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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,	*	March 18, 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 13, AFTERNOON SESSION
TRANSCRIPT OF NONJURY TRIAL
BEFORE THE HONORABLE CARL J. BARBIER
UNITED STATES DISTRICT JUDGE

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Calvin Barnhill

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CALVIN BARNHILL - DIRECT

AFTERNOON SESSION**(March 18, 2013)**

* * * * *

(WHEREUPON, CALVIN BARNHILL, having been previously duly sworn, testified as follows.)

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

All right. Mr. Hymel.

DIRECT EXAMINATION

BY MR. HYMEL:

Q. Mr. Barnhill, let's next talk about the converter. Is there evidence that the crew diverted?

A. Yes.

Q. What was your basis for that statement?

A. I think both of the phone calls maybe indicated that they were shutting the well and they were going to divert -- or had diverted and were shutting the well in. I think the phone call from Mr. -- in the interview or the post-incident notes of Mr. Vidrine, I believe that was indicated. And I believe Mr. Ezell in his phone call had indicated something to that effect.

Q. What's the fact that the crew diverted mean to you?

A. Again, you know, that they recognized there was live fluid in the riser, and they were diverting the flow.

Q. How long is the time from when the diverter is activated

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13:19 1 until the diverter closes?

13:19 2 A. Roughly around 45 seconds.

13:19 3 Q. Were you in the courtroom when Randy Ezell testified that
13:19 4 the diverter was lined up to the mud-gas separator?

13:20 5 A. I believe I was. I was aware of that fact. I believe I
13:20 6 was, yes.

13:20 7 MR. HYMEL: Please go to TREN-2210.2.T0.

13:20 8 BY MR. HYMEL:

13:20 9 Q. Have you seen these BP deepwater well control guidelines
13:20 10 before?

13:20 11 A. Yes, I believe I've seen those.

13:20 12 MR. HYMEL: All right. Let's go to 2210.17.1.T0.

13:20 13 BY MR. HYMEL:

13:20 14 Q. Have you seen these provisions?

13:20 15 A. Yes.

13:20 16 Q. What are the significance of these provisions?

13:20 17 A. Well, again, it indicates that when you close your
13:20 18 diverter that you're to direct fluid through the riser gas
13:20 19 buster. The gas buster is a slang term that we use for mud-gas
13:20 20 separator.

13:20 21 And then 13 says, When you have rapid expansion of
13:20 22 fluids near the surface, attempt to keep the flow going through
13:20 23 the gas buster as opposed to overboard lines to minimize
13:20 24 synthetic oil going into the Gulf, but be prepared to divert.

13:21 25 Q. So are these BP guidelines consistent with lining up the

CALVIN BARNHILL - DIRECT

13:21 1 converter to the mud-gas separator?

13:21 2 A. They're consistent with that and then staying on the
13:21 3 mud-gas separator as long as you can.

13:21 4 Q. Do you have an opinion as to whether the Transocean drill
13:21 5 crew switched from the mud-gas separator to go overboard?

13:21 6 A. I don't know. The information I reviewed didn't indicate
13:21 7 that. I know Mr. Ezell testified that he saw fire coming out
13:21 8 of the diverter line. I have no reason to doubt that that's
13:21 9 what he saw. I just don't know one way or the other.

13:21 10 Q. Let's next talk about the emergency disconnect system.
13:21 11 What is the emergency disconnect system?

13:21 12 A. The EDS system is a system that I think -- the emergency
13:21 13 disconnect system.

13:21 14 Q. Let me stop you, Mr. Barnhill. We put up D-6647. Now,
13:22 15 what does this show?

13:22 16 A. Basically, it shows the BOP stack that we looked at this
13:22 17 morning with the two sections showing -- you can see the dark
13:22 18 and plain area between the two sections, which is where the
13:22 19 disconnect would occur if you were EDS'g the well.

13:22 20 Q. And so how does the EDS work?

13:22 21 A. Basically, it's a process function that once you engage it
13:22 22 by activating the proper buttons, basically, there's a sequence
13:22 23 that goes into place that would culminate in the closing of the
13:22 24 blind shear rams and the disconnecting of the LMRP from the
13:22 25 lower marine stack -- the lower BOP stack.

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13:22 1 Q. Mr. Webster testified that Captain Kuchta should not have
13:22 2 waited to get information from other people; he should have
13:22 3 just EDS'd. What is your response to that?

13:22 4 A. I don't agree with that comment.

13:22 5 I think you have to have communication between the
13:23 6 rig floor and the bridge. The rig floor is where the well
13:23 7 control operations are being conducted.

13:23 8 To me, EDS'g is a terminal operation. Once you do
13:23 9 that, I mean, you're going to disconnect from that BOP stack
13:23 10 with that LMRP, you're going to lose that functionality. If
13:23 11 that well is not spaced out appropriately or if you haven't
13:23 12 worked through all your well control sequences, you're going to
13:23 13 cut off those possibilities.

13:23 14 Q. Now, we talked earlier today about the fact that the
13:23 15 VBR -- there was a pressure spike that indicated the VBR
13:23 16 sealed. What does that mean to you with regard to our
13:23 17 discussion here about EDS'd?

13:23 18 A. Well, again, there were operations that were going on post
13:23 19 the time that we believe the fluid blew up through the rotary
13:23 20 table, which would include the activation of the VBR which it
13:23 21 seemed -- which appeared to affect the seal for some period of
13:23 22 time.

13:23 23 Q. So does the fact that the VBR appeared to seal indicate
13:24 24 that the crew was going through the well control sequence?

13:24 25 A. Yes. I mean, it looked like they were working through a

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13:24 1 well control sequence at the time that the VBRs were closed.

13:24 2 Q. And if Captain Kuchta would have EDS'd immediately,
13:24 3 without calling the drill floor, he could have interrupted what
13:24 4 the drill crew was doing?

13:24 5 A. That sequence would have not -- they would have not gone
13:24 6 forward with that sequence.

13:24 7 Q. All right. Now, we've been discussing the events during
13:24 8 the displacement of the well. Now I want to kind of go before
13:24 9 this, and let's talk about the events leading up to the
13:24 10 displacement.

13:24 11 A. Okay.

13:24 12 MR. HYMEL: Please put up D-6579.

13:24 13 BY MR. HYMEL:

13:24 14 Q. What is this document, and what does it demonstrate?

13:24 15 A. This appears to be a listing of the various TA procedures
13:24 16 or the versions of the TA procedures that were circulated back
13:24 17 into -- from the rig. I think there were five different
13:25 18 procedures or versions of the procedures that were actually --
13:25 19 maybe even six, looking at this -- that were sent to the rig
13:25 20 and back and to.

13:25 21 MR. HYMEL: Put up D-6646.

13:25 22 BY MR. HYMEL:

13:25 23 Q. I want to go back to our discussion earlier about how BP
13:25 24 intended to TA this well, and let's talk a little bit more in
13:25 25 detail. You stated in your report that it appeared that the

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13:25 1 lockdown sleeve kind of became a focus of the TA procedure.

13:25 2 Please explain that.

13:25 3 A. Well, the lockdown sleeve is a production apparatus that
13:25 4 basically locks the top of the casing into the wellhead area so
13:25 5 that as you're producing this well, you don't get unwanted
13:25 6 movement of the casing.

13:25 7 Deepwater wells, to be economically viable, just by
13:25 8 the cost of going and looking for them, have to be able to
13:26 9 produce high volumes of hydrocarbons in a short period of time
13:26 10 or a high rate of producibility to make them economically
13:26 11 viable.

13:26 12 So as you produce the reservoir fluids that are under
13:26 13 temperature and pressure down in the earth and they come up
13:26 14 through the wellbore, they tend to heat the tubulars in the
13:26 15 wellbore, and that tends to pressurize the wellbore. And the
13:26 16 combination of pressure and temperature tend to affect the
13:26 17 pressure in the various annuli of the well and in the casing so
13:26 18 the casing can actually try to expand on you as you're
13:26 19 producing or contracting your shut-in. So to lock the top of
13:26 20 the casing in place, you install the lockdown sleeve.

13:26 21 Q. What effect does installing the lockdown sleeve or
13:26 22 intending to install the lockdown sleeve at this point in the
13:26 23 well have on the TA procedure?

13:26 24 A. Well, it would have altered the TA procedure. We know
13:26 25 from the original TA procedure that was done, they set the

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13:26 1 surface plug 800 to 1,000 feet below the mud line. Here,
13:27 2 because the decision had been made to set the lockdown sleeve
13:27 3 and to set the lockdown sleeve last so that you wouldn't damage
13:27 4 it, because of the procedure that was required, that required
13:27 5 moving the surface plug deeper in the well.

13:27 6 That's the reason it moved from roughly about
13:27 7 5800 feet down to about 8300 feet, 8367, somewhere in that
13:27 8 range.

13:27 9 So one of the results was to move your plug deeper
13:27 10 down. Then the decision associated with that, to set the plug
13:27 11 in water, meant that you were going to remove more of the mud
13:27 12 out of the wellbore during the TA procedure.

13:27 13 So it looked like to me, in going through the TA
13:27 14 procedures, that the focus became more the successful setting
13:27 15 of this lockdown sleeve than the management of the well at the
13:27 16 end.

13:27 17 Q. Mr. Barnhill, you state at page 4 of the executive summary
13:27 18 of your report that "the displacement of the SBM" -- and what
13:28 19 does that mean?

13:28 20 A. Synthetic-base mud.

13:28 21 Q. -- "...with seawater reduced the hydrostatic pressure in
13:28 22 the Macondo well to a greater degree than normal."

13:28 23 What do you mean by that?

13:28 24 A. Typically, when we get ready to abandon or temporarily
13:28 25 abandon a well in a floating operation, you're going to remove

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13:28 1 the riser and the BOP stack. That goes with the rig.

13:28 2 So basically what you're doing is -- and remember, we
13:28 3 talked about how our primary well control was the hydrostatic
13:28 4 pressure created by the drilling mud, which was the length of
13:28 5 the column times the density of the fluid.

13:28 6 Well, we're going to be removing the riser in the BOP
13:28 7 system, so we're going to be greatly reducing the length of
13:28 8 column that's available. So to be able to do that -- and by
13:28 9 the way, that link that's associated with the riser is called
13:28 10 the "riser margin." So when we remove the riser, we remove
13:28 11 that riser volume, we have to make sure that the well is
13:28 12 appropriately sealed with other types of flow barriers, in the
13:29 13 event the well's underbalanced, so that the well cannot flow on
13:29 14 us or have a well control problem.

13:29 15 Q. When did the lockdown sleeve need to be installed?

13:29 16 A. The lockdown sleeve is basically associated with the
13:29 17 production operations. It could have been installed in the
13:29 18 completion operations.

13:29 19 Q. And when you say "the completion operations," does that
13:29 20 mean the *Deepwater Horizon* could have TA'd the well and left
13:29 21 and another rig, whether it be the *Deepwater Horizon* or another
13:29 22 rig, come back and install the lockdown sleeve?

13:29 23 A. That's my understanding, yes.

13:29 24 Q. How would the TA procedure have been different if BP chose
13:29 25 to set the lockdown sleeve during completion and just TA the

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13:29 1 well the way it is, without setting the lockdown sleeve?

13:29 2 A. Well, if you were going to do, let's say, a more
13:29 3 traditional TA procedure, then basically, once they've got the
13:29 4 shoe track set and the determination was to use the shoe track,
13:30 5 the undisturbed shoe track was the bottom plug, then they could
13:30 6 have come in and conducted their negative test, which was based
13:30 7 along the kill line. They could have done it before they ran
13:30 8 their displacement string, before they did any displacement,
13:30 9 before they introduced any spacer into the well.

13:30 10 That would have given them the equivalent of a
13:30 11 testing with the seawater gradient down to about 6500 feet. So
13:30 12 they could have tested, basically, what the equivalent setup of
13:30 13 the well was going to be after the TA was completed. Pretty
13:30 14 straightforward, just like they had done on the initial TA.

13:30 15 If they had done that, then they could have set the
13:30 16 upper plug, even in water, say from 5800 to 6000 feet, and we
13:30 17 wouldn't have been in the situation we ultimately wound up in.

13:30 18 Q. Let me make sure I understand this.

13:30 19 Let's talk about the negative pressure test that was
13:30 20 done. We haven't gotten to it yet, but I just want to set the
13:31 21 stage here. How was -- the negative pressure test that was
13:31 22 done on April 20th, how was it set up?

13:31 23 A. Basically, the negative test that was actually conducted
13:31 24 was embedded within the displacement. A fair portion of the
13:31 25 displacement had already occurred. They had basically

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13:31 1 displaced the displacement string with seawater and had
13:31 2 displaced the seawater all the way back up, with the game plan
13:31 3 being that the spacer material and the heavy or the weighted
13:31 4 mud would be above the BOP so that you could close the BOP and
13:31 5 then do your test.

13:31 6 So it was -- the term I use is the test was
13:31 7 "embedded" within the displacement.

13:31 8 Q. Okay. Now let's go back to what you said about how the
13:31 9 negative pressure test could have been performed if the
13:31 10 lockdown sleeve was going to be set at another time. Explain
13:31 11 that to us.

13:31 12 A. Well, again, you could have basically done the test very
13:32 13 similar to what they did in the initial TA. If you go back --
13:32 14 I think it was the April 14th procedure -- it called for using
13:32 15 base oil -- displace the kill line with base oil down to the
13:32 16 wellhead.

13:32 17 If you do that, you're going to get about a 6500-foot
13:32 18 equivalent displaced in depth with seawater, which would have
13:32 19 put the depth of the seawater below where your surface plug
13:32 20 would have been set if you didn't have to make allowances for
13:32 21 setting the lockdown sleeve last.

13:32 22 Q. So when you say you could have displaced the kill line
13:32 23 with seawater and do the negative pressure test that way, are
13:32 24 you telling us you would not have to displace any of the water
13:32 25 or any of the mud in the wellbore; you would just be displacing

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13:32 1 the mud in the kill line?

13:32 2 A. Give me that question one more time.

13:32 3 Q. Sure. When you say you would displace the mud in the kill
13:32 4 line to do the negative pressure test, are you telling us that
13:32 5 you would then not have to displace any of the mud in the
13:33 6 wellbore?

13:33 7 A. If you would displace with base oil, which is lighter than
13:33 8 seawater, then the effective gradient would have been deeper
13:33 9 than the effect of seawater to the wellhead.

13:33 10 My calculations indicate that that would have gotten
13:33 11 you down to about a depth of 6500 feet, which would be below
13:33 12 where you would have set the upper plug if you had set it in
13:33 13 seawater in the wellbore when you were abandoning the wellbore.

13:33 14 So, yes, you could have negatively tested with base
13:33 15 oil to the wellhead prior to displacing the mud out of the well
13:33 16 itself or removing the mud from the riser system.

13:33 17 Q. Okay. Let's move on. Let's talk about some of the
13:33 18 different things that were done during the displacement.

13:33 19 MR. HYMEL: And let's go to D-6643.

13:34 20 BY MR. HYMEL:

13:34 21 Q. Are you ready?

13:34 22 A. Yes.

13:34 23 Q. Let's talk about the production casing first. When did BP
13:34 24 run the production casing?

13:34 25 A. They ran it on April the 18th.

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13:34 1 Q. Were there any indications that the production casing was
13:34 2 successfully run?

13:34 3 A. Yes. I think, reviewing the drilling reports that I
13:34 4 reviewed, the indications from the rig would be that it was
13:34 5 really installed without any problems.

13:34 6 Q. And the production casing being successfully run indicated
13:34 7 what?

13:34 8 A. That you would have had a steel pipe or a steel liner
13:34 9 across the exposed or the hydrocarbon-bearing intervals that
13:34 10 had been exposed during the drilling of the well.

13:34 11 Q. Was there any information about the production casing that
13:34 12 the Transocean drill crew were not told?

13:35 13 A. I don't believe they were aware of the discussions about
13:35 14 long -- whether they were going to run a long string or a liner
13:35 15 or the use of -- how many centralizers they were going to run,
13:35 16 those type of discussions. I don't believe they were aware of
13:35 17 those.

13:35 18 Q. What were the risks associated with running the different
13:35 19 number of centralizers?

13:35 20 A. Well, there was indication from some of the work that
13:35 21 Halliburton had done that by running a minimal number of
13:35 22 centralizers, in this case, seven -- I think there were
13:35 23 actually six that were run -- then there was some indication of
13:35 24 a risk of severe gas flow.

13:35 25 Q. Let's move on to the production casing cement. When was

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13:35 1 the cement job run?

13:35 2 A. The cement job was run on April 19th and 20th. It ended
13:35 3 shortly after midnight on the morning of April 20th, 2010.

13:35 4 Q. Were there indications that the cement job was successful?

13:35 5 A. Yes. I think, from the guys on the rig's perspective, the
13:35 6 indication was that the cement job had gone well. There was
13:36 7 indication from the Halliburton guys and the BP guys that the
13:36 8 job had gone well. There was no loss circulation, there was
13:36 9 lift pressure. So I think the indications were that the cement
13:36 10 had gone well. There was a CVL crew standing by that got sent
13:36 11 in without being run.

13:36 12 Again, they would have been aware that some
13:36 13 centralizers were run, but not all of them. So I think the
13:36 14 indications, the feedback on the rig, would have been we had a
13:36 15 successful cement job.

13:36 16 Q. And the cement job being a success would indicate what?

13:36 17 A. Well, again, now you would have had cemented casing or
13:36 18 cemented pipe across those hydrocarbon-bearing zones, and what
13:36 19 remained to be done was to verify those barriers.

13:36 20 Q. Was there any information about the cement job that the
13:36 21 Transocean drill crew was not told?

13:36 22 A. I don't think they were aware of the status of the
13:36 23 incompleteness of the testing on the foam cement. That's my
13:37 24 memory.

13:37 25 Q. What was the next step in the TA procedure?

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13:37 1 A. Actually, there were positive tests that were run. Once
13:37 2 the casing was cemented in place, then they did a positive test
13:37 3 on the seal assembly, on the hanger, once it was set. They did
13:37 4 a positive test before stinging out of the hanger; then they
13:37 5 stung out of the hanger, and stung back in to make sure they
13:37 6 could get free with their running string.

13:37 7 They retested the seal assembly at that point in
13:37 8 time. Then they tripped out of the hole with their running
13:37 9 string. They picked up their combination displacement string
13:37 10 and cementing string. That was a tapered string. It had
13:37 11 3 1/2-inch tubing, 5 1/2-inch drill pipe, and 6 1/2 drill pipe
13:37 12 that composed -- or made up the string.

13:38 13 They ran that back into the hole to about 4800,
13:38 14 4900 feet, shut the blind shear rams, pumped up through the
13:38 15 kill line to do a pressure test, which would have tested the
13:38 16 blind shears, the seal assembly, the -- or the wellhead area,
13:38 17 the casing itself, down to the top wiper plug, and the top
13:38 18 wiper plug, assuming that that was what was holding.

13:38 19 Q. When were those tests performed?

13:38 20 A. That was, I believe, during the morning hours of
13:38 21 April 20th.

13:38 22 Q. Were there indications that the positive tests were
13:38 23 successful?

13:38 24 A. Yes. Everything I saw -- I mean, I think the term that I
13:38 25 saw from most of the reports and the indications from the folks

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13:38 1 were that it was rock solid.

13:38 2 Q. And the positive test being successful indicated what?

13:38 3 A. Well, again, that would be an indication that you have

13:38 4 done a test to confirm the barriers that you put in place, that

13:38 5 test had been successful. Back at this time frame, actually,

13:39 6 the positive test was the only required test under the

13:39 7 regulations. You weren't required to do, really, any more

13:39 8 testing than this. So this would have indicated a positive

13:39 9 outcome for both the cement and the casing that was installed.

13:39 10 Q. What happened after the positive pressure test?

13:39 11 A. Basically, they opened their BOPs -- or opened the blind

13:39 12 shear rams, they ran the combination string on down to the

13:39 13 depth of 87- -- or 8367 feet and then they started doing their

13:39 14 displacement.

13:39 15 Q. How was the displacement set up?

13:39 16 A. Well, initially, they were pumped -- they pumped the

13:39 17 spacer material out of the tanks where the spacer material

13:39 18 would have been located on the rig out of the mud pump -- mud

13:39 19 pit area. That was followed with seawater out of the sea

13:39 20 chest. So that fluid was pumped down the drill pipe, around up

13:40 21 the annular space around the displacement string and the

13:40 22 production casing back up to a point -- I think the initial

13:40 23 plan had been to place the spacer above the top of the BOPs.

13:40 24 The calculations are kind of plus or minus on that.

13:40 25 Some calculations, I think, showed that it was slightly above

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13:40 1 it; some calculations showed that that spacer was still
13:40 2 actually in the BOPs at the time they stopped to do the
13:40 3 negative test.

13:40 4 Q. Where was the displacement set up to pump to?

13:40 5 A. The returns initially were being taken back on the rig in
13:40 6 the rig's pit area.

13:40 7 Q. Okay. And then after the sheen test, where was the
13:40 8 displacement set up to pump to?

13:40 9 A. After -- if the sheen test was successful, which would
13:40 10 indicate that you were basically returning spacer back at that
13:40 11 point in time. Then it was set up for the returns to go
13:40 12 overboard.

13:40 13 Q. Okay. Now, when the returns were set up to go overboard,
13:41 14 how was the flow-out monitor?

13:41 15 A. The flow-out monitor after the sheen test would have been
13:41 16 monitored with the rig's HiTECH flow show; the Sperry-Sun sonic
13:41 17 flow show would have been bypassed.

13:41 18 Q. And with the well pumping water out of the sea chest, how
13:41 19 was the flow-in monitored?

13:41 20 A. Again, it would be a situation where you were looking at
13:41 21 pump volume versus strokes.

13:41 22 MR. HYMEL: Okay. Please put up TRES-40002.61.T0.

13:41 23 BY MR. HYMEL:

13:41 24 Q. This is from Dr. Bourgoyne's report, and he states that:
13:41 25 "When pumping from the sea chest, the total pump strokes times

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13:41 1 the pump volume factor is an accurate measure of the volume
13:41 2 pumped into the well."

13:41 3 Do you agree with that?

13:41 4 A. I do. That's how we've done it for years.

13:41 5 Q. Then moving on to the next sentence: "The accuracy of the
13:41 6 volumes measured from pump strokes is second only to volumes
13:42 7 measured in a metering tank."

13:42 8 Do you agree with that?

13:42 9 A. Yes.

13:42 10 Q. So, Mr. Barnhill, with the flow-in being pumped from the
13:42 11 sea chest and monitored by the pump strokes versus the pump
13:42 12 volumes and the flow-out being monitored by the flow-out
13:42 13 sensor, how would you describe that displacement procedure?

13:42 14 A. Well, again, the displacement procedure, the way I would
13:42 15 describe it is it was an open-pit procedure. By that, I mean
13:42 16 you were sucking out of one system and returning to another
13:42 17 system or returning overboard. A closed system would be -- I
13:42 18 would be taking fluid out of and returning fluid back to the
13:42 19 same system, maybe a series of connected tanks, but it would be
13:42 20 the same system.

13:42 21 So basically, you were taking it out of either the
13:42 22 mud pit system or the sea chest and then returning it back to
13:42 23 the mud pit system at some point.

13:42 24 Q. What are the differences between an open-pit system and a
13:43 25 closed-pit system?

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13:43 1 A. Well, again, as I've just said, you have a situation
13:43 2 where, in a closed-pit system, you're taking out and returning
13:43 3 to the same system. In an open system, you're taking out of a
13:43 4 different point and you are returning it to a different point.

13:43 5 Q. What are the similarities between an open-pit system and a
13:43 6 closed-pit system?

13:43 7 A. The similarities are you're going to have a situation
13:43 8 where basically your volume in is going to be measured the same
13:43 9 way, and the volume out as related to flow -- returned flow is
13:43 10 going to be essentially monitored the same way.

13:43 11 Q. So just to make sure I understand, even in an open-pit
13:43 12 system, you can monitor flow-in and flow-out?

13:43 13 A. You can. There is -- in the closed-pit system, you have
13:43 14 an additional component, but you can monitor those in an
13:43 15 open-pit system.

13:43 16 Q. Now, the displacement procedure and the way it was set up,
13:43 17 who created that displacement procedure?

13:43 18 A. I think the procedure itself was actually drafted up by
13:43 19 M-I.

13:43 20 Q. And who approved the displacement procedure?

13:43 21 A. BP would have approved it.

13:44 22 Q. Let's talk about the operations taking place during the
13:44 23 displacement.

13:44 24 What operations were taking place during the
13:44 25 displacement?

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13:44 1 A. My understanding is there were several concurrent
13:44 2 operations that were going on. These operations would be
13:44 3 routine-type of operations that would be dealing with mob-ing
13:44 4 or -- or demob-ing a rig, or preparing the rig for a rig move
13:44 5 away from the location, where things like the crane was
13:44 6 backloading or moving equipment around. There was fluid
13:44 7 being -- or synthetic-base mud being transferred to a vessel,
13:44 8 there was fluid movements on the vessel.

13:44 9 So just kind of routine operations of those type.

13:44 10 Q. There's been some discussion about the transfers to the
13:44 11 supply boat, the MV *Bankston*. Do you think transferring mud to
13:44 12 the supply boat played any part in this well control event?

13:44 13 A. I do not. The transfers to the *Bankston* stopped at 5:17
13:44 14 in the afternoon, so I do not think it was a factor in the well
13:45 15 control situation or the way the well control situation was
13:45 16 done.

13:45 17 Q. How would you characterize the multiple operations that
13:45 18 were taking place during the TA procedure?

13:45 19 A. Well, again, they were routine-type of operations for a --
13:45 20 to prepare a rig for a rig move.

13:45 21 Q. Who approved the multiple operations?

13:45 22 A. Ultimately, it would have been BP. If BP would have
13:45 23 decided they didn't want those to occur at that time, then they
13:45 24 would not have occurred at that time.

13:45 25 Q. Let's go back to D-6643, and let's talk about the negative

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13:45 1 pressure test.

13:45 2 When was the negative pressure test performed?

13:45 3 A. It started at around 5:00 in the afternoon of the 20th and
13:45 4 I think it concluded around 8:00 in the afternoon on the 20th.

13:45 5 Q. Who had the ultimate authority on the rig to determine
13:45 6 whether the negative pressure test was successful?

13:45 7 A. The ultimate authority would have rested with BP. They
13:46 8 would have made the call whether to accept or reject the test
13:46 9 and move forward.

13:46 10 Q. Who was responsible for designing the negative pressure
13:46 11 test?

13:46 12 A. The design of the test, as far as when you were going to
13:46 13 do the test, what part of the procedure the test was going to
13:46 14 be performed in. Basically, the type of fluids that you were
13:46 15 going to use, those type of issues would have all been designed
13:46 16 by BP.

13:46 17 MR. HYMEL: Okay. Connie, let's go back to 6579.

13:46 18 BY MR. HYMEL:

13:46 19 Q. We had this demonstrative up when we were talking about
13:46 20 the TA procedures, but I want to ask you a different question.
13:46 21 I want to ask you how many negative pressure test procedures
13:46 22 were in the different TA procedures.

13:46 23 A. Looks like four of the procedures had at least one, if not
13:46 24 two, forms of negative tests done.

13:46 25 Q. Did the negative pressure test procedures change as they

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13:46 1 went from one TA procedure to the other?

13:47 2 A. Yes, they did change.

13:47 3 Q. Let's go to TREG-5730.3.1.T0.

13:47 4 What is this document?

13:47 5 A. This document looks to me to be the -- to be the

13:47 6 April 16th document indicating the procedure that was approved

13:47 7 by the MMS.

13:47 8 Q. How many negative pressure test procedures do you see in

13:47 9 this document?

13:47 10 A. They're not stated as -- both as negative tests but, to

13:47 11 me, I see effectively two negative tests in this document.

13:47 12 Q. Where is the first one?

13:47 13 A. The first one is line 1. It says: "Negative test casing

13:47 14 to seawater gradient equivalent to 30 minutes with the kill

13:47 15 line."

13:47 16 Q. Where is the second one?

13:47 17 A. The fact that once you displace the seawater, you're going

13:47 18 to monitor the well for 30 minutes. In effect, you're

13:47 19 monitoring to see what the effect of the differential created

13:47 20 by the seawater displacement is doing. It's, in effect, a

13:48 21 negative test.

13:48 22 Q. Did BP conduct the negative pressure test as specified on

13:48 23 this procedure approved by the MMS?

13:48 24 A. In my opinion, they did not.

13:48 25 Q. Did BP get approval to deviate from this MMS-approved

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13:48 1 procedure?

13:48 2 A. Not that I'm aware of.

13:48 3 Q. What's your understanding as to how the procedure got
13:48 4 changed?

13:48 5 A. It was my understanding that there was some discussion
13:48 6 surrounding what had been approved with what they were actually
13:48 7 trying to accomplish, which was to test with seawater displaced
13:48 8 to the depth of 8367 feet in the well. And so there was some
13:48 9 discussion about having to make some changes to make -- to make
13:48 10 the two compatible. I think, ultimately, my understanding is,
13:48 11 Mr. Guide decided instead of going with two tests, they would
13:48 12 go with a single test embedded within the -- within the
13:48 13 displacement procedure.

13:49 14 Q. Now, let's discuss the negative pressure test that was
13:49 15 performed on April 20th, 2010. How was that negative pressure
13:49 16 test initially set up to be monitored?

13:49 17 A. It was initially being monitored on the drill pipe.

13:49 18 Q. Okay. Let's go to TREN-547.

13:49 19 **MR. HYMEL:** Judge, I understand that there's been
13:49 20 some issues about the GMT time, and I want to warn you there's
13:49 21 a GMT time on this document. I wish I could explain it to you
13:49 22 as to why and what it really means. I can't. So 547, I think
13:49 23 this was sent out at about 10:46.

13:49 24 **MR. REGAN:** Rough justice, you can subtract about
13:49 25 four hours.

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13:49 1 MR. HYMEL: Subtract about four hours?

13:49 2 MR. REGAN: About four, yeah.

13:49 3 MR. HYMEL: Five hours?

13:49 4 THE COURT: Subtract about four hours?

13:49 5 MR. REGAN: Yes, sir.

13:49 6 MR. HYMEL: So this would be 3?

13:49 7 BY MR. HYMEL:

13:49 8 Q. Mr. Barnhill, unfortunately, my question is not about the
13:50 9 time.

13:50 10 THE COURT: Is the time important?

13:50 11 MR. HYMEL: Well, you can -- you can -- just so it's
13:50 12 clear, I think everybody agrees this was sent out before the
13:50 13 negative pressure test on April 20th.

13:50 14 THE COURT: Four hours would be 11:36?

13:50 15 MS. KARIS: Your Honor, it's actually 10:36. It's
13:50 16 five hours because there's another document that indicates this
13:50 17 is 10:36.

13:50 18 THE COURT: So it's 10:36. So everybody agree with
13:50 19 that? Anybody disagree with that?

13:50 20 I'll take that as a stipulation. Okay.

13:50 21 BY MR. HYMEL:

13:50 22 Q. All right. Mr. Barnhill, my question to you is -- let me
13:50 23 find my question here: Is monitoring on the drill pipe, the
13:50 24 way the negative pressure test was set up on April 20th, is
13:50 25 that consistent with this April 20th, 10:36 a.m. procedure?

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13:50 1 A. I don't see anything in here that would prohibit you from
13:50 2 monitoring on the drill pipe. Certainly, the indications are
13:50 3 that the -- that you're using seawater in your kill line. But
13:51 4 there's no prohibition against monitoring on the kill line,
13:51 5 which should be full of seawater also.

13:51 6 Q. Okay. Let's go back to 2807.1.1.T0. This is the M-I
13:51 7 displacement procedure we looked at a little earlier.

13:51 8 Is monitoring the negative pressure test on the drill
13:51 9 pipe on April 20th, 2010, consistent with this M-I displacement
13:51 10 procedure?

13:51 11 A. That's -- again, there's no -- there -- actually on this
13:51 12 one, there's no indication where to monitor. You could monitor
13:51 13 on either. If your kill line was lined up, which -- certainly,
13:51 14 there's no reason you could not monitor on the drill pipe.

13:51 15 Q. Mr. Barnhill, could the negative pressure test have been
13:51 16 completed on the drill pipe?

13:51 17 A. It could have been. In my opinion, it was.

13:51 18 Q. Were any anomalies observed while monitoring the negative
13:51 19 pressure test on the drill pipe?

13:51 20 A. Yes.

13:52 21 Q. What were those anomalies?

13:52 22 A. Again, you had 1400 pounds -- well, at different times,
13:52 23 you would try to bleed the drill pipe pressure off and the
13:52 24 drill pipe would determine.

25

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13:52 1 BY MR. HYMEL:

13:52 2 Q. What was causing some of the pressure, at least?

13:52 3 A. Well, initially -- and I know this is kind of a matter of
13:52 4 semantics. Some people have talked about two negative tests,
13:52 5 some people have talked about a continuation of a single test.

13:52 6 Initially, when they set the test up and they tried
13:52 7 to bleed the drill pipe pressure off and the drill pipe
13:52 8 pressure came back. The action they took at that point, to me,
13:52 9 was consistent with my experience from working in the field.

13:52 10 They started kind of investigating the surface
13:52 11 situation to see if they could -- see if there was some kind of
13:52 12 surface indication of what the problem might be. At some
13:52 13 point, somebody took a flashlight and looked down the riser and
13:52 14 saw that the fluid level had dropped in the riser, and that was
13:52 15 an indication to them that fluid was seeping through the BOP
13:52 16 and you had pressure contact with the -- on the annular side,
13:53 17 which would create an unbalanced column, which would give you
13:53 18 pressure on the drill pipe side.

13:53 19 They increased the closing pressure in the lower
13:53 20 annular, pressured that up, effected a seal, and then topped
13:53 21 off the riser and went forward with the test.

13:53 22 Q. You said that the annular was leaking. Was there anything
13:53 23 wrong with the annular?

13:53 24 A. No. Annulars are designed to seal from the bottom up.
13:53 25 The fact that you had a substantial differential across the

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13:53 1 annular from the top down, because of the heavier fluids --
13:53 2 much more heavier fluids in the riser space than underneath in
13:53 3 the well just meant that it required more closing pressure to
13:53 4 effect the seal.

13:53 5 Q. Would the negative pressure test being monitored on the
13:53 6 drill pipe have given a drill crew the correct result?

13:53 7 A. I think it did give them the correct result.

13:53 8 Q. What was that result?

13:53 9 A. That this negative test was not successful. There was a
13:54 10 significant question here that the operation should not go
13:54 11 forward.

13:54 12 Q. And based on what? What was being shown that they could
13:54 13 see that the negative pressure test was not successful?

13:54 14 A. Again, you had an anomaly. You had pressure that kept
13:54 15 returning on your drill pipe after you had indications that you
13:54 16 had solved the surface problem.

13:54 17 Q. Now, was the negative pressure test completed on the drill
13:54 18 pipe like the Transocean drill crew had set up the negative
13:54 19 pressure test?

13:54 20 A. It was not. It was completed on --

13:54 21 Q. Okay.

13:54 22 A. The monitoring of the test was completed on the kill line.

13:54 23 Q. And why?

13:54 24 A. That's -- based on the interview notes, it appears that
13:54 25 Mr. Vidrine believed he needed to do that to comply with the

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13:54 1 APD.

13:54 2 Q. All right. Pull up TREG-5.2.1.T0. This is interview
13:54 3 notes of Bob Kaluza where the notes state that -- Mr. Kaluza
13:55 4 said: "Don insisted that it must be done down the kill line.
13:55 5 Permit was for down kill line."

13:55 6 Is this consistent with your recollection?

13:55 7 A. It is.

13:55 8 Q. Let's go back to TREG-570.3.1. This is the MMS-approved
13:55 9 TA procedure that we looked at earlier.

13:55 10 Now, line 1 requires: "Negative tests...30 minutes
13:55 11 with kill line."

13:55 12 Correct?

13:55 13 A. "Negative test casing to seawater gradient equivalent for
13:55 14 30 minutes with kill line."

13:55 15 Correct.

13:55 16 Q. Was that negative pressure test on line 1 conducted?

13:55 17 A. No. This test was designed to be done before -- based on
13:55 18 the steps here, before the 3 1/2-inch stinger was tripped to
13:55 19 8367, which did not occur.

13:55 20 MR. HYMEL: Connie, keep that up.

13:56 21 BY MR. HYMEL:

13:56 22 Q. Okay. So you talked about the second negative pressure
13:56 23 test in this procedure being on line 3. Does the TA procedure
13:56 24 require that the monitoring on line 3 be done on the kill line?

13:56 25 A. It does not require that the monitoring has to be on the

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13:56 1 kill line.

13:56 2 Q. So Mr. Vidrine moved the negative pressure test from the
13:56 3 drill pipe to the kill line; is that correct?

13:56 4 MR. BROCK: Objection, leading.

13:56 5 THE COURT: Sustained.

13:56 6 Restate your question.

13:56 7 BY MR. HYMEL:

13:56 8 Q. What were the results of the negative pressure test
13:56 9 performed on the kill line?

13:56 10 A. There was an indication of no flow-out of the kill line.
13:56 11 So the field people or the folks on the rig that were
13:56 12 monitoring the tests on the kill line believed that this had
13:56 13 indicated that they had gotten a successful negative test on
13:57 14 the well.

13:57 15 Q. What was the pressure on the drill pipe at that time?

13:57 16 A. My memory is it was 1400 psi.

13:57 17 Q. What should the BP well site leader have done with those
13:57 18 results?

13:57 19 A. I think, with the anomaly, the operation should not have
13:57 20 gone forward. As I had discussed earlier -- I think it was
13:57 21 during my deposition -- to me, there are three possible
13:57 22 outcomes on a negative test: You can have an absolutely good
13:57 23 negative test where there's no question it's good; you can have
13:57 24 an absolutely bad negative test where there's no question it's
13:57 25 bad; or you can have an anomaly, an inconclusive negative test.

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13:57 1 This isn't baseball, the tie doesn't go to the runner, the tie
13:57 2 goes to the failed test.

13:57 3 So if it's good, it's good; if it's inconclusive or
13:57 4 if it's bad, it's not a good test. You don't need to go
13:57 5 forward.

13:57 6 Q. What did Mr. Vidrine do?

13:57 7 A. The operations went forward.

13:57 8 Q. What's your basis for your statement that the operations
13:57 9 went forward?

13:58 10 A. Again, I think, as we had seen in one of the excerpts,
13:58 11 there was an instruction from Mr. Vidrine to proceed with the
13:58 12 dumping of the fluid.

13:58 13 Q. Did anybody declare the negative pressure test a success?

13:58 14 A. I've seen documents that -- and statements and
13:58 15 post-incident statements, I think one that was signed by both
13:58 16 company men, where they indicated that the belief was the
13:58 17 negative test was successful.

13:58 18 MR. HYMEL: Please put up TREX-51133-2.

13:58 19 BY MR. HYMEL:

13:58 20 Q. And this is a statement signed by Mr. Vidrine and
13:58 21 Mr. Kaluza. It's already been introduced into evidence. And
13:58 22 it states: "Successful negative test monitored at the kill
13:58 23 line."

13:58 24 Is that consistent with your recollection?

13:58 25 A. It is.

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13:58 1 Q. Mr. Bly suggested during his testimony that no flow from
13:59 2 the kill line was caused by the Transocean drill crew leaving a
13:59 3 valve closed.

13:59 4 What is your response to that?

13:59 5 A. It's possible. In my opinion, I think it's unlikely. I
13:59 6 think, when you look at the amount of time that this crew had
13:59 7 been on this rig, you also look at the number of times the kill
13:59 8 line had been functioning in this particular event, you know,
13:59 9 that's a possibility.

13:59 10 But typically, when you line up something like that
13:59 11 and you're seeing a result, again, one of the things you do, if
13:59 12 you question that result, you're going to kind of double-check
13:59 13 your surface setup to make sure that, you know, basically,
13:59 14 everything is set up okay.

13:59 15 So, you know, to me, I think that's unlikely.

13:59 16 THE COURT: Wait, wait. What's unlikely? What
13:59 17 Mr. Bly said or that the kill line was just inadvertently
13:59 18 closed?

13:59 19 THE WITNESS: That there was a valve closed on the
13:59 20 kill line.

13:59 21 THE COURT: So you agree with what Mr. Bly said in
13:59 22 that respect?

13:59 23 THE WITNESS: I think he says -- and he thinks it's
13:59 24 likely that it was closed.

14:00 25 THE COURT: Oh, okay. So you think it's unlikely?

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14:00 1 THE WITNESS: I think it's unlikely.

14:00 2 BY MR. HYMEL:

14:00 3 Q. Mr. Barnhill, where was the drill crew during the negative
14:00 4 pressure test?

14:00 5 A. There were certain supervisory parts of the drill crew
14:00 6 that were in the drill shack during the conducting of the
14:00 7 negative test. There were other members of the drill crew that
14:00 8 were in different places on the rig.

14:00 9 Q. Would there have been an indication in the drill shack if
14:00 10 a valve on the kill line had been closed?

14:00 11 A. If it would have been one of the failsafe valves on the
14:00 12 kill line in the BOP stack, yes, there should have been a
14:00 13 red/green indicator light to indicate that position.

14:00 14 And then as far as the lineup on the trip tank, on
14:00 15 the panel itself on the screen, there should be an indication
14:00 16 on whether the valve is open or closed.

14:00 17 Q. What time did the negative pressure test start?

14:00 18 A. Again, I think it happened around 5:00 in the afternoon.

14:00 19 Q. What time did the negative pressure test end?

14:00 20 A. Again, around 8:00 in the evening.

14:00 21 Q. What does that indicate to you?

14:01 22 A. Well, again, this was a test that normally does not take
14:01 23 you three hours to perform. The fact that they spent three
14:01 24 hours indicates to me that the men on the rig were trying to
14:01 25 get this right, trying to understand it, and were trying to

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14:01 1 move forward accordingly.

14:01 2 Q. In forming your opinions, did you see any evidence that
14:01 3 the Transocean drill crew intentionally misinterpreted the
14:01 4 negative pressure test?

14:01 5 A. I did not.

14:01 6 Q. What do you make of the bladder effect?

14:01 7 A. It's -- I've not heard of that term in the context that
14:01 8 it's being used here. So, you know, I'm not aware of the
14:01 9 context that they've used it here. So it's just not a term I'm
14:01 10 familiar with in this setting.

14:01 11 Q. You state in your report that if the Transocean drill crew
14:01 12 did relate the pressure to the bladder effect, and if the well
14:02 13 site leader relied on the drill crew, "this illustrates too
14:02 14 much reliance on the drill crew, in my opinion."

14:02 15 What do you mean by that?

14:02 16 A. Well, again, I think this drill crew was an experienced
14:02 17 crew, and they were very good at what they do.

14:02 18 I think, when you start talking about well conditions
14:02 19 and downhole conditions, the BP company man, that's kind of
14:02 20 their bailiwick. That's their responsibility, is the well.
14:02 21 And they basically have the BP engineering and operations group
14:02 22 onshore behind them.

14:02 23 So I think if you have a significant question about
14:02 24 that and you're unsure about it and you're even unsure about it
14:02 25 to the point where the guys are kind of teasing you on the rig,

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14:02 1 then at that point you go back to your technical support, which
14:02 2 would be the BP onshore people, and you confirm or deny whether
14:02 3 you think that's a good test or not.

14:02 4 Q. Now, you made a comment about the guys teasing you on the
14:03 5 rig. What do you mean by that?

14:03 6 A. I think Mr. Vidrine, in his -- in the post-incident
14:03 7 interview notes, had indicated that maybe even at some point
14:03 8 they were kind of picking at him a little bit for persisting to
14:03 9 question whether this had, indeed, been a good test or not.

14:03 10 Q. Were the results of the negative pressure test ever
14:03 11 questioned?

14:03 12 A. Yes. In my opinion, they were.

14:03 13 Q. When?

14:03 14 A. There was a phone call at 8:52 between the senior drilling
14:03 15 engineer, where there was a discussion concerning the anomaly.
14:03 16 I think the senior engineer at that point in time questioned
14:03 17 whether the test could have been lined up properly.

14:03 18 At that point in time, you were still in the
14:03 19 situation where the procedure could have been stopped, the
14:03 20 displacement could have been stopped, the negative test could
14:03 21 have been repeated.

14:03 22 And, in fact, at that point, I think you would have
14:03 23 actually had a cleaner test because the spacer would have been
14:03 24 further up the hole and you could have circulated until you
14:04 25 got -- or you would have had good seawater both in the kill

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14:04 1 line and the drill pipe, and I think you would have gotten a
14:04 2 more definitive test.

14:04 3 MR. HYMEL: Please put up TREG-4447.6.1 T0.

14:04 4 BY MR. HYMEL:

14:04 5 Q. This has been shown already during this trial. It states:
14:04 6 "Vidrine told Mark that the crew had zero pressure on the kill
14:04 7 line, but that they still had pressure on the drill pipe. Mark
14:04 8 said he told Don that you can't have pressure on the drill pipe
14:04 9 and zero pressure on the kill line in a test that's properly
14:04 10 lined up."

14:04 11 Is that consistent with your recollection?

14:04 12 A. It is.

14:04 13 Q. What information did Mr. Hafle have available to him at
14:04 14 this time?

14:04 15 A. Well, I mean, he certainly had the information just given
14:04 16 to him by Mr. Vidrine. I think the interview notes also
14:04 17 indicate that maybe he had the well Insite system called up on
14:04 18 his computer so he could get the realtime feedback from the
14:04 19 wells also.

14:04 20 MR. HYMEL: Let's put up TREG-50964.3.1.T0.

14:05 21 BY MR. HYMEL:

14:05 22 Q. This is an interview -- these are Mr. Corser's notes of
14:05 23 that same interview of July 8, 2010, of Mr. Hafle. And it
14:05 24 states: "Mark had Insite up."

14:05 25 Is that consistent with your recollection?

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14:05 1 A. It is.

14:05 2 Q. What does that mean to you, that Mr. Hafle had Insite up?

14:05 3 What could he have done with that?

14:05 4 A. Well, again, he could monitor along as they're doing this,

14:05 5 getting the information offshore. And so that would have given

14:05 6 him some ability to see what was happening.

14:05 7 Plus, like I said, the information from Mr. Vidrine,

14:05 8 to me, should have raised a question in his mind about the

14:05 9 validity of the test.

14:05 10 Knowing that the TA procedure that was being followed

14:05 11 was going to significantly reduce the hydrostatic pressure in

14:05 12 this well, again, I think that would have been a good time to

14:05 13 call a timeout and repeat the test and confirm whether you,

14:05 14 indeed, had proper isolation of the barrier or not.

14:06 15 Q. Where did Mr. Vidrine go after the 8:52 call?

14:06 16 A. The interview notes indicate he went to the rig floor.

14:06 17 Q. And what did he do?

14:06 18 A. Basically, the indications are he checked, and everything

14:06 19 looked fine. He gave the instruction that -- at some point

14:06 20 during that -- to go ahead and dump overboard.

14:06 21 Q. What was the effect of dumping overboard?

14:06 22 A. Well, again, you're going to now take the spacer that's in

14:06 23 the riser, which is supplying some hydrostatic support, and

14:06 24 pump it overboard and replace it with seawater, so you're going

14:06 25 to further reduce the hydrostatic pressure more.

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14:06 1 Q. What does that mean, to further reduce the hydrostatic
14:06 2 pressure? What effect does that have?

14:06 3 A. Well, if you've got a seal, then it's going to do just
14:06 4 that. It's going to reduce the hydrostatic pressure in the
14:06 5 well.

14:06 6 If there is a communication pathway between the
14:06 7 formations that you've drilled through, then you're going to
14:06 8 increase the differential pressure across those barriers, or
14:07 9 those faulty barriers, whichever it is.

14:07 10 So you're going to have a situation where if you've
14:07 11 got communication, then you're going to further underbalance
14:07 12 the well and allow the well control situation to develop.

14:07 13 Q. What do you mean by "communication"?

14:07 14 A. The fact that if you have a pathway -- that the pressures
14:07 15 and fluids within the formation that you've drilled through
14:07 16 have a pathway to communicate with the wellbore, and you're
14:07 17 reducing the pressure in the wellbore, then the fluids have the
14:07 18 ability to flow through that pathway into that wellbore.

14:07 19 MR. HYMEL: Connie, let's go back to D-6643.

14:07 20 BY MR. HYMEL:

14:07 21 Q. Let's continue your discussion about the negative pressure
14:07 22 test, Mr. Barnhill.

14:07 23 Were there indications on the rig that the well had
14:07 24 been secured and the barriers confirmed after the negative
14:07 25 pressure test?

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14:07 1 A. Give me that question one more time, please.

14:07 2 Q. Sure. Were there indications on the rig that the well had
14:08 3 been secured and the barriers confirmed after the negative
14:08 4 pressure test?

14:08 5 A. Yes. I think the people on the rig believed that the
14:08 6 negative pressure test had been successful.

14:08 7 Q. All right. Were there any indications about the negative
14:08 8 pressure test that the Transocean drill crew were not told?

14:08 9 A. I haven't seen anything to indicate to me that they were
14:08 10 aware of the questions raised or the issue raised by the senior
14:08 11 drilling engineer questioning whether the test could have been
14:08 12 properly lined up or not.

14:08 13 Q. Mr. Barnhill, of all of the information that we have
14:08 14 listed here that the crew were not told, what of that
14:08 15 information do you consider to be the most critical?

14:08 16 A. To me, the most critical piece of information would be the
14:08 17 problem identified by the senior drilling engineer as to the
14:08 18 veracity of the negative test that had just been conducted and
14:08 19 that was being relied on to confirm that you had, indeed, a
14:09 20 valid, in-place, tested, verified barrier that was testing the
14:09 21 fluid flow in the direction from the hydrocarbon-bearing zones
14:09 22 into the well.

14:09 23 Q. All right. Mr. Barnhill, let's talk about that. This is
14:09 24 our last series of questions. Okay?

14:09 25 Mr. Bly testified that he would want to know anything

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14:09 1 that was going to impinge on well integrity.

14:09 2 Do you agree with him?

14:09 3 A. I do.

14:09 4 Q. Did the findings of the negative pressure test, discussed
14:09 5 by Mr. Vidrine and Mr. Hafle, that there was pressure on the
14:09 6 drill pipe and zero pressure on the kill line, did that affect
14:09 7 the integrity of the well?

14:09 8 A. Yes. The fact that you had an anomaly had -- was a
14:09 9 potential indication that the integrity of the well had not
14:09 10 been established and you had not verified those barriers.

14:09 11 Q. What is your response to the statement that Mr. Hafle did
14:10 12 not have the full context for what had transpired in the test,
14:10 13 and it wasn't clear to Mr. Hafle whether Don was talking about
14:10 14 the first or second negative test?

14:10 15 MR. BROCK: Your Honor, I'm going to object to
14:10 16 Mr. Barnhill making predictions or giving opinions about what
14:10 17 people were thinking at that point in time.

14:10 18 THE COURT: I'll sustain the objection to the way the
14:10 19 question was phrased.

14:10 20 MR. HYMEL: Just give me one second.

14:04 21 BY MR. HYMEL:

14:04 22 Q. Mr. Barnhill, Mr. Bly was asked a question during his
14:11 23 examination. Do you see where it says that "Mark said he
14:11 24 didn't have the full context for what had transpired in the
14:11 25 test, and it wasn't clear to him what Don was talking about,

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14:11 1 the first or the second test."

14:11 2 That's on page 1347 of Mr. Bly's testimony. What is
14:11 3 your response do that statement?

14:11 4 **MR. BROCK:** Your Honor, that's just asking him to
14:11 5 respond to a statement. He's reading the statement into the
14:11 6 record from the notes.

14:11 7 **THE COURT:** Yeah.

14:11 8 **MR. BROCK:** That's all he's doing.

14:11 9 **THE COURT:** I agree. I sustain the objection.

14:11 10 You can ask him, you know, what he would have
14:11 11 done, I guess, if he was told that. That would be a fair
14:11 12 question.

14:11 13 Do you want to answer that? I'll ask it.
14:11 14 Mr. Hymel's having trouble asking the question.

14:11 15 **THE WITNESS:** I think that given the information at
14:11 16 that time with the anomaly, knowing that the procedure called
14:12 17 for significantly removing -- or removing significant
14:12 18 hydrostatic pressure from this well, I think at that point in
14:12 19 time, that should have been a red flag to stop the operation
14:12 20 and, if necessary, repeat the negative test.

14:12 21 And if he didn't have all the information, then
14:12 22 you needed to get what you needed to satisfy yourself.

14:12 23 **BY MR. HYMEL:**

14:12 24 **Q.** Mr. Barnhill, you've worked as a company man, haven't you?

14:12 25 **A.** I have.

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14:12 1 Q. And the company man is the same thing as a well site
14:12 2 leader?

14:12 3 A. They are.

14:12 4 Q. Is the information discussed during the 8:52 call,
14:12 5 pressure on the drill pipe and the zero pressure on the kill
14:12 6 line during the negative pressure test, the type of information
14:12 7 the well site leader would share with the drill crew?

14:12 8 A. If I had that information, then yes, I would share it.

14:12 9 Q. You've worked on a drill crew, too, haven't you?

14:12 10 A. I have.

14:12 11 Q. Is the information discussed during the 8:52 call,
14:12 12 pressure on the drill pipe and zero pressure on the kill line
14:13 13 during the negative pressure test, the type of information the
14:13 14 drill crew would want to know?

14:13 15 A. Yes. If I was in a supervisory position with the drill
14:13 16 crew and there was information concerning the integrity of the
14:13 17 well, I'd want to know that. Yes.

14:13 18 MR. HYMEL: Those are all the questions I have.

14:13 19 Thank you, Judge.

14:13 20 THE COURT: All right. I don't know if we could
14:13 21 agree on the order now. We're in Transocean's case. Who wants
14:13 22 to go next? Do we have a volunteer?

14:13 23 Plaintiffs? Okay.

24

25

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CROSS-EXAMINATION

14:13 1
14:13 2 **BY MR. STERBCOW:**

14:14 3 Q. Mr. Barnhill, good afternoon.

14:14 4 A. Good afternoon.

14:14 5 Q. Paul Sterbcow. I'll be asking you questions on
14:14 6 cross-examination for the Plaintiffs' Steering Committee.

14:14 7 A. Okay.

14:14 8 Q. In your report you conclude that the surface blowout was a
14:14 9 culmination of multiple factors, decisions, oversights, and
14:14 10 mistakes. Fair statement?

14:14 11 A. Fair statement.

14:14 12 Q. Wouldn't you agree with me, based on your education,
14:14 13 training, and experience, that a sound safety management
14:14 14 system -- be it BP, Transocean, or any of the other players
14:14 15 involved in the Macondo well -- would either be designed to
14:14 16 prevent or significantly reduce the risk of such multiple
14:14 17 oversights and mistakes? That's the goal?

14:14 18 A. I think the goal of any safety system, yeah, is to
14:14 19 eliminate as many unknowns as you can. Yes.

14:15 20 Q. And at the end of the day, aren't we talking about the
14:15 21 analysis and the prevention of known risks associated with this
14:15 22 operation? That's what we're trying to accomplish, from
14:15 23 beginning to end?

14:15 24 A. You are. You're trying -- if there is a -- something
14:15 25 that's recognizable, you're trying to respond to that. Yes.

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14:15 1 Q. Now, the rig crew, in particular the Transocean drill
14:15 2 crew, is only going to be as good as management allows them to
14:15 3 be in terms of their ability to recognize and respond to known
14:15 4 risks. And by that, I mean they can only be as good as they
14:15 5 are trained. Correct?

14:15 6 A. I think that's part of it. I think training enters into
14:15 7 it. I think experience enters into it. So, you know,
14:15 8 obviously, there are certain things you can train for. There
14:16 9 are other things that experience teaches us that are not
14:16 10 necessary to train for. But I think you have to provide the
14:16 11 basics that somebody then can take that information and adapt
14:16 12 it as they need to.

14:16 13 Q. Okay. And in this particular case, you've testified you
14:16 14 reviewed the well control handbook, you've reviewed the actual
14:16 15 training that Transocean provided to the crew?

14:16 16 A. I have.

14:16 17 Q. In terms of what Transocean did to prepare the crew of the
14:16 18 *Deepwater Horizon* -- or any crew, for that matter, employed by
14:16 19 them to address the situation faced by the crew this night --
14:16 20 if I understand you correctly, you didn't go beyond the well
14:16 21 control handbook and the training they were provided on the
14:16 22 job. Correct?

14:16 23 A. What I looked at was basically how they were -- what well
14:16 24 control training they received. Basically, were they
14:16 25 certified? What was the foundation for the certification for

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14:16 1 that program, the various drills and the different things that
14:17 2 they received?

14:17 3 And, you know, I have to tell you, Mr. Sterbcow, in
14:17 4 looking at it, it looked to me that this was fundamentally a
14:17 5 basic well control situation. And I think these men had the
14:17 6 training that was necessary to understand the basic well
14:17 7 control situation and to react to it.

14:17 8 Q. Yet as we stand here today -- and you say this in your
14:17 9 report quite candidly -- we still don't have an explanation
14:17 10 because, unfortunately, we can't talk to the men who were on
14:17 11 the drill floor --

14:17 12 A. Correct.

14:17 13 Q. -- as to how in the world they could have missed this the
14:17 14 way they did?

14:17 15 A. Absolutely. I think, you know, there are -- if you want
14:17 16 to say -- three basic 64 billion-dollar questions in this case.

14:17 17 Number one, why did they -- you know, why was the
14:17 18 negative test deemed a success?

14:17 19 Number two, why wasn't the -- you know, why wasn't
14:17 20 the operation stopped at around 9:00 and the test repeated?

14:17 21 And why wasn't the well shut in at 9:32 or 9:33, when
14:18 22 there was an anomaly?

14:18 23 We don't know the answers to those questions.

14:18 24 Q. All right. And you haven't undertaken or been asked to
14:18 25 undertake -- no criticism of you -- undertaken to try to find

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14:18 1 the answers to those questions, not by looking at what occurred
14:18 2 with respect to these gentlemen on this rig, but taking that
14:18 3 analysis off the rig and up Transocean's management chain. You
14:18 4 haven't looked at that?

14:18 5 A. I have not looked at that.

14:18 6 Q. Likewise, I don't think -- and correct me if I'm wrong --
14:18 7 you didn't review the competence of the *Deepwater Horizon*
14:18 8 marine crew, did you, versus the drill crew?

14:18 9 A. Did not. I did not look at the marine side.

14:18 10 Q. That wouldn't be an area that you would typically involve
14:18 11 yourself?

14:18 12 A. Would not be.

14:18 13 Q. All right. Did you look at all of Transocean's policy and
14:18 14 procedure for communications between the drill crew and the
14:18 15 marine crew in certain situations?

14:18 16 A. Only as it related to the question of the communication as
14:19 17 it relates to the well and the functionality of, say, an
14:19 18 operation like an ESD or something like that -- or EDS. I'm
14:19 19 sorry, not ESD, an EDS.

14:19 20 Q. But you would agree -- and I think you mentioned earlier
14:19 21 that the bridge certainly needed -- the marine crew,
14:19 22 particularly those on duty, the DPOs on the bridge, need to
14:19 23 understand what's going on, particularly during a displacement
14:19 24 temporary abandonment procedure?

14:19 25 A. I don't know that the marine crew needs to understand -- I

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14:19 1 don't think you need to make well experts or well control
14:19 2 experts out of the marine crew. I think what they need to
14:19 3 understand is that at appropriate times there has to be good
14:19 4 communication between the two sides.

14:19 5 Just like I don't expect the drill crew to become
14:19 6 seafarers -- they're two different functions -- but I do expect
14:19 7 there to be good communication between the two.

14:19 8 Q. And the reason for that is that the marine crew should at
14:20 9 least know that the drill crew is entering into a phase of the
14:20 10 Macondo well where they're going to be displacing, they're
14:20 11 going to be intentionally underbalancing, and there were risks
14:20 12 that are associated with those procedures?

14:20 13 A. You know, Mr. Sterbcow, I don't know that I ever thought
14:20 14 of it in that aspect. Again, I would expect the drill crew to
14:20 15 be good at what they did, and I would expect the marine crew to
14:20 16 be good at what they do.

14:20 17 I would expect -- if a situation arose where there
14:20 18 needed to be communication between the two to establish kind of
14:20 19 the rules of the road, if you will, at the time, I would have
14:20 20 expected that to occur.

14:20 21 Q. All right. Is that a specific issue that you looked at?
14:20 22 And that's a two-part question. Number one, the policy,
14:20 23 Transocean policy surrounding that communication; and two,
14:20 24 whether or not either crew followed the policy?

14:20 25 A. I did not.

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14:20 1 Q. Okay. Is it fair to conclude, though, that the drill
14:21 2 crew, the guys on the floor in the drill shack dealing with the
14:21 3 drilling end, are entitled to rely on the competence of the
14:21 4 marine crew in the event that that vessel faces a surface
14:21 5 blowout?

14:21 6 A. I think it's reasonable to expect both groups to be -- to
14:21 7 rely on the other. I also think that included in that is an
14:21 8 expectation that one group is not going to do something that
14:21 9 may be detrimental to the other group without confirming that
14:21 10 that needs to be done or that there's communication between
14:21 11 those two.

14:21 12 Q. Right. And that goes back to the communication element?

14:21 13 A. It does.

14:21 14 Q. All right. If I understood what you said correctly, you
14:21 15 do not want the captain -- or for that matter, anybody on the
14:21 16 marine crew -- to just automatically EDS in the event of a well
14:21 17 control situation, because that could cause more problems than
14:21 18 it would solve, basically?

14:21 19 A. It could, yes.

14:21 20 Q. Did you see anywhere in any policy or procedural manual or
14:22 21 in any -- at least training that you looked at -- and
14:22 22 understanding you're concentrating on the drill side -- where
14:22 23 the marine crew was instructed or trained on what to do when a
14:22 24 surface blowout resulted in a complete inability to communicate
14:22 25 with the drill crew, like this one did?

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14:22 1 A. Again, I did not look at the training of the marine crew,
14:22 2 so I don't know what their training was.

14:22 3 Q. If you assume for me, for purposes of my question, that
14:22 4 there is no such policy; if God forbid, what happens this night
14:22 5 happens -- and let me back up and ask you.

14:22 6 Isn't it reasonable to expect that if you have a
14:22 7 surface blowout uncontrolled, like this one, the first place or
14:22 8 the most susceptible location on the rig to explosion and fire
14:22 9 is the drill floor?

14:22 10 A. It would certainly be one of those, yes.

14:22 11 Q. Given that foreseeability, wouldn't you agree with me that
14:22 12 there should be some policy and procedure in place that guides
14:23 13 the marine crew, if this happens, on what they should and
14:23 14 should not do? And by "this," meaning we can't communicate
14:23 15 with the guys on the drill floor; we can't talk to the driller;
14:23 16 we're not sure whether he's tried to EDS or what he's done.
14:23 17 What do we do now?

14:23 18 Shouldn't there be some policy in place to deal with
14:23 19 that?

14:23 20 **MR. HYMEL:** Judge, we would like to object on the
14:23 21 ground that this is outside the scope of his report.

14:23 22 **MR. STERBCOW:** Well, first of all, Your Honor, it's
14:23 23 cross-examination. The EDS issue came up. That's the reason
14:23 24 I'm asking these questions.

14:23 25 **THE COURT:** I'll overrule the objection.

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14:23 1 THE WITNESS: Would you give me the question again?

14:23 2 BY MR. STERBCOW:

14:23 3 Q. Sure. I'm going to try.

14:23 4 Wouldn't you agree with me, given the foreseeability
14:23 5 of a surface blowout, the risk of fire/explosion is greater or
14:23 6 maybe even greatest on the drill floor, that that's the source
14:23 7 of the problem?

14:23 8 A. Correct.

14:23 9 Q. Shouldn't there be some policy or procedure in place that
14:23 10 the marine crew is trained on and must follow to ensure that
14:23 11 they take all necessary steps to save as many people as they
14:24 12 can, and the rig, in the event they can't communicate with the
14:24 13 drill crew?

14:24 14 A. Again, that sounds like a reasonable premise to me.
14:24 15 Whether the industry does it that way or not, I don't know.
14:24 16 That's not an issue I've looked at.

14:24 17 I can tell you, in my experience, typically not all
14:24 18 of the drilling supervisory personnel are going to be on the
14:24 19 rig floor at any one time, so there should be access to
14:24 20 someone.

14:24 21 But again, whether -- you know, your words make sense
14:24 22 to me. Whether that's what the industry does or not from the
14:24 23 marine side, I don't know.

14:24 24 Q. And in terms of what actually happened that night on the
14:24 25 bridge once communication was lost with the drill crew, that's

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14:24 1 not something you looked at for purposes of this case?

14:24 2 A. I did not.

14:24 3 Q. All right. Once the mud reaches the drill floor, wouldn't
14:24 4 you or the industry in general consider this to be a full-blown
14:25 5 emergency?

14:25 6 A. I think any time that you have mud blowing through a
14:25 7 rotary table, it is an emergency-type situation. I've seen
14:25 8 different situations where mud's come through a rotary table
14:25 9 for a variety of different reasons. But it could rise to the
14:25 10 level of an emergency situation.

14:25 11 Q. And in your time line, which you've gone through in great
14:25 12 detail and you talk about in your report as well, have you
14:25 13 thought about the exact time, hours and minutes, when it was
14:25 14 too late for the drill crew to stop mud and gas from reaching
14:25 15 the drill floor?

14:25 16 What time would that have been, roughly, if you know?

14:25 17 A. Don't know. Again, that's why I made the comment when we
14:25 18 went through the initial presentation, that we reach a period
14:25 19 in there where everything's kind of confused and conflicted as
14:25 20 to what happened in what order.

14:25 21 We do know that mud blew through the rotary table at
14:26 22 some point; we do know the well was shut in at some point; we
14:26 23 do know the diverter was activated at some point. We know all
14:26 24 those things. We don't particularly know the order or the
14:26 25 sequencing in which they occurred.

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14:26 1 There were simulations run. Whether the simulations
14:26 2 are good or bad kind of depends on what goes in them, I guess.

14:26 3 Q. Right.

14:26 4 A. So I can tell you some of the results I saw. From my
14:26 5 experience of having been involved in this for many years now,
14:26 6 it surprised me, the "rapidity" of everything that supposedly
14:26 7 could happen. And I've been dealing with deepwater high fluid
14:26 8 rate reservoirs for quite some time now, and I was surprised at
14:26 9 how fast the simulations indicated everything could happen.

14:26 10 So to give you a precise time, I cannot. It was just
14:26 11 kind of all jumbled up there at the end.

14:26 12 Q. All right. In a deepwater well control situation, I think
14:26 13 you made the point we're almost talking about two separate
14:27 14 issues. One is trying to cut off the influx before it reaches
14:27 15 the mud line or the BOP?

14:27 16 A. Correct.

14:27 17 Q. And then if you can't do that, you try to cut it off at
14:27 18 the mud line. But then you have to deal with what's between
14:27 19 the BOP and the ship, which is essentially what's in the riser?

14:27 20 A. You're going to have to do that either way.

14:27 21 The situation is, obviously, the more that gets into
14:27 22 the riser, the more the situation you're going to have to deal
14:27 23 with. Even in a straightforward well control situation, you
14:27 24 will have some amount of influx that's trapped between the top
14:27 25 preventer that's closed and your choke line that you're using

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14:27 1 that you're going to have to deal with.

14:27 2 But certainly the more influx you allow, the more
14:27 3 critical the situation becomes.

14:27 4 Q. And is the riser part sometimes referred to in the
14:27 5 industry as a "riser unloading event"? Is that what they're
14:27 6 called?

14:27 7 A. It is.

14:27 8 Q. So we're talking about when the mud and the gas actually
14:27 9 gets into the riser pipe itself and then unloads?

14:27 10 A. Correct.

14:27 11 Q. All right.

14:27 12 A. Basically, the expansion of the gas forces the fluid out.

14:28 13 Q. Now, I think you said that the well went underbalanced at
14:28 14 around 9:00, give or take?

14:28 15 A. I think, in looking at everything, we see a change in the
14:28 16 drill pipe character sometime around 8:52, 8:50, somewhere in
14:28 17 there.

14:28 18 Q. Does the drill crew know that they are now dealing with a
14:28 19 well that's underbalanced?

14:28 20 A. I think -- when you say what do they know, I think they
14:28 21 understood that during the displacement operation that there
14:28 22 was going to be significant removal of hydrostatic pressure
14:28 23 which at some point had the potential to underbalance the well
14:28 24 to the formations. That potential, though, only exists if
14:28 25 there's a pathway or a communication between the formation and

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14:28 1 the wellbore.

14:28 2 And supposedly, that's the question the negative test
14:28 3 is to answer. If you deem the negative test is successful,
14:29 4 what you're in effect telling yourself is there is no pathway;
14:29 5 the well is sealed. So even though I may have a reduction in
14:29 6 hydrostatic pressure, I'm not creating an underbalanced
14:29 7 situation.

14:29 8 Q. So the drill crew, knowing at some point clearly they're
14:29 9 going to create an underbalanced situation, because we have to
14:29 10 do that to get the end --

14:29 11 A. The intent of the TA procedure was to create a situation
14:29 12 where you were reducing the hydrostatic pressure in the
14:29 13 wellbore.

14:29 14 Q. Which they knew. Everybody knew that?

14:29 15 A. Yes.

14:29 16 Q. Okay. And I would assume everybody also knew, including
14:29 17 the drill crew, that the negative test was the safety-critical
14:29 18 test to determine whether the hydrocarbons or the well -- the
14:29 19 hydrocarbons were in communication with the well so as to
14:29 20 either give you the red light -- stop and look and see -- or
14:29 21 there's no communication, we have the green light, we can
14:29 22 continue to displace?

14:29 23 A. It was certainly one of two. We had a positive test,
14:30 24 which theoretically, if you got a leak, it could show you the
14:30 25 leak -- or not theoretically; it would show you the leak. And

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14:30 1 then you've got a negative test. The difference between the
14:30 2 positive test -- the positive test is testing in the direction
14:30 3 opposite of flow, where the negative test tests in the
14:30 4 direction of flow. And interestingly enough as --

14:30 5 **THE COURT:** You meaning from the top down?

14:30 6 **THE WITNESS:** No. It's basically -- what I'm doing
14:30 7 is I'm creating a lower pressure in the well. So if there is a
14:30 8 pathway from, say, the hydrocarbon-bearing formation that's
14:30 9 exposed to that lower pressure, then the fluids will flow in.

14:30 10 The other way, the positive test, I'm putting
14:30 11 more pressure in the wellbore with the thought that the fluid's
14:30 12 going to flow out.

14:30 13 **BY MR. STERBCOW:**

14:30 14 **Q.** And is that more to test the casing, the pipe itself, than
14:30 15 the integrity of the well and whether you have flow? I'm
14:30 16 talking about the positive test.

14:30 17 **A.** It's certainly more -- it's a test on what is feeling the
14:30 18 positive pressure. The negative test tends to be -- in my
14:31 19 opinion, tends to be a better test in that it sheds light on
14:31 20 weaknesses; where the positive test does that, but the
14:31 21 pressure's got to be applied against the weakness. I don't
14:31 22 know if that makes a whole lot of sense. It didn't make a
14:31 23 whole lot of sense to me when I just said it.

14:31 24 **Q.** But at the end of the day, everybody has an
14:31 25 appreciation -- certainly BP, the well site leaders, those

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14:31 1 supervising the well site leaders, and the drill crew -- have
14:31 2 an appreciation for the fact that the negative test has to be
14:31 3 deemed successful because if it's not, it automatically means
14:31 4 there is a potential issue in the well that has to be
14:31 5 addressed?

14:31 6 A. Correct.

14:31 7 In fact, under BP's own requirement, there has to be
14:31 8 a confirmation of the flow barriers, and that's one of the
14:31 9 things that both the positive and the negative tests are
14:31 10 designed to tell you: that you have confirmation of these flow
14:32 11 barriers, that these flows are sealed.

14:32 12 And a negative test -- sometimes we see wells pass
14:32 13 positive tests and then don't pass negative tests. If you get
14:32 14 an anomaly on your negative test, that, in effect, is telling
14:32 15 me you have not confirmed those barriers.

14:32 16 Q. Okay. And as of about 8:00 p.m. on the night of
14:32 17 April 20th, the results are in and, according to what we all
14:32 18 know now, at a minimum, the negative test is inconclusive?

14:32 19 A. I agree with that comment.

14:32 20 Q. And as you said, it's not baseball. If it's inconclusive,
14:32 21 you've got to stop and look, because if it's inconclusive bad
14:32 22 and you don't stop, we know what can happen?

14:32 23 A. Right. The tie does not go to the runner; the tie does
14:32 24 not go to good; the tie goes to "I haven't confirmed my
14:32 25 barrier."

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14:32 1 Q. And isn't it fair to say that, number one, the Transocean
14:32 2 crew is certainly familiar with what a negative test is?

14:33 3 A. That's my understanding, yes.

14:33 4 Q. And the Transocean crew is familiar with why a negative
14:33 5 test is run?

14:33 6 A. I think that's true.

14:33 7 Q. And with respect to this particular crew on this rig, have
14:33 8 you heard or read anything in the record about Jimmy Harrell
14:33 9 insisting that negative tests were performed on the *Deepwater*
14:33 10 *Horizon*?

14:33 11 A. My understanding is, in the morning meeting there was a
14:33 12 presentation of the TA procedure. Apparently, the negative
14:33 13 test was not mentioned. And Jimmy brought it up and said,
14:33 14 "Hey, we've got to do a negative test."

14:33 15 Q. Okay. Did -- and you were here for Mr. Ezell, I think. I
14:33 16 may be wrong about that.

14:33 17 A. I was.

14:33 18 Q. Did you hear Mr. Ezell testify that Jimmy Harrell insisted
14:33 19 on the negative test because of a bad experience he had had
14:33 20 years before, and felt like that test had to be run at all
14:33 21 times when the situation called for it?

14:33 22 A. I think that's correct.

14:33 23 Q. Did you also hear Mr. Ezell say that it was the first time
14:34 24 that he could recall that that particular crew had ever faced a
14:34 25 situation where they had differential pressure on the drill

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14:34 1 pipe and the kill line during a negative test?

14:34 2 A. I believe he indicated that was the first time he had
14:34 3 seen -- or had heard of that, yes.

14:34 4 Q. And that would indicate two things. Number one, if
14:34 5 Mr. Ezell, a senior toolpusher, was aware of it, certainly the
14:34 6 drill crew -- Mr. Revette, Mr. Anderson, and Mr. Clark -- also
14:34 7 would have been aware of the fact that they had differential
14:34 8 pressure on the drill pipe and the kill line?

14:34 9 A. I think they were.

14:34 10 Q. Number two, all of them faced that situation, and at least
14:34 11 according to Mr. Ezell, they're not sure how to respond because
14:34 12 they've never seen it before.

14:34 13 MR. BROCK: I'll object to that. That's speculation,
14:34 14 asking him --

14:34 15 THE COURT: Overruled.

14:34 16 THE WITNESS: Again, I think Mr. Ezell had indicated
14:34 17 that he had not seen that situation. It would surprise me that
14:34 18 the other guys had not seen that situation.

14:35 19 When you embed in your question that they would
14:35 20 not know how to respond, I don't necessarily agree with that
14:35 21 part of the question. Part of what you get taught in well
14:35 22 control is hydrostatic pressure -- the function of hydrostatic
14:35 23 pressure. I would have expected him to know and understand
14:35 24 that.

14:35 25 Again, I think part of the issue was here you

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14:35 1 had -- with the spacers strung out across the BOP stack and
14:35 2 potentially in the kill line, I think you had an unequal, an
14:35 3 uneven pressure distribution. I think the guys attributed a
14:35 4 lot of what they were seeing to that unequal pressure
14:35 5 distribution, and I think they misinterpreted that.

14:35 6 That's why, to me, at some point, particularly
14:35 7 when the senior engineer questioned the test, the better thing
14:35 8 to have done would have been to repeat the test when you know
14:35 9 you've got clean fluids and you can understand what you're
14:36 10 seeing.

14:36 11 I think the fact of having the unbalanced
14:36 12 column -- I don't want to say convinced them, but gave them a
14:36 13 rationale or an explanation as to what they were seeing that
14:36 14 made sense to them.

14:36 15 **BY MR. STERBCOW:**

14:36 16 **Q.** All right. And having said that, then, you sort of
14:36 17 answered my next question. Rather than having been able,
14:36 18 through formal training or through experience or training
14:36 19 manual or policy and procedure book that they could go to and
14:36 20 read, the gentlemen on the drill floor were put in a situation
14:36 21 where they had to do the best they could interpreting
14:36 22 information that the senior toolpusher says he had never faced
14:36 23 before to try to come up with the best possible way to move
14:36 24 forward?

14:36 25 **A.** Well, again -- and that's why I made the comment earlier

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14:36 1 about experience. There's information you can teach. You can
14:36 2 teach basic well control; you can teach advanced well control
14:36 3 fundamentals; you can teach the hydrostatic principles; you can
14:36 4 teach them the phenomena of unbalanced columns. All of that
14:37 5 information, and at some point you have to apply that.

14:37 6 And I think, unfortunately, they did here. I think
14:37 7 they looked at this thing and said, "I've got an unbalanced
14:37 8 column. You run the numbers, you get about 1500 psi, which is
14:37 9 not too far from 1400 psi; and instead of saying, "We don't
14:37 10 understand this, we need to repeat the test," I think they
14:37 11 said, "We understand this; it's an unbalanced column, let's
14:37 12 go." I think that was a misinterpretation of the situation.

14:37 13 Q. And unfortunately, it was misinterpretation, it was just
14:37 14 wrong. They read it wrong, as it were?

14:37 15 A. In my opinion, yes, it was wrong.

14:37 16 Q. And from that point forward -- from 8:00 p.m. forward, if
14:37 17 I understand what you've testified to and what's in your
14:37 18 report, an hour later we're close to or we're going
14:37 19 underbalanced, give or take?

14:37 20 A. Yes.

14:37 21 Q. By 9:14, I believe you said two anomalies appeared, and
14:37 22 you called them maybe changes too subtle to notice.

14:38 23 A. I think the early deal, particularly on a vertical
14:38 24 presentation, with everything else that was going on, I think
14:38 25 that would have been tough to pick up, yes.

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14:38 1 Q. All right. But by 9:43, when our initial attempt to shut
14:38 2 the well in occurred, it appears that close to 300 -- they have
14:38 3 a 300-barrel kick on their hands, give or take?

14:38 4 A. I think that's what the simulations indicate, yes.

14:38 5 Q. So between looking at the negative test at 8:00 p.m.,
14:38 6 having whatever discussion they had and coming to the
14:38 7 conclusion that it was okay to go forward, to 9:43 p.m., when
14:38 8 the initial attempt to shut-in occurred, an hour and 43 minutes
14:38 9 passed where an experienced, trained drill crew, working with a
14:39 10 BP-trained well site leader, don't have any idea what they're
14:39 11 getting ready to face?

14:39 12 A. Well, when you say they don't have any idea what they're
14:39 13 getting ready to face, I think they understood what the
14:39 14 procedures going forward were. I think they understood -- and
14:39 15 certainly at least part of that period of time, or a
14:39 16 substantial part of that time, the well was overbalanced. I
14:39 17 think they -- but they understood that the procedure that they
14:39 18 were moving into was going to reduce the hydrostatic pressure
14:39 19 in that wellbore.

14:39 20 Again, I think they had -- based on their belief that
14:39 21 the negative test had been good, that they had potentially an
14:39 22 unbalanced column, they had convinced themselves that they were
14:39 23 dealing with a sealed, secure well and it was okay to move
14:39 24 forward.

14:39 25 You know, Mr. Sterbcow, I really don't think these

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14:39 1 guys would have consciously said, you know, "Damn the
14:39 2 torpedoes, let's move ahead."

14:39 3 I think they were convinced they had a sealed well,
14:40 4 based on the information that they had gotten from the negative
14:40 5 test.

14:40 6 Q. I absolutely agree with you. And I think that's got to
14:40 7 lead to the conclusion that, given that that's true, that they
14:40 8 would never, ever -- this group or any group for that matter --
14:40 9 say "Damn the torpedoes, we'll deal with it if it happens."

14:40 10 You've got to conclude that they were not trained, or
14:40 11 certainly not adequately trained, to deal with the situation
14:40 12 they faced that night. Because if they had been, they would
14:40 13 have at least said, "You know what, Mr. Vidrine? We hear what
14:40 14 you're saying, we understand that you think it's okay, but
14:40 15 we've never -- at least we've never seen this before. We need
14:40 16 to stop and look at this again."

14:40 17 A. I disagree with your conclusion. The information I looked
14:40 18 at, I think they were trained to understand well control and
14:40 19 the pressures that were developing.

14:41 20 I think that basically what happened, because of all
14:41 21 the issues with the spacer leaking back through, it gave a
14:41 22 ready explanation. Okay? And, unfortunately, that ready
14:41 23 explanation was incorrect.

14:41 24 And we all agree -- and I guarantee you, they wish,
14:41 25 we all wish -- that that ready explanation had not been there.

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14:41 1 But I -- you know, I think there was an explanation that fit a
14:41 2 potential scenario in their mind and they moved forward.

14:41 3 Again, I think, later on, when the question arose,
14:41 4 "can't be," if that information gets transferred and the test
14:41 5 gets recreated or redone when there is a -- you're in a more
14:41 6 conducive wellbore, i.e. saltwater in the kill line, saltwater
14:41 7 in the drill pipe, known quantities on both sides, you would
14:42 8 have gotten a result that they would have interpreted
14:42 9 correctly.

14:42 10 Q. Should the drill crew -- or even above the drill crew --
14:42 11 should anyone from the Transocean side of this approached
14:42 12 Mr. Vidrine and said, "We have our own negative test procedure
14:42 13 we use on this vessel. We want to use ours."

14:42 14 Should somebody have done that?

14:42 15 A. Well, again, they were -- they were, obviously,
14:42 16 comfortable using the drill pipe. But they had done -- on the
14:42 17 kill line before, this was not the only time they had done it
14:42 18 on the kill line. They were obviously comfortable on the drill
14:42 19 pipe.

14:42 20 One of the problems, again, I think dealing with the
14:42 21 field guys is they -- they look at black and white from the
14:42 22 standpoint of, "I've got a pipe here. It's connected into my
14:42 23 well. Nothing's coming out of my pipe."

14:42 24 So to say at that point, should they have gone back
14:42 25 and demanded it to be done on the kill line? I don't know that

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14:43 1 the field guys would have done that.

14:43 2 Q. Would doing a test in a way that was not -- was foreign to
14:43 3 them, or something they weren't used to, does it introduce an
14:43 4 element of risk into this process that otherwise wouldn't be
14:43 5 there if they had done the test the way that the Transocean
14:43 6 crew was used to and familiar with doing the test?

14:43 7 A. I think that's a possibility.

14:43 8 Q. Given that, was it incumbent upon the BP company man to
14:43 9 make sure that the Transocean drill crew was comfortable with
14:43 10 doing the test the way BP was telling them they had to do the
14:43 11 test?

14:43 12 MR. BROCK: Your Honor, I'm going to object to the
14:43 13 hypothetical. There's no evidence, none in the record, that
14:43 14 the Transocean crew was uncomfortable doing the test on the
14:43 15 kill line. So I think that that's speculation.

14:43 16 MR. STERBCOW: I'll rephrase it.

14:43 17 THE COURT: Okay. Go ahead and rephrase it.

14:43 18 BY MR. STERBCOW:

14:43 19 Q. Given that there is evidence that the senior toolpusher,
14:43 20 at least, was not familiar with this situation, familiarity
14:43 21 with the test, doing the test, experience with the test is
14:44 22 going to breed more comfort in a drill crew; correct?

14:44 23 If they do the test the way they've done it over and
14:44 24 over and over again, they've got experience on how the test is
14:44 25 run, they've got experience on the test results, and they're

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14:44 1 going to feel more comfortable interpreting the test; correct?

14:44 2 **MR. BROCK:** Object to that. That's a big question.

14:44 3 There are a lot of hypotheticals in there. I can't even
14:44 4 remember the beginning of the question. I object to it.

14:44 5 **THE COURT:** All right. I sustain it.

14:44 6 **MR. STERBCOW:** Let's do it this way.

14:44 7 Carl, pull up TREX-00675.1.

14:44 8 **BY MR. STERBCOW:**

14:44 9 **Q.** This is an e-mail from May 12th, 2010, from rig manager
14:44 10 Paul Johnson to some other Transocean personnel, "Subject:
14:44 11 Negative test procedure. Dan, the procedure for the negative
14:44 12 test is as follows."

14:44 13 **THE COURT:** What's the date?

14:44 14 **MR. STERBCOW:** May 12th, 2010, post-accident.

14:45 15 **THE COURT:** Post-accident. Okay.

14:45 16 **MR. STERBCOW:** After the fact.

14:45 17 **BY MR. STERBCOW:**

14:45 18 **Q.** First, let me ask you, Mr. Barnhill.

14:45 19 Have you seen this before?

14:45 20 **A.** I may have. I don't recognize it right off, but I may
14:45 21 have seen this before.

14:45 22 **Q.** Would you agree with me -- and I'll give you a minute or
14:45 23 however long you need -- that the procedure for the negative
14:45 24 test, as described in this e-mail by the *Deepwater Horizon* rig
14:45 25 manager, is different from the procedure utilized on

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14:45 1 April 20th, 2010?

14:45 2 A. Give me a minute to read it.

14:45 3 Q. Sure. Go ahead.

14:45 4 A. (Witness reviews document.)

14:45 5 Okay. The question was?

14:46 6 Q. Is this procedure, as spelled out by Mr. Johnson in the
14:46 7 e-mail, different than the actual second negative test
14:46 8 procedure done on the rig that night?

14:46 9 A. This procedure would actually check for flow through the
14:46 10 cement unit, which would be lined up off of the drill pipe
14:46 11 side, which would be different than they were used to.

14:46 12 Q. And that's consistent with Mr. Ezell, the senior
14:46 13 toolpusher, testifying earlier in the case that they weren't
14:46 14 familiar with the situation where they had differential pipe
14:46 15 pressures in a negative test?

14:46 16 A. Well, he certainly testified he wasn't familiar with the
14:46 17 differential pressures.

14:46 18 Again, I didn't take from that comment that that
14:46 19 meant that he was not comfortable or used to seeing monitoring
14:46 20 on one side versus the other.

14:46 21 But this procedure, as written here, is different
14:46 22 than monitoring on the drill pipe -- I'm sorry -- than
14:46 23 monitoring on the kill line.

14:46 24 Whether the drill pipe monitoring that they had done
14:46 25 before included the cement unit, I don't know. I'd have to go

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14:47 1 back and look, Mr. Sterbcow.

14:47 2 Q. That's okay.

14:47 3 Have you read any testimony from any hands who were
14:47 4 on the rig that night and survived the explosion and fire that
14:47 5 they were present when Mr. Vidrine and Mr. Harrell had a
14:47 6 conversation about the negative test?

14:47 7 Do you recall any of that?

14:47 8 A. When?

14:47 9 Q. Earlier in the day.

14:47 10 A. At the time of the test? I'm sorry. At the time of the
14:47 11 morning meeting?

14:47 12 Q. Right.

14:47 13 A. Yes. I think I remember something about that, yes.

14:47 14 Q. Do you recall Mr. Harrell -- or there being testimony
14:47 15 specifically from floor hand Darryl Clarke Baron and rig
14:47 16 mechanic/second engineer Doug Brown, that Mr. Harrell expressed
14:47 17 concern that the Transocean crew had never done a negative test
14:47 18 the way it was being proposed and wasn't sure it was going to
14:47 19 work?

14:47 20 A. I don't remember that specific testimony. I remember
14:47 21 there being a discussion about the negative test in the morning
14:47 22 meeting where Mr. Harrell wanted to have the negative test
14:47 23 done. I don't remember that level of detail.

14:47 24 Q. Okay. Do you recall ever hearing or reading that, at some
14:48 25 point in the conversation, Mr. Harrell told Mr. Vidrine, "Well,

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14:48 1 you know, I guess that's what those pinchers are for"?

14:48 2 A. I do remember that comment.

14:48 3 Q. Wouldn't you agree with me, based on the context of this
14:48 4 case, Mr. Harrell's referring to the BOP?

14:48 5 A. He is.

14:48 6 Q. And more likely than not, the blind shear ram component of
14:48 7 the BOP?

14:48 8 A. That would be my take from the comment.

14:48 9 Q. So what we have, after this meeting discussing the
14:48 10 proposed negative test procedure, is the rig OIM basically
14:48 11 saying, "Well, we'll go with you. But if it doesn't work, at
14:48 12 least we'll be able to close the blind shear rams."

14:48 13 **MR. BROCK:** Your Honor, I'm not sure precisely of the
14:48 14 source of this testimony. I think it's MBI testimony. And if
14:48 15 it is, I object to it. And I'm just saying I'm not precisely
14:48 16 sure.

14:48 17 **MR. STERBCOW:** For the record, Your Honor, floor hand
14:48 18 Baron's deposition is TRES-25224, page 34, line 1, to page 38,
14:48 19 line 15.

14:48 20 Engineer Brown's testimony is in TRES-25108,
14:49 21 page 53, line 7, to page 57, line 4. Both of these gentlemen
14:49 22 specifically recount Mr. Harrell saying that exact quote, which
14:49 23 Mr. Barnhill --

14:49 24 **THE COURT:** This is testimony from depositions?

14:49 25 **MR. STERBCOW:** Depositions, which have been submitted

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14:49 1 by the PSC in bundles.

14:49 2 MR. BROCK: I apologize.

14:49 3 MR. STERBCOW: And I didn't make that clear. I'm
14:49 4 sorry.

14:49 5 BY MR. STERBCOW:

14:49 6 Q. Mr. Barnhill, you understand that the *Deepwater Horizon*
14:49 7 had worked for BP for nine years?

14:49 8 A. They had. That's my understanding. The rig had been
14:49 9 employed by BP or its predecessors for nine years.

14:49 10 Q. So these guys knew each other well?

14:49 11 A. They did.

14:49 12 Q. And when the OIM makes a statement like, "Well, I guess
14:49 13 that's what we've got those pinchers for," shouldn't that alert
14:49 14 the well site leader, the OIM, the senior toolpusher, all the
14:49 15 way down the line, certainly on the drill crew side, that there
14:49 16 is a fundamental disagreement about risks that we are
14:49 17 introducing into a procedure that is intended to displace the
14:50 18 well, remove the hydrostatic head, and potentially expose the
14:50 19 vessel to a blowout?

14:50 20 A. You know, again, I'd need -- it's one of those comments --
14:50 21 you'd almost need to be there and hear it and see how it was
14:50 22 intended.

14:50 23 If Mr. Harrell felt that strongly about it, I would
14:50 24 have expected him to pursue the issue.

14:50 25 Q. And again, that's not something you looked into or went

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14:50 1 down that path?

14:50 2 A. I did not.

14:50 3 Q. Okay. But at least at the end of the day, you and I can
14:50 4 agree that, by going with the BP final negative test procedure,
14:50 5 an element of both unfamiliarity and, therefore, additional
14:50 6 risk is introduced into the temporary abandonment procedure;
14:50 7 correct?

14:50 8 **MR. BROCK:** My same objection from earlier. There's
14:50 9 no evidence that the men were confused about the test, how it
14:50 10 was going to be conducted, or how to interpret it. There's no
14:50 11 evidence of that.

14:51 12 **THE COURT:** Well, I think it's a fair question for an
14:51 13 expert to -- if he can answer that.

14:51 14 **THE WITNESS:** Could you give me the question again?

14:51 15 **BY MR. STERBCOW:**

14:51 16 Q. Sure.

14:51 17 At the end of day, can't we agree that the fact that
14:51 18 a negative test that does not mirror the test noted by
14:51 19 Mr. Johnson in this e-mail coming from the rig that, according
14:51 20 to Mr. Ezell, introduces a situation -- pipe pressure
14:51 21 differential that they didn't see -- at the very least that
14:51 22 introduces an increased risk for the drill crew, certainly the
14:51 23 Transocean crew, that a mistake is going to be made and a
14:51 24 catastrophe is going to occur. The risk is higher than it
14:51 25 would have been otherwise?

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14:51 1 A. I think -- to me, Mr. Sterbcow, the more critical thing
14:51 2 was the embedding of the negative test in the displacement
14:51 3 procedure, more so than which side I was monitoring on.

14:52 4 So I think the overall process increased the risk
14:52 5 versus other things that could have been done. I don't know if
14:52 6 that answers your question or not, but that would be my take on
14:52 7 it.

14:52 8 Q. Well, it sort of answers my question, but let me move on.
14:52 9 Let me make a point -- a different point.

14:52 10 I think we could conclude that the drill crew did not
14:52 11 know that, as of 8:00, this well was telling them that zonal
14:52 12 isolation had not been achieved. Clearly, they didn't pick
14:52 13 that up.

14:52 14 A. Correct. I think at 8:00 you were still in primary well
14:52 15 control, meaning that the hydrostatic pressure of the fluids in
14:52 16 the well were exerting more pressure on the formations than the
14:52 17 pressure in the formations exerted back.

14:52 18 Q. All right.

14:52 19 A. So you were in primary well control. So, no, they did not
14:52 20 know.

14:52 21 Q. And given that, they did not know -- nor apparently did
14:53 22 they anticipate -- that the well was telling them that, if they
14:53 23 proceeded to displacement and continued to displace to an
14:53 24 underbalanced state, that they could very well cause an influx
14:53 25 of hydrocarbons into the well?

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14:53 1 A. I think their belief, based on the -- their interpretation
14:53 2 of the negative test was they were dealing with a sealed
14:53 3 wellbore, so that reducing that hydrostatic in the wellbore
14:53 4 would not have a communication pathway with the
14:53 5 hydrocarbon-bearing formation. So, therefore, they were not --
14:53 6 at that stage, there was no concern for a developing well
14:53 7 control situation.

14:53 8 Q. All right. And you were not asked to, and nor have you,
14:53 9 looked into Transocean's history of well events or management
14:53 10 of well events off of the rig to see if there are any lessons
14:53 11 that can be learned or if there are any patterns with respect
14:53 12 to these types of events occurring on this rig or other rigs?

14:53 13 A. As part of my review for my report and my testimony, I did
14:54 14 not do that.

14:54 15 Q. All right. Now, let's look at -- you talked a fair amount
14:54 16 on direct about pore pressure frac gradient.

14:54 17 A. Correct.

14:54 18 Q. And you said that in deepwater it's more of an issue than
14:54 19 it is in shallow water, typically?

14:54 20 A. Correct.

14:54 21 Q. You have this conversion, so the pressure you need
14:54 22 downward to maintain control, and too much pressure or you'll
14:54 23 fracture the formation?

14:54 24 A. Basically, when we drill wells, it's in a sense a
14:54 25 balancing act. You want to have enough pressure to overcome

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14:54 1 the pressure in the formations that you're drilling through,
14:54 2 but you don't want to have so much pressure that you're
14:54 3 fracturing the rock. Because when that happens, you lose your
14:54 4 column link, which reduces your pressure, which could introduce
14:54 5 a well control problem.

14:54 6 **MR. STERBCOW:** Carl, would you pull up TREX-22924.

14:51 7 **BY MR. STERBCOW:**

14:51 8 **Q.** I think -- and I'll give you a chance to look at this.
14:54 9 It's a time line.

14:54 10 **A.** Okay.

14:54 11 **Q.** If we go through it, it appears over time that what's
14:55 12 occurring with Macondo is this drill crew is struggling with
14:55 13 the very two issues you just talked about. They appear to go
14:55 14 from a situation where the drilling mud, the synthetic
14:55 15 oil-based drilling mud, is too light and they experience maybe
14:55 16 a kick or a ballooning issue, and they respond to that.

14:55 17 And within days or weeks, they are dealing with a
14:55 18 loss return situation because the synthetic oil-based mud is
14:55 19 too heavy.

14:55 20 Is that fair, based on this -- assuming this time
14:55 21 line is accurate?

14:55 22 **A.** Well, we know that, throughout the drilling of the well,
14:55 23 they had issues; sometimes with well control, sometimes with
14:55 24 lost circulation. So those issues did occur in this well, yes.

14:55 25 **Q.** And the issue can be deemed -- or can be termed something

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14:55 1 called the safe drilling margin; correct? That's what we're
14:56 2 looking for?

14:56 3 A. Correct. You basically have, in reality, two safe
14:56 4 drilling margins.

14:56 5 Q. I was just going to say that. One on the upper end, one
14:56 6 on the lower end?

14:56 7 A. Correct.

14:56 8 Q. And were you here when Dr. Huffman testified about
14:56 9 drilling margins that were faced at Macondo?

14:56 10 A. Yes, I heard his testimony.

14:56 11 Q. And did you hear him testify that there were repeated
14:56 12 instances where the drilling margin was at or less zero -- less
14:56 13 than 0.3 pounds per gallon?

14:56 14 A. Yes. I heard the testimony that there were times when the
14:56 15 drilling margin was below that, yes.

14:56 16 Q. Now, based on your education, training, and experience,
14:56 17 and all the positions you've held in the oilfield, do you agree
14:56 18 that, at .3 or less, it is extremely difficult to continue
14:56 19 drilling the hole?

14:56 20 **MR. BROCK:** Your Honor, I'm going to object to this
14:56 21 as being beyond the scope of his expert report. He does walk
14:56 22 through just factually what some of the values are in terms of
14:56 23 tests that were conducted. But he does not say in his report,
14:57 24 and he tells us in his deposition, that that's not an area
14:57 25 which he expects to express opinions.

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14:57 1 **THE COURT:** Well, if this was Transocean asking the
14:57 2 question, I'd sustain the objection. But since this is
14:57 3 cross-examination, I'll overrule it.

14:57 4 Go ahead.

14:57 5 **MR. BROCK:** Well, I don't mean to be too
14:57 6 argumentative.

14:57 7 **THE COURT:** It's not necessarily -- I mean,
14:57 8 cross-examination sometimes can go outside the bounds of the
14:57 9 report if it's relevant to his testimony. So --

14:57 10 **MR. BROCK:** Well, he gave a general description of
14:57 11 pore pressures and frac gradients, which is --

14:57 12 **THE COURT:** Okay.

14:57 13 **MR. BROCK:** There's a general statement in the
14:57 14 report. But he tells us in his deposition, and he does not say
14:57 15 in his report that he intends to express opinions about this.
14:57 16 So there's not been discovery conducted here.

14:57 17 **THE COURT:** I'll let the witness answer if he's able
14:57 18 to answer. If it's something he hasn't investigated or he has
14:57 19 no opinion on, he can tell us that.

14:57 20 **THE WITNESS:** Could you give me the question again,
14:57 21 please?

14:57 22 **BY MR. STERBCOW:**

14:57 23 **Q.** If the drill crew faced situations at Macondo where there
14:57 24 was a drilling margin of .3 pounds per gallon or less between
14:58 25 your pore pressure and your frac gradient, based on your

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14:58 1 education, training, and experience in the oilfield, would --
14:58 2 number one, would you agree with me that that poses a very
14:58 3 difficult situation to drill a well, geologically?

14:58 4 **MR. BROCK:** Same objection.

14:58 5 **THE WITNESS:** It can create a difficult situation.
14:58 6 There are times where we deal with .3 drilling margins; there's
14:58 7 times we deal with less drilling margin in trying to establish
14:58 8 casing points and those types of things. But it can create a
14:58 9 very difficult situation, yes.

14:58 10 **BY MR. STERBCOW:**

14:58 11 **Q.** And at some point, the margin becomes so tight that it
14:58 12 becomes a well control issue as well, does it not?

14:58 13 **A.** Typically, it will become tight enough that -- when you're
14:58 14 into that situation, typically what you're doing at that point
14:58 15 is you're looking for a casing point.

14:58 16 **Q.** Right.

14:58 17 **A.** You want to get -- you want to get casing set, so you
14:59 18 protect the shallower formations while you're able to increase
14:59 19 your mud weight to control the deeper formations.

14:59 20 **Q.** And during those time periods, is it not, from a drilling
14:59 21 standpoint, more prudent to go slow enough to where the folks
14:59 22 who are predicting your pore pressures and your frac gradients
14:59 23 and the drill margins you're going to face can keep up with
14:59 24 your rate of penetration?

14:59 25 **A.** Typically, you would not like to outdrill your data, if

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14:59 1 you can help it.

14:59 2 Q. And if you're in a situation with a well that has very
14:59 3 tight margins and you are outdrilling your data, does that
14:59 4 create a potential well control situation?

14:59 5 MR. BROCK: I'm just going to renew any objection on
14:59 6 scope of report and just a disclaimer of this type of testimony
14:59 7 in the deposition.

14:59 8 THE COURT: All right. Overruled.

14:59 9 You can answer.

14:59 10 THE WITNESS: I mean, potentially, yes, you could
14:59 11 create a well control situation.

14:59 12 BY MR. STERBCOW:

14:59 13 Q. And if members of BP's geology team were complaining that
15:00 14 they could not keep up with the rate of penetration, the rate
15:00 15 of drilling, is that not a situation that would require
15:00 16 stoppage and an analysis and a determination as to whether the
15:00 17 drilling rate, the rate of penetration was too fast, given the
15:00 18 conditions of this well?

15:00 19 MR. BROCK: Same objection. Beyond the scope.

15:00 20 THE COURT: Can you answer that?

15:00 21 THE WITNESS: Well, my answer would be, it may well.

15:00 22 Again, I have not -- this was not an area I
15:00 23 focused on in my report. From a general standpoint, my answer
15:00 24 would be, yeah, it may well could. To answer specifically in
15:00 25 this instance, I haven't reviewed the information.

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15:00 1 **BY MR. STERBCOW:**

15:00 2 **Q.** And if that were to occur -- one more question -- would

15:00 3 the simple solution be to slow down?

15:00 4 **MR. BROCK:** Same objection.

15:00 5 **THE WITNESS:** Yes.

15:00 6 **BY MR. STERBCOW:**

15:00 7 **Q.** Right? You control the rate that you're drilling?

15:01 8 **A.** You can control your -- yes.

15:01 9 **Q.** Now, you did mention in your report -- and for the record,

15:01 10 it's page 15, PDF page 23.

15:01 11 You noted that the well was far over budget, way past

15:01 12 completion date. I think you mentioned plus or minus \$33

15:01 13 million and 82 days. Do you recall that?

15:01 14 **A.** I do.

15:01 15 **Q.** I might be stating the obvious, but the faster you drill

15:01 16 the well, the sooner you complete the well; correct?

15:01 17 **A.** Maybe.

15:01 18 **Q.** Maybe?

15:01 19 **A.** Maybe.

15:01 20 **Q.** Depending on what happens?

15:01 21 **A.** Yes. That's right.

15:01 22 That doesn't always prove out to be the best.

15:01 23 **Q.** Right. Because you encounter problems that will delay it?

15:01 24 **A.** Yes.

15:01 25 **Q.** Understood.

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15:01 1 For every day that you can remove the vessel from the
15:01 2 well is a day that you save the vessel's day rate; correct?
15:01 3 You're not going to pay for it if you're done?
15:01 4 A. Well, I guess my understanding here, Mr. Sterbcow, is they
15:01 5 were under a contract basis. So -- and, again, I haven't
15:02 6 reviewed the contract. I don't know if there was a difference
15:02 7 in rate when they were off the well or on the well.
15:02 8 If you're on a true day rate and you're drilling day
15:02 9 by day, then that's a true statement. If it's a contract basis
15:02 10 long term, you'd have to look at the terms of the contract.
15:02 11 Q. So if this particular vessel was drilling pursuant to a
15:02 12 day rate, then what I said would be true?
15:02 13 A. It would be, yes.
15:02 14 Q. All right. And in Appendix A of your report, you noted in
15:02 15 outline form essentially 35 -- I'll call them "issues" --
15:02 16 A. Right.
15:02 17 Q. -- where you -- and what's the purpose of you doing this
15:02 18 in summary form in Appendix A?
15:02 19 A. Basically, what I was looking at again were these are the
15:02 20 issues of fact or factors that I think, particularly given the
15:02 21 light of the questions of the negative test, where if somebody
15:02 22 would have kind of gone back and looked at the history versus
15:02 23 the inconclusive nature of the negative test, coupled with
15:03 24 the -- what would, at that point, be future operations, then in
15:03 25 my opinion, I think all of that information would have created

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15:03 1 a decision not to move forward with the displacement of this
15:03 2 well.

15:03 3 Q. Okay. And you sort of answered, really, my last question.
15:03 4 Would you agree with me, without going through them
15:03 5 individually, that a number of the issues that you raise in
15:03 6 your Attachment A were judgment calls made by BP? Is that a
15:03 7 fair statement?

15:03 8 A. They were.

15:03 9 Q. And a number of those judgment calls were made -- the
15:03 10 consequences of which were to save either time or money or
15:03 11 both; do you agree with that?

15:03 12 A. I think there were items in there that that's what the
15:03 13 decision was based on, yes.

15:03 14 MR. STERBCOW: I don't have anything further. Thank
15:03 15 you.

15:03 16 Thank you, Mr. Barnhill.

15:03 17 THE COURT: All right. It's 3:00. Let's take about
15:03 18 a 15-minute recess.

15:03 19 THE DEPUTY CLERK: All rise.
15:03 20 (WHEREUPON, the Court took a recess.)

15:23 21 THE COURT: All right. Let's see. BP, I guess, is
15:23 22 up next?

15:23 23 MR. BROCK: I think it's Halliburton, Your Honor.

15:23 24 THE COURT: Oh, Halliburton?

15:23 25 MR. GODWIN: The United States is, Your Honor.

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15:23 1 **THE COURT:** Okay. I don't know how you guys figured
15:23 2 out the order. I have a list of where we started the trial,
15:23 3 but if that's agreeable, that's fine.

15:23 4 United States you had a question?

15:23 5 **MR. UNDERHILL:** Your Honor, my colleague --

15:23 6 **MS. LAWRENCE:** The United States has no questions for
15:23 7 Mr. Barnhill. Thank you, Your Honor.

15:23 8 **THE COURT:** Great.

15:23 9 **MR. MAZE:** Alabama has no questions.

15:23 10 **THE COURT:** Okay.

15:23 11 **MR. KANNER:** Louisiana has no questions.

15:23 12 **THE COURT:** Great. Okay. So that brings us to
15:23 13 Halliburton.

15:24 14 **MR. HARTLEY:** Floyd Hartley for Halliburton,
15:24 15 Your Honor. May I proceed?

15:24 16 **THE COURT:** Yes.

15:24 17 **CROSS-EXAMINATION**

15:25 18 **BY MR. HARTLEY:**

15:24 19 **Q.** Good afternoon, Mr. Barnhill.

15:24 20 **A.** Good afternoon.

15:24 21 **Q.** I'll try not to cover the ground that's already covered.

15:24 22 To start, I have you on cross-examination. I think we're going
15:24 23 to find a lot of common ground, or at least I hope so.

15:24 24 I want to start off with well monitoring and the
15:24 25 responsibilities for monitoring the well. I think you talked

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15:24 1 about -- in response to some of Mr. Hymel's questions -- that
15:24 2 the drilling crew has the primary responsibility for monitoring
15:24 3 the well. Is that fair?

15:24 4 A. Particularly, the driller is.

15:24 5 Q. Particularly, the driller or the person performing the
15:24 6 function of the driller?

15:24 7 A. Correct.

15:24 8 Q. As a backup or a second set of eyes, you have the Sperry
15:24 9 mud logger or other mud logging company that may be on the rig?

15:24 10 A. Correct.

15:24 11 Q. Would you agree that, between the driller and the mud
15:24 12 logger, that they have different sets of and quantity of data
15:24 13 available to them?

15:24 14 A. Typically, they do. The setups are somewhat different.

15:24 15 Q. The driller and the drill crew will have more visibility
15:25 16 into the operations going on on the rig?

15:25 17 A. I think that's correct from the standpoint of the
15:25 18 rig-related operations. As far as some of the downhole
15:25 19 parameters, that may or may not be true; but certainly from the
15:25 20 rig-related activities, I think that's true.

15:25 21 **MR. HARTLEY:** That's a good distinction. Let's pull
15:25 22 up D-8179.

15:25 23 **BY MR. HARTLEY:**

15:25 24 Q. You're familiar with the setup and configuration of the
15:25 25 drill shack as it was on the *Deepwater Horizon*?

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- 15:25 1 A. Generally, yes.
- 15:25 2 Q. I think D-8179 will be a picture you've likely seen before
- 15:25 3 of the drill shack.
- 15:25 4 Maybe?
- 15:25 5 A. I was just going to say there's just some handsome guy in
- 15:26 6 my picture.
- 15:26 7 Q. Is the picture shown in D-8179 consistent with your
- 15:26 8 understanding of what the drill shack on the *Deepwater Horizon*
- 15:26 9 looked like?
- 15:26 10 A. Yes.
- 15:26 11 Q. I think, in answer to my question drawing a distinction
- 15:26 12 between downhole conditions and rig operations, you were
- 15:26 13 talking about, for example, the drill crew can see out of these
- 15:26 14 windows at the rotary table?
- 15:26 15 A. Correct.
- 15:26 16 Q. And they actually have windows in the drill shack up above
- 15:26 17 so they can see into the derrick?
- 15:26 18 A. They do.
- 15:26 19 Q. The rig operations going on on the rig are visible to
- 15:26 20 them?
- 15:26 21 A. They are.
- 15:26 22 Q. In fact, the driller or person serving in that capacity
- 15:26 23 actually control the operations?
- 15:26 24 A. Generally, as related to the well, yes.
- 15:26 25 Q. Okay. Now, on the left-hand side of D-8179, there's a

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15:26 1 monitor that's labeled "Driller Sperry-Sun Display." Do you
15:26 2 see that?

15:26 3 A. I do.

15:26 4 Q. Now, is it your understanding that the drill crew had
15:26 5 available to them on the *Deepwater Horizon* all of that data
15:26 6 that was available to the Sperry mud logger?

15:26 7 A. I think they had certain information that was displayed
15:27 8 from the Sperry-Sun display. Obviously, they didn't have his
15:27 9 number of monitors that the Sperry-Sun mud logger had in his
15:27 10 shack. My impression, in listening to Mr. Keith, was that
15:27 11 there were somewhat different displays. I don't know where
15:27 12 that one went, but it just disappeared.

15:27 13 So they did have access to certain Sperry-Sun data,
15:27 14 yes.

15:27 15 Q. You were present in the courtroom when Mr. Keith
15:27 16 testified?

15:27 17 A. I was.

15:27 18 Q. And you heard him testify that there was a channel on the
15:27 19 rig's CCTV system that anybody could flip that channel and see
15:27 20 his graphical display?

15:27 21 A. I don't remember -- I know that there were different
15:27 22 settings for the CCTV. I remember him talking about he could
15:27 23 adjust it to, as an example, look at the return flow line and
15:27 24 things like that. As far as what was on the CCTV as far as the
15:28 25 Sperry-Sun data, you'd just have to refresh my memory on that.

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15:28 1 I remember the testimony about the Sperry-Sun display, I just
15:28 2 don't remember the CCTV part.

15:28 3 Q. If Mr. Keith testified that the graphical display
15:28 4 available to him was also available on TV systems and monitors
15:28 5 throughout the rig, you wouldn't have any reason to disagree
15:28 6 with that?

15:28 7 A. I would not.

15:28 8 Q. And you were also present for Mr. Ezell's testimony;
15:28 9 right?

15:28 10 A. I was.

15:28 11 Q. And do you remember when Ms. Clingman put up the animation
15:28 12 of the drill shack and walked Mr. Ezell through the description
15:28 13 of that?

15:28 14 A. I do.

15:28 15 Q. Do you recall Mr. Ezell testifying, when he was looking at
15:28 16 the Sperry-Sun display, that what he had available to him in
15:28 17 the drill shack was that graphical display of the data of the
15:28 18 Sperry monitor?

15:28 19 A. Again, I remember that, and my impression was, not only
15:28 20 from the testimony, but from -- just from my work experience
15:28 21 and everything, that there would be Sperry-Sun data available
15:28 22 on the rig floor as well as other spots of the rig, to include
15:29 23 the toolpusher's and the company man's offices.

15:29 24 Again, exactly what was on those displays at any one
15:29 25 time, I do not know.

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15:29 1 Q. Okay. Fair point.

15:29 2 Let's look at D-8180.

15:29 3 Do you remember looking at this interior picture with

15:29 4 Mr. Hymel on direct?

15:29 5 A. I remember looking at a similar picture. I don't remember

15:29 6 quite in that format, but I remember a similar picture.

15:29 7 Q. In the lower right-hand corner of this demonstrative, we

15:29 8 have the interior of the drill shack -- mud logger's cabin as

15:29 9 it appeared circa 2003. Do you understand that?

15:29 10 A. I'll take your word for it.

15:29 11 Q. In response to Mr. Hymel's questions, you looked at the

15:29 12 lower right-hand screen with the data displayed. Do you recall

15:29 13 going through that with Mr. Hymel?

15:29 14 A. I do.

15:29 15 Q. And I think at the time, you testified that it was your

15:29 16 understanding that this is the data that was available to the

15:29 17 drill crew. By "this," I mean that data display.

15:29 18 A. Correct. My understanding from Mr. Keith's testimony was,

15:30 19 when -- he pointed to that particular monitor and he said,

15:30 20 "That would be what would be displayed to the drill shack."

15:30 21 Q. Now, are you aware of any data that was available to the

15:30 22 Sperry-Sun mud logger that was not available to the driller?

15:30 23 A. Whether all of the return mud logging data would have been

15:30 24 available as far as cutting size, fluorescence, those types of

15:30 25 things, I don't know.

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15:30 1 I think from a drilling parameter standpoint, all the
15:30 2 data was probably available.

15:30 3 Q. Again, you've helped clarify an overly broad question.

15:30 4 So separating formation evaluation, gas
15:30 5 chromatography sort of equipment that might be going on during
15:30 6 drilling operations, strictly speaking, the drilling plan was
15:30 7 monitored during the displacement procedures. Are you aware of
15:31 8 any data of those sensor readings available to the mud logger
15:31 9 that were not also available to the drill crew?

15:31 10 A. I think the data was available. Exactly what the format
15:31 11 was, I don't know. But I think the data was available.

15:31 12 Q. But the reverse situation wasn't true, was it? Some data
15:31 13 was available to the Transocean drill crew that was not
15:31 14 available to the mud logger?

15:31 15 A. Yes. Some of it, we've already talked about.

15:31 16 Q. And that would be the flow-out readings?

15:31 17 A. The flow-show reading on the Sperry-Sun sensor when the
15:31 18 flow was routed overboard. I think some of the BVT
15:31 19 equipment -- again, when you are routing things overboard,
15:31 20 those type of things would not have been available.

15:31 21 Q. Is that important, in your mind, that that data be
15:31 22 available to the mud logger during a displacement procedure
15:31 23 where they're going to divert at a position that effectively
15:31 24 blinds him to an indication of a kick?

15:31 25 A. Obviously, I think the more information you can get, the

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15:31 1 better off you are. I think that data either needs to be
15:32 2 available or it needs to be understood, as an example in this
15:32 3 case, how you account for monitoring without that data; i.e,
15:32 4 the response of a drill pipe pressure or those type of things.

15:32 5 But, obviously, the more data you can have at your
15:32 6 disposal the better off you are.

15:32 7 Q. Now, in devising a displacement procedure and directing
15:32 8 flow overboard, would it be safer and more sound practice to do
15:32 9 it in a manner that would allow the mud logger to continue to
15:32 10 monitor flow out of the well?

15:32 11 A. Based on what we know today, I would say yes. I think
15:32 12 anyone would say yes. Again, I think the procedure that they
15:32 13 were following, at least my impression of that, was the
15:32 14 procedure that they had been doing pretty much the entire time
15:32 15 since the rig had been out there doing these type of things.

15:32 16 I can tell you that it is not an uncommon procedure
15:32 17 to dump fluids overboard at the end of the well, once you have
15:33 18 confirmed the flow barriers and you are convinced that the well
15:33 19 is secure.

15:33 20 So -- but again, based on where we are today and the
15:33 21 fact I'm sitting in this room, I think, yes, there are better
15:33 22 ways to do it.

15:33 23 Q. So as of April 20th, 2010, are you saying it was common
15:33 24 practice to displace in a manner that blinded the mud logger to
15:33 25 pit gains and flow-out of the well?

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15:33 1 A. If you're asking me if I've ever seen a situation before
15:33 2 where they were discharging out a well overboard, my answer's
15:33 3 yes, I have seen that before. Again, do I think it's a good
15:33 4 practice not to, as you put it, blind the mud logger? Not
15:33 5 necessarily, but that gets into positioning equipment that the
15:33 6 mud logger is going to have a hand in.

15:33 7 Q. By that, you mean the flow-out sensor itself?

15:33 8 A. The flow-out sensor itself.

15:33 9 Q. Now in your review of the records and testimony of this
15:34 10 case, have you reviewed any information regarding the placement
15:34 11 of that flow-out sensor? Why it was there and who recommended
15:34 12 it?

15:34 13 A. I think it's -- I haven't looked at this issue in a long
15:34 14 time. My memory, and it may be flawed, is that there was a
15:34 15 joint discussion between the rig and the Sperry-Sun folks as to
15:34 16 where they were going to position equipment.

15:34 17 Q. So is it your understanding that Transocean actually did
15:34 18 the welding, cut it in and selected that location?

15:34 19 A. They would certainly do the cutting and the welding. Now
15:34 20 whether that would, in my experience -- again, that may not
15:34 21 have anything to do with this -- in my experience, typically,
15:34 22 folks like the mud loggers or whoever that have to position
15:34 23 equipment is going to get with, initially, the company man,
15:34 24 because that's who they're working for.

15:34 25 In the end, the company man is going to send him to

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15:34 1 the OIM, and he's going to say, "You guys figure out the best
15:34 2 place to put this equipment." And that's how it gets done.

15:34 3 Q. Now, in forming your opinions and reviewing the underlying
15:34 4 data to get there, did you review information about how
15:34 5 displacement procedures were typically conducted on the
15:35 6 *Deepwater Horizon*?

15:35 7 A. I think I saw some information on that. I think it was
15:35 8 fairly limited information, but I think I saw some information
15:35 9 on that.

15:35 10 Q. With respect to this specific issue on the diversion
15:35 11 overboard, is it your understanding that it was the standard
15:35 12 practice to divert in a manner that the mud logger was unable
15:35 13 to see flow-out and pit gains at that point they sent fluid
15:35 14 overboard?

15:35 15 A. To tell you the truth, I really don't remember. I don't
15:35 16 remember with that specificity whether they had bypassed it in
15:35 17 this manner before or not.

15:35 18 Q. So we've talked about well monitoring a little bit.

15:35 19 **THE COURT:** Let me ask one question.

15:35 20 So other than relocating the Sperry sensor, what
15:35 21 would have been the other option, not to bypass?

15:35 22 **THE WITNESS:** Again, depending on the configuration
15:35 23 of the rig, there may not have been another option. If you
15:35 24 have a -- depending on how the gumbo box or the possibility is
15:36 25 configured, if you had a bypass chute in that, you could have

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15:36 1 maybe gone through the bypass chute, going into the gumbo box
15:36 2 and out. But if you don't have that bypass chute, then
15:36 3 basically to dump overboard, you've got to go around, unless
15:36 4 you've got a dump valve in your sand traps or something like
15:36 5 that.

15:36 6 But the problem with that is, if that sand trap
15:36 7 hasn't been cleaned, then you run the risk of getting sand and
15:36 8 synthetic-base mud into the Gulf, so you don't want to do that.

15:36 9 **THE COURT:** Was there any option other than dumping
15:36 10 overboard at that point?

15:36 11 **THE WITNESS:** As far as the -- I mean, you could have
15:36 12 gotten the vessel out there and discharged the spacer material
15:36 13 and any contaminated seawater to the vessel and hauled it off.
15:36 14 But one of the reasons that BP chose to use the spacer in the
15:36 15 configuration they did, which was the two loss circulation
15:37 16 material pills mixed together, was they believed that by doing
15:37 17 that and circulating through the well, then it was permissible
15:37 18 under the current regime or current regs to be able to
15:37 19 discharge that overboard and not have to do that.

15:37 20 **BY MR. HARTLEY:**

15:37 21 **Q.** Let's pull up TREX-5025 to address Judge Barbier's
15:37 22 question.

15:37 23 **THE COURT:** What was that sound?

15:37 24 **MR. HARTLEY:** An iPad that was not silenced.

15:37 25 **THE COURT:** Is that from the video?

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15:37 1 MR. HARTLEY: I'm not going to say who it's from.
15:37 2 I'm not going to answer that question.
15:37 3 THE COURT: I think Mr. Godwin 'fessed up.
15:37 4 MR. GODWIN: Yes, Judge.
15:37 5 THE COURT: Okay.
15:37 6 THE WITNESS: He's not going to rat his boss out.
15:37 7 MR. GODWIN: I apologize for the interruption, Judge.
15:37 8 MR. HARTLEY: 5125.
15:37 9 THE COURT: Was that your ring?
15:37 10 MR. GODWIN: I opened it up. I opened it up and it
15:37 11 went off.
15:37 12 THE COURT: Not your phone; it was your iPad?
15:38 13 MR. GODWIN: No, Your Honor. Thank you, Judge.
15:38 14 THE COURT: All right.
15:38 15 BY MR. HARTLEY:
15:38 16 Q. Now, Mr. Barnhill, you were involved to some extent in the
15:38 17 Transocean investigation, I think you testified this morning.
15:38 18 A. I was.
15:38 19 Q. You had some conversation with Mr. Ambrose?
15:38 20 A. Yes, I've had conversations with him.
15:38 21 Q. During the course of that investigation, were you a
15:38 22 participant or hear his discussions about the findings that
15:38 23 Transocean was coming to during the course of that
15:38 24 investigation?
15:38 25 A. Generally -- yes. Certain aspects of it, yes.

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15:38 1 Q. Judge Barbier was just asking you about an alternative to
15:38 2 discharging overboard to allow the mud logger to still see
15:38 3 flow. Were you a participant in any of those Transocean
15:38 4 discussions where they realized that there was an alternative,
15:38 5 that they could have discharged and it would have allowed the
15:38 6 mud loggers to see flow?

15:38 7 A. No. If I would have been aware of that, I would have told
15:38 8 you that a while ago when you asked the question.

15:38 9 Q. I don't always ask the best questions.

15:38 10 A. What I was aware of from those discussions -- one of
15:38 11 questions I had was, when you converted the flow to go
15:38 12 overboard and you bypassed the gumbo box, how -- what was the
15:39 13 valve configuration? Was it a configuration where the valve
15:39 14 was located on the side of the flow line or at the bottom of
15:39 15 the flow line? And so when you diverted, you know, physically,
15:39 16 how did you do that? And that was my involvement in it.

15:39 17 Q. TREX-5125 is an e-mail from Bob Walsh to Wesley Bell, both
15:39 18 Transocean employees. Are you familiar with them?

15:39 19 A. Yes, I know Wesley. I think I know Bob.

15:39 20 Q. As part of the Transocean investigation report, we have
15:39 21 this e-mail that reads, at least in part, that "what is
15:39 22 interesting to me is, if the Sperry sensor was located at the
15:39 23 entry to the box, why would the crew want to use the bypass
15:39 24 line to send the flows from the flow line directly overboard,
15:39 25 when they can just close the feeds to the shale shakers? The

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15:39 1 box is designed so that it will spill over into the gumbo chute
15:39 2 if the volume entering the box exceeds the volume going out to
15:40 3 the shale shakers, causing the pool height to rise."

15:40 4 Do you see those sentences, Mr. Barnhill?

15:40 5 A. I do.

15:40 6 Q. So based on this, it would seem that there was an
15:40 7 alternative available to the crew that night, that they could
15:40 8 discharge overboard yet still allow the mud logger to see flow?

15:40 9 A. Well, but basically what happens in this design -- and
15:40 10 that was kind of what I was talking about before -- you could
15:40 11 actually accommodate a flow rate where some of the flow would
15:40 12 go across the top of your shakers. But shakers being shakers,
15:40 13 even when they're off, with the screens on there, you would get
15:40 14 some fluid discharge into your sand trap area.

15:40 15 So then the question would become, what do I do with
15:40 16 whatever fluid's in my sand -- basically in that area of the
15:40 17 sand trap. So that would either have to be hauled off or do
15:40 18 something with. How efficient this would be, I don't know
15:40 19 because I didn't do this research. But you could have cut the
15:40 20 shakers off and you could have run the fluid across it. What
15:41 21 the efficiency would be, I have no idea.

15:41 22 Q. So we have an efficiency question, but it's still viable?

15:41 23 A. It's still viable. Again, like I said, if the sand traps
15:41 24 had actually been cleaned before this, you could have dumped it
15:41 25 into the sand trap; and if you've got a basically discharged

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15:41 1 port out of the sand trap, you could have done it that way.

15:41 2 Q. Well, the sand traps were dumped earlier that evening,
15:41 3 weren't they?

15:41 4 A. Yeah, but I don't know if they had been cleaned.

15:41 5 Q. So you would have to clean it before you could use this
15:41 6 alternative?

15:41 7 A. If you had synthetic-base mud, you wouldn't want all that
15:41 8 contaminating that and then dump it into the Gulf of Mexico.

15:41 9 Q. Setting the efficiency of displacement or flow aside,
15:41 10 would this be a safer alternative in terms of allowing the mud
15:41 11 logger to continue monitoring flow out of the well?

15:41 12 A. Well, certainly, if you continue to go past this monitor,
15:41 13 he's going to be able to flow.

15:41 14 Now, given everything that happened -- and I think
15:41 15 the natural answer, sitting here, is yes, it would be safer.
15:42 16 Whether it could have been accomplished in a safe manner
15:42 17 without doing that -- you know, for a lot of years, we've done
15:42 18 it in a safe manner without doing it. So...

15:42 19 Q. And you've told Mr. Hymel that the leading indicators of a
15:42 20 kick are pit gain and flow-off out of a well?

15:42 21 A. They are. That's the two what I call real-time primary
15:42 22 indicators.

15:42 23 Q. Right. Gas cutting from mud, there's going to be a lag to
15:42 24 get them out?

15:42 25 A. Right.

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15:42 1 Q. Standpipe pressure, could be a variety of things
15:42 2 influencing it?

15:42 3 A. Correct.

15:42 4 Q. So flow-out and pit gains are the two you really want to
15:42 5 focus on?

15:42 6 A. The great thing about those is those tend to be real
15:42 7 common. If something happens at the bottom of well, I get an
15:42 8 immediate reaction at the top of the well, through either
15:42 9 flow-out or pit gain, then I can see them and respond to them.

15:42 10 Q. In which case you would want the displacement procedure
15:42 11 set up so that those, as you call them, real-time indicators,
15:42 12 are still available to the mud logger to review out of the
15:42 13 well?

15:42 14 A. Well, you certainly want those to be monitorable as much
15:42 15 as you can. Ideally, you would like the mud logger to have the
15:43 16 ability to continue to monitor that, yes. That doesn't
15:43 17 interfere with his ability to monitor other things, but you
15:43 18 would like that, if you could, yes.

15:43 19 Q. Understood. Let's move on for a minute to well control
15:43 20 responsibility.

15:43 21 The driller and the operator are the entities
15:43 22 primarily responsible for well control. Fair?

15:43 23 A. They are.

15:43 24 Q. I think you testified to some of this earlier, and
15:43 25 adhering to the judge's admonishment, I'm not going to cover

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15:43 1 too much of the same ground.

15:43 2 But the driller is instructed and trained to shut in
15:43 3 the well immediately upon detection or suspicion of a kick.

15:43 4 A. If he's -- I would say it a little differently. If he
15:43 5 suspects a well control situation has developed, he should
15:43 6 confirm that with a flow check. If the flow check is positive,
15:43 7 then, yes, he should shut the well.

15:43 8 Q. So you would take the intermediate step of a flow check
15:43 9 before shutting in the well?

15:43 10 A. Correct.

15:43 11 **THE COURT:** How long does it take to do that?

15:43 12 **THE WITNESS:** Flow check? Not long, I think four or
15:43 13 five minutes.

15:44 14 Again, you may have to wait a little bit of time
15:44 15 for everything to settle down, so maybe 10 or 15.

15:44 16 **THE COURT:** Talking about walking out and actually
15:44 17 looking?

15:44 18 **THE WITNESS:** You shut everything down, take the
15:44 19 flashlight, walk out, look in the rotary table, or you call the
15:44 20 shaker house and have somebody check the chute at the end of
15:44 21 the mud box. It's not a difficult thing --

15:44 22 **THE COURT:** There's a couple different ways to do it?

15:44 23 **THE WITNESS:** Couple of different ways to do it.

15:44 24 **BY MR. HARTLEY:**

15:44 25 Q. I want to contrast that responsibility with the mud logger

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15:44 1 again. In this case the mud logger has no well control
15:44 2 responsibility, does he?

15:44 3 A. He doesn't have a well control responsibility from the
15:44 4 aspect of once something is detected, the actions that are
15:44 5 taken from that point forward, that is correct.

15:44 6 Q. Right. So we draw the distinction between monitoring up
15:44 7 to the point you find something -- a problem, an anomaly, what
15:44 8 have you --

15:44 9 A. Correct.

15:44 10 Q. -- from that point, actually responding to it, the mud
15:44 11 logger has no responsibility?

15:44 12 A. Right. And you have different levels of conscientiousness
15:44 13 in mud loggers. I've seen some mud loggers, if they saw
15:45 14 something, they'd get up and go out and walk to the flow line
15:45 15 and see. Some don't.

15:45 16 But once something is suspected -- not necessarily
15:45 17 detected, but suspected -- then typically that starts a
15:45 18 conversation. And based on that conversation a decision is to
15:45 19 move forward and shut the well in, and the mud logger would not
15:45 20 be involved in the shutting-in process.

15:45 21 Q. He doesn't have any access to the BOP control panels?

15:45 22 A. He does not.

15:45 23 Q. He can't access the diverter, to route it to either the
15:45 24 mud-gas separator or the overboard?

15:45 25 A. They'd probably shoot him if he tried. I'm kidding.

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15:45 1 MR. HARTLEY: Let's pull up TREN-1453.

15:45 2 BY MR. HARTLEY:

15:45 3 Q. In the course of preparing your opinions and looking
15:45 4 through the well control training of the Transocean personnel,
15:45 5 did you have an opportunity to review TREN-1453, which is the
15:45 6 *Deepwater Horizon Emergency Response Manual*?

15:45 7 A. I did.

15:46 8 MR. HARTLEY: Let's turn to the page Bates-numbered
15:46 9 48232.

15:46 10 BY MR. HARTLEY:

15:46 11 Q. This will set out the three different levels of emergency
15:46 12 situations. Do you see under Section 1.1, "Level of well
15:46 13 control emergencies are defined below," and it has the three
15:46 14 levels?

15:46 15 A. I do.

15:46 16 Q. Level 1 is any kick situation; Level 2 is further analysis
15:46 17 where there's continued adverse development; Level 3 is where
15:46 18 you get uncontrolled well blowout. Do you see those?

15:46 19 A. Correct.

15:46 20 Q. Is that generally consistent with your understanding of
15:46 21 how Transocean trained its employees on the *Deepwater Horizon*
15:46 22 in terms of the levels of emergencies to respond to?

15:46 23 A. Yes. I think that's consistent, yes.

15:46 24 MR. HARTLEY: Let's turn to Bates page 48238.
25

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15:46 1 BY MR. HARTLEY:

15:46 2 Q. You'll see on this page, Mr. Barnhill, under Section 5.9,
15:46 3 Mud Logger -- all the way down to Level 3: "*The Deepwater*
15:47 4 *Horizon Emergency Response Manual* sets forth mud logger's
15:47 5 duties in Level 1, 2, and 3 emergency situations."

15:47 6 Do you see that?

15:47 7 A. I see a mud logger, General A and B, Level 1, Level 2,
15:47 8 Level 3, yes.

15:47 9 Q. And in each case the *Deepwater Horizon Emergency Response*
15:47 10 *Manual* for Level 1 and Level 2 indicates that the mud logger's
15:47 11 job is essentially to monitor what's going on?

15:47 12 A. It is. Now, keep in mind, these particular procedures are
15:47 13 for a shallow gas kick.

15:47 14 Q. Right.

15:47 15 A. When we're talking about well control and shallow gas
15:47 16 kick, that is not the situation we had here --

15:47 17 Q. Understood.

15:47 18 A. -- but these are the responsibilities of the mud logger
15:48 19 under that situation.

15:48 20 Q. And his responsibilities would be the same in the
15:48 21 deepwater environment?

15:48 22 A. He may be actually monitoring additional things, other
15:48 23 than just gas readings, abnormal gas readings.

15:48 24 Q. I guess the point is, under Level 1, Level 2, emergencies,
15:48 25 setting aside the scope of data he's monitoring, his

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15:48 1 responsibility is just to monitor?

15:48 2 A. To monitor and report.

15:48 3 Q. Monitor and report.

15:48 4 A. It doesn't do any good just to monitor. If you're
15:48 5 monitoring and you see something, you've got to tell somebody.

15:48 6 Q. And when you get to a Level 3 situation, his
15:48 7 responsibility is simply to evacuate or abandon the unit?

15:48 8 A. If you have a blowout in process at that time, then, yes.

15:48 9 Q. There's no point in time where the mud logger is
15:48 10 responsible for taking responsive actions?

15:48 11 A. He does not affirmatively shut the well in, record the
15:48 12 pressures, monitor the riser, prepare the kill sheet, and kill
15:48 13 the well. He does not do that.

15:48 14 Q. Now, having talked about the general responsibilities for
15:49 15 monitoring and well control, I want to turn our attention for a
15:49 16 little bit to the actual operations on April 20th.

15:49 17 A. Okay.

15:49 18 Q. Now, Mr. Hymel did walk you through some of the indicators
15:49 19 you talked about, so I'm not going to go into much length with
15:49 20 that when we get there.

15:49 21 A. Okay.

15:49 22 Q. I do, however, want to set up some context beforehand.

15:49 23 Now, you talked, in response to some of Mr. Hymel's
15:49 24 questions, about what was going on that night as being routine
15:49 25 operations for a rig move. Do you recall that?

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15:49 1 A. I do.

15:49 2 Q. Now, those were not routine operations for a displacement
15:49 3 procedure, though, were they?

15:49 4 A. No. Typically, those were the routine type of operations
15:49 5 that would go on when you were preparing the rig for a rig
15:49 6 move.

15:49 7 Q. Typically, what you would do for a displacement procedure
15:49 8 is stop all of these other operations, do the displacement
15:49 9 procedure, and then proceed to the crane movement, the cleaning
15:49 10 of the pits and so forth?

15:49 11 A. That would be typical in my experience. That's usually at
15:49 12 the discretion of the company man, but that would be typical in
15:49 13 my experience.

15:49 14 Q. And based upon your experience in the industry, who makes
15:49 15 the decision as to those simultaneous or concurrent operations
15:50 16 going on during the displacement procedure?

15:50 17 A. Ultimately that would be the company man that would either
15:50 18 decide he wanted it done that way or, if somebody started doing
15:50 19 it that way and he didn't want it done that way, he would stop
15:50 20 that.

15:50 21 **MR. HARTLEY:** Let's pull up D-8167.

15:50 22 **BY MR. HARTLEY:**

15:50 23 Q. I'm going to talk a little bit about some of these
15:50 24 operations that were going on that night.

15:50 25 Now, looking through the bullet point list under

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15:50 1 D-8167, you would agree that all of these operations were going
15:50 2 on at some point the evening of April 20th. I will carve out
15:50 3 the off-loading mud to the *Damon Bankston* because you testified
15:50 4 earlier it stopped at 5:17.

15:50 5 A. It did.

15:50 6 Q. So after 5:17, all the other items on this bullet point
15:50 7 are going on during the displacement procedure fairly
15:50 8 concurrently?

15:51 9 A. Well, they were happening at different times; they were
15:51 10 not all occurring at the same time. As an example, the
15:51 11 diverting of the fluid overboard, we know that didn't happen
15:51 12 until about 9:14. The repeated emptying of the sand traps
15:51 13 during displacement, again, I don't remember that with enough
15:51 14 specificity to know exactly when that happened. Staggering of
15:51 15 the rig pumps were at a specific time. So all of these were
15:51 16 kind of at specific times. They weren't all occurring
15:51 17 throughout the entire operation.

15:51 18 Q. Carving aside, again, the off-loading mud to the *Damon*
15:51 19 *Bankston*, all of the rest of these activities were going on at
15:51 20 some point between the end of the negative test, by 8:00,
15:51 21 until, say, 9:30?

15:51 22 A. I believe that's correct.

15:51 23 Q. And each of the items identified on D-8167 affect the
15:51 24 sensor data responses being monitored by both the mud logger
15:51 25 and the drill crew. Would you agree with that?

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15:52 1 A. They would certainly affect some of the MOB crew, yes.

15:52 2 Q. You talked with Mr. Hymel a little bit about the open-pit
15:52 3 system, so I'm not going to get into the details of that. But
15:52 4 the fact that they're drawing water from the sea chest for
15:52 5 displacement affects their ability, to some extent, to evaluate
15:52 6 the pit gains, the amount of fluid?

15:52 7 A. Well, you could -- again, if you're taking out of the sea
15:52 8 chest and returning to a pit, you can certainly determine
15:52 9 in-flow rate. That's just -- you know, like I said, the pump
15:52 10 volume factor times the stroke rate. You can calculate that
15:52 11 volume.

15:52 12 Typically, on mud pits, one of the things a rig knows
15:52 13 is the volume capacity of the pumps -- I'm sorry, the pits --
15:52 14 typically how many barrels per inch the pits hold. So if I'm
15:52 15 taking water from -- from the sea chest and discharging it into
15:53 16 a tank, and I start with basically an empty tank, I can
15:53 17 calculate how many -- you know, I can determine how much volume
15:53 18 I've gained; and in that tank, that corresponds with the
15:53 19 in-flow rate that I'm pumping in or not.

15:53 20 So as long as I'm doing that part of the operation, I
15:53 21 can monitor it. Once I start going overboard, then I lose that
15:53 22 capability.

15:53 23 Q. Then I think the more accurate way -- and correct me if
15:53 24 I'm wrong -- referring to the open-pit system, is, it makes it
15:53 25 more complicated or requires more tasks to properly evaluate

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15:53 1 the flow of fluid?

15:53 2 A. Well, yeah, I guess that's a little more complicated than
15:53 3 just looking up at a readout versus looking up at a volume or
15:53 4 having to determine the volume. So yes, I guess it would make
15:53 5 it a little more complicated.

15:53 6 Q. You heard Mr. Keith's testimony about how he was tracking
15:53 7 the movement of mud between the contained pits on the rig?

15:53 8 A. I think that's correct.

15:53 9 Q. And he would open a database, pull it up and see what the
15:54 10 volume was at the beginning of a transfer, and then pull it up
15:54 11 again at the end and calculate the net change.

15:54 12 Do you recall that?

15:54 13 A. I do.

15:54 14 Q. That is not the sort of task you can engage in using an
15:54 15 open-pit system --

15:54 16 A. Well, it's something --

15:54 17 Q. -- that's not going to another pit before being displaced?

15:54 18 A. Right. It's a complication in the process.

15:54 19 Q. The second bullet point on D-8167 discusses the flushing
15:54 20 of the trip tank. Based upon your review of the information,
15:54 21 you're aware that on at least one occasion the rig crew dumped
15:54 22 the trip tank across the flow line?

15:54 23 A. Yes.

15:54 24 Q. And doing that is going to impact the flow-out readings
15:54 25 for both the Transocean paddle sensor and the Sperry sonic

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15:54 1 sensor?

15:54 2 A. Yes. If they're both online, it would affect both of
15:54 3 them, yes.

15:54 4 Q. You would want to know, as that operation is happening,
15:54 5 that it's actually occurring as you're monitoring the flow-out
15:55 6 reading, would you not?

15:55 7 A. Well, I think, in looking at your data, you're going to
15:55 8 have an idea that it's occurring. You certainly may want to
15:55 9 reconfirm it. But you've got -- my appreciation, from looking
15:55 10 at the data that was displayed, you can see changes in trip
15:55 11 tank volume. You generally know when you're on the rig where
15:55 12 the trip tank is being dumped to, so you can see a
15:55 13 corresponding change in flow rate out. You may feel that you
15:55 14 want to call and just confirm that they, yes, opened the valve,
15:55 15 but you can see the effect on the data on your monitor.

15:55 16 Q. It takes more time and effort to track what's going on,
15:55 17 not having that advance notice?

15:55 18 A. Well, you have to pay attention to your data.

15:55 19 Q. The third bullet point talks about the staggering of the
15:55 20 rig pumps. I think you talked about this a little bit on
15:55 21 direct with Mr. Hymel. That's where the rig pumps came online
15:55 22 after a machine test in a staggered manner.

15:55 23 By doing it in that manner, that's going to affect
15:55 24 standpipe pressure and other readings that are being seen.

15:56 25 A. It would. It would affect the flow rate in and flow rate

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15:56 1 out and your return flow rate.

15:56 2 Q. And, in fact, that's one of the points where Mr. Keith
15:56 3 called the drill floor to ask about it?

15:56 4 A. He did.

15:56 5 Q. You mentioned, when we first pulled this demonstrative up,
15:56 6 about the emptying of the sand traps. Once the trip tank --
15:56 7 that's something that's going to affect flow-out readings, by
15:56 8 emptying those across the flow line?

15:56 9 A. If it was across the flow line, it will affect it, yes.

15:56 10 Q. The next bullet point is transferring mud between pits.
15:56 11 The specific pits are listed there.

15:56 12 But as you reviewed the data, was it your opinion
15:56 13 that there was more fluid transfers than typical for a
15:56 14 displacement procedure?

15:56 15 A. There were quite a few transfers. To be quite honest, I
15:56 16 didn't go back and compare them with other historical
15:56 17 information that I may have, to say was this more or less. But
15:56 18 there were pit transfers that were occurring.

15:56 19 Q. By transferring so much among and between the pits, it's
15:56 20 going to require more effort tracking those fluid volumes?

15:57 21 A. It would require effort to track the fluid volumes.

15:57 22 You have to remember -- and when you say more than
15:57 23 normal, keep in mind that in this situation they're
15:57 24 displacing -- well, actually, they're displacing 8,367 feet of
15:57 25 mud out of the wellbore. That's going to equate to about

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15:57 1 2200 barrels of fluid that you've got to find a home for.

15:57 2 You've got to put them somewhere on that rig. So again, it's
15:57 3 going to require that being done.

15:57 4 When you were drilling wells in shallower water
15:57 5 depths, the volumes wouldn't be as great. When you drill that
15:57 6 well in 9700 feet of water, they would have had more mud than
15:57 7 that to deal with. So it would vary from time to time.

15:57 8 Q. Certainly before the displacement procedure began, the rig
15:57 9 crew, the well site leader, understood the depth at which they
15:57 10 were going to displace?

15:57 11 A. Give me that question one more time. I'm sorry.
15:57 12 one more time. I'm sorry.

15:57 13 Q. The drill crew and the well site leader knew that they
15:57 14 were displacing to 8367 feet?

15:58 15 A. They did.

15:58 16 Q. They knew they were going to account for the mud?

15:58 17 A. They did.

15:58 18 Q. They knew they were doing to have to find a home for that
15:58 19 mud when it came back to the rig?

15:58 20 A. They knew it would be put in the pits on the rig and
15:58 21 ultimately moved off the rig.

15:58 22 Q. So it would stand to reason that they would have those
15:58 23 pits available in advance to bring the mud back?

15:58 24 A. Or someplace to do it. I think there was a period of time
15:58 25 where they may have been actually going straight to the *Damon*

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15:58 1 *Bankston*. So -- but they would have had to find a place to put
15:58 2 it.

15:58 3 Q. Put it in a column tank?

15:58 4 A. I don't know that -- well, they may not have. Like I
15:58 5 said, I think there was a period of time they were going to the
15:58 6 *Bankston*. But they could have put some to the column tanks.

15:58 7 Q. Now, in reviewing the material to prepare your opinions in
15:58 8 this case, do you recall reading deposition testimony to the
15:58 9 effect that pits had already been cleaned and the reason all of
15:58 10 this mud movement was going on was because they didn't want to
15:58 11 take mud to pits that they had already cleaned?

15:58 12 A. You know, I was asked that question in my deposition. And
15:58 13 to be honest with you, I couldn't remember whether the tank
15:58 14 crew had started or not. I just couldn't remember. And I
15:59 15 didn't go back and research that question before I got up here.
15:59 16 So...

15:59 17 Q. Based upon your experience in the oil and gas industry,
15:59 18 would you tend to clean the pits before or after the
15:59 19 displacement procedure?

15:59 20 A. Depending on what I needed and what I thought the process
15:59 21 was going to entail. If I wanted to put it all in the pits and
15:59 22 I needed the pit space, I wouldn't have the pit crew down there
15:59 23 cleaning it ahead of time.

15:59 24 Q. The next bullet point on D-8167 is diverting fluid
15:59 25 overboard. This is the discussion we had, where after the

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15:59 1 sheen test they shut the valve, and at that point the mud
15:59 2 logger could no longer see flow-out or pit gains.

15:59 3 A. Correct.

15:59 4 Q. Transocean, at that time, still could?

15:59 5 A. They could see --

15:59 6 Q. Flow?

15:59 7 A. They couldn't see the flow-out and they couldn't see the
15:59 8 pit gains. But they could see the return mud flow on their
15:59 9 flow check.

15:59 10 Q. The fluid coming out of the wellbore, after the point of
15:59 11 diversion at about 2110, 2114, that time frame, that fluid
16:00 12 still passed the Transocean paddle sensor on the rig?

16:00 13 A. Correct.

16:00 14 Q. Which would then lead to an indication in the drill shack
16:00 15 whether there was or was not flow in a percentage reading?

16:00 16 A. It should have, yes.

16:00 17 Q. So at all points on the evening of April 20th, the driller
16:00 18 had available to him a flow-out reading from the well?

16:00 19 A. He should have, yes.

16:00 20 Q. The second-to-the-last bullet point on D-8167 talks about
16:00 21 the crane and the rig movement.

16:00 22 Did you read documents -- deposition testimony
16:00 23 suggesting that the crane was in operation at various points
16:00 24 during the displacement procedure?

16:00 25 A. Yes.

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16:00 1 Q. The crane was not something you would need to use for
16:00 2 displacement, is it?

16:00 3 A. No. The only way the crane might get involved would be,
16:00 4 if you needed to transfer some fluid to the boat, then you had
16:01 5 to run a hose or something to the boat.

16:01 6 But in the overall scheme of the displacement
16:01 7 procedure, no, you would not -- the crane is not necessary for
16:01 8 that.

16:01 9 Q. The offloading ended at 5:17. So there would have been no
16:01 10 reason to use the crane that night during the displacement
16:01 11 procedure?

16:01 12 A. That's correct.

16:01 13 Q. Use of the crane will affect fluid volumes in the pits?

16:01 14 A. It can, yes.

16:01 15 Q. As the drill crew and the mud logger are reviewing the pit
16:01 16 levels, those sensor data responses will change and fluctuate
16:01 17 based on crane movement and general rig movement?

16:01 18 A. They will.

16:01 19 Q. Okay. The last point on D-8167 talks about the lack of
16:01 20 communication.

16:01 21 Did you hear Mr. Keith's testimony that at no point
16:01 22 in the evening of April 20th did anybody place a phone call to
16:01 23 him telling him what was going on on the rig?

16:01 24 A. I believe that's correct.

16:01 25 Q. Is that consistent with your understanding of the facts,

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16:01 1 based on your review of all of the other deposition testimonies
16:02 2 and records you have reviewed?

16:02 3 A. To be honest, I don't remember whether there was --
16:02 4 whether there was an indication of two-way communication or
16:02 5 not.

16:02 6 I said I am aware of various calls where Mr. Keith
16:02 7 called the rig floor to ask questions. I think there -- I
16:02 8 believe there was some two-way communication, maybe, when
16:02 9 Mr. Willis was on. But again, this is from memory, so...

16:02 10 Q. You don't recall reading anything where anybody called
16:02 11 Mr. Keith that evening to tell him what was going on?

16:02 12 A. As I sit here, I do not.

16:02 13 Q. Similarly, you don't recall reading anything about any PA
16:02 14 announcements on the rig advising Mr. Keith and others of these
16:02 15 rig activities we're talking about in D-8167?

16:03 16 A. I don't remember any PA communications involving these
16:03 17 particular items.

16:03 18 Q. You've heard Mr. Keith tell you that -- or tell us --
16:03 19 testify that nobody called him and there were no PA
16:03 20 announcements?

16:03 21 A. I didn't particularly remember the PA announcements, but I
16:03 22 remember the note that nobody called him.

16:03 23 Q. You don't have any reason to dispute that?

16:03 24 A. I do not.

16:03 25 Q. Now, as you walked through some of the data with Mr. Hyme1

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16:03 1 about the various time frames, you were giving your analysis
16:03 2 about what was happening, what was going on.

16:03 3 In monitoring the well, whether you're on the drill
16:03 4 crew or the mud logger, it's important to understand the
16:03 5 context of what's going on on the rig in order to properly
16:03 6 evaluate the data, isn't it?

16:03 7 A. Well, it's important -- first and foremost, it's important
16:03 8 to understand the context of what's going on in the hole. And
16:03 9 then, also, for rig functions that can affect the monitoring of
16:03 10 what's going into and coming out of the hole, it's important to
16:03 11 understand those.

16:03 12 Q. For example, the things listed on D-8167 that influence
16:04 13 your sensor data responses, you would want to communicate those
16:04 14 to the mud logger so he's better able to understand what's
16:04 15 going on on the rig?

16:04 16 A. Well, like I said, from the different types of sensors he
16:04 17 has, he can certainly see what's going on and reach
16:04 18 conclusions.

16:04 19 I am of the school that more communication is better.
16:04 20 So yes, I would -- you know, if I was -- if my drill crew was
16:04 21 doing something that was going to affect the mud logger's data,
16:04 22 then I'd want them to tell him that.

16:04 23 Q. Now, on that "more communication is better" point, I want
16:04 24 to shift the focus a little bit to the pump schedule.

16:04 25 I think -- you didn't talk about this with Mr. Hymel,

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16:04 1 but it seemed to be a large component of your report, that
16:04 2 during this displacement procedure nobody prepared a pump
16:04 3 schedule. Did they?

16:04 4 A. I didn't see where a pump -- what I call a pump
16:04 5 displacement schedule had been prepared, which would have
16:04 6 basically given everybody an idea of what the pressure profiles
16:04 7 should have been.

16:04 8 Q. By that, you mean at various points in the procedure what
16:05 9 pressures you would expect?

16:05 10 A. Correct.

16:05 11 Q. What volumes of fluid you would expect to return?

16:05 12 A. I was more interested, particularly, in the pressure
16:05 13 component of it. But you could also expand it to do volumes.

16:05 14 I broke it down into three -- three separate curves,
16:05 15 or three separate plots, if you will: one that dealt with
16:05 16 bleed-off volumes, one that dealt with pressure versus strokes,
16:05 17 and then there was another one that also dealt with a different
16:05 18 form of bleed-off data.

16:05 19 Q. And the reason that would be important is so the people
16:05 20 monitoring the well have some idea of what to expect during the
16:05 21 course of the displacement procedure?

16:05 22 A. Yeah. You've got a basis where you can look and see, "At
16:05 23 this point I should be seeing X. Is my general trend agreeing
16:05 24 with X or not?" I think that's important.

16:05 25 Q. Easier to see whether there's an anomaly in the data or

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16:05 1 not, whether there's an irregularity downhole with the well or
16:06 2 not, if you have one of those pump schedules?

16:06 3 A. There is to a point. Again, I'm all in favor of doing
16:06 4 those. I think you can read certain anomalies that -- you
16:06 5 know, the indication of those anomalies are such that with or
16:06 6 without a chart, they should be -- if they are observed, they
16:06 7 should be acted upon.

16:06 8 Q. Okay. Recognizing that Mr. Hymel went through some of
16:06 9 this data in some detail with you, I'm going to refrain from
16:06 10 asking the same questions. But I do want to talk a little bit
16:06 11 about the kick indicators or the anomalies that evening.

16:06 12 I think it's consistent, what you said here today in
16:06 13 your report is that -- if I understand correctly -- the early
16:06 14 arguable indicators were very subtle and hard to detect?

16:06 15 A. I think so, yes.

16:06 16 Q. You wouldn't expect anybody on the rig to have noticed any
16:06 17 abnormality, to notice that there was an issue prior to
16:07 18 shutting down for the machine test at 9:08?

16:07 19 A. I don't know that I would have faulted them for not
16:07 20 necessarily picking those up. That's correct.

16:07 21 Q. Whether it was an arguable flow change or a 100 psi
16:07 22 increase in standpipe pressure.

16:07 23 Those are not noticeable enough where you would say
16:07 24 that should have been caught?

16:07 25 A. Right. Again, once you get into analyzing the data and

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16:07 1 specifically looking at things, there might be things you could
16:07 2 come back and say, "Hey, I want to show you this, so next time
16:07 3 maybe." But it's not like, you know, "Why didn't you catch
16:07 4 this?"

16:07 5 Q. And part of that, I think, is to your point that you were
16:07 6 doing a retrospective analysis where you know the outcome, you
16:07 7 have fully-formed traces, not seeing it scroll real-time.

16:07 8 A. Right.

16:07 9 Q. It's more difficult to see as the trend is developing.

16:07 10 A. In the real world we don't know the future. No one, prior
16:07 11 to April the 20th, had anything like *Deepwater Horizon* in their
16:07 12 database. So they're looking at information that they're
16:08 13 getting real-time. They're seeing the present and some of the
16:08 14 past, and they're reacting to that based on their experience,
16:08 15 training, and their knowledge at that time.

16:08 16 Q. And then if we jump past the sheen test, where they pick
16:08 17 up the pumps again at about 2114, I think your testimony is --
16:08 18 and your report suggests -- that it's difficult to identify a
16:08 19 trend or an anomaly from that point until 9:30 or so because of
16:08 20 all the various activities going on.

16:08 21 A. Correct. There were things that were changing the data
16:08 22 that -- that could be explained when you looked at the change.

16:08 23 Q. So other than the slight increase during the sheen test
16:08 24 and then the 833 psi spike on the kill line at about 9:27,
16:08 25 everything else was readily explainable by what you would

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16:08 1 expect downhole and what's happening on the rig?

16:08 2 A. Yes.

16:08 3 Now, where I think a -- there's two issues on that.

16:08 4 One, where I think a pump displacement chart would have come in
16:09 5 handy, you would have seen -- as an example, when you shut down
16:09 6 for the sheen test, the pressure didn't come down as far as it
16:09 7 should have.

16:09 8 And then once we get further out -- and again, this
16:09 9 is the beauty about being able to lay the whole thing out -- we
16:09 10 can see a marked total increase in the upward parameter of the
16:09 11 drill pipe pressure.

16:09 12 And again, those are the types of things that -- you
16:09 13 know, at some point the anomalies, if you are looking at that
16:09 14 data, are going to be recognizable, and they should be acted
16:09 15 on.

16:09 16 Q. In the course of your career, and as you've been in the
16:09 17 oil and gas industry, have you seen pump displacement charts
16:09 18 prepared?

16:09 19 A. I have prepared them.

16:09 20 Q. Whose responsibility is it, based on your experience, to
16:09 21 provide that sort of information?

16:09 22 A. Typically, I would need to provide them. Or if it was a
16:09 23 complicated geometry and I had a mud man out there, or a mud
16:09 24 engineer that had a hydraulics program -- although typically,
16:09 25 as a company man, I usually had a hydraulics program with me

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16:09 1 also, as I would tend to run them.

16:10 2 One of the things about this well system during the
16:10 3 displacement, it was a complicated geometry. You had three
16:10 4 different sizes of drill pipe. You had 3 1/2, 5 1/2, 6 5/8.
16:10 5 The combination of the drill string by annular design gave you
16:10 6 five volumes on your annular side.

16:10 7 So we had three volume changes internally to the
16:10 8 drill string, five volume changes externally. You had three
16:10 9 different types of fluids, you had a 14-pound mud, you had a
16:10 10 16-pound spacer, and you had 8.6 water.

16:10 11 So those were all issues that it kind of becomes hard
16:10 12 to do just a little back-of-the-envelope. You can, but it's
16:10 13 going to take you a while.

16:10 14 Q. It takes you more time to calculate pressures, responses,
16:10 15 bleed-off volume, and the like?

16:10 16 A. Right. So the easier thing to do, if somebody's got a
16:10 17 hydraulics program, is, run the program, plot out your pressure
16:10 18 responses, and do the displacement.

16:10 19 **THE COURT:** You said this is in the software?

16:10 20 **BY MR. HARTLEY:**

16:10 21 Q. It's like a virtual hydraulic software?

16:11 22 A. Yes.

16:11 23 Q. And when you said that you would typically do it in your
16:11 24 role as a driller, a well site leader, a consultant, because
16:11 25 you've certainly worn a few hats?

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16:11 1 A. Typically, as a company man on location, I would run those
16:11 2 numbers or ask the mud company to run those numbers for me.

16:11 3 Q. Now, I want to talk for just a minute about the increase
16:11 4 in pressure during the sheen test. And I think, if I
16:11 5 understand you correctly, that it does not strike you as an
16:11 6 anomaly that there was still pressure on the standpipe when
16:11 7 they -- after they shut down the pumps.

16:11 8 A. No. As long as you've got heavier fluid in your annular
16:11 9 space than you've got in your drill string, then you're going
16:11 10 to have pressure applied back towards the drill string. Which,
16:11 11 when you shut down, the pumps are going to hold that pressure,
16:11 12 or trap that pressure, so you would see it on the gauge.

16:11 13 Q. Then when you see the pumps ramp down to zero, the fact
16:11 14 that the drill pipe pressure didn't go all the way down, that's
16:11 15 fine?

16:11 16 A. No. If you saw a drop and you hadn't run the numbers,
16:12 17 then that would look-- you know, that would be a normal
16:12 18 response: My pressure is dropping.

16:12 19 Q. And then during that six minutes or so, when the standpipe
16:12 20 pressure increased -- about what? 246 psi?

16:12 21 A. Whatever it was, about 250 pounds.

16:12 22 Q. A fairly subtle indication?

16:12 23 A. Well, it's -- it's an anomaly. If you're looking -- if
16:12 24 you've got that data available to you, if you can see that
16:12 25 data, it's an anomaly. You know, it's -- basically with that

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16:12 1 pump off, that drill pipe pressure ought to be tracking.

16:12 2 Q. It should stay flat?

16:12 3 A. It should stay flat. So if it's going up, something's
16:12 4 going on. And so if you're monitoring, I think that warrants
16:12 5 an alert and there needs to be some type of response to what
16:12 6 you're seeing.

16:12 7 Q. All right. Mr. Barnhill, I want to switch focus for a
16:12 8 minute and talk about the negative test.

16:12 9 A. Okay.

16:13 10 Q. Early on in your direct examination, you had a wellbore
16:13 11 schematic and you mentioned getting the primary cement job down
16:13 12 at the very bottom and then operation procedure.

16:13 13 Do you recall that generally?

16:13 14 A. I do.

16:13 15 Q. Now, it's fair to say that you wouldn't rely on that
16:13 16 primary cement job to be a barrier until you had actually
16:13 17 confirmed the zonal isolation?

16:13 18 A. Correct. You would test it before you relied on it.

16:13 19 Q. And that would be a cement evaluation tool like a CBL?

16:13 20 A. Again, depending on the configuration of your well.

16:13 21 The problem with trying to test cement in a shoe
16:13 22 track is you can only run the CBL down to the top of your float
16:13 23 collar. It ain't going to go in your shoe track because your
16:13 24 shoe track is full of cement.

16:13 25 Q. You'll at least be able to get top of cement?

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16:13 1 A. You could get top of cement.

16:13 2 Q. And the integrity of the cement from the top down to the
16:13 3 shoe, to the float collar?

16:13 4 A. You could. And more importantly, again, this is where the
16:13 5 positive and negative tests come in to confirm those.

16:13 6 Q. And that's why you would want to have a negative test and
16:13 7 why it's safety-critical, is because it is that test of those
16:13 8 downhole barriers?

16:14 9 A. In my opinion, you always want to do a positive and a
16:14 10 negative test.

16:14 11 Again, like I said earlier, you know, regulatory,
16:14 12 negative tests were not required. Positive tests were
16:14 13 required; negative tests were not required.

16:14 14 I personally always opted to do the negative test.

16:14 15 Q. Now, in the conduct and design of that negative test,
16:14 16 that's not something that the cementers or the mud loggers with
16:14 17 Halliburton are involved in, are they?

16:14 18 A. They are not. They may be involved simply from being on
16:14 19 their unit, having the pressure routed to their unit, bleeding
16:14 20 the fluid off, and watching the pressure responses.

16:14 21 They may comment. You know, they'll -- I may ask
16:14 22 you, you know, "How much fluid did you bleed back?" and you'll
16:14 23 tell me.

16:14 24 But that's their involvement. They're involved.
16:14 25 They're on the periphery.

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- 16:14 1 Q. They don't design the negative test?
- 16:14 2 A. They do not.
- 16:14 3 Q. They don't interpret the results of it?
- 16:14 4 A. They do not.
- 16:14 5 Q. They'll simply maybe turn valves on the cement pump that's
16:14 6 being used?
- 16:14 7 A. And report information back to you.
- 16:14 8 Q. And I think, if I understood correctly, based on your
16:15 9 testimony to Mr. Hymel about the negative test, it's your
16:15 10 opinion that it was not a successful negative test, confirmed
16:15 11 that there was no zonal isolation, and the well should have
16:15 12 been shut in at that point?
- 16:15 13 A. In my opinion, it was an inconclusive negative test. Now,
16:15 14 once I ran the calculations, I personally became convinced that
16:15 15 it was the formation that was talking to you. But it was an
16:15 16 inconclusive negative test.
- 16:15 17 So, you know, at best, it told you that you didn't
16:15 18 have confirmation that your downhole barriers were effective.
16:15 19 That's what it told you.
- 16:15 20 Q. And because it's a safety-critical test, because the tie
16:15 21 did not go to the runner, it's your opinion they should have
16:15 22 shut in the well at about 8:00, at the end of that second
16:15 23 negative test, or the first long one?
- 16:15 24 A. I think at that point the cleanest option, the cause of
16:15 25 the potential loading -- the location of the spacer in the BOP

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16:15 1 region, either across the BOP stack and into the annular spacer
16:16 2 or maybe into the -- into the kill line, the best thing to have
16:16 3 done would have been just to circulate for some period of time
16:16 4 until you know -- checking your returns -- until you know
16:16 5 you've got clean saltwater in your drill string, in your
16:16 6 annulus, in your kill line. Shut it back in. Now you've got a
16:16 7 consistent fluid all the way around, and your pressures ought
16:16 8 to equalize.

16:16 9 Q. So, in other words, you should not displace the well?

16:16 10 A. I would -- no, you should not continue to displace the
16:16 11 well.

16:16 12 Q. As you've said a few times, that mud, the density and the
16:16 13 height, is the primary well control barrier?

16:16 14 A. As you remove the weighted fluid, whether it be mud or
16:16 15 spacer, you are reducing the hydrostatic pressure in this well.

16:16 16 Q. Early on, in some of your responses to Mr. Hymel's
16:16 17 questions, you commented that a blowout occurs when a well
16:17 18 control situation gets out of control.

16:17 19 Do you recall that?

16:17 20 A. I do.

16:17 21 Q. And that's what happened on the Macondo well April 20th,
16:17 22 2010?

16:17 23 A. It did. There was a loss -- the well -- the control of
16:17 24 the well was lost to the surface.

16:17 25 Q. Transocean lost control of that well?

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16:17 1 A. I think there were a lot of factors involved, but control
16:17 2 of the well was lost to the surface, yes.

16:17 3 Q. Right. And Transocean was responsible for maintaining
16:17 4 that well control?

16:17 5 A. Transocean was responsible for monitoring the well.
16:17 6 Sperry-Sun was responsible for the monitoring of the well. BP
16:17 7 played a role in the decision to continue the displacement with
16:17 8 the procedure that was being done.

16:17 9 I think there were mistakes made that compounded this
16:17 10 issue and allowed this issue to happen.

16:17 11 I'm not here to cast aspersions or blame. I was
16:17 12 asked to give technical information, but I think there's issues
16:17 13 for all.

16:17 14 Q. So the well control system, as I think you explained to
16:18 15 Mr. Hymel, consists of -- at least as you talked about it
16:18 16 today -- the BOP keeping hydrocarbons below the mud line and
16:18 17 then the diverter system to deal with the riser unloading,
16:18 18 hydrocarbons getting into the riser; fair?

16:18 19 A. Correct. The BOPs are your device to shut in the well.
16:18 20 The well starts 5,000 feet below the water level. The riser
16:18 21 protection is your diverter system. The riser in your rig
16:18 22 protection.

16:18 23 Q. The Transocean drill crew was responsible for the
16:18 24 operation and activation of the BOP in response to a well
16:18 25 control event?

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16:18 1 A. They are.

16:18 2 Q. Transocean is responsible for the operation of the
16:18 3 diverter system to address hydrocarbons once they enter the
16:18 4 riser?

16:18 5 A. They are.

16:18 6 Q. No other entity on that rig was responsible for either the
16:18 7 BOP or the diverter system in terms of activation in response
16:18 8 to a well control event?

16:18 9 A. That's correct. They are -- Transocean was responsible
16:18 10 for the activation of the BOP.

16:18 11 Q. And you testified at some length about the training of the
16:18 12 Transocean drill crew, and I think you said that it's your view
16:19 13 that they were trained consistent with industry standards?

16:19 14 A. It is.

16:19 15 Q. On April 20th, 2010, they did not respond consistent with
16:19 16 the industry standards and their training, did they?

16:19 17 A. They did not.

16:19 18 Q. Pull up D-8007, please.

16:19 19 Is it your opinion, Mr. Barnhill, that had they
16:19 20 responded consistent with their training, that the well would
16:19 21 have been under control and we would not have had a blowout?

16:19 22 A. Based on what the simulations tell us -- that's really all
16:19 23 we have to go by. But based on what the simulations tell us, I
16:19 24 believe if the well had been flow-checked around 2133 and shut
16:19 25 in, there's the -- and, obviously, I'm not psychic, I don't

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16:19 1 know what would have happened. But I don't think the events as
16:19 2 they transpired would have happened. It would be a completely
16:19 3 different set of events, but the events that transpired would
16:19 4 not have happened.

16:19 5 Q. Had the Transocean drill crew shut in the well about 2133,
16:20 6 2134, it's more likely than not that there would not have been
16:20 7 a blowout?

16:20 8 A. Certainly, in the manner in which we saw, I think that's
16:20 9 correct. Whether there would be or wouldn't be, I can't tell
16:20 10 you. I'm not psychic, but I think the events that transpired
16:20 11 would not have happened in the manner they transpired.

16:20 12 Q. I've got D-8007 on the screen. It's a clock that we've
16:20 13 used a few times outlining the well control response
16:20 14 activities.

16:20 15 As best we can tell from your report and from the
16:20 16 Transocean investigation report --

16:20 17 A. Uh-huh.

16:20 18 Q. -- I want to walk through a little bit of this with you.

16:20 19 The first entry talks about, at 2126, 2127, a
16:20 20 pressure increase on the kill line.

16:20 21 Do you agree with that timing?

16:20 22 A. I do.

16:20 23 Q. That's what you looked at --

16:20 24 A. I think it might have backed up a little bit earlier than
16:20 25 that on the kill line, but about that time frame.

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16:20 1 Q. And that's what you talked about with Mr. Hymel where they
16:20 2 saw something that led them to shut off the rig pumps?

16:20 3 A. Yes.

16:20 4 Q. And when they did that, they didn't shut them off
16:20 5 completely; they staggered them down over a few minutes?

16:21 6 A. Well, you have a -- actually, they shut them down pretty
16:21 7 quickly. You have to have an automated shutdown feature on
16:21 8 these particular pumps. But he actually shut down -- remember
16:21 9 that it's three pumps, two online and one on the boost pump.
16:21 10 So he initially shut down the two pumps on the wells, and then
16:21 11 he closed down the boost pumps. So -- and all that was done
16:21 12 within probably, looked like, a minute, minute and a half, to
16:21 13 two minutes. So it was done pretty quickly.

16:21 14 Q. About 2130, we have the pumps completely shut off?

16:21 15 A. Correct. I would have put it at 2131, but there's no
16:21 16 point in quibbling about that.

16:21 17 Q. I think in your report what you say is they shut down the
16:21 18 pumps to "diagnose" the situation?

16:21 19 A. That's that it looked like to me, yes. They had
16:21 20 recognized an anomaly and they were shutting down to diagnose
16:21 21 the situation.

16:21 22 Q. And what you've told us here today about, right after that
16:21 23 entry, right about 2131, we should have an entry for a flow
16:21 24 check? That's what they should have done?

16:21 25 A. I would have probably looked at it -- again, when you

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16:21 1 first shut it down, the pressures appear to be kind of flat and
16:22 2 then they kicked up and started increasing. And I think at
16:22 3 that point, whether that's 32 or 33, somewhere in there, I
16:22 4 would have done a flow check.

16:22 5 Q. So in the minute or two after shutting off the rig pumps,
16:22 6 you would have flow-checked?

16:22 7 A. Once everything was shut down and stabilized and I saw
16:22 8 that pressure increase and recognized it, I would have done a
16:22 9 flow check.

16:22 10 Q. I think you told Judge Barbier that the flow check would
16:22 11 have taken a handful of minutes, maybe?

16:22 12 A. Yes.

16:22 13 Q. On 8007, we have an entry at 2138 that hydrocarbons
16:22 14 entered the riser.

16:22 15 A. Correct.

16:22 16 Q. Is that consistent with your understanding of what the
16:22 17 modeling suggests?

16:22 18 A. That's what the modeling indicates, yes.

16:22 19 Q. So had the Transocean drill crew acted in the manner
16:22 20 you're suggesting -- doing a flow check right after shutting
16:22 21 off the pumps, then shutting in the well -- they would have
16:22 22 shut it in before any hydrocarbons got into the riser?

16:22 23 A. If the simulations are correct, that's true. They would
16:22 24 have still had a significant gain. So what the outcome of that
16:23 25 shut-in would be, I don't know. But based on this simulation,

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16:23 1 the indication is -- the indications are that the hydrocarbons
16:23 2 would not have entered the riser.

16:23 3 Q. And that gain, that significant gain you mentioned, that
16:23 4 would have all been mud on the rig; there wouldn't be any
16:23 5 hydrocarbons to then ignite?

16:23 6 A. Again --

16:23 7 Q. Based on the simulations?

16:23 8 A. My crystal ball is not that good to say what would have
16:23 9 happened. I think any time you start getting large volumes of
16:23 10 influx into a wellbore, it's unpredictable.

16:23 11 Q. Fair enough.

16:23 12 A. You know, again, I'm not trying to quibble with you. I
16:23 13 just don't know.

16:23 14 Q. Understood. We don't have a crystal ball.

16:23 15 A. Yes.

16:23 16 Q. In looking at this time frame where the drill crew see the
16:23 17 kill line increase and they shut off the rig pumps, they knew
16:23 18 at that time that there were previous issues with the negative
16:23 19 test, didn't they?

16:23 20 A. Give me that question one more time.

16:23 21 Q. By 9:30 that night, when they're seeing this anomaly and
16:23 22 responding to it to diagnose the situation, by that point in
16:24 23 the evening, they already knew that there had been some issues,
16:24 24 the negative test reading pressure on the drill pipe, and none
16:24 25 on the kill line?

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16:24 1 A. They knew there had been anomalies that -- to me, I
16:24 2 believe that they had believed they had worked out the issues
16:24 3 and understood why they had those anomalies. So I think at
16:24 4 this point, they were still thinking they had a secure,
16:24 5 sealed-in wellbore.

16:24 6 Q. And this drill crew, as you said earlier, they were the
16:24 7 same drill crew on the rig on March 8th when it took a kick?

16:24 8 A. They were.

16:24 9 Q. They knew this well had had some prior problems?

16:24 10 A. Yes. They had been part of the crew that drilled the
16:24 11 well. They had not been there the whole time, but they had
16:24 12 been there part of the time.

16:24 13 Q. Based on this prior knowledge from the March 8th kick from
16:24 14 problems on this well in particular, do you think they should
16:24 15 have exercised additional vigilance in responding to this kick?

16:24 16 A. Well, again, I mean my opinion, I don't think, can be any
16:24 17 more clear than what my opinion is. I think at 2133 they
16:24 18 should have done a flow check; they would have seen a flow and
16:25 19 they would have shut the well in. That's about as clear as I
16:25 20 can state it.

16:25 21 Q. All right. Well, let's jump ahead then. I don't want to
16:25 22 beat this dead horse too much.

16:25 23 Down here at 2145, where Transocean's drill crew
16:25 24 diverted fluid to the mud/gas separator --

16:25 25 A. Correct.

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16:25 1 Q. -- that's consistent with your understanding of both the
16:25 2 timing and the drill crew's response?

16:25 3 A. You know, again, once we get past about 2140, the timing,
16:25 4 everything gets kind of muddled. We know at some point the
16:25 5 indications were that they diverted. The indications were the
16:25 6 initial diversion were to the mud/gas separator.

16:25 7 But really what happened, and the sequence it
16:25 8 happened, I don't know. As I've said multiple times, I don't
16:25 9 know.

16:25 10 Q. You read the Transocean investigation report?

16:25 11 A. I did.

16:25 12 Q. Do you know whether these times are consistent with your
16:25 13 theory -- your tentative or preliminary findings as to when the
16:25 14 drill crew took those actions in the 2143, 2145 time frame?

16:26 15 A. That looks like -- I mean, I've read several investigative
16:26 16 reports --

16:26 17 Q. You have?

16:26 18 A. -- BP, the Presidential Commission. That looks like the
16:26 19 times that correspond to the Transocean report, but they're all
16:26 20 within the same general range.

16:26 21 Q. Now, I was a little unclear when you were talking with
16:26 22 Mr. Hymel about this point of diversion. Is it your
16:26 23 understanding that at any point the drill crew actually sent it
16:26 24 to the 14-inch overboard diverter lines?

16:26 25 A. I don't know whether they diverted overboard or not. I

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16:26 1 think that's a question -- I mean, to get to the mud/gas
16:26 2 separator, it's got to go through a portion of the 14-inch
16:26 3 line. But to divert overboard, again, I don't know whether
16:26 4 they ever had the opportunity to do that, whether they did
16:26 5 that. The data was not clear to me.

16:26 6 I heard Mr. Ezell talk about the fire coming out of
16:26 7 the line. I have no reason to doubt him. But prior to that, I
16:27 8 don't know.

16:27 9 **THE COURT:** This is getting pretty repetitive,
16:27 10 Mr. Hartley. The witness just explained exactly what he said
16:27 11 earlier today, you know.

16:27 12 **MR. HARTLEY:** I'm trying to get to the next point.

16:27 13 **THE COURT:** Yes.

16:27 14 **BY MR. HARTLEY:**

16:27 15 **Q.** Transocean's investigation report concluded otherwise,
16:27 16 though, that the rig crew never diverted overboard prior to the
16:27 17 explosion?

16:27 18 **A.** I don't remember, to be honest with you. They may have.

16:27 19 **Q.** Let's pull up TREN-4248.

16:27 20 I think you said you've reviewed the Transocean
16:27 21 investigation report, Mr. Barnhill?

16:27 22 **A.** I have.

16:27 23 **Q.** If we go to page 193 --

16:27 24 **THE COURT:** Well, you know, I don't know what you're
16:27 25 going to prove by this. The witness has said he doesn't know

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16:27 1 one way or the other. Whatever Transocean's report says, I
16:27 2 guess it says. It's in the record; right?

16:27 3 **MR. HARTLEY:** I'm not sure whether this has been
16:28 4 introduced or not, yet, Your Honor.

16:28 5 **THE COURT:** I'm assuming it's in or will be in
16:28 6 evidence.

16:28 7 **MR. HARTLEY:** Okay.

16:28 8 **THE COURT:** I just don't know the benefit of asking
16:28 9 him beyond what he's already said.

16:28 10 **MR. HARTLEY:** I'll --

16:28 11 **THE COURT:** Let's try to move on.

16:28 12 **MR. HARTLEY:** I'll try to move on and clarify.

16:28 13 **THE COURT:** Let's try to move this on.

16:28 14 **BY MR. HARTLEY:**

16:28 15 **Q.** In doing your work for this case, Mr. Barnhill, did you
16:28 16 look at the configuration of the *Deepwater Horizon*,
16:28 17 specifically the diverter system and the various lines?

16:28 18 **A.** I mean, I'm generally aware of -- as the flow schematic we
16:28 19 showed earlier -- what the general layout was, yes.

16:28 20 **Q.** Are you familiar with there being a separate 6-inch
16:28 21 mud/gas separator line versus the 14-inch line?

16:28 22 **A.** I am.

16:28 23 **Q.** Have you done any review or investigation between those
16:28 24 two lines to see whether one or the other had been activated?

16:28 25 **A.** I haven't done any kind of investigative work. I mean, I

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16:28 1 think I've seen indications where there's some belief that the
16:29 2 fluid may have been coming out of the 6-inch line; there's
16:29 3 indications that fluid may have been coming out of the 14-inch
16:29 4 line. I don't know.

16:29 5 Q. The last subject, then. I think you mentioned in your
16:29 6 deposition that you are familiar, at least generally, with the
16:29 7 *Sedco 711* incident in the North Sea?

16:29 8 A. I was generally aware of it, yes.

16:29 9 Q. Since your deposition, have you done any more review,
16:29 10 looked up any more of the information relating to that event?

16:29 11 A. I don't know that I've seen anything new on that. I know
16:29 12 that I was generally familiar with it. Whether I saw that
16:29 13 information, I -- I assume I saw it before my deposition. I
16:29 14 don't know that I saw anything new on that after my deposition.
16:29 15 I know I saw some information. Whether it was new or not, I
16:29 16 don't know.

16:29 17 Q. That was a well control event in the North Sea that was
16:29 18 similar to what happened ultimately on the *Deepwater Horizon*?

16:29 19 A. There were some similarities, there were some differences,
16:29 20 yes.

16:29 21 Q. They were circulating to seawater in *Sedco 711*?

16:30 22 A. I know they were doing -- to me, they had a live wellbore
16:30 23 and they were doing a completion operation where they were
16:30 24 going to an upper completion, and a flow valve failed. Whether
16:30 25 they were actually in the process of doing displacement or not,

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16:30 1 I don't remember.

16:30 2 Q. Did you ever look at the Transocean "Lessons Learned" from
16:30 3 its review of that *Sedco 711* incident?

16:30 4 A. I may have. I don't remember now whether I did or not.

16:30 5 Q. There was a global advisory issued on April 5th and a
16:30 6 North Sea-specific advisory issued on April 14th. Do you
16:30 7 recall looking at either of those two?

16:30 8 A. I think I have seen those, yes.

16:30 9 MR. HARTLEY: Let's pull up TREN-1525.

16:30 10 BY MR. HARTLEY:

16:31 11 Q. This looks to be a PowerPoint presentation relating to a
16:31 12 toolpusher's conference call in North Sea. Is this a document
16:31 13 you reviewed, Mr. Barnhill?

16:31 14 A. I don't know that I've -- whether I've seen this specific
16:31 15 document or not. Again, like I said, I didn't evaluate this
16:31 16 for purposes of my report, but I think I have seen some
16:31 17 information on it. Whether I saw this particular document or
16:31 18 not, I don't know.

16:31 19 Q. Okay. Well, then, I'm not going to deal too much with you
16:31 20 on that.

16:31 21 Let's skip to TREN-7114. This would be the global
16:31 22 advisory that was issued on April 5th that I think you did say
16:31 23 you reviewed.

16:31 24 A. I believe I've seen this. Let's see --

16:31 25 Q. If we blow up the top part, it's the cover e-mail from

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16:31 1 Barry Braniff forwarding the global ops advisory on April 5th,
16:31 2 2010. Have you seen that, Mr. Barnhill?

16:31 3 A. I don't know if -- I don't know that I've seen this
16:31 4 particular document or not. I may have, but I don't remember
16:32 5 it, sitting here.

16:32 6 Q. Let's skip to the page Bates-labeled 43227. This is the
16:32 7 global operations advisory from April 5th, 2010.

16:32 8 A. I see that.

16:32 9 Q. Did you review this, Mr. Barnhill?

16:32 10 A. I think I may have seen this document, yes.

16:32 11 Q. And you'll see that, if we take the blowout away, that
16:32 12 they're proposing some changes to the *Transocean Well Control*
16:32 13 *Handbook*. Were you familiar with that?

16:32 14 A. If I've seen the document, then, yes, I would have been
16:32 15 familiar with it.

16:32 16 Q. Let me give you a moment to look at it and make sure it's
16:32 17 as I represent it.

16:32 18 A. (Witness reviews document.)

16:32 19 Okay.

16:32 20 Q. Now, I want to go specifically to the next paragraph
16:32 21 that -- the actual changes being proposed and the highlight
16:32 22 right below it.

16:32 23 By the way, have you seen any evidence that this
16:33 24 global operations advisory ever made it to the *Deepwater*
16:33 25 *Horizon* before April 20th, 2010?

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- 16:33 1 A. I don't remember seeing anything on this.
- 16:33 2 Q. Do you remember Mr. Ezell saying he never saw it?
- 16:33 3 A. I remember the discussions with him. I think that's
- 16:33 4 right.
- 16:33 5 Q. In preparing your report and doing your analysis, did you
- 16:33 6 review the deposition of Paul Johnson, one of the rig managers
- 16:33 7 of the *Deepwater Horizon*?
- 16:33 8 A. I think I did look at Paul's deposition before my report,
- 16:33 9 if I remember right.
- 16:33 10 Q. Do you recall him testifying that it hadn't been
- 16:33 11 circulated because Bill Sannan, the general manager for North
- 16:33 12 America, just hadn't got around to it yet?
- 16:33 13 A. Seemed like I remember something about somebody being on
- 16:33 14 vacation or something.
- 16:33 15 Q. So if we look at the specific change being proposed, the
- 16:33 16 first sentence says: "When preparing to displace to a
- 16:33 17 completion fluid which will put the well underbalance, a
- 16:34 18 displacement pumping schedule must be developed and then
- 16:34 19 followed."
- 16:34 20 Do you see that sentence?
- 16:34 21 A. I do.
- 16:34 22 Q. That's something that would have been handy on the
- 16:34 23 *Deepwater Horizon* on April 20th, wouldn't it?
- 16:34 24 A. In my opinion, it would have been.
- 16:34 25 Q. And then it outlines what some of the pumping schedule

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16:34 1 would have included that would have allowed the rig crew to
16:34 2 better monitor operations?

16:34 3 A. Yes, there's several there.

16:34 4 Q. Now, the highlighting at the end of this paragraph says:
16:34 5 "Do not be complacent because the reservoir has been isolated
16:34 6 in in-flow testing. Remain focused on well control and
16:34 7 maintain good well control procedures."

16:34 8 Do you see that?

16:34 9 A. I do.

16:34 10 Q. Now, I think part of your opinion in this case, from what
16:34 11 I understood in reading your report, is that at 2127 or so,
16:34 12 when the drill crew saw this anomaly, they strictly looked
16:34 13 initially at surface issues or problems because they assumed
16:34 14 the well was okay?

16:34 15 A. I think they believed that the well was secure. I think
16:34 16 they focused more on surface indicators than they did downhole
16:35 17 indicators, yes.

16:35 18 Q. They adopted this sort of blinkered approach that happened
16:35 19 on the *Sedco 711*?

16:35 20 A. What do you mean by "blinkered"?

16:35 21 Q. Because of the assumption that there was a positive
16:35 22 in-flow or negative test, they discounted any problems downhole
16:35 23 and looked strictly at the surface indicators?

16:35 24 A. Wait. You said because there had been an influx downhole?

16:35 25 Q. In-flow test or negative test. Because they'd had what

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16:35 1 they thought was a successful test, they discounted any
16:35 2 problems downhole initially and focused strictly on the
16:35 3 surface?

16:35 4 A. I think, basically, what had occurred during the negative
16:35 5 test was they had convinced themselves they understood what
16:35 6 the anomaly was, so that the well was secured. At the point in
16:35 7 time when they saw the anomaly later on, they shut down.
16:35 8 Believing that they had a sealed, secured well, they responded
16:36 9 to what they thought was a surface situation.

16:36 10 At some point, they realized that was incorrect. It
16:36 11 obviously cost them valuable time. And the results, we all
16:36 12 know.

16:36 13 Q. Now, do you think it would have been helpful for the drill
16:36 14 crew to have been reminded of this procedure, of this
16:36 15 vigilance, because a well control event had just happened in
16:36 16 the North Sea?

16:36 17 A. I have no idea.

16:36 18 Q. You don't know whether that would have changed any of the
16:36 19 results?

16:36 20 A. I mean, I know they knew that just from reviewing the
16:36 21 information I reviewed. Whether this would have made a
16:36 22 difference or not, I don't know how to answer that question. I
16:36 23 don't know.

16:36 24 **MR. HARTLEY:** Thank you, Mr. Barnhill.

16:36 25 **THE WITNESS:** Sure.

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16:36 1 MR. HARTLEY: Pass the witness, Your Honor.

16:36 2 THE COURT: BP?

16:36 3 CROSS-EXAMINATION

16:37 4 MR. BROCK: Your Honor, okay to proceed?

16:37 5 THE COURT: Yes.

16:37 6 BY MR. BROCK:

16:37 7 Q. Mr. Barnhill, good afternoon.

16:37 8 A. Good afternoon.

16:37 9 Q. I introduced myself to you back a little bit ago. I'm
16:37 10 Mike Brock, and I represent BP, and I have some questions for
16:37 11 you. I need to say that I have you on cross-examination so
16:37 12 that it's in the record.

16:37 13 A. Okay.

16:37 14 Q. One of the things that you mentioned there at the end of
16:37 15 the last set of questions was that you saw in this case that
16:37 16 there were issues for all. Do you remember saying that?

16:38 17 A. I do.

16:38 18 Q. And one of the things that you said in your report was
16:38 19 that the Macondo well blowout was the culmination of multiple
16:38 20 factors, decisions, oversights, and mistakes; is that correct?

16:38 21 A. It is.

16:38 22 Q. And ultimately you would say that what happened on
16:38 23 April the 20th, 2010, was the result of actions taken by many
16:38 24 different parties?

16:38 25 A. I think there were -- there were mistakes that were made

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16:38 1 by multiple groups that contributed to this, yes.

16:38 2 Q. There were mistakes that were made by BP that contributed
16:38 3 to this accident?

16:38 4 A. Yes.

16:38 5 Q. And you've talked about some of those?

16:38 6 A. I have.

16:38 7 Q. There were mistakes that were made by Transocean that
16:38 8 contributed to this accident, and you've talked about some of
16:38 9 those; correct?

16:38 10 A. I have, yes.

16:38 11 Q. And there were mistakes that were made by
16:38 12 Sperry-Sun/Halliburton that contributed to this accident;
16:38 13 correct?

16:38 14 A. I think so, yes.

16:38 15 Q. And then when we talk about Halliburton, you did not
16:38 16 undertake to look at specifically the cement issues in the
16:39 17 case, so that would be for other people to testify about?

16:39 18 A. Correct. I did not look at the cementing issues in this
16:39 19 case.

16:39 20 Q. All right. Now, you've talked about this a little bit,
16:39 21 and I don't want -- I'm going to try my best not to replot
16:39 22 ground today.

16:39 23 One of the things that you have talked about is the
16:39 24 experience of the Transocean crew; correct?

16:39 25 A. Correct.

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16:39 1 Q. You would agree that it would be prudent for an operator
16:39 2 like BP to engage the *Deepwater Horizon* rig and its crew to
16:39 3 drill the Macondo well?

16:39 4 A. Yes.

16:39 5 Q. That would be a good decision by BP?

16:39 6 A. In my opinion, yes, given the history and the track record
16:39 7 of this rig and its crews, yes.

16:39 8 Q. The *Deepwater Horizon* had some of the best people that
16:39 9 were working on rigs in the Gulf of Mexico and had drilled, as
16:39 10 you've characterized it, record-setting wells?

16:40 11 A. Yes. During my review over the last -- I guess it's been
16:40 12 close to three years now, this was a well thought of,
16:40 13 experienced crew that I believe was technically capable.

16:40 14 Q. They were proud of their record?

16:40 15 A. They were, and I think justifiably so.

16:40 16 Q. And BP was proud of its record in terms of working with
16:40 17 Transocean for the several years leading up to this event;
16:40 18 correct?

16:40 19 A. Yes. I think that's correct.

16:40 20 Q. You have described for us that the central theme in terms
16:40 21 of drilling is to get a good quality, usable wellbore in a safe
16:40 22 manner; correct?

16:40 23 A. Correct.

16:40 24 Q. Do you believe that the men and women of BP and Transocean
16:40 25 who designed this well, drilled the well, implemented the

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16:40 1 design were using their best efforts to achieve that purpose?

16:40 2 A. Yes. I think they were all working towards the central
16:40 3 goal of getting this well drilled, getting it completed, or
16:41 4 getting it finished, temporarily abandoned, and moving on to
16:41 5 the next project.

16:41 6 Q. And doing it in a safe manner?

16:41 7 A. I think so, yes.

16:41 8 Q. The well site leaders do not have the primary
16:41 9 responsibility for monitoring the well, do they?

16:41 10 A. Not for monitoring, they do not, sir.

16:41 11 Q. They do not have the responsibility for continuously
16:41 12 monitoring the well, do they?

16:41 13 A. They do not.

16:41 14 Q. I'm not going to ask the question again about who has that
16:41 15 primary responsibility, so I'll see if I can stay out of
16:41 16 trouble.

16:41 17 Now, in terms of the driller's responsibility, one of
16:41 18 the ways he does that is to monitor fluids; correct?

16:41 19 A. He does.

16:41 20 Q. And another tool that's available to him is to monitor
16:41 21 pressure?

16:41 22 A. It is.

16:42 23 Q. And the drilling personnel on the *Deepwater Horizon* had a
16:42 24 variety of ways to monitor the status of the well; correct?

16:42 25 A. They did.

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16:42 1 Q. "The methods range from using sophisticated data
16:42 2 acquisition systems to more mundane techniques of using drill
16:42 3 crew members to manually check certain well criteria"?

16:42 4 A. That sounds like an incredibly well-read statement.

16:42 5 Q. It comes right from your report.

16:42 6 A. Yes, I agree with that statement.

16:42 7 Q. I'm trying to not put them all up and just see if we can
16:42 8 work through them. I'll raise my hand when I'm reading from
16:42 9 the report. No trick intended by that.

16:42 10 A. Understood.

16:42 11 Q. One important point here is that you would expect that a
16:42 12 minimum of two people would be in the Transocean driller's
16:42 13 shack at all times?

16:42 14 A. Yes, I would.

16:42 15 Q. All right. And in that driller's shack is the BOP panel
16:42 16 that is operated by the crew; correct?

16:43 17 A. Let me just put one caveat on that.

16:43 18 Q. Sure.

16:43 19 A. Certainly during active drilling operations, there may be
16:43 20 times during rig moves or things like that; but yes, during
16:43 21 active drilling operations.

16:43 22 Q. From the time you put the BOP down on the seafloor until
16:43 23 the time you pull the BOP up and sail off, you would expect two
16:43 24 people to be in the driller's shack monitoring the well
16:43 25 continuously?

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16:43 1 A. Correct.

16:43 2 Q. And it's prudent in terms of having the driller and the
16:43 3 assistant driller there to watch the well; correct?

16:43 4 A. Well, right.

16:43 5 The primary responsibility -- again, not to repeat
16:43 6 myself as a driller. The AD has other functions that he's
16:43 7 doing from time to time. He's more -- a lot of times, more in
16:43 8 the pipe-handling role. But certainly there should be -- when
16:43 9 you have a live well and active operations going on, there
16:43 10 should be constant monitoring of the well.

16:43 11 Q. And you agree that the driller's responsibility to monitor
16:44 12 the well continues through the temporary abandonment of the
16:44 13 Macondo well?

16:44 14 A. I do.

16:44 15 Q. It is well known amongst the drilling industry that tested
16:44 16 barriers can fail?

16:44 17 A. It is.

16:44 18 Q. And for that reason -- and you heard Mr. Ezell talk about
16:44 19 it -- that's a period of time during which you should be paying
16:44 20 very close attention to the activity within the well?

16:44 21 A. Not -- I wouldn't necessarily confine it just to when you
16:44 22 had tested barriers, but certainly when you had tested barriers
16:44 23 where you knew you were going to be significantly reducing the
16:44 24 hydrostatic pressure in the well, where you were basically
16:44 25 taking primary well control off the table, then it would gain

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16:44 1 in importance.

16:44 2 Q. Just to make sure I understand what you're saying, if we
16:44 3 look ahead just a bit in time and we say, "We have conducted a
16:44 4 negative test, and the people on the rig believe it's
16:45 5 successful" -- so we'll start with that point. Are you with
16:45 6 me?

16:45 7 A. I am.

16:45 8 Q. Then the drill crew understands that the next step in
16:45 9 terms of the temporary abandonment is going to be an
16:45 10 underbalancing of the well in order to put the well in a
16:45 11 position where you can set the cement plug; correct?

16:45 12 A. Likely so. Now, all that depends on water depth, the
16:45 13 amount of the riser volume. You don't always displace to the
16:45 14 point where you're physically underbalanced, but there is a
16:45 15 possibility that that can happen.

16:45 16 Q. All right. Just to put it simply: In terms of the drill
16:45 17 crew's responsibility in terms of monitoring the well, it
16:45 18 continues during the temporary abandonment process?

16:45 19 A. It does.

16:45 20 Q. And you're not aware of any time between 9:00 and
16:45 21 9:49 a.m. on the evening of the 20th when the Transocean
16:46 22 driller was not monitoring the well?

16:46 23 A. I am not.

16:46 24 Q. Now, Sperry-Sun mud loggers also have the capability to
16:46 25 track volumes and pressures associated with fluid handling?

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16:46 1 A. They do.

16:46 2 Q. And, in fact, we heard from Joe Keith -- and you've
16:46 3 described it some yourself -- that they did, in fact, track
16:46 4 fluid movements during the well displacement?

16:46 5 A. That's my understanding, yeah.

16:46 6 Q. And you heard Mr. Keith testify that he was able to do his
16:46 7 job in terms of understanding where fluids were moving, flow-in
16:46 8 and flow-out; correct?

16:46 9 A. That was my understanding of his testimony, yes.

16:46 10 Q. And it's correct, is it not, that Sperry-Sun's obligation
16:46 11 to monitor the well continued through the temporary abandonment
16:46 12 procedure?

16:46 13 A. It did.

16:46 14 Q. You agree that nothing about the driller's responsibility
16:47 15 to monitor a well like Macondo is contingent on the design of
16:47 16 the well?

16:47 17 A. If I understand your question correctly, I agree with it,
16:47 18 yes, sir. The well-monitoring function should be separate and
16:47 19 apart from well design.

16:47 20 Q. And it's not contingent -- that is, the obligation to
16:47 21 monitor is not contingent on the stage of the well; correct?

16:47 22 A. It is not.

16:47 23 Q. And as we've said or other witnesses have said, the
16:47 24 driller's responsibilities are to constantly monitor to detect
16:47 25 anything unusual or out of the ordinary?

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16:47 1 A. Yes, sir.

16:47 2 Q. And the responsibility to constantly monitor during any
16:47 3 operation is something that's been true throughout your 40-plus
16:48 4 years in the industry?

16:48 5 A. Either the driller or his designee will monitor the well
16:48 6 during active operations, yes, when you have a wellbore exposed
16:48 7 or your last up, yes.

16:48 8 Q. Have you read the deposition of Brandon Burgess, who was
16:48 9 on the *Deepwater Horizon* rig?

16:48 10 A. I did.

16:48 11 Q. Do you remember that he was one of the drillers?

16:48 12 A. I do.

16:48 13 Q. Do you remember that he testified that there is no time
16:48 14 during the life of the well between drilling or temporary
16:48 15 abandonment, or some other stage of the well, that he believes
16:48 16 that you could pay less attention to monitoring the well? Do
16:48 17 you remember him saying that?

16:48 18 A. I remember testimony to that effect. I don't remember it
16:48 19 word for word, but I remember it.

16:48 20 Q. Do you remember him saying, "No, not in my book"?

16:48 21 A. Generally, yes.

16:49 22 Q. And looking at Joe Keith's testimony, do you remember that
16:49 23 he also said that -- if someone had told him that the negative
16:49 24 test may not be good, that the cement on the production casing
16:49 25 could be unstable, that there was a risk of severe gas flow

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16:49 1 potential and channeling with the cement job on the production
16:49 2 casing, "Would that have made you more vigilant in any way?"
16:49 3 and him saying, "No, that would not change what I do. I always
16:49 4 monitor the well"?

16:49 5 A. I caught most of that question. I know you read a list of
16:49 6 things --

16:49 7 Q. Yeah.

16:49 8 A. -- but I do remember Mr. Keith talking about that he
16:49 9 constantly monitored the well.

16:49 10 Q. And that's what you would expect in terms of the standard
16:49 11 of care for both drillers and mud loggers; correct?

16:49 12 A. I would.

16:49 13 Q. Now, I want to turn our attention now to some questions
16:50 14 about the last hour. Okay?

16:50 15 A. Okay.

16:50 16 Q. First, drillers are trained to recognize subtle
16:50 17 indications of kicks; correct?

16:50 18 A. Yes. They should be trained to recognize subtle
16:50 19 indications. Again, that in context with what-all they're
16:50 20 doing, but yes.

16:50 21 Q. Even to put a finer point on it, drillers are trained to
16:50 22 recognize subtle indications for potential kicks; right?

16:50 23 A. If they see something that they believe is out of the
16:50 24 ordinary or is an anomaly, then they're taught to respond to
16:50 25 that.

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16:50 1 Q. And the driller has the capability, as we've talked about,
16:50 2 to adjust his monitors to ensure that he can monitor the well;
16:50 3 correct?

16:50 4 A. Typically, the driller would set up the monitors where
16:50 5 he's comfortable with his ability to monitor what he's seeing.

16:50 6 Q. Right. If he doesn't feel comfortable with the settings
16:50 7 on his monitoring equipment, he has the ability to change those
16:51 8 settings so that he can -- so that he can safely monitor the
16:51 9 well?

16:51 10 A. To an extent, yes.

16:51 11 Q. Now, in terms of this event, you would expect -- you would
16:51 12 certainly expect a drilling crew to catch a kick before it
16:51 13 reaches 300 barrels?

16:51 14 A. I would.

16:51 15 Q. In fact, on a floating vessel, for a kick to be caught --
16:51 16 a kick should be caught in the range of 20 to 30 barrels?

16:51 17 A. Something in that range. Again, a lot of that's going to
16:51 18 depend on ocean conditions, inflow, capability of the
16:51 19 formation, those type of things. But typically, catch and
16:51 20 confirm kicks in a floating operation is a little bit more
16:51 21 convoluted than, say, a land or a fixed-bottom situation.

16:51 22 So I think that's an appropriate discussion range, a
16:51 23 range for discussion.

16:51 24 Q. Generally the standard of care, the standard of practice
16:51 25 would say that you ought to catch a kick within 20 to

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16:52 1 30 barrels on a deepwater floating vessel?

16:52 2 A. I think that's, again, a general discussion point.

16:52 3 Q. You know that Transocean policy says that kicks above
16:52 4 20 barrels are considered red zone kicks?

16:52 5 A. Yes.

16:52 6 MR. BROCK: Now, if we could go to 50000.42.1.

16:52 7 BY MR. BROCK:

16:52 8 Q. I want to pull out a statement from your report.

16:52 9 So we're starting now here on the time period that
16:52 10 begins at 2100 hours. Do you see that?

16:52 11 A. I do.

16:52 12 Q. And you say: "The circulating drill pipe pressure began
16:52 13 to change direction, with the very subtle increase being
16:52 14 observed in the expanded post-incident Sperry-Sun data
16:52 15 presentation."

16:52 16 Do you see that?

16:52 17 A. I do.

16:52 18 Q. And then the next statement down says: The circulating
16:52 19 drill pipe pressure appears to have increased 100 psi during
16:53 20 that time while the pump rate remained constant.

16:53 21 Do you see that?

16:53 22 A. I do.

16:53 23 Q. And that refers to that period of time, 9:01 to 9:08, that
16:53 24 you discussed this morning, doesn't it?

16:53 25 A. It does, yes.

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16:53 1 Q. Now, by 2108, the modeling shows us that about 40 barrels
16:53 2 of hydrocarbons were estimated to have entered the well;
16:53 3 correct?

16:53 4 A. I'd have to go back and look at the simulations, but I
16:53 5 think that's correct.

16:53 6 Q. Let's just look real quick at 1.92.2 -- well, actually,
16:53 7 1.1.1.

16:53 8 THE COURT: Is this from his report?

16:53 9 MR. BROCK: This is from the Bly report that he was
16:54 10 using for his modeling.

16:54 11 BY MR. BROCK:

16:54 12 Q. All right. So you see there's the cover page. And then
16:54 13 if we look at 1.92.2, do you see that the analysis on the
16:54 14 modeling showed that approximately 39 barrels of fluid gain
16:54 15 from the reservoir occurred over the 10-minute period 2058 to
16:54 16 2108.

16:54 17 Do you see that?

16:54 18 A. I do.

16:54 19 Q. Do you agree that the well was flowing beginning at 2052?

16:54 20 A. I think that's when we see some indication in the drill
16:54 21 pipe pressure that that's when it happened. Obviously, I can't
16:54 22 pinpoint it to right at that moment; but I think that's
16:54 23 probably a reasonable estimate, is when conditions started to
16:54 24 change downhole.

16:54 25 Q. Would your best judgment, based on everything that you've

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16:54 1 looked at, be that the well began to flow around 2052?

16:54 2 A. That's the number that I placed on it. But again, that's
16:55 3 a plus or minus number.

16:55 4 Q. All right. And do you have any reason to dispute this
16:55 5 statement that by 2108, there was a 39-barrel gain from the
16:55 6 reservoir?

16:55 7 A. I'm sure that was reported correctly, from what the
16:55 8 simulation showed. Now, what the background, input parameters
16:55 9 were in the simulation, I do not know. But I have no reason to
16:55 10 dispute that, when run, the stimulator gave them that number.

16:55 11 Q. Okay. Do you believe that the well was flowing at 2101 to
16:55 12 2108?

16:55 13 A. I think there probably was slight flow-out of the well at
16:55 14 that point in time. That's 39 barrels over 10 minutes. That
16:55 15 would be about 3.9 barrels per minute, on average. That
16:55 16 probably was not an unrealistic flow rate.

16:55 17 Q. Okay. Thank you.

16:56 18 Let's move, then, to the period of time -- well, I
16:56 19 guess just to wrap this point up: With regard to the
16:56 20 March 8th kick, you testified that the Transocean crew
16:56 21 successfully caught the kick in less than 20 barrels?

16:56 22 A. I think it was 10 to 12 barrels is when they detected the
16:56 23 kick, yeah.

16:56 24 Q. And here, by 2108, this well has flowed at double the red
16:56 25 zone rate as established by Transocean?

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16:56 1 A. Well, not necessarily at the rate, but the volume.

16:56 2 Q. Thank you. It flowed at double the volume of the red zone
16:56 3 standard set by Transocean?

16:56 4 A. It has.

16:56 5 Q. Now, let's focus on the period of time now, please, sir,
16:56 6 2108 to 2114.

16:56 7 MR. BROCK: If we could put up 50000.7.2.

16:56 8 BY MR. BROCK:

16:56 9 Q. Mr. Barnhill, this is on page 6 of your report. So if you
16:57 10 want to look at that, feel free to do that.

16:57 11 A. Okay.

16:57 12 Q. Now, you state in your report that "it is unknown why the
16:57 13 personnel monitoring the well during displacement did not
16:57 14 recognize the developing well control situation at least by the
16:57 15 end of the sheen test"; correct?

16:57 16 A. I do.

16:57 17 Q. If you look at the sentence that's about four lines down
16:57 18 in the pull-out, "A pressure buildup with the pumps off for the
16:57 19 sheen test is clearly indicated on the Sperry-Sun chart."

16:57 20 Do you see that?

16:57 21 A. I do.

16:57 22 Q. And do you say, sir, in your report, that this anomaly
16:57 23 should have triggered action by the drill crew and the
16:57 24 Sperry-Sun mud logger to check out the anomaly.

16:57 25 A. If that information -- if that anomaly was seen and

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16:57 1 detected, then yes, in my opinion, it should have prompted
16:58 2 action.

16:58 3 Q. Now, isn't it correct that the standard of care or the
16:58 4 standard of practice for a driller and a mud logger would say
16:58 5 that, if you have a 250 psi increase during a period of time
16:58 6 when the pumps are off and nothing should be happening, that
16:58 7 that is something that should be detected?

16:58 8 A. Again, depending on the presentation that you have and the
16:58 9 information, then if it's visible, it should be detected, it
16:58 10 should be recognized as an anomaly, and it should be acted on.
16:58 11 That's what I said in my report.

16:58 12 Q. Yes, sir.

16:58 13 So you agree that the driller and the mud logger have
16:58 14 an obligation, under the standard of care or the standard of
16:58 15 practice, to set their screens in such a way that they can
16:58 16 detect a 250 psi increase during a period of time when the
16:58 17 pumps are down?

16:59 18 A. I think they should set their monitoring devices, which
16:59 19 would include the screens, within a range that would allow them
16:59 20 to detect the information that was developing in the well,
16:59 21 whatever that might be. That's typically based on a historical
16:59 22 basis of what's been going on on that particular well. So it
16:59 23 should be set where they can monitor the well.

16:59 24 Q. Do you believe that the monitors should have been set on
16:59 25 the evening of the 20th in such a way that a 250 psi increase

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16:59 1 would be visible during the period of time when the pumps were
16:59 2 down?

16:59 3 A. I think, yes, that probably, if you were going to have a
16:59 4 situation where you were looking at pump pressure at that
17:00 5 period of time, that that would be something that you could
17:00 6 see, as we saw from the Sperry-Sun chart.

17:00 7 Q. It would be reasonable for the drillers and the mud
17:00 8 loggers to have their equipment set in such a way?

17:00 9 A. I think it would be. I think -- again, I think with the
17:00 10 typical scales, you would be able to see that, if that was the
17:00 11 presentation that was on your screen.

17:00 12 Q. Okay. Let me direct your attention to 87201.1, which is
17:00 13 the Transocean Well Incident Report. I just want to show a
17:00 14 couple of screen shots out of that, sir.

17:00 15 A. Sure.

17:00 16 Q. See that this is the cover page?

17:00 17 A. I do.

17:00 18 Q. And you've read this?

17:00 19 A. I have.

17:00 20 Q. Now, if we turn over to 87201.115.1, do you see that this
17:00 21 is a screen shot that is proposed by Transocean for the period
17:00 22 of time that we've just been talking about, beginning about
17:01 23 2109? It covers a much longer period of time, but I want to
17:01 24 focus on the pressure, which is the green line, from about 2109
17:01 25 to 2114. Do you see that?

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17:01 1 A. I do, yes.

17:01 2 Q. And that pressure increase, on the scale proposed by

17:01 3 Transocean, is clearly visible, is it not?

17:01 4 A. It is to me, yeah.

17:01 5 Q. And if you saw that, it would demand an investigation;

17:01 6 correct?

17:01 7 A. Yes. If I saw that, then I would start questioning why

17:01 8 that was occurring, you know. Did I not get the pumps off

17:01 9 completely? What was going on? Do I need to flow-check? What

17:01 10 do I need to do?

17:01 11 Q. Okay. And if you saw something like this, the pumps are

17:01 12 down, a flow check would be the primary well control

17:01 13 intervention that would be available?

17:02 14 A. Yes. I think the first thing I'd do, again, is, I would

17:02 15 confirm that I shut the pump off all the way.

17:02 16 Q. Yes, sir.

17:02 17 A. And then after that, then, yes, I would start looking at

17:02 18 well control.

17:02 19 Q. And as you described earlier, one well control

17:02 20 intervention, in terms of determining if you have flow, would

17:02 21 be simply to walk to the rotary table or sending someone to the

17:02 22 rotary table with a flashlight and look down; correct?

17:02 23 A. Yes.

17:02 24 If you believed you were still having flow through

17:02 25 your return flow line, you could look at the CCTV. If that was

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17:02 1 not available to you, you could send somebody to the rotary
17:02 2 table. If you felt like you didn't want to have anybody out of
17:02 3 the shack, you could send somebody or contact somebody to go to
17:02 4 the shaker house and confirm.

17:02 5 Q. And you believe that, at 2108 to 2114, that a flow check
17:02 6 would have revealed a flowing well?

17:02 7 A. I do.

17:02 8 Q. Now, there was one other tool available to the drillers in
17:03 9 the drill shack, and that was to look at a digital read of
17:03 10 increase in pressure in-flow; correct?

17:03 11 A. Yes. You had the ability -- in fact, whether they
17:03 12 actually had this presentation up on the screen or actually had
17:03 13 a digital format up -- you know, it may have been the digital.
17:03 14 I don't know.

17:03 15 MR. BROCK: All right. So let's look at 87201.119.1.
17:03 16 And I'm looking for the time on this -- actually, we know what
17:03 17 the time is -- okay. Go back to 87201.119, please.

17:03 18 BY MR. BROCK:

17:03 19 Q. All right. So this is -- this is looking at two screen
17:03 20 shots together. Do you see -- the top one is the pressure at
17:03 21 9:08 p.m., start of the sheen test; and the bottom one is the
17:04 22 pressure at 9:14 p.m., at the end of the sheen test.

17:04 23 Do you see that?

17:04 24 A. I do.

17:04 25 MR. BROCK: All right. Then just for ease of

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17:04 1 reference, we'll turn to the next one, which is 87201.119.1.
17:04 2 That's right.
17:04 3 **BY MR. BROCK:**
17:04 4 **Q.** So you see that the pressure here at 9:08 p.m. is shown to
17:04 5 be 1075.9? Do you see that?
17:04 6 **A.** Yes, I do.
17:04 7 **Q.** That's the -- about the fourth column over, the big
17:04 8 columns in the middle. Do you see that?
17:04 9 **A.** I do.
17:04 10 **Q.** Do you have a pointer there?
17:04 11 **A.** I can try to circle it. I'll give it a shot.
17:04 12 **Q.** I was just going to --
17:04 13 **A.** How about that?
17:04 14 **Q.** Excellent, excellent. Thank you.
17:04 15 You're actually the first person in the trial to have
17:04 16 successfully done that.
17:04 17 **A.** That was sheer luck.
17:05 18 **Q.** So that shows the pressure that would be seen on the
17:05 19 digital readout if this screen was being used at 9:08. Do you
17:05 20 see that?
17:05 21 **A.** I do.
17:05 22 **Q.** And this screen would give you a running total over time,
17:05 23 so we'd just have to pick points in time. But this is the
17:05 24 9:08. Do you see that?
17:05 25 **A.** I do.

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17:05 1 Q. All right. Then if we go to what we see at 9:14, which is
17:05 2 87201.119.2, do you see there that in the screen shot that
17:05 3 Transocean proposes in its report, it's showing 1291.4?

17:05 4 A. I do.

17:05 5 Q. So this is another way that the Transocean driller can
17:05 6 access information about changes in pressure?

17:05 7 A. Yes.

17:05 8 Now, my impression is he would not have had two
17:06 9 screens side by side. So basically he would have looked at it
17:06 10 at 9:08, saw a pressure. If he looked back, say, at 9:14, he
17:06 11 would have seen a different pressure. Whether that would have
17:06 12 registered with him or not -- in other words, they don't have
17:06 13 the two screens for comparison purposes like we do here.

17:06 14 Q. I understand that, and thank you for that clarification.

17:06 15 We were looking at two points in time, six minutes
17:06 16 apart; correct?

17:06 17 A. That's correct. That's correct.

17:06 18 Q. But during that period of time, if the driller was paying
17:06 19 attention and watching this screen, he would have seen a trend
17:06 20 digitally of pressure increase while the pumps were down?

17:06 21 A. Right. Depending on how that translates out and when he
17:06 22 walks -- like I said, if he shut it down originally, watched it
17:06 23 for, let's say, the first minute or two, and everything seemed
17:06 24 to be okay, then got busy doing something else, he may miss the
17:06 25 change. But if he saw the change, he certainly should have

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17:07 1 reacted to it.

17:07 2 Q. Even if he missed the digital change, he still has the

17:07 3 benefit of the trend line so that he can see what's happening

17:07 4 over that six-minute period of time?

17:07 5 A. If he has the trend line called up. I don't know whether

17:07 6 he did or not.

17:07 7 Q. So he has available to him a trend line as a tool that he

17:07 8 can use as well as a digital readout?

17:07 9 A. He has those tools. Whether they were actually -- which

17:07 10 ones he had called up, I do not know.

17:07 11 Q. Your opinion is that the Transocean drilling crew should

17:07 12 have conducted a manual flow check followed by immediate

17:07 13 shut-in no later than 2131?

17:07 14 A. 32, 33, within that range, that's correct.

17:07 15 Q. Let me just show you what you've said in your deposition

17:07 16 on this issue and see if you stand by this.

17:08 17 **MR. BROCK:** Let's look at 393, 6 through 12, please.

17:08 18 **BY MR. BROCK:**

17:08 19 Q. Actually, this may be consistent with what you just said.

17:08 20 I apologize.

17:08 21 A. That's okay.

17:08 22 Q. It's your opinion that, once the rig pumps were shut down

17:08 23 at 2131, that a manual flow check, followed by an immediate

17:08 24 shut-in in the Macondo well, should have occurred?

17:08 25 A. Yes, and basically right, the time was referring to when

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17:08 1 the pump got shut down.

17:08 2 Q. Sure. You're saying the well should have been shut in by

17:08 3 2133, 2134, something --

17:08 4 A. Something like that. He would have shut the pump down.

17:08 5 He would have had some period of time for the pressure to

17:08 6 stabilize from the pump coming offline.

17:08 7 The first couple minutes, it looks like, or a minute

17:08 8 or so, it looked like things were basically flat. Then you

17:08 9 would have started to see the pressure move up. And at that

17:08 10 point, I think you start investigating the anomaly.

17:09 11 Q. Even at 2131, there was time for a reasonable driller to

17:09 12 conduct a flow check and shut in the well before gas was above

17:09 13 the riser?

17:09 14 A. Based on the simulation we looked at when Halliburton was

17:09 15 asking the questions, that's what it appears, yes.

17:09 16 Q. Thank you.

17:09 17 Now, at 2136, you say in your report that the drill

17:09 18 crew opened a valve on the standpipe manifold and bled the

17:09 19 pressure for around two minutes. Do you recall that?

17:09 20 A. I do.

17:09 21 Q. Now, that is not a well control action, is it?

17:09 22 A. It's not a primary well control action. It is an action

17:09 23 that happens at times in well control after a shut-in, to check

17:09 24 to see if you've trapped pressure during the shut in.

17:09 25 Q. Sure.

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17:09 1 A. But it is not a primary well control function.

17:09 2 Q. And your view is that the diagnostic process and the

17:09 3 response time was too long for the developing well control

17:10 4 situation?

17:10 5 A. That's my opinion, yes, it is.

17:10 6 Q. Based on your 40 years of experience in the industry,

17:10 7 would you agree that the failure to detect a kick of upwards of

17:10 8 500 barrels is an extraordinary event?

17:10 9 A. Yes. You know, I've seen -- I have seen that happen in

17:10 10 the past, but it is out of the ordinary. That's one of the

17:10 11 things that makes this really so hard to get your arms around,

17:10 12 is the magnitude of the kick.

17:10 13 Q. Transocean's policy calls for a driller and assistant

17:10 14 driller to shut in the well if there are any doubts; correct?

17:10 15 A. It does.

17:10 16 Q. And do you agree that BP is -- or was entitled to rely on

17:10 17 Transocean to do just that?

17:10 18 A. Yes.

17:10 19 Q. You've heard many times a saying, "Shut in the well first

17:11 20 and then investigate"?

17:11 21 A. Or something roughly equivalent to that.

17:11 22 I mean, basically, having taught a lot of well

17:11 23 control, my comment is it doesn't get any better. The sooner

17:11 24 you can shut it in, the better off you are.

17:11 25 Q. Is it a phrase that's commonly heard in well control

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17:11 1 amongst drillers, shut in the well and then investigate?

17:11 2 That's the standard of practice?

17:11 3 A. Again, I don't know that I've heard that exact
17:11 4 phraseology, but it's, you know, shut it in and then figure out
17:11 5 what you've got. "Investigate" sounds more like you guys
17:11 6 talking than those field guys talking. It means the same
17:11 7 thing.

17:11 8 Q. We run into that a lot.

17:11 9 You agree that the driller has full authority to
17:11 10 flow-check or shut in the well as he sees fit, and is not
17:11 11 obligated to check in with the company man before doing that?

17:12 12 A. My understanding -- in fact, that's my understanding of
17:12 13 Transocean's policy, that he does not need to do that.

17:12 14 Q. Okay. New subject. Thank you for your patience.

17:12 15 I'm going to turn to the negative test now.

17:12 16 A. Okay.

17:12 17 Q. First of all, just to clean up something that was said a
17:12 18 little earlier today, do you agree that the Transocean crew was
17:12 19 capable of setting up a negative test, whether it be on the
17:12 20 drill pipe or the kill line?

17:12 21 A. Yes, I think they were capable of doing that.

17:12 22 I think their preference was to do it on the drill
17:12 23 pipe side -- as far as the monitoring, is what we're talking
17:12 24 about, I guess.

17:13 25 Q. Okay.

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17:13 1 A. But they had done it other ways in the past.

17:13 2 Q. Let me just pause just for a second. I want to remind you
17:13 3 about some testimony from Mr. Ezell during the trial, if you
17:13 4 don't mind.

17:13 5 A. Okay.

17:13 6 Q. This is --

17:13 7 MR. BROCK: My Ezell call-outs. I don't have a page.
17:13 8 Give me the ELMO, if you don't mind, please.

17:13 9 BY MR. BROCK:

17:13 10 Q. All right. Do you see -- this is Mr. Ezell's testimony:

17:13 11 "QUESTION: Is your crew capable of setting up a
17:13 12 negative test, whether it be on the drill pipe or kill
17:13 13 line?

17:13 14 "ANSWER: Sure. They can set up a negative pressure
17:13 15 test. It doesn't matter.

17:13 16 "QUESTION: And you said you had done them earlier,
17:13 17 at prior times, on the kill line. It was just more common
17:14 18 to do on the drill pipe?

17:14 19 "ANSWER: Right, right.

17:14 20 "QUESTION: Did you have any concern about the drill
17:14 21 crew or the procedures when you left the drill shack that
17:14 22 day?

17:14 23 "ANSWER: No. Because in my mind, I knew Jason would
17:14 24 have a good safety meeting and have a good plan and
17:14 25 implement the plan with the crews, you know. And if he

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17:14 1 had anything that he was concerned about, I knew he would
17:14 2 call me."

17:14 3 Do you remember him saying that?

17:14 4 A. Generally. I don't know that I remember it word for word,
17:14 5 but I generally remember that conversation.

17:14 6 **THE COURT:** Do you want to give us the page of that
17:14 7 deposition?

17:14 8 **MR. BROCK:** I will. For some reason it's not printed
17:14 9 on the piece of paper I have, but I will. I'll put it here so
17:14 10 I'll remember it.

17:14 11 **THE WITNESS:** Wait. There's a page number at the
17:14 12 top.

17:14 13 **MR. BROCK:** Was there? Ah, thank you.

17:14 14 1802, Your Honor, lines 13 through 25.

17:15 15 **THE COURT:** All right.

17:15 16 **BY MR. BROCK:**

17:15 17 **Q.** Now, you would expect a drill crew -- let me take a step
17:15 18 back.

17:15 19 You understand that there was a meeting on the rig
17:15 20 around 11:00 in the morning to discuss the displacement
17:15 21 procedure to include the negative test; correct?

17:15 22 A. I do.

17:15 23 **Q.** And you've talked a little bit about some of the things
17:15 24 that Jimmy Harrell said at that meeting, based on things you've
17:15 25 looked at; correct?

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17:15 1 A. Yes.

17:15 2 Q. You know that there was a discussion about the conduct of
17:15 3 the displacement and the negative test. They went through the
17:15 4 procedure at that meeting; correct?

17:15 5 A. I know there was discussions about it, yeah.

17:15 6 Q. And you would expect from the Transocean crew, if they had
17:15 7 concerns or issues with conducting the negative test and the
17:15 8 way it was being proposed, that they would speak up and say
17:15 9 something?

17:15 10 A. That would be my expectation, yeah.

17:15 11 Q. And do you know of any information that would indicate
17:16 12 that anyone from Transocean said, "This is a bad idea. We
17:16 13 shouldn't do it this way"?

17:16 14 A. I'm not aware of that comment. As I sit here, I certainly
17:16 15 don't remember it.

17:16 16 Q. All right. Now, you've talked a little bit about MMS
17:16 17 regulations. It's true, is it not, that BP could have complied
17:16 18 with MMS regulations in place on April 20th, 2010, even if it
17:16 19 had not performed a negative test?

17:16 20 A. That is true.

17:16 21 Q. You're not aware of any law or regulation anywhere that
17:16 22 defines how to interpret a negative test?

17:16 23 A. No. As far as how to interpret a negative test, I am not.

17:16 24 Q. Not aware of guidances from IADC on how to conduct a
17:16 25 negative test?

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17:16 1 A. Certainly not prior to this event.

17:16 2 Q. Yeah. So let's take prior to April 20th. Not aware of
17:17 3 any guidances prior to April 20th on how to conduct a negative
17:17 4 test?

17:17 5 A. Correct. In fact, you can get on the Internet right now
17:17 6 and find a lot of negative test procedures.

17:17 7 Q. All right. Not aware of any guidances from SPE on how to
17:17 8 interpret a negative test prior to April 20th?

17:17 9 A. No. I did not go back and research to see what was
17:17 10 available. I was not aware of anything. To my knowledge,
17:17 11 there was none.

17:17 12 Q. You didn't do any research to see what negative tests used
17:17 13 by other operators looked like prior to preparing your report,
17:17 14 did you?

17:17 15 A. I did not specifically for this matter go out and research
17:17 16 other procedures. As I think I indicated in my deposition,
17:17 17 I've written negative test procedures; I've conducted negative
17:17 18 tests; I've seen -- I've reviewed negative test procedures for
17:17 19 other companies, but I did not, as a part of my investigation
17:17 20 here, go out and do research on negative tests.

17:18 21 Q. Now, I think you've said this, but let me just get you to
17:18 22 confirm it.

17:18 23 You know that the Transocean crew was experienced at
17:18 24 conducting and interpreting negative pressure tests?

17:18 25 A. Yes. From my understanding, they had done it before and

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17:18 1 had participated in the interpretation.

17:18 2 Q. And, in fact, just prior to coming to Macondo, the
17:18 3 Transocean crew had conducted a negative test at the Kodiak
17:18 4 well; correct?

17:18 5 A. That's my understanding.

17:18 6 Q. If we could look quickly at 3326.

17:18 7 Do you see this is a negative test while displacing
17:18 8 doc that's dated January 28th, 2010?

17:18 9 A. I am.

17:18 10 Q. Do you see here that it says "Negative Test While
17:18 11 Displacing"?

17:18 12 A. I do.

17:19 13 Q. And if we turn the page here to the actual procedure --
17:19 14 I've actually pulled out paragraph 5 -- do you see it says:
17:19 15 "Displace down drill pipe with seawater to the top of stack."

17:19 16 Do you see that?

17:19 17 A. I do.

17:19 18 Q. And then No. 8, which is the next call-out, is 3326.2.3.
17:19 19 In this test, they were monitoring pressure; right?

17:19 20 A. Yes. So they would have had whatever they were monitoring
17:19 21 on closed in, to see if pressure built up.

17:19 22 Q. And the *Deepwater Horizon* crew also had experience in
17:19 23 planning, conducting, and interpreting negative tests that were
17:19 24 conducted on choke and kill lines; correct?

17:20 25 A. I'm certainly aware of lining up on kill lines before. I

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17:20 1 think -- whether they would have actually monitored on the
17:20 2 choke line or not, I don't know, but I know on kill lines.

17:20 3 Q. So you know they've done other tests looking at the
17:20 4 outcomes on the kill line; correct?

17:20 5 A. Correct.

17:20 6 Q. Now, are you aware that Transocean actually has a THINK
17:20 7 plan for negative pressure tests that checks for flow on the
17:20 8 choke or kill lines?

17:20 9 A. I know I've seen some THINK plans. I'm assuming you're
17:20 10 going to it up so I can see what --

17:20 11 Q. I will.

17:20 12 MR. BROCK: All right. It's 4640.1.1, please.

17:20 13 BY MR. BROCK:

17:20 14 Q. Do you see that this is a *Deepwater Horizon*-specific THINK
17:20 15 procedure for negative flow tests using the choke and kill
17:20 16 lines?

17:21 17 A. Yes, I see that there.

17:21 18 Q. And it goes through a plan and it has a "Communication"
17:21 19 column there in terms of who will be doing what and how
17:21 20 communications should take place?

17:21 21 A. It does.

17:21 22 I notice one of the things on here, when it says
17:21 23 "Check for flow," is to ensure that flow path is open. So
17:21 24 double-check that the line is, indeed, open.

17:21 25 Q. So one of the things I wanted to ask you about -- I

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17:21 1 appreciate you mentioning that --

17:21 2 **MR. BROCK:** If we could go to Demonstrative

17:21 3 D-6652-11. 6652-11.

17:22 4 **BY MR. BROCK:**

17:22 5 **Q.** I wanted to follow up on something that you said earlier
17:22 6 today. We were talking about this period of time over here,
17:22 7 just before 2120, when there is this spike right here. Do you
17:22 8 see that?

17:22 9 **A.** I do.

17:22 10 **Q.** And did you say that this -- that this occurred when they
17:22 11 restarted Pump No. 2.

17:22 12 **A.** Right. If you look over to the pump rate -- yeah, right
17:22 13 there. And you can kind of see the little corresponding blip.

17:22 14 **Q.** Right here?

17:22 15 **A.** Yeah, on the blue.

17:22 16 **Q.** So they restarted Pump No. 2 just before 2120; do you see
17:22 17 that?

17:22 18 **A.** Correct.

17:22 19 **Q.** That's 9:20; correct?

17:23 20 **A.** It is.

17:23 21 **Q.** And did you say earlier today that Pump No. 2 had not been
17:23 22 in use since about 8:00?

17:23 23 **A.** I think in the call-outs that we had looked at, if I
17:23 24 remember it sitting here, I don't think I remember seeing
17:23 25 Pump No. 2 online in those call-outs before that.

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17:23 1 Q. Okay. So Pump No. 2 had been down. And when it was
17:23 2 restarted, it blew a valve; correct?

17:23 3 A. It popped the popoff valve. Correct.

17:23 4 Q. In other words, somewhere in the system, a valve was
17:23 5 closed when they thought it was open?

17:23 6 A. Either that or there was an obstruction. But I think in
17:23 7 the -- in the indication when Mr. Keith called Mr. Curtis, he
17:23 8 indicated they had forgot to open the valve.

17:23 9 Q. That's my point.

17:23 10 And that valve is somewhere on the kill line, isn't
17:23 11 it?

17:23 12 A. It would have been somewhere in that system, in that
17:24 13 manifold system. That's correct.

17:24 14 Q. Somewhere in the kill line was a closed valve that caused
17:24 15 this pressure spike when Pump No. 2 was restarted; fair?

17:24 16 A. Fair.

17:24 17 Q. All right. Your understanding is that the first negative
17:24 18 test -- the negative test that was conducted on the drill pipe
17:24 19 progressed to a point where the men noticed that there was an
17:24 20 anomaly in terms of pressure increases that should not be
17:24 21 there; correct?

17:24 22 A. Yes, sir.

17:24 23 Q. People on the Transocean drill crew, as well as the well
17:24 24 site leaders, knew about the pressure anomaly that took -- that
17:25 25 occurred when the test was conducted on the drill pipe;

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17:25 1 correct?

17:25 2 A. Right. Basically, my understanding is, again, they
17:25 3 attempted to bleed the pressure off, it built back up; and I
17:25 4 don't remember now whether it was one or two times. But then
17:25 5 they started looking for a surface manifestation as to why that
17:25 6 might be happening.

17:25 7 Q. But the point is, that during the conduct of that test,
17:25 8 increased pressure on the drill pipe would be an anomaly?

17:25 9 A. Yes.

17:25 10 Q. And it would be one that would need to be investigated and
17:25 11 resolved?

17:25 12 A. In my opinion, it would.

17:25 13 Q. And the Transocean crew, as well as the BP well site
17:25 14 leaders, were aware of that?

17:25 15 A. I think the well site leader may have not gotten up there
17:25 16 until after the Transocean guys were already looking for the
17:25 17 fluid level in the riser. That's my memory. So at least
17:26 18 initially, this was the Transocean people trying to resolve the
17:26 19 question.

17:26 20 Q. You had Kaluza, who had been -- Bob Kaluza, who had been
17:26 21 present for some period of time; and then Don Vidrine is coming
17:26 22 in toward the end of the first test?

17:26 23 A. No, this is a little bit before that.

17:26 24 Basically what had happened is, Kaluza had been on
17:26 25 the floor for maybe the positive test. There was something he

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17:26 1 had been on the floor for. He had left to go down and finish
17:26 2 up the cement procedure for setting the surface plug, and then
17:26 3 he was coming back up because of the start of the negative
17:26 4 test.

17:26 5 Q. All right. Fair enough.

17:26 6 You would say that BP was being prudent in specifying
17:26 7 that a negative test be conducted on April the 20th; correct?

17:26 8 A. Yes.

17:26 9 Q. And that BP was prudent in conducting the test multiple
17:26 10 times?

17:26 11 A. I think the attempt to resolve the anomalies and
17:26 12 understand the situation indicated that everybody -- as I said
17:27 13 earlier, that everybody on that rig was working to understand
17:27 14 the situation and try to get it right.

17:27 15 Q. Okay. When the test was moved over to the kill line, it
17:27 16 would be prudent to observe for 30 minutes for flow?

17:27 17 A. 30 minutes is -- actually, you'd be surprised how long 30
17:27 18 minutes could be, but it's a good period of time to see if
17:27 19 there are any changes in the wellbore.

17:27 20 Q. And what you know from the review of the records and the
17:27 21 statements is that there was discussion on April the
17:27 22 20th amongst the two company men, the toolpushers, the OIM, and
17:27 23 the drill crew, about the results of the negative pressure
17:27 24 tests; correct?

17:27 25 A. Correct. There were multiple discussions about the test.

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17:28 1 Q. And you're aware, are you not, from the statements and
17:28 2 from the depositions, that the Transocean representatives were
17:28 3 advancing the idea of a bladder effect or an annular
17:28 4 compression?

17:28 5 A. That has certainly been put forward as one of the possible
17:28 6 explanations, yes.

17:28 7 Q. If anyone on the Transocean crew had thought that the
17:28 8 negative pressure test was not a good test, it would be their
17:28 9 obligation to speak up and say, "Stop the job, we're not going
17:28 10 forward"?

17:28 11 A. I think if they believed that there was still an
17:28 12 outstanding issue, they could -- that they were not capable of
17:28 13 resolving --

17:28 14 Q. It's incumbent on the crew -- that is, the well site
17:28 15 leaders and the Transocean crew -- to try to reach an agreement
17:29 16 about whether or not an important test like this has passed?

17:29 17 A. I think it's incumbent on them to try to get it right, and
17:29 18 I think they were trying to get it right.

17:29 19 Q. They have to reach agreement that what they're seeing is a
17:29 20 good test?

17:29 21 A. Yes. Basically -- but at the end of the day, it's the BP
17:29 22 well site leader that ultimately has to say, "Let's go
17:29 23 forward."

17:29 24 Certainly, if everybody thinks -- or if somebody has
17:29 25 an issue that they shouldn't go forward, they can raise that

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17:29 1 issue. At the end of day, really, the only guy that can say
17:29 2 "Let's go forward" is the BP well site leader.

17:29 3 Q. You would agree that the Transocean representatives
17:29 4 involved in interpreting the negative test made a mistake?

17:29 5 A. They did. I think all the guys on the floor made a
17:29 6 mistake.

17:29 7 Q. And that the Transocean crew would not have proceeded with
17:30 8 declaring the negative test a success if they did not feel
17:30 9 comfortable with the explanation that was given for the
17:30 10 differential pressure?

17:30 11 A. Again, you know, we've heard the discussion about the
17:30 12 bladder effect. Obviously, the Transocean guys are not around
17:30 13 to comment about that.

17:30 14 Whether it was that, whether it was a bleed from the
17:30 15 hydrostatic pressures in the well were basically creating an
17:30 16 unbalanced situation, if that was the explanation, at some
17:30 17 point everybody on the rig became convinced that the test was
17:30 18 good, the well was secure, and ultimately the BP company man
17:30 19 made the decision to move forward.

17:30 20 Q. Now, you're aware that Transocean's senior toolpusher,
17:30 21 Randy Ezell, testified that if he were performing a negative
17:31 22 test, he bled off pressure and it built back up, that he would
17:31 23 need to stop and investigate?

17:31 24 A. I believe he did testify to that.

17:31 25 Q. And that's what you would expect of a senior toolpusher, a

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17:31 1 toolpusher, or a driller?

17:31 2 A. I would, and a company man.

17:31 3 Q. Yes, and a company man?

17:31 4 A. And a company man.

17:31 5 Q. And Mr. Ezell likewise testified that he would not declare
17:31 6 a negative test successful before investigating the cause of
17:31 7 the pressure buildup; correct?

17:31 8 A. I believe he testified to that, yes.

17:31 9 Q. And, again, that's what you would expect of a company man,
17:31 10 senior toolpusher, a toolpusher, and a driller in terms of
17:31 11 their competency to understand differential pressures during
17:31 12 the conduct of a negative test?

17:31 13 A. Yes. If there was an anomaly, I would expect that anomaly
17:31 14 to be investigated.

17:31 15 In fact, I'll take it one step further. When the
17:32 16 senior drilling engineer found out about it, that there was an
17:32 17 anomaly, again, steps should have been taken to resolve this
17:32 18 issue.

17:32 19 Q. All right. I want to ask you a few questions now about
17:32 20 Mr. Vidrine and his activity on the evening of the 20th.

17:32 21 A. Okay.

17:32 22 Q. From your expert report, you list two sets of documents
17:32 23 that you reviewed with regard to statements that were made by
17:32 24 Mr. Vidrine after the incident; is that correct?

17:33 25 A. I know I reviewed some well site interviews. I assume

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17:33 1 they got them all listed. Whether they did or not, I don't
17:33 2 know.

17:33 3 Q. Let's look at TREX-50000.76.1.

17:33 4 Do you see there that in your expert report you
17:33 5 inform us that you looked at two sets of interview notes with
17:33 6 regard to Don Vidrine?

17:33 7 A. That's -- that appears to be what that indicates, yes.

17:33 8 Q. Now, let me ask you to turn your attention, if I could, to
17:34 9 3A.1.1. I'm going to pull that up.

17:34 10 Do you see that this is a set of typewritten notes?
17:34 11 It's Robinson, Martin, Cowie, Don Vidrine, BP. Do you see
17:34 12 that?

17:34 13 A. I do.

17:34 14 Q. Now, you're aware, are you not, that these interviews were
17:34 15 conducted shortly after the event?

17:34 16 A. That's my understanding, yes.

17:34 17 Q. And are you aware that Don Vidrine, in terms of the -- in
17:34 18 appearance and his conduct during the meeting was distressed.
17:34 19 He wasn't -- he oftentimes was not talking about things in
17:34 20 sequence, and the people that were conducting the interviews
17:34 21 were doing their best to understand what Don Vidrine remembered
17:35 22 about the evening in question?

17:35 23 A. I did not know that. That would not surprise me, but I
17:35 24 did not know that.

17:35 25 Q. The Court will hear from some of the witnesses who

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17:35 1 conducted those interviews. And I know you haven't looked at
17:35 2 Mr. Cowie's deposition or Mr. Robinson's, but that wouldn't
17:35 3 surprise you to know that, given what Mr. Vidrine had just been
17:35 4 through; correct?

17:35 5 A. It would not.

17:35 6 Q. And you also know from your review of the Bly report that
17:35 7 the Bly report did not endeavor to take word-for-word
17:35 8 transcripts from the people that they were talking to; they
17:35 9 would be writing down notes, but these were basically engineers
17:35 10 conducting these investigations?

17:35 11 A. Understood.

17:35 12 Q. Now, when we look at this note here, if we look at
17:35 13 call-out 3A.2.1, I want to focus on the second paragraph right
17:36 14 there where it says: "Closed it in, opened the bag, lined up
17:36 15 pumps."

17:36 16 Do you see that?

17:36 17 A. Yes.

17:36 18 Q. Then he says -- the notes read: "Guys let me know when
17:36 19 the pill comes up, do sheen test, went to office to check
17:36 20 calls."

17:36 21 Do you see that?

17:36 22 A. I do.

17:36 23 Q. Then -- this doesn't make perfect sense. But then he
17:36 24 says: "Call to say pill was back."

17:36 25 Do you see that?

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17:36 1 A. Yes. Actually, it does not read bad to me.

17:36 2 Q. Okay.

17:36 3 A. From a field standpoint, it kind of reads in a sequence.

17:36 4 Q. Okay.

17:36 5 So: "Guys to let me know when pill comes up, will do
17:36 6 the sheen test, went to the office to check calls."

17:36 7 Then he got a call to say the pill was back. Do you
17:36 8 see that?

17:36 9 A. I do.

17:36 10 Q. And then the next notes is -- this is one you referred to
17:36 11 earlier today, I think: "Went to rig floor."

17:36 12 Do you see that?

17:36 13 A. I do.

17:37 14 Q. That does not say, "Went to drill shack," does it?

17:37 15 A. In my opinion, though, based on my experience --

17:37 16 Q. Stay with my question, please, sir.

17:37 17 A. I understand.

17:37 18 Q. Does not say, "Went to rig floor," does it?

17:37 19 A. It does not -- it does say, "Went to rig floor."

17:37 20 Q. I'm sorry. Does not say, "Went to drill shack"?

17:37 21 A. Correct.

17:37 22 Q. Does not say that, does it?

17:37 23 A. It does not.

17:37 24 Q. "Everything fine.

17:37 25 "Realized at that point to check flow, was not

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17:37 1 flowing as far as he knows."

17:37 2 Now, does that suggest to you that Don didn't
17:37 3 actually do the flow check himself, but someone may have
17:37 4 reported that to him?

17:37 5 A. That, or either he looked at the CCTV monitor and didn't
17:37 6 see anything or -- you're right -- somebody else checked and he
17:37 7 says: "Shaker hand and mud engineer monitoring."

17:37 8 So...

17:37 9 Q. Now, the shaker hand and the mud engineer, they don't do
17:37 10 their work in the drill shack, do they?

17:37 11 A. Typically, no. They do wander in and out, but typically,
17:37 12 their work is not done there. That's correct.

17:38 13 Q. Now, is the term "doghouse" sometimes referred to as
17:38 14 the -- is that the term that's sometimes used to talk about the
17:38 15 drill shack?

17:38 16 A. Typically, in my experience, when you talk about the
17:38 17 doghouse, that tends to be more of a land-type operation. But
17:38 18 it's a term that is used on occasion to talk about where the,
17:38 19 quote/unquote, knowledge box is, which is where the driller
17:38 20 puts stuff at times.

17:38 21 Q. Let's look at 3A.2.2.

17:38 22 Do you see down here -- this is sort of where things
17:38 23 are not going sequentially. We had talked about the sheen
17:38 24 test, and now we're going back in time but a little later in
17:38 25 the notes to talk about the negative test again. Do you see

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17:38 1 that?

17:38 2 A. I do.

17:38 3 Q. And you've referenced this earlier today. Four lines down

17:39 4 it says: Negative test - TO had dismissed drill pipe pressure

17:39 5 as anything serious, somewhat joked about my concern over drill

17:39 6 pipe - they found it humorous that I kept talking about it.

17:39 7 Do you see that?

17:39 8 A. I do.

17:39 9 Q. Then look at the next line: In doghouse - Ezell,

17:39 10 Anderson, Kaluza -- it says Sevette, but I think that means

17:39 11 Revette -- mud engineer Leo and Gordon, maybe Charles Credeur.

17:39 12 Do you see that?

17:39 13 A. Correct.

17:39 14 Q. Now, that right there is talking about the driller's

17:39 15 shack, isn't it?

17:39 16 A. That's what it appears to be, yes.

17:39 17 Q. And the term that's used there is "doghouse," isn't it?

17:39 18 A. It is.

17:39 19 Q. Then look at 3A.3.1. And you see 3A.3.1: "No issues

17:40 20 known about the BOP equipment." We're talking about a

17:40 21 different issue here.

17:40 22 But look down here where he said, "If space out was

17:40 23 standard, Don said, 'Yes, posted in doghouse.'"

17:40 24 Do you see that?

17:40 25 A. I do.

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- 17:40 1 Q. And is that referring to the drill shack, in your mind?
- 17:40 2 A. Yes, it is.
- 17:40 3 Q. Now, if Don Vidrine were going to watch the sheen test,
17:40 4 where would he go?
- 17:40 5 A. Typically, if he was going to watch them catch the sample,
17:40 6 he'd go to the shaker house. And they would typically do it in
17:40 7 the mud lab to see if they were having -- what the percentages
17:40 8 were.
- 17:40 9 Q. Now, isn't the procedure with regard to the sheen test is
17:40 10 that someone will catch the sample as it's coming in and then
17:41 11 walk it right across to the mud lab where the tests would be
17:41 12 conducted to see if the spacer has come back?
- 17:41 13 A. Typically, yes.
- 17:41 14 Q. Because if the spacer has come back, then it's appropriate
17:41 15 to give the order to dump overboard?
- 17:41 16 A. It is.
- 17:41 17 Q. You have a water-based fluid that's coming back up that
17:41 18 is -- that is acceptable to pump overboard?
- 17:41 19 A. Correct.
- 17:41 20 Q. And we talked about this a little bit earlier today in
17:41 21 terms of standards and practices. It's not a breach of the
17:41 22 standard for displacement to bypass the mud logger's flow meter
17:41 23 and dump overboard, is it?
- 17:41 24 A. In my opinion, it is not.
- 17:41 25 Q. And in any event, you do have the ability to monitor flow

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17:41 1 during that period of time on this well with the Transocean
17:42 2 HITEC monitor?

17:42 3 A. You do.

17:42 4 **MR. BROCK:** Now, can you put up for me, Mark -- I
17:42 5 mean Robinson's interview notes, please.

17:42 6 **BY MR. BROCK:**

17:42 7 **Q.** Now, let me go back and show you the first page of this
17:42 8 first.

17:42 9 **MR. BROCK:** 4A, this is Exhibit 4-A, TREX-49. Can I
17:42 10 see page 1 of that, please.

17:42 11 **BY MR. BROCK:**

17:42 12 **Q.** So this is "Steve's interview with Don Vidrine." Do you
17:43 13 see that?

17:43 14 A. I do.

17:43 15 **Q.** And they have some topics there they're going to discuss
17:43 16 with him; correct?

17:43 17 A. Appears to be, yes.

17:43 18 **Q.** Then if you go to the call-out that we were just showing,
17:43 19 I want to call your attention to one thing.

17:43 20 Do you see this has a time on it, 2110? It says:
17:43 21 "Gave order to start."

17:43 22 Do you see that?

17:43 23 A. I do.

17:43 24 **Q.** And then again we come down. There's "Hafle called, Don
17:43 25 told him negative test looked squirrly." And then he said,

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- 17:43 1 "But we're underbalanced."
- 17:43 2 And then what's the next line there say?
- 17:43 3 A. It says: "Watched sheen test (approved it), then to
17:43 4 office."
- 17:43 5 Q. Now, the sheen test was conducted during the period of
17:43 6 time 2108 to 2114; correct?
- 17:43 7 A. It was.
- 17:43 8 Q. And if this note is accurate, Don Vidrine was not in the
17:43 9 drill shack during that period of time, was he?
- 17:43 10 A. If this note is accurate, then he's either watching the
17:44 11 sheen test from the rig floor, which is where he said he went,
17:44 12 or he is not on the rig floor. Because the sheen test is not
17:44 13 being conducted on the rig floor. So if he watched the sheen
17:44 14 test in the mud lab, then obviously he's not on the rig floor.
- 17:44 15 If he's on the rig floor and he's watching the sheen
17:44 16 test, then he's looking at the shut-in pressure buildup that
17:44 17 we've been talking about.
- 17:44 18 So again, we've got two different notes that say two
17:44 19 different things.
- 17:44 20 Q. This note here says, "Watched sheen test"; correct?
- 17:44 21 A. He does.
- 17:44 22 Q. And one of the places where you watch the sheen test is in
17:44 23 the mud lab?
- 17:44 24 A. Yes.
- 17:44 25 Q. In fact, if you're eyeballing it, you have to be in the

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17:44 1 mud lab to see it; correct?

17:44 2 A. Correct. Which is not on the rig floor.

17:44 3 Q. And if you're in the mud lab, you're not in the drill
17:44 4 shack, are you?

17:44 5 A. And you're not on the rig floor. Correct.

17:44 6 Q. But the point here is, from these notes, you don't know
17:45 7 where Don Vidrine was from 2108 to 2114, do you?

17:45 8 A. Well, I know what -- if he says he went to the rig floor,
17:45 9 in my opinion, I know where he is. With this entry, then there
17:45 10 is a question where he was at when he said he watched the sheen
17:45 11 test. Correct.

17:45 12 Q. You don't have personal knowledge of where he was?

17:45 13 A. I do not.

17:45 14 Q. And you can't say from these notes where he was?

17:45 15 A. I cannot.

17:45 16 Q. All right. Let's talk a little bit about the temporary
17:45 17 abandonment procedure, please.

17:45 18 A. Okay.

17:45 19 Q. Again, the *Deepwater Horizon* crew had experience with
17:45 20 temporary abandonment procedures; correct?

17:45 21 A. They had some, yes.

17:46 22 Q. Well, you would say that the Transocean crew was trained
17:46 23 and knowledgeable in how to accomplish a temporary abandonment?

17:46 24 A. I think they understood how to do it, yeah.

17:46 25 Q. And you have said today and in your report that BP

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17:46 1 generated a number of different temporary abandonment
17:46 2 procedures between April 12th and April the 20th; correct?

17:46 3 A. Correct.

17:46 4 Q. And you're aware, are you not, that -- let me step back
17:46 5 for one other thing.

17:46 6 You haven't personally prepared a temporary
17:46 7 abandonment procedure for an offshore well in 20 years;
17:46 8 correct?

17:46 9 A. Probably close to that, yes.

17:47 10 Q. And as part of this exercise, in terms of being an expert
17:47 11 here, you didn't look at temporary abandonment procedures used
17:47 12 by other operators in the Gulf, did you?

17:47 13 A. I did not do research on that.

17:47 14 Q. And when you thought about the level of risk for any of
17:47 15 the Macondo temporary abandonment procedures, you based your
17:47 16 comparison on any one of the temporary abandonment procedures
17:47 17 at Macondo against others that were in the e-mail strings that
17:47 18 you talked about; correct?

17:47 19 A. What I looked at was the fact that we had a very expensive
17:47 20 exploratory well that was drilling, had finally been
17:47 21 accomplished on, that had made a significant discovery, and how
17:47 22 those negative tests stacked up as far as curing that well,
17:47 23 kind of based on the history of the well, as I appreciated it,
17:48 24 in conjunction with the various versions that I saw in the
17:48 25 e-mails. So I took all of that into account.

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17:48 1 Q. Now, if we think about the test that was the one you liked
17:48 2 the best, the April 14th procedure -- can we talk about that
17:48 3 one?
17:48 4 A. The one that I thought was the lowest risk of the ones I
17:48 5 saw?
17:48 6 Q. Yes.
17:48 7 A. Okay.
17:48 8 MR. BROCK: Let's look at 537.1.2, which is an
17:48 9 April 14th e-mail string called "Forward Ops."
17:48 10 BY MR. BROCK:
17:48 11 Q. And do you see this here is a note from Morel to Wilson
17:48 12 and Ronnie Sepulvado saying, "Below are plans forward. Could
17:48 13 you please update the five-day planner to reflect? I will send
17:48 14 out a detailed procedure shortly"?
17:48 15 Do you see that?
17:48 16 A. I do.
17:49 17 Q. And he is seeking feedback from his well site leader
17:49 18 before he finalizes the plan; correct?
17:49 19 A. That's what it appears, yes.
17:49 20 Q. This is a good thing for a drilling engineer to do?
17:49 21 A. It is.
17:49 22 Q. And you agree that the April 14th procedure does not set
17:49 23 out to be a complete procedure?
17:49 24 A. It does not. I think there were additional things that
17:49 25 needed to be included.

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17:49 1 Q. And you agree that at this point in time, April 12th to
17:49 2 14th, the temporary abandonment procedure was not yet final and
17:49 3 was a work in progress?

17:49 4 A. It was definitely a work in progress.

17:49 5 Q. There was a procedure that was also sent out on the 12th;
17:49 6 and with this one on the 14th, you're still looking at draft
17:50 7 procedures that are put out to comment?

17:50 8 A. It is basically a procedure that is a work in progress.
17:50 9 They started on the 12th, and I think they culminated on the
17:50 10 20th.

17:50 11 Q. Now, if we look at TREG-545 GMT.1.2, do you see that this
17:50 12 is an April 15th note from Morel to Sepulvado, Vidrine, Kaluza,
17:50 13 Lambert and others?

17:50 14 A. I do.

17:50 15 Q. And here Morel is indicating that things could still
17:50 16 change between the 15th and the 20th?

17:50 17 A. He indicates that things could still change, that is
17:50 18 correct.

17:50 19 Q. Right. If anything --

17:50 20 A. Basically, whether they got approval or not.

17:50 21 Q. I'm sorry. "If anything changes, I will update and send
17:50 22 the next revision out."

17:50 23 A. Correct.

17:51 24 Q. "We are still waiting for approval of the departure to set
17:51 25 our surface plug 3,000 feet below the mud line."

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17:51 1 Do you see that?

17:51 2 A. I do.

17:51 3 Q. "If we do not get this approved, the displacement/plug
17:51 4 will be completed shallower after running the lockdown sleeve.
17:51 5 Please let me know if you have any questions or suggestions."

17:51 6 Do you see that?

17:51 7 A. I do.

17:51 8 Q. Now, what's your understanding of why BP is thinking about
17:51 9 setting the surface plug at 3,000 feet below the mud line?

17:51 10 A. Basically because they want to run the lockdown sleeve
17:51 11 last. They don't want to damage the lockdown sleeve -- so that
17:51 12 they shifted it from the beginning of the procedure to the end
17:51 13 of the procedure for that purpose.

17:51 14 Q. Okay. And are there risks involved in -- to the integrity
17:51 15 of the lockdown sleeve if you do it at an earlier point in
17:52 16 time? Are there engineering risks that go with that?

17:52 17 A. There could be. You could damage the seal assemblies on
17:52 18 it.

17:52 19 Q. Sure. The difference that we're talking about here, in
17:52 20 terms of what BP is thinking about, is, "Are we going to set
17:52 21 the surface plug at 1,000 feet below the mud line or 3,000 feet
17:52 22 below the mud line?"

17:52 23 A. Well, that's what they're talking about in this particular
17:52 24 deal. To me, there's more involved in it. There are other
17:52 25 decisions that follow this, and it changes up the nature of how

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17:52 1 and when and where you do the negative test.

17:52 2 But basically, part of the discussion is, "Do we set
17:52 3 it at 1,000 feet, the upper plug, or do we set it at 3,000 feet
17:52 4 to accommodate the lockdown sleeve?"

17:52 5 Q. Now, let me ask you to turn -- let's just finish this
17:52 6 out -- to 570.1.1.

17:52 7 Do you recognize this as the application for permit
17:53 8 to modify --

17:53 9 A. Yes.

17:53 10 Q. -- the displacement?

17:53 11 A. This appears to be an APM, yes.

17:53 12 Q. And then if we look at 570.3.2, do you see that this is a
17:53 13 temporary abandonment procedure that is submitted to the MMS?

17:53 14 A. Yes.

17:53 15 Q. And I think you may have looked at this today.

17:53 16 A. I did.

17:53 17 Q. Okay. Do you agree that this procedure is generally
17:53 18 consistent with the April 15th procedure that we looked at?

17:53 19 A. This late in the day, I'd have to go back and look at the
17:53 20 two; but, you know, I -- again, I see the procedure here.

17:53 21 Right now I don't remember the April 15th, even though we just
17:53 22 looked at it.

17:53 23 Q. What if I said to you in your deposition, I asked you the
17:53 24 question:

17:53 25 "QUESTION: And is that temporary abandonment

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17:53 1 procedure, in your view, consistent with the
17:54 2 April 15th temporary abandonment procedure?

17:54 3 "ANSWER: Yes, generally."

17:54 4 Would that help you?

17:54 5 A. It would.

17:54 6 Q. All right.

17:54 7 A. Normally, I try to be straightforward in these things.

17:54 8 Q. I appreciate that. Thank you.

17:54 9 A. But that would help.

17:54 10 MR. BROCK: All right. So let's look at the
17:54 11 temporary abandonment procedure that will be TRES-97.1.1.

17:54 12 BY MR. BROCK:

17:54 13 Q. Do you see that this is the note from Brian Morel to Don
17:54 14 Vidrine, Mr. Kaluza, Mr. Lambert, Mr. Earl Lee, John Guide,
17:54 15 Mark Hafle, Mr. Cocalles, and others?

17:54 16 A. I do.

17:54 17 Q. And is this the operations note for the procedure that was
17:54 18 actually conducted?

17:54 19 A. Appears to be, yes.

17:55 20 Q. Do you agree with the expert for the United States of
17:55 21 America, Mr. Heenan, when he testified that the final temporary
17:55 22 abandonment procedure met the standard of care for an operator
17:55 23 in the way that the negative test is written?

17:55 24 A. You know, I don't remember that testimony of his. But the
17:55 25 fact that they're given the instruction to do a negative test

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17:55 1 and not expanding on it any more than that at that period of
17:55 2 time, with the way that negative tests were viewed, April 20th,
17:55 3 2010, I would not find this inconsistent.

17:55 4 Q. You would not find this inconsistent with the standard of
17:55 5 care?

17:55 6 A. I would not.

17:56 7 Q. Let me step back just for a second on the
17:56 8 April 14th procedure.

17:56 9 One of the things you told us in your deposition was
17:56 10 that the primary -- let me step back just a second.

17:56 11 Your primary criticism of the April 12th procedure is
17:56 12 that it did not include a negative pressure test; correct?

17:56 13 A. Right. If I was kind of looking at everything to compare
17:56 14 from a risk status, then it did not have one, correct.

17:56 15 Q. And you remember that was a note that was sent out to the
17:56 16 rig and said, "What are your inputs?" And it was just the
17:56 17 beginning of the process of establishing the procedure;
17:56 18 correct?

17:56 19 A. I do.

17:56 20 Q. So there's nothing sinister in the fact that it's not
17:56 21 there; it's just that we're getting started with the process?

17:57 22 A. Right.

17:57 23 Q. And it's appropriate to have back-and-forth between the
17:57 24 folks on the rig and the folks on the shore as that is put
17:57 25 together and put in process?

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17:57 1 A. It is. I was a little surprised not to see one in there
17:57 2 originally. But again, it's part of a back-and-to type
17:57 3 situation.

17:57 4 Q. They finally got to a procedure that was okay, though?

17:57 5 A. Yes. I would have tweaked it a little bit, but...

17:57 6 Q. Okay. Now, on the procedure for the 14th that you have
17:57 7 described --

17:57 8 **MR. BROCK:** If we could look at 537.1.4.

17:57 9 **BY MR. BROCK:**

17:58 10 Q. Do you see that this is a procedure that was suggested on
17:58 11 the 14th? Correct?

17:58 12 A. I do.

17:58 13 Q. And in this test, if you look down about seven lines to
17:58 14 the place where it says "wait on cement" -- do you see that?

17:58 15 A. I do.

17:58 16 Q. In the April 14th test, you would be setting the surface
17:58 17 cement plug before you conducted the negative test?

17:58 18 A. You would have. That's why I just said a minute ago I
17:58 19 would have tweaked it a little bit.

17:58 20 Q. This is the one on the 14th; correct?

17:58 21 A. It is. And this is the one I thought, of all of them, was
17:58 22 probably the lower risk. It needed some tweaking. But again,
17:58 23 in my report I didn't say this was a perfect procedure; I just
17:58 24 said, of the ones I looked at, I felt this was the lowest risk.

17:58 25 Q. Now, it's correct, is it not, that if BP had utilized the

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17:59 1 procedure that was being discussed on April the 14th, it would
17:59 2 not have tested the cement in the shoe track? Correct?

17:59 3 A. If they would have gone with the procedure exactly as
17:59 4 written, it would not have been a direct test on the cement in
17:59 5 the shoe track.

17:59 6 Q. Because there would have been a 300-foot cement plug in
17:59 7 the well somewhere below the BOP?

17:59 8 A. That's correct. You wouldn't have known what was holding.
17:59 9 You wouldn't have known whether it was a 300-foot plug or the
17:59 10 shoe track that was holding.

17:59 11 Q. So you could conduct the test and not have stability in
17:59 12 the shoe track but not know it because your 300-foot plug or
17:59 13 your surface plug was holding; correct?

17:59 14 A. If you did it in this order, that's correct.

17:59 15 Q. And there are dangers and risks in doing it that way;
17:59 16 correct?

17:59 17 A. There are.

17:59 18 Q. Because eventually you would come back to complete the
18:00 19 well, and when you did, the first thing you would have to do
18:00 20 would be to drill through the cement plug at the surface;
18:00 21 correct?

18:00 22 A. You would.

18:00 23 Q. And if you didn't have well integrity, you might -- you
18:00 24 might well run into a well control event as soon as you got
18:00 25 back to the well and drilled through the cement?

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18:00 1 A. That is a possibility.

18:00 2 Again, that's why I think there were some very good
18:00 3 things in this. I liked where they were setting the plug, the
18:00 4 fact that they were going to test with -- I think they talked
18:00 5 about testing with base oil to the kill line here.

18:00 6 Again, I think it needed to be tweaked as far as when
18:00 7 things got done. But of the ones that I looked at, I thought
18:00 8 this was the best one that I looked at.

18:00 9 Q. Okay. But we agree that if you perform a negative test
18:00 10 only after setting the cement plug, you're not specifically
18:00 11 testing the shoe track or the annulus cement?

18:01 12 A. No. You would want to do your negative test -- you could
18:01 13 do two. You could do a negative test before you set the plug,
18:01 14 and you could do a negative test after you set the plug.

18:01 15 But typically -- well, the way it would be done is
18:01 16 you would do the negative test; you would set the upper plug
18:01 17 within 1,000 feet of the mud line; you would go back and
18:01 18 weight-test that plug, meaning you set weight on it; and then
18:01 19 you would complete your TA.

18:01 20 Q. The judge will see your report, and I'll just let it speak
18:01 21 for itself. But in your report you say that amongst the
18:01 22 procedures that were being proposed in the early days, the
18:01 23 April 14th was the one you liked?

18:01 24 A. It was the lowest risk of the ones that I looked at.

18:01 25 Q. But despite being lowest risk, it did not test the cement

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18:01 1 in the shoe track?

18:01 2 A. It did not, not the way it's set up here.

18:01 3 THE COURT: Mr. Brock, how much more do you think you
18:01 4 have?

18:02 5 MR. BROCK: I've probably got 15 to 30 minutes.

18:02 6 THE COURT: All right. Let's just break for the
18:02 7 evening. We'll have to come back. Let's recess until
18:02 8 8:00 a.m. in the morning.

18:02 9 THE DEPUTY CLERK: All rise.

18:02 10 MR. BRIAN: Your Honor, before everybody departs, I
18:02 11 thought I might give everybody notice on what I think is the
18:02 12 order tomorrow.

18:02 13 THE COURT: Thank you.

18:02 14 MR. BRIAN: You'll recall that we wanted a break in
18:02 15 the order and put Mr. Newman on at 8:00 a.m. So what I
18:02 16 anticipate is we'll put Mr. Newman on at 8:00, then come back
18:02 17 to Mr. Barnhill.

18:02 18 If there's additional time, I think Mr. Quirk is
18:02 19 available. So I would suggest that we go to Quirk, if that's
18:02 20 acceptable with Your Honor and the PSC.

18:02 21 THE COURT: That's after we finish with Mr. Barnhill?

18:02 22 MR. BRIAN: Yes.

18:02 23 And if we still have time, we would then propose
18:02 24 to play the videotapes of Mr. Murry Sepulvado and Leo Lindner,
18:02 25 which together are about half an hour. I'm pretty positive

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18:02 1 that will fill the day.

18:03 2 **THE COURT:** How long do you think you'll take with
18:03 3 Mr. Newman?

18:03 4 **MR. BRIAN:** I could take -- I'm going to work with
18:03 5 him again tonight. It could be as much as two hours on direct,
18:03 6 maybe less; but it could be two hours or so.

18:03 7 Then after that, on Wednesday -- because
18:03 8 everybody has asked me -- shot me e-mails asking -- Mr. Childs
18:03 9 would come next, followed by Mr. Young. I'm sure that would
18:03 10 fill up Wednesday.

18:03 11 **THE COURT:** Young is a fact witness?

18:03 12 **MR. BRIAN:** Childs is an expert. Mr. Young is a fact
18:03 13 witness.

18:03 14 I'm sure that would fill up Wednesday and
18:03 15 probably spill into Thursday.

18:03 16 Young will be followed by McMahan, then
18:03 17 Mr. Winslow, who are fact witness, possibly some videotapes.
18:03 18 And I anticipate we would get to Mr. Ambrose probably next
18:03 19 Monday.

18:03 20 **THE COURT:** If you haven't already done that, why
18:03 21 don't you circulate what you just told us by e-mail.

18:03 22 **MR. BRIAN:** I will.

18:03 23 We are not going to call Mr. Scates. And we are
18:03 24 considering whether to call Mr. McMahan, but we need to
18:04 25 evaluate that as -- we'll probably make a final decision either

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18:04 1 tomorrow evening or Wednesday morning.

18:04 2 **THE COURT:** Okay.

18:04 3 **MR. BRIAN:** And I will circulate that, Your Honor.

18:04 4 **THE COURT:** Thank you very much.

18:04 5 All right. You have a good evening.

18:04 6 **MR. BRIAN:** Thank you, Your Honor.

18:04 7 (WHEREUPON, the proceedings were concluded.)

8 *****

9 **CERTIFICATE**

10 I, Jodi Simcox, RMR, FCRR, Official Court Reporter
11 for the United States District Court, Eastern District of
12 Louisiana, do hereby certify that the foregoing is a true and
13 correct transcript, to the best of my ability and
14 understanding, from the record of the proceedings in the
15 above-entitled and numbered matter.

16
17
18 *s/Jodi Simcox, RMR, FCRR*
19 Jodi Simcox, RMR, FCRR
20 Official Court Reporter
21
22
23
24
25

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\$33 [1] 4384/12	18th [1] 4319/25 193 [1] 4438/23	3 1/2 [1] 4424/4 3 1/2-inch [2] 4322/11 4335/18 3,000 feet [4] 4495/25 4496/9 4496/21 4497/3	
'	2	3.9 barrels [1] 4459/15 30 [7] 4329/14 4329/18 4335/14 4480/16 4480/17 4480/17 4503/5 30 barrels [2] 4456/16 4457/1 300 [2] 4305/23 4367/2 300 barrels [1] 4456/13 300-barrel [1] 4367/3 300-foot [3] 4501/6 4501/9 4501/12 3089 [1] 4306/17 32 [2] 4434/3 4467/14 33 [2] 4434/3 4467/14 3326 [1] 4475/6 3326.2.3 [1] 4475/18 34 [1] 4374/18 35 [1] 4385/15 355 [1] 4306/14 35th [1] 4306/14 36028 [1] 4304/10 36130 [1] 4305/10 36604 [1] 4303/4 3668 [1] 4302/20 3700 [2] 4306/6 4306/10 38 [1] 4374/18 39 barrels [2] 4458/14 4459/14 39-barrel [1] 4459/5 393 [1] 4467/17 3:00 [1] 4386/17 3A.1.1 [1] 4484/9 3A.2.1 [1] 4485/13 3A.2.2 [1] 4487/21 3A.3.1 [2] 4488/19 4488/19	
'fessed [1] 4398/3 'Yes [1] 4488/23	20 [4] 4302/5 4456/16 4456/25 4493/7 20 barrels [2] 4457/4 4459/21 20004 [2] 4304/22 4306/4 2003 [1] 4392/9 20044 [2] 4304/17 4305/6 2010 [18] 4302/5 4321/3 4330/15 4332/9 4342/23 4371/9 4371/14 4372/1 4394/23 4429/22 4431/15 4442/2 4442/7 4442/25 4446/23 4473/18 4475/8 4499/3	4	
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...with [1] 4315/21 .3 [3] 4380/18 4381/24 4382/6	0	5	
0.3 pounds [1] 4380/13 00675.1 [1] 4371/7 02771 [1] 4302/7	0.3 pounds [1] 4380/13 00675.1 [1] 4371/7 02771 [1] 4302/7	5 1/2 [1] 4424/4 5 1/2-inch [1] 4322/11 5,000 feet [1] 4430/20 5.2.1.TO [1] 4335/2 5.9 [1] 4406/2 500 [3] 4302/20 4305/9 4307/19 500 barrels [1] 4469/8	
1	1,000 feet [4] 4315/1 4496/21 4497/3 4502/17 1.1 [1] 4405/12 1.1.1 [1] 4458/7 1.92.2 [2] 4458/6 4458/13 1/2 [1] 4322/11 10 [2] 4403/15 4459/22 10 minutes [1] 4459/14 10-CV-02771 [1] 4302/7 10-CV-4536 [1] 4302/9 10-MD-2179 [1] 4302/4 10-minute [1] 4458/15 100 psi [2] 4421/21 4457/19 1000 [2] 4306/17 4307/16 1001 [1] 4306/10 101 [1] 4303/16 1075.9 [1] 4465/5 10:36 [3] 4331/15 4331/17 4331/18 10:36 a.m [1] 4331/25 10:46 [1] 4330/23 11 [2] 4477/3 4477/3 1100 [1] 4306/6 1110 [1] 4306/20 11:00 in [1] 4472/20 11:36 [1] 4331/14 12 [2] 4459/22 4467/17 1201 [2] 4306/3 4307/9 1221 [1] 4307/5 1291.4 [1] 4466/3 12th [5] 4371/9 4371/14 4495/1 4495/5 4495/9 13 [3] 4302/14 4310/21 4472/14 1308 [1] 4303/19 1331 [1] 4307/12 1347 [1] 4347/2 14-inch [4] 4437/24 4438/2 4439/21 4440/3 14-pound [1] 4424/9 1400 [3] 4332/22 4336/16 4366/9 14271 [1] 4304/22 1453 [2] 4405/1 4405/5 14th [7] 4441/6 4494/2 4495/2 4495/6 4500/11 4500/20 4501/1 14th that [1] 4500/6 15 [4] 4374/19 4384/10 4403/15 4503/5 15-minute [1] 4386/18 1500 [1] 4366/8 1525 [1] 4441/9 15th [1] 4497/21 15th and [1] 4495/16 16-pound [1] 4424/10 1601 [1] 4303/3 1665 [1] 4307/12 1700 [1] 4307/9 18 [2] 4302/7 4309/2	1	5

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<p>6</p> <p>6 5/8 [1] 4424/4 6-inch [2] 4439/20 4440/2 600 [3] 4303/10 4303/13 4306/17 6000 feet [1] 4317/16 601 [1] 4303/6 60654 [1] 4305/24 618 [1] 4303/22 64 billion-dollar [1] 4351/16 6500 feet [2] 4317/11 4319/11 6500-foot [1] 4318/17 6579 [2] 4313/12 4328/17 6643 [3] 4319/19 4327/25 4344/19 6646 [1] 4313/21 6647 [1] 4311/14 6652-11 [1] 4477/3</p>	<p>9</p> <p>90071 [1] 4306/14 94005 [1] 4305/13 94102 [1] 4304/11 97.1.1 [1] 4498/11 9700 feet [1] 4414/6 9:00 [1] 4359/14 9:00 and [2] 4351/20 4452/20 9:01 [1] 4457/23 9:08 [5] 4421/18 4457/23 4465/19 4465/24 4466/10 9:08 p.m [2] 4464/21 4465/4 9:14 [4] 4366/21 4409/12 4466/1 4466/10 9:14 p.m [1] 4464/22 9:20 [1] 4477/19 9:27 [1] 4422/24 9:30 [3] 4409/21 4422/19 4435/21 9:32 [1] 4351/21 9:33 [1] 4351/21 9:43 [1] 4367/1 9:43 p.m [1] 4367/7 9:49 a.m [1] 4452/21 9th [1] 4303/13</p>	<p>above-entitled [1] 4505/15 Abramson [1] 4303/5 absolutely [4] 4336/22 4336/24 4351/15 4368/6 accept [1] 4328/8 acceptable [2] 4489/18 4503/20 access [5] 4356/19 4390/13 4404/21 4404/23 4466/6 accident [5] 4371/14 4371/15 4447/3 4447/8 4447/12 accommodate [2] 4400/11 4497/4 accomplish [3] 4330/7 4349/22 4492/23 accomplished [2] 4401/16 4493/21 according [3] 4362/17 4364/11 4376/19 accordingly [1] 4340/1 account [3] 4394/3 4414/16 4493/25 accuracy [1] 4325/5</p>
<p>7</p> <p>7-5395 [1] 4304/10 701 [2] 4305/16 4305/19 70113 [1] 4302/24 70130 [6] 4303/7 4303/13 4304/7 4305/17 4306/24 4307/19 70139 [1] 4305/20 70163 [1] 4306/7 70360 [1] 4303/16 70458 [1] 4303/19 70501 [1] 4306/18 70502 [1] 4302/21 70801 [1] 4303/23 70804 [1] 4305/13 711 [4] 4440/7 4440/21 4441/3 4444/19 7114 [1] 4441/21 75270 [1] 4307/10 7611 [1] 4304/16 77002 [2] 4306/10 4307/17 77006 [1] 4304/4 77010 [2] 4307/5 4307/13 77098 [1] 4306/21 7780 [1] 4307/20</p>	<p>A</p> <p>a.m [4] 4331/25 4452/21 4503/8 4503/15 abandon [3] 4315/24 4315/25 4407/7 abandoned [1] 4449/4 abandoning [1] 4319/13 abandonment [21] 4352/24 4376/6 4451/12 4452/9 4452/18 4453/11 4454/15 4492/17 4492/20 4492/23 4493/1 4493/7 4493/11 4493/15 4493/16 4495/2 4497/13 4497/25 4498/2 4498/11 4498/22 ability [11] 4343/6 4344/18 4350/3 4402/16 4402/17 4410/5 4456/5 4456/7 4464/11 4489/25 4505/13 able [13] 4314/8 4316/8 4365/17</p>	<p>4505/15 above-entitled [1] 4505/15 Abramson [1] 4303/5 absolutely [4] 4336/22 4336/24 4351/15 4368/6 accept [1] 4328/8 acceptable [2] 4489/18 4503/20 access [5] 4356/19 4390/13 4404/21 4404/23 4466/6 accident [5] 4371/14 4371/15 4447/3 4447/8 4447/12 accommodate [2] 4400/11 4497/4 accomplish [3] 4330/7 4349/22 4492/23 accomplished [2] 4401/16 4493/21 according [3] 4362/17 4364/11 4376/19 accordingly [1] 4340/1 account [3] 4394/3 4414/16 4493/25 accuracy [1] 4325/5</p>
<p>8</p> <p>8,367 feet [1] 4413/24</p>	<p>8.6 [1] 4424/10 800 [1] 4315/1 8007 [3] 4431/18 4432/12 4434/13 8167 [9] 4408/21 4409/1 4409/23 4411/19 4415/24 4416/20 4417/19 4418/15 4419/12 8179 [4] 4388/22 4389/2 4389/7 4389/25 8180 [1] 4392/2 82 [1] 4384/13 820 [1] 4302/23 8300 feet [1] 4315/7 833 psi [1] 4422/24 8367 [2] 4315/7 4335/19 8367 feet [3] 4323/13 4330/8 4414/14 87 [1] 4323/13 87201.1 [1] 4462/12 87201.115.1 [1] 4462/20 87201.119 [1] 4464/17 87201.119.1 [2] 4464/15 4465/1 87201.119.2 [1] 4466/2 8:00 [5] 4409/20 4428/22 4477/22 4503/15 4503/16 8:00 a.m [1] 4503/8 8:00 in [2] 4328/4 4339/20 8:00 p.m [3] 4362/16 4366/16 4367/5 8:00 you [1] 4377/14 8:00, this [1] 4377/11 8:50 [1] 4359/16 8:52 [5] 4341/14 4343/15 4348/4 4348/11 4359/16</p>	<p>4374/12 4381/17 4382/18 4397/18 4401/13 4419/14 4423/9 4426/25 4453/6 4462/10 abnormal [1] 4406/23 abnormality [1] 4421/17 about [194] 4309/11 4311/10 4312/14 4312/17 4313/9 4313/23 4315/6 4315/7 4316/3 4317/11 4317/19 4318/8 4318/17 4319/11 4319/17 4319/23 4320/11 4320/13 4321/20 4322/13 4326/22 4327/10 4327/25 4328/19 4330/9 4330/20 4330/23 4330/24 4331/1 4331/2 4331/4 4331/8 4333/4 4333/5 4335/22 4340/18 4340/23 4340/24 4340/24 4341/4 4343/8 4344/21 4345/7 4345/23 4346/13 4346/16 4346/25 4349/20 4357/12 4357/13 4358/13 4359/8 4361/16 4362/16 4363/8 4363/16 4366/1 4366/8 4373/6 4373/13 4373/21 4375/16 4375/23 4376/9 4378/16 4379/13 4380/8 4381/15 4386/17 4388/1 4389/13 4390/22 4391/1 4393/15 4396/4 4396/18 4398/22 4399/1 4400/10 4402/6 4403/16 4406/15 4407/14 4407/19 4407/24 4408/23 4409/12 4410/2 4411/6 4412/19 4412/20 4413/3 4413/6 4413/25 4416/11 4416/20 4417/19 4418/13 4418/15 4419/1 4419/2 4419/25 4421/11 4422/17 4422/24 4423/9 4424/2 4425/3 4425/20 4425/21 4426/8 4428/9 4428/22 4430/15 4431/11 4432/5 4432/19 4432/25 4433/1 4433/14 4433/16 4433/22 4433/23 4436/19 4437/3 4437/22 4438/6 4443/13 4447/5 4447/8 4447/15 4447/17 4447/20 4447/23 4449/14 4451/18 4453/14 4455/8 4455/14 4456/1 4458/1 4459/15 4460/17 4462/22 4462/22 4462/24 4465/7 4465/13 4466/6 4470/24 4471/3 4471/20 4472/1 4472/23 4473/2 4473/5 4473/16 4476/25 4477/6 4477/22 4478/24 4480/23 4480/25 4481/16 4482/11 4482/13 4483/16 4483/19 4484/19 4484/22 4487/14 4487/16 4487/18 4487/23 4487/25 4488/5 4488/6 4488/14 4488/20 4488/20 4489/20 4491/17 4492/16 4493/14 4493/18 4494/1 4494/2 4496/8 4496/19 4496/20 4496/23 4500/13 4502/5 4503/25 above [8] 4318/4 4323/23 4323/25 4369/10 4389/16 4457/3 4468/12 4505/15</p>

A		
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