the diverter, correct?
- 17:21 18 A. Yes.
- 17:21 19 Q. You also state that for those OJT modules to be passed or
- 17:21 20 completed by the employee, it must be signed off by the
- 17:21 21 employee's supervisor, correct?
- 17:21 22 A. Yes.
- 17:21 23 Q. Did you actually look at those modules?
- 17:21 24 A. I looked at some of them, yes.
- 17:21 25 Q. In the modules they have statements likes how do you use

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17:21 1 the diverter and so forth, correct?

17:21 2 A. Yes.

17:21 3 Q. So what the employee has to do is he has to go on the
17:21 4 computer and learn how to do that, and then he has to bring his
17:21 5 supervisor and go show his supervisor that he knows how to do
17:21 6 it, correct?

17:21 7 A. That's correct.

17:21 8 Q. The specific OJT modules you talked about in Footnote 3
17:21 9 have to do with the diverter, correct?

17:22 10 A. That's correct.

17:22 11 Q. Now, the last line of Footnote 3 states that "additionally
17:22 12 the Well Control Handbook states 'at any time, if there is a
17:22 13 rapid expansion of gas in the riser, the diverter must be
17:22 14 closed, if not already, and the flow diverted overboard.'"

17:22 15 Did I read that correctly?

17:22 16 A. That's correct.

17:22 17 Q. That's really a basic of well control when you are dealing
17:22 18 with deepwater well control where you can get gas that goes
17:22 19 above -- that gets above the BOP, correct?

17:22 20 A. Right.

17:22 21 Q. I want to talk about that in more detail since it is
17:22 22 important.

17:22 23 MR. HYMEL: Rami, let's go to 8173.67.2.

17:22 24 BY MR. HYMEL:

17:22 25 Q. This is a quote from the last two pages of your report.

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17:22 1 And I want to back up a little bit. For you to be
17:22 2 able to understand the concept that you must divert overboard,
17:22 3 you first have to understand the concept that the marine riser
17:23 4 can unload quickly, correct?

17:23 5 A. Right.

17:23 6 Q. That's what this states. It states that you read the
17:23 7 manuals, and "it was also recognized in Transocean presentation
17:23 8 material that I reviewed that the Marine Riser could unload
17:23 9 quickly when gas begins breaking out of solution."

17:23 10 Did I read that correctly?

17:23 11 A. It's a low-pressure vessel. It's like shaking up a Coke
17:23 12 bottle and taking your finger off. It can come at your face.

17:23 13 Q. Correct. Once it gets above the BOP, the gas starts
17:23 14 expanding, correct?

17:23 15 A. Once you get to the bubble point of the gas, then here it
17:23 16 comes.

17:23 17 Q. But my point really is, to understand that you have to
17:23 18 divert overboard, you first have to understand this predicate
17:23 19 that gas can start coming at you pretty quick if it gets above
17:23 20 the BOP, correct?

17:23 21 A. Yes.

17:23 22 Q. That was in Transocean's training material. Do you agree?

17:23 23 A. I agree.

17:23 24 MR. HYMEL: So then let's go to 8173.67.8.T0. This
17:23 25 is from page 67, the second-to-last page of your report, and it

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17:24 1 talks about the same provision we read in Footnote 3, that the
17:24 2 crews are taught to divert overboard.

17:24 3 But I just want to focus on your language here.
17:24 4 You state: "Answers to questions about the mud-gas separator
17:24 5 and diverter and Transocean Well Control Training manuals
17:24 6 clearly showed that their policy was to divert overboard if a
17:24 7 kick is taken that goes undetected and a significant gas volume
17:24 8 enters the riser."

17:24 9 That's what you said, isn't it?

17:24 10 A. It is. That's the way it was written up.

17:24 11 Q. You saw it in the policies, and it was clear to you in the
17:24 12 policies, correct?

17:24 13 A. Yes.

17:24 14 Q. You didn't have to put that in here, that it clearly
17:24 15 showed, but that was your impression when you read the policy,
17:24 16 wasn't it?

17:24 17 A. Yes, it was. That's why I put it in the report.

17:24 18 MR. HYMEL: Rami, let's go to 8173.68.1.T0.

17:24 19 BY MR. HYMEL:

17:24 20 Q. Then lastly -- this will finish up this section, is that
17:24 21 you stated in your report at the last -- on the last page, "The
17:25 22 training material that I reviewed was appropriate and of a high
17:25 23 quality"; is that correct?

17:25 24 A. That's correct.

17:25 25 Q. Let's go on to a new subject.

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17:25 1 You issued a rebuttal report in this case, didn't
17:25 2 you?

17:25 3 A. Yes.

17:25 4 MR. HYMEL: Rami, go to 8174.

17:25 5 BY MR. HYMEL:

17:25 6 Q. This is the front page of your rebuttal report, isn't it?

17:25 7 A. Yes.

17:25 8 Q. One of the reasons you issued this rebuttal report was to
17:25 9 rebut the opinions of Donald Weintritt, an expert retained by
17:25 10 Halliburton, correct?

17:25 11 A. Yes.

17:25 12 Q. Mr. Weintritt had certain opinions about the spacer in
17:25 13 which you strongly disagreed, true?

17:25 14 A. That's true.

17:25 15 MR. HYMEL: Let's go to TREN-8174.9.1.T0.

17:25 16 BY MR. HYMEL:

17:25 17 Q. Now, this blowout here, the highlights -- we put the
17:25 18 highlights in. But the bolding and the underlines of the words
17:26 19 "may have," "may not have," "may have," those -- that's your
17:26 20 bolding and underlining, correct?

17:26 21 A. It is.

17:26 22 Q. That was one of the reasons you disagree with
17:26 23 Mr. Weintritt, because his opinions were based on words such as
17:26 24 "may have," "may not have" and so forth, correct?

17:26 25 A. Yeah, it was just all kind of "it might have happened this

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17:26 1 way."

17:26 2 Q. Excuse me?

17:26 3 A. It was all "it might have happened this way" type of
17:26 4 testimony.

17:26 5 Q. So basically what you are saying is an opinion -- strike
17:26 6 that.

17:26 7 So basically what you are saying is an expert who
17:26 8 bases his opinion on what may have been or may not have been
17:26 9 really doesn't have an opinion. Do you agree?

17:26 10 A. I agree. I think you need to look at some real data and
17:26 11 study the issues.

17:26 12 Q. So that's why you wrote this rebuttal report, to talk
17:26 13 about the language that Mr. Weintritt used, correct?

17:26 14 A. That's correct.

17:26 15 MR. HYMEL: Rami, let's go to 8173.68.1.T0.

17:26 16 BY MR. HYMEL:

17:27 17 Q. This is what we just finished looking at: "The training
17:27 18 material that I reviewed was appropriate and of a high
17:27 19 quality."

17:27 20 That was your statement close to the very end of your
17:27 21 report, true?

17:27 22 A. Second-to-last line.

17:27 23 Q. So then let's go to the next line. And you what say is:
17:27 24 "What may have been lacking were adequate emergency drills
17:27 25 simulating high flow rate conditions."

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17:27 1 You wrote that, didn't you?

17:27 2 A. Yeah. And I didn't know whether it was lacking or not.
17:27 3 That's why I said "may have." I was just sort of searching for
17:27 4 how in the world did this happen.

17:27 5 Q. That's what I want to talk with you about. I'm not being
17:27 6 critical. I want to talk with you about when Mr. Roy grabbed
17:27 7 on to this language and he went through it with you and asked
17:27 8 you if you thought the crews were trained in emergency drills
17:27 9 and if you thought that based on their activities and actions,
17:27 10 you thought they were properly trained.

17:27 11 And the real answer is you don't have an opinion on
17:27 12 this, do you?

17:27 13 A. Well, you know, I know something happened and I do know
17:27 14 from past experience that trying to maintain training intensity
17:28 15 on something that hardly ever happens is a difficult thing to
17:28 16 do. I think that's a fact. Now, whether or not it was
17:28 17 lacking, I really don't know.

17:28 18 Q. Whether or not that type of training was lacking on this
17:28 19 rig at this time for this crew, you don't know, correct?

17:28 20 A. I don't know, but I know they didn't do the right thing.

17:28 21 Q. We have admitted that to a certain extent.

17:28 22 Did you read Mr. Barnhill's report?

17:28 23 A. No. I'm sorry, I --

17:28 24 Q. You didn't read Mr. Barnhill's report?

17:28 25 A. Well, I read his report. I didn't read his trial

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17:28 1 testimony.

17:28 2 Q. He is one of your former students, isn't he?

17:28 3 A. Yeah, I know Calvin real well.

17:28 4 Q. I just wanted to make sure you didn't see the report and
17:28 5 threw it away because he was one of your students.

17:28 6 A. No, no.

17:28 7 Q. Let's get back to where we were.

17:28 8 THE COURT: What was his grade?

17:28 9 THE WITNESS: They were not very good, Judge.

17:28 10 THE COURT: You don't have to answer that.

17:29 11 MR. HYMEL: Can I make an objection?

17:29 12 THE WITNESS: No, I'm kidding. I'll say this: He
17:29 13 finished strong.

17:29 14 THE COURT: I was obviously kidding with my question.

17:29 15 BY MR. HYMEL:

17:29 16 Q. But you have to admit he is a well-respected petroleum
17:29 17 engineer in the industry. Isn't he?

17:29 18 A. He is, and he knows a lot about well control.

17:29 19 Q. Let's get back to where we were, and I just want to finish
17:29 20 up on this point. So all the questions Mr. Roy asked you about
17:29 21 emergency drills and what our people did and what their actions
17:29 22 showed or anything, that was really just speculation on your
17:29 23 part, correct?

17:29 24 A. Say it again.

17:29 25 Q. Sure. All the questions Mr. Roy asked you about whether

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17:29 1 our crews were properly trained with regard to emergency
17:29 2 drills, simulating high-flow conditions, and the fact that
17:29 3 maybe they weren't trained because they did certain things or
17:29 4 didn't do certain things, any answers you gave were basically
17:30 5 speculation because you don't have an opinion on this issue,
17:30 6 correct?

17:30 7 A. Well, there's a certain amount of speculation in there, I
17:30 8 agree, because I don't know for sure. I wasn't there. I
17:30 9 didn't see the training.

17:30 10 Q. Really, one of the points is some of the guys that were
17:30 11 there we can't talk to, correct?

17:30 12 A. That's right.

17:30 13 Q. So you wouldn't want to be speculating about that, would
17:30 14 you?

17:30 15 A. That's true.

17:30 16 Q. Now, let's talk about some of the drills they did do. Are
17:30 17 you aware that the *Deepwater Horizon* drill crew performed
17:30 18 diverter drills?

17:30 19 A. Well, I assume that they did. I didn't see any in reading
17:30 20 the records, but I may have missed some.

17:30 21 Q. The diverter drills were listed in the IADC reports. You
17:30 22 aren't saying they are not in there, are you?

17:30 23 A. No, uh-uh.

17:30 24 Q. Are you aware that BP --

17:30 25 A. It's been a long time since I read those records.

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17:30 1 Q. Are you aware that BP's DWOP required that the BP well
17:31 2 site leader supervise the diverter drills? Are you aware of
17:31 3 that?

17:31 4 A. I guess I didn't remember that.

17:31 5 Q. Well, let's refresh your memory.

17:31 6 MR. HYMEL: Pull up TREG-93.47.1.T0.

17:31 7 BY MR. HYMEL:

17:31 8 Q. Section 15.2.7 states: "Kick detection, diverter,
17:31 9 circulating, stripping and shut-in drills shall be held
17:31 10 regularly until the designated company representative is
17:31 11 satisfied that each crew demonstrates suitable BP standards."

17:31 12 Did I read that correctly?

17:31 13 A. You did.

17:31 14 Q. "Designated company representative" means the well site
17:31 15 leader, correct?

17:31 16 A. That's correct.

17:31 17 Q. So basically what this says is the BP well site leader was
17:31 18 responsible for making sure any crews that worked for them --
17:31 19 whether it be Transocean crew, Noble crew, anybody else, they
17:31 20 did these drills, including the diverter drills,
17:31 21 satisfactorily, to his opinion, correct?

17:32 22 A. Yes.

17:32 23 Q. You didn't know about this, did you?

17:32 24 A. I don't recall it, so maybe I didn't. I'm not real sure
17:32 25 what's in the drill at this point. I would have to go back and

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17:32 1 study that to see exactly what they were practicing.

17:32 2 Q. Now, there was some discussion earlier about the fact that
17:32 3 the diverter was lined up to the mud-gas separator, and I want
17:32 4 to talk about that.

17:32 5 Do you understand that when the drill crew closed the
17:32 6 diverter that the flow was sent to the mud-gas separator?

17:32 7 That's in all the internal reports. You saw that, didn't you?

17:32 8 A. Yes. It's pretty clear from the records that that's what
17:32 9 happened.

17:32 10 Q. But you understand, don't you, that BP's policies are
17:32 11 consistent with lining up the diverter to the mud-gas
17:32 12 separator? You understand that, don't you?

17:32 13 A. Well, I guess I don't understand that. I would like to
17:32 14 see more on that, especially if we are talking about a
17:32 15 displacement at the end of the well like this.

17:32 16 Q. Sure. Well, okay.

17:33 17 MR. HYMEL: TREX-2210.2.T0.

17:33 18 BY MR. HYMEL:

17:33 19 Q. Have you ever seen these NAX Deepwater Gulf of Mexico --
17:33 20 I'm sorry -- NAX-DW Gulf of Mexico Deepwater Well Control
17:33 21 Guidelines, have you seen these?

17:33 22 A. I really can't say. I don't recall it just looking at it.

17:33 23 MR. HYMEL: Let's go to TREX-2210.17.1.T0.

17:33 24 BY MR. HYMEL:

17:33 25 Q. Section 3 talks about "close diverter and direct fluid

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17:33 1 through riser gas buster."

17:33 2 Did I read that correctly?

17:33 3 A. You did.

17:33 4 Q. Section 13 talks about "when rapid expansion of fluids
17:33 5 near surface attempt to keep flow going through the gas
17:33 6 buster - as opposed to overboard lines - to allow minimize
17:33 7 synthetic oil mud going into the Gulf, but be prepared to
17:33 8 divert."

17:33 9 Did I read that correctly?

17:33 10 A. You did.

17:34 11 Q. Now, did you hear Randy Ezell's trial testimony where he
17:34 12 sat in that chair and said that BP agreed with the idea of the
17:34 13 mud-gas separator being the default?

17:34 14 A. I guess I didn't read that.

17:34 15 MR. HYMEL: Let's pull up trial transcript 1787.

17:34 16 THE WITNESS: I guess I would like to clarify too
17:34 17 under what conditions these diverter drills are referring to.
17:34 18 Are we talking about at the end of a kick, when you have a
17:34 19 little gas trapped under the marine riser, that you are trying
17:34 20 to clear the riser or -- you know, what are the specifics of
17:34 21 the drill? Does it cover situations where -- you know, like we
17:34 22 saw here where you have a big influx get above the BOP,
17:34 23 undetected? Does the drill distinguish between all of that and
17:34 24 does BP's policy distinguish between all of that? I would
17:35 25 almost have to go back and study this and come back to be able

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17:35 1 to properly answer some of these questions.

17:35 2 MR. HYMEL: Rami, pull out lines 6 through 22.

17:35 3 BY MR. HYMEL:

17:35 4 Q. Now, Mr. Ezell was asked:

17:35 5 "QUESTION: What was the default setting on the
17:35 6 *Deepwater Horizon* for the diverter?

17:35 7 "ANSWER: It was the mud-gas separator.

17:35 8 "QUESTION: Who set that as the default?

17:35 9 "ANSWER: Well, that was -- that system, as long as I
17:35 10 can remember, has default due to the environmental impact
17:35 11 of just diverting synthetic-based mud overboard. You
17:35 12 would want to try to remove the entrained gas and divert
17:35 13 the synthetic back to the pits.

17:35 14 "QUESTION: And were you all encouraged by BP to try
17:35 15 to use the mud-gas separator initially for flow?"

17:35 16 Mr. Brock makes a good objection. It's sustained.

17:35 17 "QUESTION: What BP guidance did you receive, if any,
17:35 18 about the option between overboard and the mud-gas
17:35 19 separator?

17:36 20 "ANSWER: They agreed with the idea of the mud-gas
17:36 21 separator being default."

17:36 22 Did I read that correctly?

17:36 23 A. You did.

17:36 24 Q. And the BP well site leader had the authority to order
17:36 25 that the diverter be lined up overboard if he did not want the

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17:36 1 diverter lined up to the mud-gas separator; isn't that correct?

17:36 2 A. I'm sure he could have done that and I'm sure Transocean
17:36 3 could have done it as well.

17:36 4 MR. HYMEL: Rami, put up Dr. Bourgoyne's deposition,
17:36 5 278. And pull out lines 23 -- and we would need to go down to
17:36 6 1 and 2 of the following page. Can we do that?

17:36 7 BY MR. HYMEL:

17:36 8 Q. What I'm going to do, Dr. Bourgoyne, is I'm going to ask
17:36 9 you -- I'm going to read this, read my question and read the
17:37 10 answer, and then I'm going to ask you some questions about it.
17:37 11 The question to you was:

17:37 12 "QUESTION: The BP well site leader had the authority
17:37 13 to order the diverter be lined up on the overboard line,
17:37 14 right?

17:37 15 "ANSWER: He certainly had that authority, I think.
17:37 16 All right."

17:37 17 And that was your answer, correct?

17:37 18 A. I still agree with that. I think Transocean as the vessel
17:37 19 operator also had the authority to line it up that way
17:37 20 regardless of what BP said.

17:37 21 Q. You talked about the actions of the drill crew, and I want
17:37 22 to go through those actions with you. We have already talked
17:37 23 about that the drill crew closed the diverter and sent the flow
17:37 24 through the mud-gas separator, true?

17:37 25 A. Yes.

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17:37 1 Q. You're also aware that the drill crew closed the annular,
17:37 2 correct?

17:37 3 A. Yes.

17:37 4 Q. And with the diverter being lined up to the mud-gas
17:38 5 separator, the flow was at least initially flowed through the
17:38 6 mud-gas separator. And we have talked about that, correct?

17:38 7 A. Yes.

17:38 8 Q. Now, are you aware of Mr. Randy Ezell's testimony that he
17:38 9 saw fire blowing out of the diverter line? Did you read his
17:38 10 trial testimony where he said that?

17:38 11 A. No. I kind of remember that, but it was probably from one
17:38 12 of the reports that I read early on.

17:38 13 Q. Well, let's look at Ezell's trial testimony, 1706, line 15
17:38 14 through 1707, line 1.

17:38 15 MR. HYMEL: Blow those up, Rami.

17:38 16 BY MR. HYMEL:

17:38 17 Q. Starting at line 15, the question was asked:

17:39 18 "QUESTION: I understand. Do you have any knowledge
17:39 19 based on what you told me -- I think the answer is going
17:39 20 to be no. Do you have any knowledge of what Dewey or
17:39 21 whomever was at the controls at the end did in terms of
17:39 22 trying to convert the gas overboard?

17:39 23 "ANSWER: I really don't, but I've got my own
17:39 24 personal thoughts. When I was on the *Bankston*, to me, in
17:39 25 my years of experience, it looked like they were diverting

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17:39 1 from the starboard diverter line.

17:39 2 "QUESTION: That's the big line?

17:39 3 "ANSWER: To me, that's what it appeared to be.

17:39 4 "QUESTION: Do you know whether or not they diverted
17:39 5 initially to the mud-gas separator, or do you know one way
17:39 6 or the other?

17:39 7 "ANSWER: No, sir, I don't know. I wish I did."

17:39 8 Have you ever heard that testimony before I just
17:39 9 read it to you?

17:39 10 A. I don't think so.

17:39 11 Q. Had you heard that David Young actually was on the rig and
17:39 12 was trying to tend to someone and saw fire being blown out of
17:39 13 the starboard diverter? Had you heard that testimony?

17:39 14 A. No.

17:39 15 MR. HYMEL: Let's go to David Young's trial
17:39 16 testimony, 5878, lines 7 through 25.

17:40 17 BY MR. HYMEL:

17:40 18 Q. And the question was asked of Mr. Young:

17:40 19 "QUESTION: Did you notice diverted gas coming out of
17:40 20 the diverter?

17:40 21 "ANSWER: I noticed when I was over next to
17:40 22 Dale Burkeen that there was fire over that area and the
17:40 23 diverter was over there. So that's what I -- that's what
17:40 24 I noticed, is that was on fire and the fire was also going
17:40 25 over our head.

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17:40 1 "QUESTION: You were making an assumption based on
17:40 2 your knowledge of the location of the starboard diverter
17:40 3 line, the 14-inch pipe that perhaps fluid was coming out
17:40 4 of there, correct?

17:40 5 "ANSWER: I was -- it was on fire coming out of the
17:40 6 diverter pipe.

17:40 7 "QUESTION: You also know that there's an over -- a
17:40 8 relief pipe in the exact same location that's a 6-inch
17:40 9 line for the mud-gas separator?

17:40 10 "ANSWER: Yes.

17:40 11 "QUESTION: Is it possible that what you were seeing
17:40 12 was coming out of the 6-inch line?

17:40 13 "ANSWER: No, it was out of the larger diverter line.

17:41 14 "QUESTION: You are positive that you could tell the
17:41 15 difference as to which line it was coming out of?

17:41 16 "ANSWER: Yes."

17:41 17 Had you ever heard that testimony before I read
17:41 18 it to you?

17:41 19 A. I don't think I have read that testimony. You know, it
17:41 20 sounds familiar from some of the initial reports that talked
17:41 21 about diverting through the diverter and the 6-inch line and
17:41 22 where the fire was. And it makes you wonder, did some of those
17:41 23 valves fail due to pressure buildup, back pressure from the
17:41 24 separator being run at such a high rate. They may have had
17:41 25 valves failing and flow going everywhere.

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17:41 1 Q. But another option is the crew diverted the flow to the
17:41 2 mud-gas separator and at some point they realized and followed
17:41 3 their training and transferred from the mud-gas separator to
17:41 4 the overboard diverter. That's one option, isn't it?

17:41 5 A. That could have happened, yes.

17:42 6 Q. And you don't know just like I don't know which one of
17:42 7 those happened, correct?

17:42 8 A. That's correct.

17:42 9 Q. But at least we have this testimony to look at, don't we?

17:42 10 A. Right.

17:42 11 Q. Okay. Then let's look a little bit further at the actions
17:42 12 that the drill crew took. Do you understand they closed the
17:42 13 VBRs around 2147? Do you understand that?

17:42 14 A. Yes, I understand.

17:42 15 Q. And you understand from the Sperry-Sun logs that there was
17:42 16 a spike in pressure that went up to about 7000 psi, which was a
17:42 17 pretty good indication that the VBRs sealed the well?

17:42 18 A. Yes.

17:42 19 Q. That's what you would expect if the well was sealed,
17:42 20 correct?

17:42 21 A. Right. The annular was leaking when they closed the VBRs,
17:42 22 they got a seal and the pressure built up.

17:42 23 Q. And I just wanted to go through this because -- I don't
17:42 24 know if you were being critical of the crew's actions when you
17:42 25 were talking about what their actions were, but I just want to

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17:42 1 make sure that at this point in time when they realized
17:42 2 something was going on, they closed the annular, they went to
17:42 3 the diverter, they may have gone from the mud-gas separator
17:42 4 back to the diverter, and then they went to the VBR and
17:42 5 actually sealed the well, true?

17:42 6 A. They did eventually try to close the well, but, of course,
17:43 7 they waited until it was blowing up through the derrick before
17:43 8 they recognized they had a kick.

17:43 9 Q. That's a totally different issue, and we are going to talk
17:43 10 about that later. Okay?

17:43 11 A. Yes. But you are right, they did do that.

17:43 12 Q. Let's talk about your opinion that the mud-gas separator
17:43 13 should have automatically routed overboard. You do not
17:43 14 consider yourself an expert in the design of mud-gas
17:43 15 separators, do you?

17:43 16 A. No, but it's not a complicated subject.

17:43 17 Q. I understand. But, actually, you didn't even look at the
17:43 18 mud-gas separator, did you?

17:43 19 A. Not in any detail, no.

17:43 20 Q. You didn't look at it at all, true?

17:43 21 A. I may have looked at some rough schematics.

17:43 22 MR. ROY: Rami, put up 139. Volume 1, 139, 1 through
17:43 23 13.

17:43 24 BY MR. HYMEL:

17:43 25 Q. The question was asked at your deposition:

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17:43 1 "QUESTION: Do you -- are you ex--- do you consider
17:44 2 yourself an expert in the design of mud-gas separators?

17:44 3 "ANSWER: No.

17:44 4 "QUESTION: Okay. Do you know whether or not the
17:44 5 design of this mud-gas separator was consistent with
17:44 6 industry standards?

17:44 7 "ANSWER: I don't -- I don't really have an opinion
17:44 8 on that. I didn't look at it. I'm probably qualified. I
17:44 9 could have, but I didn't."

17:44 10 That was your testimony at your deposition,
17:44 11 correct?

17:44 12 A. Yeah, and I stand by that. I mean, if I looked at it, it
17:44 13 wasn't in any depth. It was just kind of not to figure out
17:44 14 what happened, but just out of a curiosity of trying to
17:44 15 understand a little more about it.

17:44 16 MR. HYMEL: Rami, let's go to 8173.67. This is the
17:44 17 one we don't have. We are going to have to do it on the fly.
17:44 18 I want to pull up this section here. Pull up -- okay. Yes,
17:44 19 that's the section I want to pull up.

17:44 20 BY MR. HYMEL:

17:44 21 Q. Now, this is from page 67 of your report. And you talk
17:45 22 about the diverter and you say: "The diverter was closed, but
17:45 23 flow was not directed overboard away from the rig. Two
17:45 24 diverter lines were available to always allow downwind
17:45 25 diversion. The system should have been set up for automatic

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17:45 1 routing to the overboard lines. In the early days of the
17:45 2 diverter design for bottom-supported rigs, failures occurred
17:45 3 because the diverter would sometimes be closed before the side
17:45 4 valve was opened."

17:45 5 Did I read that correctly?

17:45 6 A. That's correct.

17:45 7 Q. So in your report when you are talking about automatic
17:45 8 opening, you are talking about the diverter, correct?

17:45 9 A. I'm talking about the diverter system, the valves that
17:45 10 open automatically as the diverter closed, to make sure you
17:45 11 don't ever completely close the system. But, you know, it's
17:45 12 the same concept.

17:45 13 Q. Right. But you are not talking about the mud-gas
17:45 14 separator in your report, correct?

17:45 15 A. Well, no. I was thinking in terms of where you are
17:46 16 routing it. I was thinking as you build up back pressure, you
17:46 17 could reroute it over to the overboard lines, was sort of the
17:46 18 concept that I had in mind.

17:46 19 Q. I understand, but let me make sure I'm clear here. Okay?
17:46 20 I thought I heard you testify earlier that the mud-gas
17:46 21 separator should have been set up, that once the flow was
17:46 22 routed to the mud-gas separator, that something in the mud-gas
17:46 23 separator should then fail at a low pressure and route the flow
17:46 24 overboard.

17:46 25 Was that your testimony?

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17:46 1 A. No. I was thinking more like there ought to be a sensor
17:46 2 in the mud-gas separator, that should a threshold pressure be
17:46 3 reached, that some valves would reroute things away from the
17:46 4 separator and through the overboard lines. Because once you
17:46 5 put it through the separator, it's too late then. You got to
17:46 6 get it in those big lines. You got to get it there in a hurry.

17:46 7 Q. I understand. But my point is, when you talked about in
17:46 8 your report routing -- automatic routing overboard, you were
17:46 9 talking about the diverter system, correct?

17:47 10 A. The diverter system, right.

17:47 11 Q. Not the mud-gas separator?

17:47 12 A. Perhaps a sensor in the mud-gas separator, but the routing
17:47 13 would be valves on the diverter.

17:47 14 Q. And the reason why you weren't talking about the mud-gas
17:47 15 separator in your report is because you never looked at the
17:47 16 mud-gas separator, true?

17:47 17 A. Not in any detail.

17:47 18 Q. So any opinions you gave earlier -- I may have
17:47 19 misunderstood, but if there's an opinion in the record about a
17:47 20 mud-gas separator and how it should be set up, one, you are not
17:47 21 an expert, correct? An expert on mud-gas separators?

17:47 22 A. Not on mud-gas separator design but, again, it's not a
17:47 23 very complicated subject.

17:47 24 Q. I understand. And then, two, you didn't look at the
17:47 25 mud-gas separator, correct?

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17:47 1 A. That's correct.

17:47 2 Q. And then, three, you told me in your deposition that you
17:47 3 had no intent to issue any opinions on mud-gas separators,
17:47 4 true?

17:47 5 A. That's true.

17:47 6 Q. You do not have an opinion as to whether the design of the
17:47 7 mud-gas separator in this case was consistent with industry
17:47 8 standards, do you?

17:47 9 A. No.

17:48 10 Q. Are you aware of Robert Grace's testimony? He is an
17:48 11 expert in this case. He gave deposition testimony where he
17:48 12 testified that he was of the opinion the mud-gas separator was
17:48 13 consistent with industry standards.

17:48 14 **MR. BROCK:** Your Honor, we have withdrawn Mr. Grace
17:48 15 as an expert in the case and have so notified the parties.

17:48 16 **THE COURT:** I sustain the objection.

17:48 17 **MR. HYMEL:** All right. Let's go to TREN-567.

17:48 18 **BY MR. HYMEL:**

17:48 19 Q. We are going to switch gears now and talk about the
17:48 20 displacement procedure.

17:48 21 Do you agree that M-I wrote the displacement
17:48 22 procedure?

17:48 23 A. Yes.

17:48 24 Q. And BP approved the displacement procedure?

17:48 25 A. Yeah. I think they had a meeting and pretty much

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17:48 1 everybody sat down and went over it at the morning meeting.

17:48 2 MR. HYMEL: Rami, pull up 567.1.1.T0.

17:48 3 BY MR. HYMEL:

17:48 4 Q. Now, in this section of the displacement procedure, you
17:48 5 agree that instructions are given by M-I and BP to the
17:49 6 Transocean rig crew of how many strokes to pump to place the
17:49 7 spacer above the annular, true?

17:49 8 A. That's true. I think it was the M-I person doing the
17:49 9 calculation, but it was done at the request of BP.

17:49 10 Q. And you also agree that the Transocean drill crew pumped
17:49 11 the number of strokes that they were told to pump in the M-I
17:49 12 procedure to place the spacer above the annular?

17:49 13 A. Well, there was some variation in what they did versus
17:49 14 what they said they were going to do.

17:49 15 Q. Okay.

17:49 16 A. But, you know, it was close.

17:49 17 MR. HYMEL: Rami, let's go to Volume 1, 114, and pull
17:49 18 up lines 4 through 20.

17:49 19 BY MR. HYMEL:

17:49 20 Q. And the question to you at your deposition was:

17:49 21 "QUESTION: All right. Let's take both of those.

17:49 22 The Transocean rig crew was responsible for placing the
17:50 23 fluids in the correct position, and you said they did not
17:50 24 do that. Do you have any evidence that the Transocean
17:50 25 drill crew did not follow the displacement procedure that

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17:50 1 was given to them?"

17:50 2 Mr. Brock made an objection. Mr. Funderburk made an
17:50 3 objection. Nobody there to rule on it.

17:50 4 And the answer was:

17:50 5 "ANSWER: Well, they pumped the number of strokes
17:50 6 that they were told to stroke in the M-I -- told to pump
17:50 7 in the M-I procedure."

17:50 8 And that was your testimony at your deposition,
17:50 9 correct?

17:50 10 A. That's correct. And it was close, close enough.

17:50 11 Q. Now, you understand that the spacer that had been pumped
17:50 12 above the annular leaked down through the annular, correct?

17:50 13 A. Yes, uh-huh.

17:50 14 Q. And you also understand that the annular is not designed
17:50 15 to hold from the top, true?

17:50 16 A. I understand.

17:50 17 Q. Since the annular is not designed to hold from the top, it
17:50 18 has a different holding pressure if you have the fluid above
17:50 19 than if you have fluid below. Do you agree?

17:51 20 A. I agree. And I think they increased that holding pressure
17:51 21 and got the leak to stop.

17:51 22 Q. That was my next question. Thank you for answering it.

17:51 23 Now, you don't have any evidence that the annular was
17:51 24 defective in any way, you do?

17:51 25 A. No. I guess the fact that after the spacer had leaked

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17:51 1 down, you know, that they just kind of went on with the
17:51 2 procedure and didn't try to correct for that.

17:51 3 Q. And that's my next question. Is it your opinion they
17:51 4 should have recirculated to get the spacer back up above the
17:51 5 annular? True?

17:51 6 A. You know, I looked at that. By that time the spacer had
17:51 7 probably spread out so much that they probably would have to
17:51 8 have gone back and started over or just switched over to the
17:51 9 drill pipe. You know, I don't think it was -- the kill line
17:51 10 was a viable way to do the test anymore after the spacer had
17:52 11 slipped down.

17:52 12 MR. HYMEL: Rami, let's go over to TREX-8173.60.1.TO.

17:52 13 BY MR. HYMEL:

17:52 14 Q. You state in your report on page 60: "Unfortunately,
17:52 15 nothing to rectify the situation was done. There was no
17:52 16 attempt to circulate the 65 barrels that was known to have
17:52 17 leaked below the blowout preventer back to the correct position
17:52 18 above it."

17:52 19 And that's what you said in your report, true?

17:52 20 A. That's what I said in my report. And after thinking about
17:52 21 it some more, I'm not sure that would have been that feasible.

17:52 22 Q. Now, the last question in this section is: Now, you also
17:52 23 believe that the BP well site leader knew that the spacer had
17:52 24 leaked through the annular?

17:52 25 A. Yes.

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17:52 1 Q. We have talked about the negative pressure test, but I'm
17:52 2 going to try to move through this pretty quickly. You
17:52 3 testified in response to some of Mr. Roy's question that the
17:52 4 most common way to conduct a negative pressure test was to
17:53 5 displace the drill pipe and monitor the drill pipe.

17:53 6 You agree that the drill crew, Transocean drill crew
17:53 7 started the negative pressure test on the drill pipe, correct?

17:53 8 A. Yes.

17:53 9 Q. And you also agree that finishing the testing on the drill
17:53 10 pipe would have provided the correct result?

17:53 11 A. I think so, yes.

17:53 12 Q. The BP well site leader decided to retest using the kill
17:53 13 line, correct?

17:53 14 A. Yes.

17:53 15 Q. You agree that the negative pressure test on the kill line
17:53 16 provided an incorrect result, true?

17:53 17 A. True.

17:53 18 Q. And you believe what they should have done was gone to the
17:53 19 drill pipe -- that's your testimony or that was your statement
17:53 20 from your deposition, "gone to the drill pipe," which means
17:53 21 they should have switched the negative pressure test back to
17:53 22 the drill pipe, correct?

17:53 23 A. Yes.

17:53 24 Q. And it's what you talked about earlier, is once you got
17:53 25 the spacer around where the kill line was, it's probably not

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17:53 1 even worth it, trying on the kill line. They should have just
17:53 2 gone back to the drill pipe, true?

17:54 3 A. That's true. And even with the spacer leading down below,
17:54 4 it could have had some effect.

17:54 5 Q. Sure. And you state that in your report. You state that
17:54 6 "and the reason is because the drill pipe presented a much
17:54 7 clearer situation," true?

17:54 8 A. That's true.

17:54 9 Q. You testified earlier -- this is in your report and you
17:54 10 testified to this -- that you stated that even though the
17:54 11 negative pressure test was not properly understood, the parties
17:54 12 involved allowed the displacement to continue.

17:54 13 Do you recall that testimony?

17:54 14 A. Yes.

17:54 15 Q. That's actually the third opinion in your report?

17:54 16 A. Yeah.

17:54 17 Q. And the point I want to make is you agree that the
17:54 18 "parties involved" in the negative pressure test included the
17:54 19 BP well site leaders, true?

17:54 20 A. Yes.

17:54 21 Now, this discussion that we have had in many
17:54 22 depositions and you and Mr. Roy had about who makes the
17:54 23 decision on the negative pressure test, I don't want to replot
17:55 24 that ground. What I do want to do is talk with you about what
17:55 25 you do after the negative pressure test.

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17:55 1 You said that who made the decision is kind of gray
17:55 2 in your mind because anybody had stop work authority?

17:55 3 A. Right.

17:55 4 Q. Stop work authority is something that's been in the oil
17:55 5 field for 20 years or so. It's well entrenched. Everybody
17:55 6 knows it and everybody knows it's out there, true?

17:55 7 A. I think that's pretty true.

17:55 8 Q. Now, is there a go-forward authority?

17:55 9 A. Can you explain that a little more?

17:55 10 Q. You've never heard of that, have you?

17:55 11 A. No.

17:55 12 Q. It's really just something I made up. Okay?

17:55 13 A. Okay.

17:55 14 Q. Can somebody at Transocean -- they can stop any job, but
17:55 15 can somebody at Transocean decide to move forward with any job?

17:55 16 A. No, probably not.

17:55 17 Q. That's ridiculous, isn't it?

17:55 18 A. Yes.

17:55 19 Q. So no matter who made the decision on the negative
17:56 20 pressure test whether it was good or not, the decision to move
17:56 21 forward had to be made by BP. Do you agree?

17:56 22 A. The initial decision was made by BP, but Transocean had to
17:56 23 concur.

17:56 24 Q. Are you talking about to move forward with the TA plan or
17:56 25 to declare the negative pressure test a success?

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17:56 1 A. Declare it a success.

17:56 2 Q. I'm talking about -- we are past the negative pressure
17:56 3 test. Whether it's a success or not, we are deciding to move
17:56 4 forward.

17:56 5 A. You're talking about the procedure.

17:56 6 Q. The procedure to move forward to the next step in the TA
17:56 7 procedure, which was to remove the hydrostatic pressure that
17:56 8 was holding this reserve back, to remove that from the well,
17:56 9 only BP can make that decision, true?

17:56 10 A. Well, that's to go forward with the displacement, right?

17:56 11 Q. That's what I'm saying.

17:56 12 A. Okay. Yes.

17:56 13 Q. Only BP can make that decision, correct?

17:56 14 A. They made the decision, and Transocean concurred with it.

17:57 15 MR. HYMEL: Rami, go to TREN-8174.10.1.T0.

17:57 16 BY MR. HYMEL:

17:57 17 Q. This is from page 10 of your rebuttal report and I'm going
17:57 18 to read it.

17:57 19 "BP has also acknowledged that the drilling team on
17:57 20 the rig, which included both BP and Transocean personnel, made
17:57 21 a mistake in not correctly interpreting the negative pressure
17:57 22 test. However, every member of the team had everything to lose
17:57 23 and nothing to gain by making the mistake. This mistake was
17:57 24 one of a series of breakdowns in well control that connected
17:57 25 together, allowed the blowout to happen. In my opinion it does

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17:57 1 not justify a conclusion of willingly and knowingly proceeding
17:57 2 with disregard for safety, i.e., being reckless."

17:57 3 Did I read that correctly?

17:57 4 A. Yes.

17:57 5 Q. You agree with me that that statement applies to
17:57 6 Transocean, because you state them in this statement, as well
17:57 7 as BP?

17:57 8 A. Yes.

17:57 9 Q. A new area but related to the negative pressure test. I
17:58 10 want to discuss your opinion as to why the kill line did not
17:58 11 flow.

17:58 12 MR. HYMEL: Let's go to 8173.63.1.T0.

17:58 13 BY MR. HYMEL:

17:58 14 Q. This section of your report, you give three reasons for
17:58 15 why the kill line did not flow. The first one was sufficient
17:58 16 effective height of spacer material, meaning hydrostatic
17:58 17 pressure created by the spacer material, true?

17:58 18 A. Yes.

17:58 19 Q. The next one is plugged kill line, correct?

17:58 20 A. Yes.

17:58 21 Q. And then the next one is closed valve, true?

17:58 22 A. That's true, yes.

17:58 23 Q. You told us at your deposition that the two most likely
17:58 24 candidates were probably plugged -- the line being plugged or a
17:58 25 closed valve. Do you remember that testimony?

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17:58 1 A. Yes.

17:58 2 Q. You also told us at your deposition you couldn't determine
17:58 3 one being more likely than the other to a comfortable degree.
17:58 4 Do you remember that?

17:58 5 A. I do. Even eliminating the first one, I'm not too
17:59 6 comfortable.

17:59 7 MR. HYMEL: Let's go to TREX-51133.3.1.

17:59 8 BY MR. HYMEL:

17:59 9 Q. Now, this is a statement signed by Mr. Vidrine and
17:59 10 Mr. Kaluza on April 20, 2010. Have you ever seen this
17:59 11 statement before?

17:59 12 A. I don't think so.

17:59 13 MR. HYMEL: Rami, let's go to TREX-51133.2.1.T0.

17:59 14 MR. BROCK: Your Honor, I'm going to object on
17:59 15 foundation. He said he has not seen this document, so I think
17:59 16 there's not a foundation for it.

17:59 17 THE COURT: Let me ask you this: Are you going
17:59 18 deeper into an area that's going to take you a while? I'm just
17:59 19 looking at the time.

17:59 20 MR. HYMEL: Yes. I didn't realize it was 6:00.

17:59 21 THE COURT: This will probably be as good as any
17:59 22 other time to stop. It's 6:00. We will recess until 8:00 in
18:00 23 tomorrow morning.

18:00 24 THE DEPUTY CLERK: All rise.

18:00 25 (Proceedings adjourned.)

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CERTIFICATE

I, Toni Doyle Tusa, CCR, 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 matter.

s/ Toni Doyle Tusa
Toni Doyle Tusa, CCR, FCRR
Official Court Reporter

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