

Deposition Testimony of:

William LeNormand

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Page 8:02 to 8:05

00008:02 This is Volume 2 of the
03 deposition of William LeNormand. Today's
04 date is June 21, 2011; the time is 8:27 a.m.,
05 and we are on the record.

Page 8:08 to 8:13

00008:08 Q. Good morning, Mr. LeNormand. My
09 name is Bruce Bowman, and I represent
10 Halliburton along with Leiza Dolghih. And
11 I'm going to ask you questions. It's kind of
12 like yesterday. You ready?
13 A. Yes, sir.

Page 13:11 to 13:17

00013:11 Q. Right. And what EDS was on the
12 HORIZON?
13 A. I don't recall.
14 Q. Not -- you don't recall?
15 But that's chosen by whom, by
16 Transocean in this situation?
17 A. Yes, sir, the --

Page 21:03 to 22:16

00021:03 Q. Okay. Let me ask you this:
04 Blind shear ram, go through how it's actually
05 supposed to operate and what's it supposed to
06 do, okay? Someone either pushes -- let's say
07 someone pushes the button. Do you have a
08 button that you can push to activate it?
09 A. The blinds sheer close?
10 Q. Yes, sir.
11 A. Yes, sir.
12 Q. Explain to me what happens then.
13 A. If you hold the enable button
14 down and you push the blind shear closed --
15 Q. Uh-huh.
16 A. -- it puts -- sends electric
17 signal down to the pod --
18 Q. Uh-huh.
19 A. -- to fire a solenoid valve.
20 Q. Uh-huh.
21 A. The solenoid valve in turn
22 supplies a 1-inch --
23 THE REPORTER:
24 Surmise?
25 THE WITNESS:
00022:01 No, supplies a -- the pilot to a
02 1-inch shear seal valve.

03 EXAMINATION BY MR. BOWMAN:
04 Q. Okay.
05 A. And then the 1-inch shear seal
06 valve supplies pressure to the close.
07 Q. Pressure's going to close?
08 A. (Moving head up and down.)
09 Q. Okay. Keep going.
10 A. It's going to put force on the
11 hydraulic pistons, which is going to cause
12 the rams to go to the closed position.
13 Q. And is there something that then
14 seals off the bore?
15 A. There's packers and -- that --
16 it's the rubber that the blades engage on.

Page 26:08 to 26:14

00026:08 Now, did you look at the blind
09 shear rams on the HORIZON after the BOP was
10 removed?
11 A. Yes, sir.
12 Q. Okay. What'd you see?
13 A. Mud and what looked to be like
14 cement sitting on top of them.

Page 27:03 to 27:25

00027:03 Q. Okay. So where was the mud
04 located?
05 A. I believe the mud was located on
06 top of the shear rams.
07 Q. On top of it, okay.
08 And is that where the cement was
09 also located?
10 A. I'm not saying it was cement.
11 It just looked like it was cement. We was a
12 pretty good ways from it.
13 Q. Okay. You saw something that
14 thought was -- are you talking about drilling
15 mud?
16 A. To me it was probably drilling
17 mud, yes, sir.
18 Q. Well, you've seen a lot of
19 drilling mud out there?
20 A. Yes, sir.
21 Q. Okay. Whatever it was, it
22 certainly looked like drilling mud to you.
23 Okay. And the other substance
24 you saw looked like cement, right?
25 A. Yes.

Page 28:18 to 29:23

00028:18 Q. Now, then, when you -- did you
19 see that once, one time, or did you see it
20 more than once?
21 A. I probably seen it a couple of
22 times.
23 Q. Couple of times?
24 Okay. Well, where were you when
25 the first time you saw it?
00029:01 A. Where was I at?
02 Q. Yes, sir.
03 A. On the Q-4000.
04 Q. Okay. And -- and was that as it
05 was being brought up is when you saw it?
06 A. No, sir. It wasn't until the
07 LMRP was pulled off the top of the -- the
08 stack is when I seen that.
09 Q. Okay. And that was on top of --
10 that wasn't done subsea; that was done on the
11 surface?
12 A. Yes, sir.
13 Q. Okay. And when's the second
14 time you saw it?
15 A. Probably a little bit later on
16 that day when we went back up there and
17 looked again.
18 Q. You and other people just
19 looking to -- out of curiosity?
20 A. No, sir. We was -- it was part
21 of our job description to function the BOP to
22 get the saltwater out and the preservation
23 fluid in.

Page 31:01 to 32:08

00031:01 Q. Okay. Have you tested
02 previously blind shear rams?
03 A. Yes, sir.
04 Q. Okay. And do you always test
05 those on surface?
06 A. I always test them on surface,
07 yes, sir.
08 Q. Okay. Have -- have you tested
09 the actual shearing ability of blind shear
10 rams?
11 A. I've seen the test done, but I
12 wasn't actually the one doing the testing.
13 Q. Okay. And how is that test
14 done?
15 A. We take a crane and a piece of
16 pipe determined by engineering and the
17 drilling contractor to be what they want
18 their shear test on, hang it by a crane and
19 stick it in the wellbore where it's across
20 the shear rams and push the shear button.
21 Q. Okay. And see if it shears?

22 A. Yes.
 23 Q. Right? Okay.
 24 A. And then we do a pressure test
 25 afterwards.
 00032:01 Q. And what's the purpose of the
 02 pressure test?
 03 A. It's to make sure it seals, I
 04 guess.
 05 Q. Yeah. Make sure you don't have
 06 any pressure, make sure it's sealed off,
 07 right?
 08 A. Yes.

Page 35:07 to 35:13

00035:07 Q. Okay. Explain the difference in
 08 the shearing abilities of the blind shear
 09 rams and the casing shear rams.
 10 A. It's my belief that the casing
 11 shear rams are designed to cut and not seal
 12 and the blind shear rams are designed to cut
 13 and seal.

Page 40:03 to 41:22

00040:03 Q. Okay. Now, let's kind of go the
 04 other way is in -- in the -- these tests that
 05 you've done on blind shear rams, has the
 06 pressure always held correctly?
 07 A. No, sir.
 08 Q. Okay. And in the situation
 09 where you didn't pressure -- when the
 10 pressure didn't hold, that would indicate it
 11 wasn't totally sealed off?
 12 A. That would be correct.
 13 Q. Okay. And so then what did you
 14 do in order to -- you probably tried to fix
 15 it, didn't you?
 16 A. If I recall, we open it up and
 17 inspect it.
 18 Q. Okay. And what'd you find?
 19 A. The pipe we were trying to shear
 20 at the time was, I don't know, something they
 21 called the pink joint. It's -- that's the
 22 only reference I know to it. And it looked
 23 like the fish had folded over and got between
 24 the two ram.
 25 Q. Okay. I'm sorry. This is stuff
 00041:01 you do all the time, and I really don't.
 02 The fish had folded over --
 03 A. Yes, sir.
 04 Q. -- what's that?
 05 What do you mean by "the fish"?
 06 A. It's a -- I just know they call

07 it the fish. I mean, it would be -- it's a
 08 piece of the pipe and they call the fish.
 09 Q. Okay.
 10 A. It folded over when they done
 11 the shear test.
 12 Q. Okay. That -- that fish is the
 13 pipe that was being sheared?
 14 A. I believe that to be correct,
 15 yes, sir.
 16 Q. Okay. And somehow during the
 17 shearing, that pipe had bent over and kept
 18 the ram from totally sealing off?
 19 A. The pipe was cut --
 20 Q. Yeah.
 21 A. -- but the piece of the pipe was
 22 between the two shear rams.

Page 42:04 to 43:05

00042:04 Q. Okay. About when was that
 05 year-wise?
 06 A. I want to say it was, like, five
 07 years ago.
 08 Q. Okay. And was that the only
 09 time this happened or has that happened more
 10 than once?
 11 A. It's the only time I can recall
 12 that happening.
 13 Q. Okay. And after you went in and
 14 you found that, what'd you do, anything?
 15 A. I personally -- the
 16 engineering's handled it. I mean, I didn't
 17 have to do anything at that point.
 18 Q. Okay. What well was this on?
 19 A. It was on the SIT of a stack.
 20 Q. It was on the SIT. Okay.
 21 Who was the operator? Who --
 22 who was -- was it an actual BOP that was on
 23 line or was this a separate test?
 24 A. It was a system integration test
 25 at Berwick.
 00043:01 Q. Okay. Okay. So what, you
 02 reported it to the engineering, and then you
 03 left it up to the engineering to do what?
 04 A. Engineering work out a solution
 05 with the problem and . . .

Page 46:23 to 46:24

00046:23 (Exhibit No. 3629 marked for
 24 identification.)

Page 47:14 to 47:15

00047:14 (Exhibit No. 3630 marked for
15 identification.)

Page 49:08 to 49:09

00049:08 (Exhibit No. 3631 marked for
09 identification.)

Page 49:15 to 50:10

00049:15 Q. Okay. Now, do you know -- or
16 did you get involved in any way in the
17 modifications or trying to find out what the
18 modifications were on the BOP stack on the
19 HORIZON?
20 A. The only modifications I would
21 have been involved with was the ones that
22 came through Cameron.
23 Q. Okay. So you didn't have to go
24 about trying to figure out what modifications
25 were done to the stack?
00050:01 A. Not that I recall.
02 Q. Okay. And the modifications
03 done through Cameron, how did you get
04 involved in those?
05 A. If -- engineering on the BOMs
06 and sometimes we'd look over the BOMs to make
07 sure the tie wraps and some of the loose ends
08 were all there so when we got to the rig,
09 we'd have the proper equipment in field
10 service.

Page 52:01 to 52:02

00052:01 (Exhibit No. 3632 marked for
02 identification.)

Page 52:13 to 53:10

00052:13 Q. Okay. Now, then, let's go down
14 to this August 22nd date. It says: "Found
15 that the ram on one side was closed on the
16 cap stack. Could be due to no open pressure
17 on the open side. After opening the rams,
18 found that we had hydrates under the rams.
19 This is an issue due."
20 Explain all that to me.
21 A. This was merely the comment that
22 the capping stack that was sitting on top of
23 the BOP.
24 Q. Yeah.
25 A. We couldn't get the rams to

00053:01 function or -- let me rephrase that.
 02 They could not get the rams to
 03 function at the time, so we couldn't get the
 04 camera down through it. And, actually, it
 05 was a Hydril stack, not a camera stack. And
 06 I had no bearings. It was just merely a
 07 comment that I noted.
 08 Q. Okay. This is the ram on the
 09 capping stack?
 10 A. That is correct.

Page 53:12 to 53:13

00053:12 (Exhibit No. 3633 marked for
 13 identification.)

Page 58:01 to 58:02

00058:01 (Exhibit No. 3634 marked for
 02 identification.)

Page 59:13 to 60:10

00059:13 Why did you care if these hot
 14 line inlets were removed?
 15 A. At the time it was my
 16 understanding that the -- the pods had been
 17 made nonretrievable and they wanted us to go
 18 retrieve the pods.
 19 So the significance in the
 20 pilot -- or the pod POCV not being there
 21 means that we needed to add a ball valve to
 22 the outside of the pod so, as we were running
 23 it, we -- to separate the S1 supply from the
 24 solenoid supply so we can keep the pod hot or
 25 have hydraulic pressure on the solenoid valve
 00060:01 while we run it on the Lars system.
 02 Q. Okay. Did you end up doing
 03 that?
 04 A. Yes, sir.
 05 Q. Okay. Did it work?
 06 A. The best of my knowledge, it
 07 worked, yes, sir.
 08 Q. Okay.
 09 (Exhibit No. 3635 marked for
 10 identification.)

Page 61:20 to 62:16

00061:20 Q. So what's he doing? He's
 21 somehow asking you, if they fire the blind
 22 shear rams and the super shears again, are
 23 they going to trip off the system? Is that

24 what he's asking you?
 25 A. Yes, sir.
 00062:01 Q. What'd you tell him?
 02 A. I don't remember exactly what we
 03 told him.
 04 Q. Would it trip off the system, in
 05 your opinion?
 06 A. Depending on the number of
 07 solenoid valves we had fired at the time.
 08 Q. Okay.
 09 A. The PETU is not designed to hold
 10 all the pod functions in at one time.
 11 Q. What are the super shears?
 12 A. It's my belief the super shear
 13 are the same as the casing shears.
 14 Q. Okay. So he's talking about the
 15 blinds shears and the casing shears?
 16 A. That's my belief yes, sir.

Page 62:20 to 62:21

00062:20 (Exhibit No. 3636 marked for.
 21 identification.)

Page 63:22 to 64:21

00063:22 Q. Okay. Let's go to the second
 23 page. Up at the top, it says "Background."
 24 You see that?
 25 A. Yes, sir.
 00064:01 Q. It says: "In order to meet the
 02 requirement of redundancy in the containment
 03 systems that are being deployed, we have
 04 identified the blue pod as necessary to meet
 05 our objective for the control of the BOP
 06 stack."
 07 Now, what's he talking about
 08 there from your standpoint?
 09 A. From my standpoint was the
 10 yellow pod didn't have a means with which to
 11 disconnect it if we had a hurricane.
 12 Q. Uh-huh.
 13 A. And what they were wanting to do
 14 is run the blue pod down with a quick
 15 disconnect so you could pull the electrical
 16 MUX cable and the hydraulics off of it and
 17 leave it subsea if something catastrophic
 18 happened and come back to it.
 19 Q. Is that what happened?
 20 A. I'm not aware of us ever having
 21 to use that, no, sir.

Page 64:24 to 64:25

00064:24 (Exhibit No. 3637 marked for
25 identification.)

Page 65:09 to 65:17

00065:09 Q. Okay. Now, down towards the
10 bottom where -- where the e-mail is from him
11 to you and some other people, where he says:
12 We still have a few pieces of the puzzle to
13 put together with the ultimate long term plan
14 for being able to operate the HORIZON BOP
15 stack.
16 You see that?
17 A. Yes, sir.

Page 65:23 to 65:24

00065:23 Q. I mean, he's talking about that
24 as opposed to a capping stack?

Page 66:02 to 66:03

00066:02 A. The best of my knowledge, yes,
03 sir.

Page 67:07 to 67:10

00067:07 Q. Right. And what parts did you
08 operate?
09 A. I can recall the fail-safe
10 valves.

Page 67:17 to 67:19

00067:17 Q. Did you try to operate parts of
18 the HORIZON BOP stack that you could not
19 operate?

Page 67:22 to 67:25

00067:22 A. There was parts that we couldn't
23 operate due to the intervention where some
24 hoses or HITS had been put in and things like
25 that.

Page 68:16 to 68:17

00068:16 Q. Did you try to see if the
17 emergency disconnect system would work?

Page 68:20 to 69:01

00068:20 A. We couldn't see if the emergency
21 disconnect circuit would work because that
22 software resides in the panels, and we were
23 using PETUs.
24 EXAMINATION BY MR. BOWMAN:
25 Q. Okay. Could you try to
00069:01 ascertain whether the deadman's would work?

Page 69:04 to 69:11

00069:04 A. We never rearmed it once we went
05 subsea with the pods.
06 EXAMINATION BY MR. BOWMAN:
07 Q. Why?
08 A. That -- why didn't we rearm it?
09 Q. Yes, sir. Yes, sir.
10 A. I didn't rearm it because I
11 never was asked to.

Page 71:13 to 72:18

00071:13 Q. After April 20th and you tested
14 it for functions with a yellow and blue pod.
15 A. On the yellow pod on the
16 Q-4000 --
17 Q. Yeah.
18 A. -- we did get it to work, if I
19 recall correctly.
20 Q. Okay. And by getting it to
21 work, what did it do?
22 A. It fired the necessary
23 functions.
24 Q. Okay. It fired.
25 Did the blind shear ram close?
00072:01 A. The pod was on the deck, and the
02 BOP was subsea.
03 Q. Okay. So that means it did
04 close or you don't know if it closed?
05 A. That means it couldn't have
06 closed.
07 Q. Okay. Because that wasn't what
08 you were testing?
09 A. We were testing the pod.
10 Q. You were testing the pod. You
11 weren't testing the shear rams to see if
12 they'd work or not?
13 A. That's correct.
14 Q. You were testing the pod to see
15 if you could get it to fire?
16 A. That's correct.
17 Q. Okay.

18 A. On surface.

Page 74:21 to 74:24

00074:21 Q. Okay. And if it's not in the
22 event log, then that would indicate you
23 didn't test it or that you just forgot to put
24 it down or what?

Page 75:02 to 75:03

00075:02 A. No, it would indicate we didn't
03 test it. Everything we done got put down.

Page 75:12 to 75:13

00075:12 (Exhibit No. 3638 marked for
13 identification.)

Page 75:19 to 75:25

00075:19 Q. Okay. Now, let's just look at
20 this first page. Does this drawing look
21 similar to what the BOP on the HORIZON would
22 have looked like?
23 A. It's missing the hot line.
24 Other than that I'd say it looked pretty
25 close.

Page 77:05 to 77:09

00077:05 Q. Yeah. Let's -- let's assume
06 that this BOP was supposed to deliver up to
07 4,000 psi as a pressure, okay? Do you have
08 to have sufficient hydraulic power to enable
09 that amount of psi to be delivered?

Page 77:12 to 77:14

00077:12 A. It is my belief that, yes, sir,
13 you'd have to have more than that in there
14 for . . .

Page 78:04 to 78:09

00078:04 Do you know who picks the, say,
05 four -- let's assume this 4,000 psi is
06 correct. Do you know who it is that picks
07 the amount of the pressure? In other words,
08 is that Cameron, is that the customer, or do
09 you know?

Page 78:12 to 78:12

00078:12 A. I believe it to be engineering.

Page 78:14 to 78:16

00078:14 Q. Okay. Engineering from?
15 A. Cameron.
16 Q. Cameron. Okay.

Page 79:20 to 79:21

00079:20 (Exhibit No. 3639 marked for
21 identification.)

Page 81:01 to 82:04

00081:01 Q. Do you have an opinion on
02 whether the blind shear rams operated at any
03 time following the explosion on the DEEPWATER
04 HORIZON -- HORIZON on April 20, 2010?
05 A. I believe at some point during
06 or after the explosion, the shear rams did
07 operate, yes, sir.
08 Q. Do you have an opinion as to
09 what operated the blind shear rams?
10 A. No, sir, I personally do not
11 have an opinion on.
12 Q. Do you have a range of choices
13 or systems that could have been responsible
14 for operating the blind shear ram? In other
15 words, can you narrow it down to two or three
16 things that might have operated the blind
17 shear ram?
18 A. Yes, sir.
19 Q. What's on your list?
20 A. The couple of things that come
21 to mind is the deadman, the auto shear, or
22 the ROV intervention is my belief.
23 Q. Anything else in addition to
24 those three you just listed for me?
25 A. Not that I can think of.
00082:01 Q. If the deadman or the AMF
02 operated the blind shear ram, do you agree
03 that that would have been done close in time
04 following the explosion on April 20, 2010?

Page 82:09 to 82:15

00082:09 A. I personally don't know the
10 exacts on when or if it did operate, no, sir.

11 EXAMINATION BY MR. BAAY:
12 Q. Right. My question's a little
13 different. Assume it had operated, would
14 that have occurred within ten minutes of the
15 explosion on April 20, 2010?

Page 82:18 to 82:25

00082:18 A. Assuming it was armed and
19 assuming it did operate, it -- it would have
20 happened whenever the loss of electrical and
21 hydraulic power and all the conditions were
22 met to fire the deadman.
23 EXAMINATION BY MR. BAAY:
24 Q. And that would have happened
25 quickly after the explosion?

Page 83:03 to 83:03

00083:03 A. It's my belief that -- yes, sir.

Page 83:05 to 83:13

00083:05 Q. For the auto shear -- and to be
06 clear on this, it's when they cut the auto
07 shear pin; is that true?
08 A. That's what would have activated
09 it, yes, sir.
10 Q. And they -- they took that step
11 as part of the intervention following the
12 explosion, didn't they?
13 A. I believe they did.

Page 83:22 to 83:25

00083:22 Q. Let me ask it this way: Is your
23 memory that the auto shear pin was cut some
24 days after the explosion?
25 A. That is correct.

Page 84:05 to 84:24

00084:05 Q. And when you say ROV
06 intervention, specifically what are you
07 talking about?
08 A. It's my belief that they used
09 the ROVs to help close the shear rams or pump
10 into the shear ram close port.
11 Q. And so, physically, that would
12 mean that your ROV would not stab onto the
13 BOP stack?
14 A. Yes, sir.

15 Q. And it would pump a certain
 16 amount of hydraulic fluid to operate the
 17 blind shear ram?
 18 A. That's my belief, yes, sir.
 19 Q. And that, in fact, that physical
 20 act of the ROV coming into the hot stab port,
 21 was done for the DEEPWATER HORIZON.
 22 Is that your understanding?
 23 A. That's my understanding, yes,
 24 sir.

Page 88:24 to 90:20

00088:24 Q. And to be clear, you were
 25 troubleshooting maintenance or service
 00089:01 problems or repair issues with BOP -- with
 02 Transocean's BOP equipment?
 03 A. Yes, sir. When y'all had
 04 downtime incidents, we'd troubleshoot it over
 05 the phone and try to get techs out to the
 06 rigs.
 07 Q. Okay. And explain to me how
 08 that worked. Would Mr. Fry call you and
 09 consult you on the problem they were having?
 10 A. Yes, sir.
 11 Q. And would he discuss with you
 12 solutions to those BOP maintenance issues?
 13 MR. NICHOLS:
 14 Objection, form.
 15 A. We would talk about the problems
 16 at hand on the rig if -- you know, and the
 17 best way to move forward in fixing the
 18 problems.
 19 EXAMINATION BY MR. BAAY:
 20 Q. And would the result of some of
 21 those conversations be that he would ask you
 22 to send a Cameron service tech out to the
 23 rig?
 24 A. Yes, sir. On some incidents we
 25 sent Cameron service techs out to the rigs.
 00090:01 Q. Okay. So in some instances, you
 02 would talk through the problem, he would find
 03 a solution that a Transocean subsea engineer
 04 could fix; is that true?
 05 A. That is correct.
 06 Q. In other circumstances you would
 07 discuss the problem and he would say, hey, I
 08 think I need to have a Cameron service hand
 09 come help me on this?
 10 A. Yes, sir.
 11 Q. Okay. And in -- in those
 12 interactions, do you believe or did -- did
 13 you draw the opinion that Mr. Fry was
 14 knowledgeable about servicing and maintaining
 15 Cameron BOPs?

16 A. Yes, sir, Mr. Fry was
17 knowledgeable on the Cameron BOP.
18 Q. Did you like Mr. Fry?
19 A. Yes, sir. I had no problems
20 with Mr. Fry.

Page 91:16 to 92:11

00091:16 Q. And by that, you mean you'd go
17 out to the rig and service the BOP together
18 with these gentlemen?
19 A. Yes, sir.
20 Q. Same set of questions for
21 Mr. Stringfellow: In your opinion was he
22 good at his job?
23 A. I believe him to be good at his
24 job, yes, sir.
25 Q. Do you believe he was
00092:01 knowledgeable about Cameron blowout
02 preventers?
03 A. Yes.
04 Q. And do you believe he was
05 knowledgeable about servicing and maintaining
06 blowout preventers?
07 A. Yes, sir.
08 Q. In other words you were
09 impressed at how he did his job?
10 A. He done a good job at doing his
11 job.

Page 95:03 to 102:06

00095:03 Q. Okay. So the AMF was a
04 fail-safe measure or a -- could have been a
05 backup to use for the well intervention
06 efforts?
07 A. I'd believe it to be called a
08 backup for the well intervention efforts.
09 Q. And what you wanted to do is
10 make sure that the AMF would function if it
11 were called upon as a backup?
12 A. If it was decided to be used,
13 yes, sir.
14 Q. And in the process of making
15 sure the AMF worked, you wanted to make sure
16 that the solenoid valves worked?
17 A. And testing the AMF is part of
18 checking to see if the solenoid valves
19 worked, yes, sir.
20 Q. Correct. And my understanding
21 is that you tested the valve, the Solenoid
22 Valve 103, in the yellow pod one time; is
23 that correct?
24 A. No, sir, it actually got tested

25 numerous times in the report. We tested it
00096:01 on the AMF.

02 Q. Let's -- let's look at
03 Exhibit 3602. So if you turn to page 3 of 19
04 and go to 2140, you see where I'm looking?

05 A. Yes, sir.

06 Q. You say you simulated deadman
07 tests on the solenoid, and you jumped a
08 sentence down and said: This was the
09 incorrect solenoid valve, as during the
10 deadman, the high pressure blind shear
11 Solenoid Valve 103 is the solenoid valve that
12 energizes?

13 A. Yes, sir.

14 Q. So that was the first attempt,
15 and then you determined that you were testing
16 the wrong solenoid valve; is that true?

17 A. That is correct.

18 Q. And then you jumped down to the
19 next time entry, 2146, and that's where you
20 test the Solenoid Valve 103 for the first
21 time.

22 Agree to that?

23 A. For the first time, yes, sir.

24 Q. Okay. And what you decide here
25 is, you say: Electromagnetic pin was held
00097:01 against Solenoid Valve 103 and the deadman
02 was fired. You say: "No indications of the
03 valve firing."

04 And so that was your first
05 indication that Solenoid 10 -- Solenoid Valve
06 103 did not work as you were expecting it to?

07 A. That is correct.

08 Q. Okay. And so my question is:
09 Was this the one time that you tested
10 Solenoid 103 when you were on the Q-4000?

11 A. No, sir. I believe we fired the
12 103 solenoid valve from SEM A and SEM B when
13 we were on the Q-4000, if I recall correctly.

14 Q. When you tested it at this entry
15 we just looked at, 2146, do you know whether
16 it was tested with both SEMs?

17 A. It's my belief that both
18 deadman's were active at that time.

19 Q. Okay. So does that mean -- help
20 me out here.

21 Does that mean that you used --
22 you energized both coils at this 2146 entry?

23 A. The AMF would energize the
24 coils. We didn't physically energize the
25 coils.

00098:01 Does that make sense?

02 Q. Sure.

03 And the AFM energized both coils
04 at this time?

05 A. The AFM should have energized
06 both coils at the time, yes, sir.
07 Q. Okay. And your testimony is, at
08 a later time -- well, let me ask it this way:
09 This was May 6, 2010.
10 You agree to that?
11 A. Yes, sir.
12 Q. When is the next time that you
13 test Solenoid Valve 103?
14 A. Give me just a second.
15 Q. If you -- if you flip to that
16 next page, 4 of 19, and this is an entry on
17 May 7, 2010, there's a note at the very
18 bottom that says: "Function 103 would not
19 fire using the PETU on SEM A or SEM B"?
20 A. Yes, sir, that's it.
21 Q. Okay. So the next time you
22 tested it was just the next day on May 7th?
23 A. Yes, sir.
24 Q. And does this entry mean that
25 you tested it with SEM A once and then with
00099:01 SEM B?
02 A. Yes, sir, I believe that to be
03 true.
04 Q. Okay. So on May 6th, you tested
05 energizing both coils; is that right?
06 A. We armed both.
07 Q. Armed both coils?
08 A. We armed the deadman in both
09 pods, I meant. You can't say the deadman's
10 fire at -- whenever all the conditions are
11 met is when it's triggered. So I mean, I
12 couldn't tell you exactly if we fired both
13 coils or . . .
14 Q. Okay. That's a good point.
15 Do you agree that when the AMF
16 is programmed, it's programmed to energize
17 both coils of Solenoid Valve 103?
18 A. It's my belief that the
19 deadman's on A fires independent of the
20 deadman on B. So it fires -- whenever A
21 receives all its information that it needs to
22 fire, it fires A and when B gets all its
23 information it needs to fire, it fires, I
24 meant. They could be simultaneous, and they
25 could be separate.
00100:01 Q. Perfectly stated.
02 So it -- they could have been
03 both energized on May 6th; but the bottom
04 line is, you agree it was tested on May 6th?
05 A. Yes, sir.
06 Q. And you agree that it was tested
07 on May 7th?
08 A. Individually, yes, sir.
09 Q. Individually. You know on May 7

10 it was tested energizing one coil at a time?
11 A. On May -- yes, sir.
12 Q. Are there any other occasions
13 during your time on the Q-4000 that you
14 believe you tested Solenoid Valve 103?
15 A. There's no more times that I
16 believe we tested the original Solenoid
17 Valve 103.
18 Q. Okay. So original Solenoid
19 Valve 103 was tested twice on the Q-4000 in
20 May of 2010?
21 A. I'd call it three times,
22 but . . .
23 Q. Why do you make the distinction?
24 A. Because we tested A, we tested B
25 and then we tested the deadman.
00101:01 Q. Understood.
02 You were not involved with any
03 additional testing on Solenoid Valve 103,
04 other than the times we've just mentioned; is
05 that right? Putting aside Michoud?
06 MR. NICHOLS:
07 Yeah.
08 EXAMINATION BY MR. BAAY:
09 Q. Putting aside Michoud.
10 MR. NICHOLS:
11 Yeah.
12 EXAMINATION BY MR. BAAY:
13 Q. We're just focused on Q-4000
14 right now.
15 A. No, sir. That was all I was
16 involved with on the Q-4000, testing the
17 solenoid valve.
18 Q. Okay. And did I understand you
19 correctly to say that the tests you were
20 performing on the Q-4000 were not designed to
21 determine why the solenoid did not fire
22 correctly?
23 A. That is correct. Our main goal
24 at that point was to get the pod up and
25 running and send it back subsea.
00102:01 Q. But when Solenoid 103 from the
02 yellow pod was tested at Michoud, it was
03 tested to determine why it did not fire
04 correctly? Do you agree to that? Why it did
05 not function correctly?
06 A. Yes, sir, I'd agree with that.

Page 107:21 to 109:01

00107:21 Here's my question: Were you
22 involved in this testing at Michoud of
23 Solenoid 103, Solenoid Valve 103?
24 MR. COULSON:
25 Objection, form.

00108:01 A. Which part of the testing?
 02 EXAMINATION BY MR. BAAY:
 03 Q. Well, this testing -- I believe
 04 the testing that Mr. Linenberger -- I'll
 05 represent to you the testing Mr. Linenberger
 06 is talking about occurred in March of 2011.
 07 MR. COULSON:
 08 Same objection.
 09 A. I was involved in the deadman
 10 testing, but the bench testing of the
 11 solenoid valve, no, sir, I was not personally
 12 involved in.
 13 EXAMINATION BY MR. BAAY:
 14 Q. Okay. Did you know before I
 15 just read you Mr. Linenberger's' answer that
 16 the valve fired successfully three times?
 17 A. The --
 18 MR. COULSON:
 19 Objection, form.
 20 A. The testing of the deadman?
 21 EXAMINATION BY MR. BAAY:
 22 Q. The testing of Solenoid Valve
 23 103.
 24 A. I believe when we had the -- the
 25 103 that came in on the pod that we tested it
 00109:01 three times and, yes, sir, it did work.

Page 113:02 to 113:20

00113:02 Q. I believe you were asked in a
 03 question -- you were asked a question about
 04 this yesterday. And -- and it states that
 05 Solenoid Valve 103 was noted not to have a
 06 Cameron supplied E connector installed. The
 07 E connector's different than the Cameron
 08 issued. Then in -- then you list Seacon
 09 identification numbers.
 10 Here's my question: Do you
 11 agree that Seacon is the supplier of
 12 E connectors for Cameron?
 13 A. I agree that Seacon supplies the
 14 E connector for Cameron, yes, sir.
 15 Q. So if Mr. Carter Erwin testified
 16 that Seacon is the supplier, you wouldn't
 17 disagree with that -- the supplier of
 18 E connectors to Cameron, you wouldn't
 19 disagree with that?
 20 A. No, sir.

Page 117:02 to 117:14

00117:02 Q. Can you describe for me what the
 03 typical circumstances are in which a Cameron
 04 service technician is called to a rig?

05 A. If a drilling contractor needs
06 maintenance or help with a rig moved
07 normally.
08 Q. Was that true for the work that
09 Cameron did for Transocean, in your
10 experience?
11 A. Yes, sir.
12 Q. And so you said maintenance
13 and -- and rig move assistance?
14 A. Yes, sir.

Page 119:01 to 119:14

00119:01 Q. Okay. Would you also go out,
02 help take apart and put -- put back together
03 ram blocks and ram assemblies?
04 A. I normally didn't do that, but
05 we had people that did.
06 Q. Cameron does it for Transocean;
07 is that right?
08 A. Yes, sir.
09 Q. And --
10 A. When called upon.
11 Q. And when you say when called
12 upon, that's when people like Mike Fry would
13 call you and ask for your assistance?
14 A. That is correct.

Page 120:05 to 121:03

00120:05 Q. Do you agree that the work that
06 Cameron does to service and inspect
07 Transocean's BOPs is an important part of
08 maintaining your blowout preventers?
09 A. Yes, sir, I believe the work
10 that Cameron does.
11 Q. Okay. During your time -- as I
12 understand it, you were a field service
13 technician for, roughly, six years in the
14 field?
15 A. Yes, sir.
16 Q. From 2000-2006; is that right?
17 A. Yes, sir.
18 Q. Okay. And through that time
19 approximately how many Transocean rigs did
20 you go service? And I'm not looking for a
21 precise number, I just need a ball park.
22 A. Probably around 100.
23 Q. Through that same time period,
24 how many times would you estimate you were on
25 the DEEPWATER HORIZON? I know you said
00121:01 several, but what's a more precise number we
02 could put on that.
03 A. Probably 20.

Page 121:15 to 122:04

00121:15 Q. Sure. Based on your experience
16 in working with Transocean in the 100
17 times -- plus times you've been on a
18 Transocean rig to help service their blowout
19 preventers, would you agree that they're
20 proactive about getting Cameron involved to
21 help service their blowout preventers?
22 MR. NICHOLS:
23 Objection, form.
24 A. I believe y'all called us when
25 y'all had problems or needed help, yes, sir.
00122:01 EXAMINATION BY MR. BAAY:
02 Q. And we weren't shy about doing
03 it; you'd agree to that?
04 A. I'd agree with that.

Page 123:07 to 123:12

00123:07 Q. Do you agree that having Cameron
08 or an OEM perform on rig inspections is an
09 important part of a BOP maintenance program?
10 A. I believe having Cameron inspect
11 equipment, yes, sir, is a good part of a --
12 the maintenance program.

Page 124:06 to 124:20

00124:06 For the DEEPWATER HORIZON, were
07 you ever involved in going out for the
08 specific purpose of disassembling and
09 inspecting major components on their blowout
10 preventers?
11 A. Working on the pods and that
12 aspect, yes, sir.
13 Q. Okay. When you say working on
14 the pods, are you talking about disassembling
15 the pods?
16 A. Rebuilding valves and stuff on
17 the pods. Normally my main goal when I went
18 to the DEEPWATER HORIZON was to -- the
19 control system, keep it up and running. And
20 working on that type of equipment.

Page 126:08 to 129:05

00126:08 And so I want to ask you this
09 question: In your experience on Transocean's
10 rigs, did you feel that the crew made safety
11 a priority?
12 A. Yes, sir.

13 Q. When you went aboard
14 Transocean's rigs, did their rig crew provide
15 you a thorough and comprehensive orientation?
16 A. Yes, sir.
17 Q. And that included a safety
18 orientation?
19 A. Yes, sir.
20 Q. Did it also -- go ahead.
21 A. Every time.
22 Q. Right. Without exception,
23 right?
24 A. Yes, sir.
25 Q. Did it also include an
00127:01 orientation and meeting about evacuation
02 plans?
03 A. Yes, sir.
04 Q. Would you agree that those plans
05 were thorough and comprehensive?
06 A. Yes, sir, and we also had
07 drills.
08 Q. Okay. Tell me about those.
09 A. They'd have them sometimes at
10 night and sometimes during the day, be fire
11 drills. And you'd have an announcement come
12 over the PA, tell you that you need to either
13 muster or head to your life -- your
14 designated lifeboat.
15 Q. When you went on Transocean's
16 rigs, what's the typical length of time you
17 would spend on the rig? Three or four days?
18 A. Sometimes up to a week, yes,
19 sir.
20 Q. Up to a week in some
21 circumstances?
22 A. Yes, sir.
23 Q. Is it fair to say you got a -- a
24 very extensive sampling and experience with
25 how Transocean conducts itself on its rigs?
00128:01 A. Yes, sir.
02 Q. I mean, you've been on -- you
03 said that, by your estimation, more than 100
04 times --
05 A. Yes, sir.
06 Q. -- you've been on Transocean's
07 rigs; is that right?
08 A. Yes, sir.
09 Q. Do you have any complaints about
10 how Transocean handled their safety
11 orientations when you would come aboard their
12 rigs?
13 A. No, sir. You went through them,
14 and they were long and extensive.
15 Q. Would you agree that in your
16 course and scope of working as a field
17 service technician for Cameron and servicing

18 Transocean's BOPs, that you gained an
19 understanding and knowledge -- knowledge as
20 to how Transocean maintains its BOPs?
21 MR. NICHOLS:
22 Objection, form.
23 A. I worked on the blowout
24 preventers for y'all; but as far as the
25 maintenance program or the way y'all
00129:01 maintained them, we really wasn't in that
02 great detail.
03 I mean, y'all asked us to do
04 specific tasks and that's what we carried
05 out.

Page 129:19 to 129:23

00129:19 Q. Sure. Based on your experience
20 on Transocean's rigs, did you get the sense
21 and do you have the opinion that Transocean
22 has an effective maintenance system in place
23 to service their blowout preventers?

Page 130:01 to 130:03

00130:01 A. I think that Transocean had some
02 policies in place to, you know, make sure
03 that their maintenance was effective.

Page 131:11 to 132:04

00131:11 Q. Okay. And I think I understood
12 you to say that, when you conduct those shear
13 tests, you hang some pipe and test the
14 capacity of the blind shear ram to cut pipe.
15 At a high level; is that
16 correct?
17 A. Yes, sir.
18 Q. When these shear tests were
19 conducted, was BP present?
20 Let's -- let's focus these on
21 the DEEPWATER HORIZON.
22 A. I don't -- the -- the tests on
23 the deck that we done for the shear test, an
24 EDS -- normally the company men were present
25 yes, sir.
00132:01 Q. Okay. And -- and that means
02 they are -- are -- they received the results
03 of the shear tests and are knowledgeable
04 about the shear tests?

Page 132:07 to 132:07

00132:07 A. On the rig, yes, sir.

Page 134:19 to 135:16

00134:19 Q. Okay. And what I understood is
 20 that the tests conducted on the blue pod, the
 21 blue pod battery specifically, those were
 22 conducted during your time on the ENTERPRISE;
 23 is that true?
 24 A. That is correct.
 25 Q. And my understanding is that the
 00135:01 first readings of the voltages from the blue
 02 pod -- blue pod batteries as taken on the
 03 ENTERPRISE were incorrectly recorded.
 04 You agree to that?
 05 A. They were either incorrectly
 06 taken or incorrectly recorded, that is
 07 correct.
 08 Q. At a high level, a mistake was
 09 made in how those voltages and how the blue
 10 pod battery was measured?
 11 A. I believe that to be correct.
 12 Q. And those voltages were later
 13 tested at Michoud, and it was confirmed that
 14 the measurements taken on the ENTERPRISE were
 15 incorrect. Is that true?
 16 A. I believe that to be true.

Page 142:08 to 144:25

00142:08 Q. Do you recall the open or closed
 09 status of the blind shear ram?
 10 A. I believe the blind shear rams
 11 to be in a closed position.
 12 Q. Do you agree that neither the
 13 AMF nor cutting the auto shear pin activates
 14 the variable bore rams?
 15 A. In this particular case, I'd
 16 agree that the AMF doesn't fire the variable
 17 bore rams, nor does the deadman -- or the
 18 auto shear, excuse me.
 19 Q. So if it were true that the
 20 variable bore rams were closed, it would have
 21 to have been done either by the rig crew or
 22 by ROV intervention. You agree to that
 23 statement?
 24 A. I would agree to that statement,
 25 yes, sir.
 00143:01 Q. Are you aware when the ROV
 02 attempted to function and close the variable
 03 bore rams, there was no increase in pressure?
 04 Are you aware of that fact?
 05 MR. NICHOLS:
 06 Objection, form.
 07 A. No, sir, I wasn't aware of the

08 ROV functions that were going on.
09 EXAMINATION BY MR. BAAY:
10 Q. Do you agree that if the ST
11 locks were not functioned by the crew and if
12 the AMF did not activate, that the variable
13 bore rams, assuming they were closed, would
14 have had to remain closed against flow for
15 more than 33 hours without locks in place?
16 MR. NICHOLS:
17 Objection, form.
18 EXAMINATION BY MR. BAAY:
19 Q. Do you understand that question?
20 A. Yes, sir.
21 The -- I'm not in engineering,
22 but it's my belief that the Cameron rams are
23 designed for pressure assist. So if you
24 would have closed them and you had pressure
25 behind them, it would help keep them in the
00144:01 closed position.
02 Q. It helps -- the pressure helps
03 keep the variable bore rams sealed; is that
04 right?
05 A. That's my belief, yes, sir.
06 Q. Okay. But it's -- it's more
07 likely that they remain sealed in the case
08 where the ST locks are activated and engaged?
09 A. That would probably be better
10 directed toward engineering.
11 Q. Well, I mean, as someone
12 who's -- who's worked on BOPs for the last 16
13 years, do you have an opinion as to whether
14 or not it's more likely that the variable
15 bore rams can remain closed against flow if
16 the ST locks are in place?
17 A. I personally believe it would
18 probably be better to close the ST locks
19 behind them than just trying to leave them
20 with the pressure behind them, but that's my
21 belief.
22 Q. Sure. There's a greater chance
23 they're going to stay closed if those ST
24 locks are activated?
25 A. That's my belief, yes, sir.

Page 145:11 to 145:16

00145:11 Q. Sure. If the blind shear rams
12 had not been activated before the auto shear
13 pin was cut on April 22nd, would you have
14 expected to see fluid discharge from the
15 control pod when it was activated by the auto
16 shear?

Page 145:19 to 145:20

00145:19 A. It would depend on the position
20 of the ram when the auto shear was fired.

Page 145:22 to 148:01

00145:22 Q. You would expect to see a
23 discharge?
24 A. Depends on the position of the
25 ram when the auto shear was fired.
00146:01 Q. Okay. And that's -- that's --
02 my question's conditioned on that. Assuming
03 your blind shear rams are open, okay?
04 A. Okay.
05 Q. And you're on it and you cut
06 your auto shear pin, you would expect to see
07 discharge of fluid from the control pod?
08 A. Assuming they're in the open
09 position, yes, sir, you would expect to see
10 fluid come from the pod.
11 Q. How many gallons would you
12 expect to see visibly discharged from the
13 open side of the blind shear ram?
14 A. Assuming they're fully opened?
15 Q. Yes, sir.
16 A. Enough to displace the open side
17 of the piston.
18 Q. Can you give me an approximation
19 in term of gallons?
20 A. I'd say 30 to 40 gallons is my
21 approximation.
22 Q. If you did not see this
23 discharge of fluid, would that allow you to
24 draw the conclusion about whether or not the
25 blind shear rams were closed by the AMF
00147:01 system?
02 MR. NICHOLS:
03 Objection, form.
04 A. Me personally, it would just
05 lead me to assume that they were in the
06 closed position. How they got that-a-way, I
07 couldn't assume on.
08 EXAMINATION BY MR. BAAY:
09 Q. Okay. Well, going back to the
10 three possibilities you gave me when I
11 started my examination.
12 A. Right.
13 Q. You said deadman, auto shear,
14 and ROV intervention; is that right?
15 A. That is correct.
16 Q. Okay. So if you are at the
17 stage of the auto shear, which is two days
18 post-explosion, and you do not see a
19 discharge when you cut the auto shear pin, in
20 your opinion, would that make it more likely

21 that the AMF functioned the blind shear rams?
22 MR. NICHOLS:
23 Objection, form.
24 A. In my opinion something closed
25 the shear rams, yes, sir, if you didn't get
00148:01 your flow.

Page 152:16 to 154:03

00152:16 And let me start just by asking
17 you whether you at any time prior to the
18 incident on April 20, 2010, had any
19 communications with anybody from Anadarko
20 concerning the DEEPWATER HORIZON or the
21 Macondo well.
22 A. None that I'm aware of, no, sir.
23 Q. After the incident on April 20,
24 2010, did you have any communications, either
25 written, oral, e-mail, or any other type of
00153:01 communication, with anybody from Anadarko
02 concerning the incident or DEEPWATER HORIZON
03 or the Macondo well?
04 A. Not that I can recall.
05 Q. Okay. So in other words, I know
06 you were involved in post-incident response.
07 While you were working on post-incident
08 response, were there any folks from Anadarko
09 who were involved working with you in any
10 respect?
11 A. Not that I can recall.
12 Q. Okay. You -- have you heard of
13 a company called Anadarko before?
14 A. Yes, sir.
15 Q. Okay. So you know who they are?
16 A. Yes, sir.
17 Q. Okay. But just to confirm, you
18 have not had any communications with them
19 about the incident or the DEEPWATER HORIZON,
20 correct?
21 A. Yes, sir, that is correct.
22 Q. Okay. To your knowledge, has
23 anybody else from Cameron had any dealings
24 with anybody from Anadarko concerning the
25 incident or the DEEPWATER HORIZON or the
00154:01 Macondo well?
02 A. As far as I know, nobody has
03 talked to Anadarko from Cameron.

Page 155:02 to 155:10

00155:02 Q. Now, other than the Solenoid 103
03 that was associated with the yellow pod and
04 the battery that was associated with the blue
05 pod, is there any other part or equipment or

06 aspect of the BOP that was on the DEEPWATER
07 HORIZON that has raised any concerns or
08 questions in your mind as far as whether or
09 not it functioned properly on April 20, 2010?
10 A. Not that I'm aware of, no, sir.

Page 166:05 to 166:12

00166:05 Q. Well, okay, I -- poor question.
06 Who was it -- to your knowledge,
07 whose responsibility it was to determine when
08 the battery would be replaced in the blue
09 pod?
10 A. In my mind, the -- Transocean
11 would do the maintenance on the SEMs and the
12 pods and the stack.

Page 175:12 to 176:23

00175:12 Q. You were asked a question in
13 connection with the original Solenoid 103
14 associated with the yellow pod. And in your
15 answer you referred to a company by the name
16 of D&D. Do you recall that?
17 A. Yes, sir.
18 Q. Who is D&D?
19 A. It's my belief it's the Diaz
20 brothers.
21 Q. Can you spell that for us?
22 A. I'm not real sure how. Doesn't
23 spell it.
24 Q. Would it -- if you wanted to
25 spell it phonetically, would it be Diaz like
00176:01 perhaps D-i-a-z?
02 A. Yes, sir, that would be close.
03 Q. And is -- is the company called
04 D&D or D a-n-d D?
05 A. I think it's the D "and" sign D.
06 Q. Okay. Is it your intention to
07 be saying that that company you think may
08 have been involved in the -- somehow in the
09 manufacturing or somehow involved in
10 producing the original Solenoid 103?
11 MR. NICHOLS:
12 Objection to form.
13 EXAMINATION BY MR. BERKA:
14 Q. Well, let me back up and ask
15 again.
16 What -- what connection does
17 that company have to the Solenoid 103, to the
18 best of your knowledge?
19 A. To the best of my knowledge,
20 they have none.
21 Q. They have what?

22 A. No connection to the 103
23 solenoid valve.

Page 179:14 to 179:25

00179:14 Q. Was there a standard supplier
15 that Cameron used when Cameron was purchasing
16 solenoids back around the year 2000?
17 A. Normally the solenoid valves are
18 built in-house, but I don't know all the
19 history on that solenoid valve.
20 Q. Now, you say normally they were
21 built in-house. So, in other words, are you
22 saying that back at that period of time,
23 normally the solenoids were actually
24 manufactured by Cameron itself?
25 A. Yes, sir.

Page 181:10 to 181:24

00181:10 Q. Now, when battery associated
11 with the blue pod was tested, do I understand
12 correctly initially it was tested on the
13 ENTERPRISE?
14 A. There was a voltage check done
15 on the ENTERPRISE, yes, sir.
16 Q. Okay. Okay. And were you --
17 did you personally conduct that test?
18 A. I was told it would be a
19 conflict of interest, so Transocean conducted
20 the test.
21 Q. Did you observe the test when it
22 was actually being conducted?
23 A. I was standing on the ground
24 when they done that test, yes, sir.

Page 182:13 to 182:15

00182:13 Q. You have no information other
14 than what's recorded in that daily report?
15 A. No, sir.

Page 182:22 to 183:09

00182:22 Q. Did you actually with your own
23 eyes see any type of readout or -- or dial or
24 gauge or were you simply told verbally what
25 the results were?
00183:01 A. We could see the readout on the
02 meter, but I couldn't see where he had the
03 meter plugged into.
04 In order to read the voltage,
05 you have to go to the pie connectors, and

06 there's cables all over it. And he's up off
07 the ground, and he holds the meter down where
08 you could see the voltage, but you couldn't
09 tell where he was taking the voltage from.

Page 185:15 to 185:25

00185:15 Q. Mr. LeNormand, my name is Phil
16 Nizialek. I represent MOEX USA and MOEX
17 Offshore in this litigation.
18 Have you ever heard of either of
19 those companies?
20 A. No, sir.
21 Q. Okay. So you have no knowledge
22 of them whatsoever, I gather?
23 A. No, sir.
24 Q. Still going to ask you a few
25 questions.

Page 187:19 to 190:17

00187:19 Q. Okay. I gather from your
20 earlier answer that you've never had any
21 personal contact with or communication with
22 anybody from MOEX or any of their
23 representatives; is that correct?
24 A. Not that I can recall.
25 Q. Okay. You've never been
00188:01 instructed to go to a rig, the
02 DEEPWATER HORIZON or any other rig, or any
03 facility whatsoever by anybody from MOEX; is
04 that correct?
05 A. That's correct.
06 Q. Okay. You've never been asked
07 by anyone from MOEX to provide them with a
08 report regarding your work, either before or
09 after the blowout, with respect to the
10 DEEPWATER HORIZON; is that correct? Or the
11 Macondo lease?
12 A. That's correct.
13 Q. Okay. You talked about having
14 worked with a group in something that you
15 called "the hive"; is that correct?
16 A. That is correct.
17 Q. I assume the hive was a command
18 center that was set up by BP and Transocean
19 after the incident; is that correct?
20 A. I believe that to be correct,
21 yes, sir.
22 Q. And was it a command center for
23 attempting to control the blowout, the
24 pollution, or all those things?
25 A. I believe it to be all those
00189:01 things.

02 Q. And you actually interacted with
03 people at the hive; is that correct?
04 A. That is correct.
05 Q. And you actually went to the
06 hive and visited with folks there?
07 A. I wouldn't call it visited, but
08 I went to the hive, yes.
09 Q. Went to the hive.
10 Okay. Did you ever receive any
11 communication from anyone in the hive who was
12 a MOEX representative or a MOEX employee?
13 A. Not that I can recall.
14 Q. Did anybody ever tell you that
15 anyone who was working in the hive was a MOEX
16 employee or representative?
17 A. Not that I can recall.
18 Q. Okay. So you received no
19 information from the hive about MOEX, either;
20 is that correct?
21 A. That is correct.
22 Q. Okay. Did you provide any
23 information regarding your work to anyone at
24 MOEX at any time?
25 A. Not that I can recall.
00190:01 Q. Okay. Did you provide any
02 reports of any kind to anyone at MOEX, that
03 you can recall?
04 A. Not that I can recall.
05 Q. Are you aware of anyone else at
06 Cameron who was working on the
07 DEEPWATER HORIZON or on the post incident
08 events that provided any reports or any
09 information whatsoever about Cameron's work
10 to MOEX?
11 A. Not that I'm aware of.
12 Q. Okay. To your knowledge, did
13 anyone at MOEX or any of its representatives
14 ever provide any technical input whatsoever
15 into the configuration of the blowout
16 preventer on the DEEPWATER HORIZON?
17 A. Not that I'm aware of.

Page 191:04 to 193:23

00191:04 Q. Mr. LeNormand, in various
05 records in the case there's a reference to
06 somebody named Country or Big Country. Who
07 is that?
08 A. I believe that to be me.
09 Q. And is Country or Big Country,
10 are those nicknames that you've gotten along
11 the line?
12 A. Yes, sir.
13 Q. Where did you get those
14 nicknames?

15 A. My dad's name is William
16 LeNormand, too, and he also works on drilling
17 rigs. And it helped distinguish between us
18 two and one of us get a nickname.
19 Q. So your dad worked in the oil
20 patch?
21 A. Yes, sir.
22 Q. All his career?
23 A. As far as I can remember, yes,
24 sir.
25 Q. Have you worked all your career
00192:01 in the oil patch?
02 A. No, sir.
03 Q. Where else did you work?
04 A. I worked as an instrument tech
05 for a company called KTI Fish building a
06 hydrogen plant for air products.
07 Q. And how long did you work with
08 them?
09 A. Roughly about six months.
10 Q. Other than that, have you worked
11 all your working life in the oil patch?
12 A. I worked as a vet tech, too, in
13 high school, but other than that I've worked
14 in the oil field, yes, sir.
15 Q. Okay. Now, does Cameron
16 manufacture blowout preventer equipment?
17 A. Yes, sir.
18 Q. And once Cameron manufactures
19 that blowout preventer equipment, can you
20 tell us whether or not Cameron then sells
21 that equipment to persons and companies who
22 operate that equipment?
23 A. Yes, sir, Cameron sells the
24 equipment.
25 Q. Now, you've been asked certain
00193:01 questions over the last couple of days about
02 something that somebody's called periodic
03 maintenance, so I want to ask you about
04 maintenance.
05 Does Cameron offer a program
06 under which Cameron, once that equipment is
07 sold to an operator, Cameron then goes out
08 and does the regular maintenance on that
09 equipment?
10 A. Yes, sir.
11 Q. What's that program called?
12 A. It's called CAMSERV.
13 Q. With respect to the equipment
14 that was sold and used in connection with the
15 DEEPWATER HORIZON, was that equipment --
16 blowout preventer equipment, was it subject
17 to the CAMSERV program?
18 A. No, sir.
19 Q. And as opposed to the CAMSERV

20 program, where Cameron would go out and work
21 regularly on the maintenance of the
22 equipment, how did the maintenance of the
23 equipment on the DEEPWATER HORIZON work?

Page 194:01 to 194:05

00194:01 A. It was my belief it was the --
02 operator is the person who purchased the
03 equipment to look after the maintenance. If
04 they needed help, they could call Cameron
05 service technicians out to the rig to help.

Page 194:20 to 196:02

00194:20 Q. And just to make sure that the
21 record is clear, is it possible to test the
22 AMF system associated with a blowout
23 preventer system like the one that was in use
24 on the DEEPWATER HORIZON?

25 A. Yes, sir.

00195:01 Q. And if someone decides that they
02 want to test the AMF system, can they do
03 that?

04 A. Yes, sir.

05 Q. Can you describe in general
06 terms how they go about doing that?

07 A. Yes, sir, if someone wanted to
08 test AM -- AMF system, the best way to go
09 about doing that would be to arm the AMF --
10 the first way I would do it was arm the AMF,
11 I'd bleed the hydraulic pressure off to my
12 pods, and I'd pull my electrical jumpers out
13 from underneath my distribution panels so
14 I've lost my power and my communications and
15 look for my predetermined functions to
16 happen.

17 Q. And is there another way to test
18 the AMF system as well?

19 A. Yes, sir, it's best to test it
20 with the loss of electrical first and then
21 also go back and lose your hydraulics to do
22 the same test to make sure the outcome's the
23 same.

24 Q. Can these tests that you've
25 mentioned with respect to the AMF system, can
00196:01 they be done while the equipment is on the
02 deck of a vessel?

Page 196:05 to 196:05

00196:05 A. Yes, sir.

Page 196:07 to 196:10

00196:07 Q. And can they also be done while
08 the equipment is subsea?
09 A. It can be done when it's subsea,
10 yes, sir.

Page 196:16 to 196:21

00196:16 Q. And so as with the AMF system,
17 can you tell us whether or not it is possible
18 to test the EDS system that is used in
19 connection with a blowout preventer equipment
20 system like the one that was in use on the
21 DEEPWATER HORIZON?

Page 196:24 to 196:24

00196:24 A. Yes, sir.

Page 197:01 to 197:13

00197:01 Q. And if -- if someone wants to
02 test the EDS system that we've described, can
03 you tell us generally how to go about doing
04 that?
05 A. If the stack's on deck, I'd put
06 the BOP in the drilling mode, and you'd hold
07 the enable button, you'd select your EDS-1,
08 EDS-2, or however many EDSs you had, and you
09 preselect the one you want to fire, and then
10 you hold the enable and hit the EDS button.
11 Q. And can this testing of the EDS
12 system, can it be done subsea as well?
13 A. It can be done subsea, yes, sir.

Page 198:02 to 198:05

00198:02 Q. Now, were you involved,
03 Mr. LeNormand, in any of the testing that is
04 reflected in Exhibit 3623?
05 A. No, sir.

Page 198:13 to 198:19

00198:13 Q. Now, Mr. LeNormand, with respect
14 to any issues that are mentioned in the
15 Exhibit 3623, do you know sitting here today
16 whether those are same or similar issues that
17 were encountered with respect to Solenoid 103
18 off the yellow pod after the incident at
19 Macondo?

Page 198:22 to 198:22

00198:22 A. No, sir.

Page 199:08 to 201:03

00199:08 Q. Now, Mr. LeNormand, you were
09 asked certain questions about information
10 that Cameron provides to its customers and
11 clients. Do you remember that?
12 A. Yes, sir.
13 Q. Now, with respect to Cameron's
14 customers, have many of those customers been
15 out there operating in the oil patch for
16 many, many years?
17 A. Yes, sir.
18 Q. And from your experience,
19 Mr. LeNormand, are those customers
20 well-familiar with the purpose and intended
21 use of blowout preventer equipment?
22 A. Yes, sir.
23 Q. You were asked certain
24 questions, Mr. LeNormand, about one single
25 document and whether or not it explained
00200:01 everything to a customer. Do you remember
02 that -- those questions?
03 A. Yes, sir.
04 Q. In your experience,
05 Mr. LeNormand, can you look at any one
06 particular document, just look at the four
07 corners of that document, and be able to tell
08 from that one document the sum total of
09 information that a customer has available
10 concerning blowout preventer equipment?
11 A. No, sir.
12 Q. Does -- in what ways in your
13 experience, in general, do customers receive
14 information about blowout preventer equipment
15 and its intended operation?
16 A. Through EBs, sales and marketing
17 and engineering.
18 Q. Are there certain manuals that
19 Cameron provides with respect to the
20 equipment that it sells?
21 A. Yes, sir.
22 Q. And can you tell us whether or
23 not those manuals are intended to be actually
24 placed on the rig and kept as part of a rig
25 book?
00201:01 MR. BAAY:
02 Objection to form.
03 A. Yes, sir.

Page 201:05 to 201:20

00201:05 Q. Now, Mr. LeNormand, you were
06 asked certain questions about some shear
07 testing that has been performed in the past.
08 Do you recall those questions?
09 A. Yes, sir.
10 Q. And in particular, I believe
11 that you were asked questions about some
12 shear testing not of pipe but of a joint
13 in -- at Berwick some years ago. Do you
14 recall those questions?
15 A. Yes, sir.
16 Q. And did you attend a session at
17 which there was an effort to use blind shear
18 rams to shear not pipe, not drill pipe, but a
19 joint of -- that was used in connection with
20 drill pipe?

Page 201:23 to 201:23

00201:23 A. Yes, sir.

Page 201:25 to 202:16

00201:25 Q. And did that testing -- can you
00202:01 tell us whether or not that testing occurred
02 at Berwick?
03 A. Yes, sir, the testing was at
04 Berwick.
05 Q. And who was the customer
06 associated with that blowout preventer
07 equipment that was tested?
08 A. BP THUNDER HORSE.
09 Q. So was BP the company that was
10 commissioning the rig?
11 A. Tran -- or Pride was actually
12 the company commissioning the rig, but the
13 rig belongs to BP, yes, sir.
14 Q. And how many years ago was this
15 testing done?
16 A. Roughly about five years ago.

Page 203:05 to 206:18

00203:05 Q. What did you think about that
06 test going into it?
07 A. We didn't think we'd get a
08 pressure test at the end of it. There was
09 some doubt.
10 Q. And when you say you didn't
11 think you would get a pressure test out of
12 it, what did you mean by that?

13 A. We were worried about the
14 tubular -- can you reask the question.
15 Q. Sure.
16 A. I'm sorry.
17 Q. When you say that you weren't
18 sure going into the test that you'd get a
19 good pressure test off that test, what do you
20 mean by that?
21 A. We wasn't for sure if the BOP
22 would hold pressure after the shear.
23 Q. And was this a fact or an
24 anticipated outcome that was discussed among
25 the persons that were participating in that
00204:01 test?
02 A. Yes, sir.
03 Q. And did the people who
04 participated in that test, did they include
05 Cameron, Pride, and BP?
06 A. Yes, sir.
07 Q. And just to be crystal clear
08 about this, did this testing occur prior to
09 the incident that occurred on April 20, 2010,
10 at Macondo?
11 A. You're asking if it happened
12 before, correct?
13 Q. Yes, sir.
14 A. Yes, sir.
15 Q. And what was -- I don't know if
16 I asked.
17 What was the rig on which this
18 equipment was going to be used?
19 A. The BP THUNDER HORSE.
20 Q. And was the BP THUNDER HORSE
21 also to be deployed in the Gulf of Mexico, or
22 do you recall?
23 A. Yes, sir.
24 Q. Now, Mr. LeNormand, you were
25 asked certain questions about your
00205:01 observations of the blind shear rams after
02 the BOP stack was pulled following April 20,
03 2010.
04 Do you recall those questions?
05 A. Yes, sir.
06 Q. And can you tell us whether or
07 not, once that entire stack was pulled and
08 the lower marine riser package was pulled off
09 the top of the stack, did you, yourself, have
10 the opportunity to look down that stack and
11 see the top of the blind shear rams?
12 A. Yes, sir.
13 Q. And tell us for the record:
14 What did you see?
15 A. Mud and cement.
16 Q. And with respect to the material
17 that you saw, was that material physically

18 sitting on top of those blind shear rams?
19 A. Yes, sir.
20 Q. Now, Mr. LeNormand, do you know
21 of your personal knowledge whether the cement
22 job that was done prior to the explosion on
23 the HORIZON rig, whether that cement job was
24 any good or not?
25 A. Personal knowledge, no, sir, I
00206:01 do not know.
02 Q. Okay. I want you to assume for
03 purposes of this question that the cement job
04 didn't hold.
05 A. Okay.
06 Q. That it was of a slurry type
07 that failed to set properly and that, when
08 the blowout occurred, that cement slurry
09 mixture was ejected up through that wellbore.
10 Can you assume that with me?
11 A. Yes, sir.
12 Q. Is what you saw sitting on top
13 of those blind shear rams after that stack
14 was pulled, would that be consistent with
15 that scenario I laid out for you?
16 MR. BOWMAN:
17 Objection, form.
18 A. Yes, sir.

Page 213:14 to 213:25

00213:14 Q. Okay. So if you're going to use
15 this BOP properly, not just push a button,
16 use it properly, you've got to know what pipe
17 it will shear and what pipe it won't shear,
18 right?
19 A. I believe, yes, sir.
20 Q. Okay. If you want to use the
21 BOP properly, you've got to know what
22 emergency sequence you should put into the
23 program to maximize your chance of it being
24 available when you need it, right?
25 A. Yes, sir.

Page 214:18 to 214:20

00214:18 Q. Does Cameron say the AMF system
19 can be safely tested when the blowout
20 preventer is on the wellhead subsea?

Page 214:23 to 214:24

00214:23 A. I believe that to be true, yes,
24 sir.

Page 215:01 to 217:09

00215:01 Q. Okay. Does Cameron say that the
02 EDS system can be safely tested when the
03 blowout preventer is subsea?
04 A. We do do test them on the -- EDS
05 tests them when the BOP is subsea, yes, sir.
06 Q. What I want to know is: Can it
07 be done safely?
08 A. Yes, sir, it can be done safely.
09 Q. Without endangering the
10 equipment, without endangering the well,
11 without endangering people's lives, you can
12 test the EDS system when the blowout
13 preventer is subsea? Do I understand you
14 correctly?
15 A. You can test the -- the EDS when
16 the blowout preventer is subsea safely, yes,
17 sir.
18 Q. Okay. What about ROV hot stab?
19 Can you test the ROV hot stab when the
20 blowout preventer is subsea?
21 A. Yes, sir.
22 Q. Okay. Now, the auto shear you
23 probably can't test when the blowout
24 preventer is subsea, correct?
25 A. It could be tested.
00216:01 Q. All right. You mean the -- by
02 "test," I don't mean activate it and
03 disconnect the LMRP.
04 Is there a way to test the auto
05 shear without disconnecting the LMRP?
06 A. On this particular rig, no, sir.
07 Q. Oh, is there a way on other
08 rigs?
09 A. You could use the hydraulic
10 deadman to do it.
11 Q. Okay. So on other rigs, there's
12 a system available where you can test the
13 auto shear without actually disconnecting the
14 LMRP unit?
15 A. That is correct.
16 Q. Okay. Is that an upgrade that's
17 available?
18 A. Yes, sir.
19 Q. Okay. Did BP ever buy it?
20 A. Not that I'm aware of.
21 Q. Did Transocean ever buy it?
22 A. Not that I'm aware of.
23 Q. By the way, you have a Mark III
24 control system that Cameron's come out with,
25 right?
00217:01 A. That is correct.
02 Q. Okay. And BP has bought that
03 system for its BP THUNDER HORSE rig operating

04 in the Gulf of Mexico?
 05 A. I believe that to be true.
 06 Q. And you believe that's a better
 07 system?
 08 A. I believe it has some
 09 advantages.

Page 218:13 to 218:16

00218:13 Q. Okay. Did BP ever talk to you
 14 about upgrading to the Mark III control
 15 system on the DEEPWATER HORIZON?
 16 A. No, sir.

Page 218:24 to 219:15

00218:24 Q. And one of the advantages of the
 25 Mark III control system is you believe you'll
 00219:01 have fewer problems with coil faults and
 02 solenoid issues.
 03 Am I correct about that?
 04 A. Yes, sir.
 05 Q. Okay. The BSR function, you
 06 told me there's two BSR functions. I guess
 07 one is low pressure and one is high pressure,
 08 correct?
 09 A. That is correct.
 10 Q. Okay. Can you run a test on the
 11 B -- BS -- blind shear rams, the BSRs, high
 12 pressure when the BOP unit is subsea?
 13 A. Yes, sir.
 14 Q. Can you do it safely?
 15 A. Yes, sir.

Page 221:19 to 221:23

00221:19 Q. Okay. And historically, that
 20 been true you know -- haven't I seen several
 21 Cameron documents that indicate that you get
 22 coil faults when you have the solenoids
 23 deployed subsea?

Page 222:01 to 222:03

00222:01 A. I believe that you wouldn't get
 02 those solenoid valve fault with the proper
 03 maintenance.

Page 222:05 to 222:08

00222:05 Q. Okay. And do I understand
 06 correctly that you can identify the solenoid

07 coil faults with proper testing?
08 A. Yes, sir.

Page 225:11 to 226:04

00225:11 Q. Okay. So if you wanted to test
12 to make sure you had emergency activation
13 capability, you've got to fire the
14 high-pressure blind shear function?
15 A. That is correct.
16 Q. Okay. Is there another way to
17 test the blind shear ram without firing the
18 high-pressure blind shear function?
19 A. Yes, sir.
20 Q. What's the other way?
21 A. Through the pod valve.
22 Q. Okay. And how do you do that?
23 Explain that to me, please.
24 A. You would push the enable and
25 the close for the blind shear rams on the
00226:01 panel, and the blind shears would close via
02 the pod. It wouldn't use the stack
03 accumulator pressure. It would just use
04 fluid from the hot line and the conduit.

Page 226:13 to 226:17

00226:13 Q. Okay. I guess if you want to
14 have an emergency system available like the
15 AMF system, you should test the high-pressure
16 blind shears to make sure that system is
17 going to be available when you need it --

Page 226:21 to 226:24

00226:21 Q. -- correct?
22 A. I believe if you're going to
23 have an AMF system, you should test the AMF
24 system.

Page 238:08 to 238:11

00238:08 Now, here's my question: When
09 the AMF system is subsea, is it possible to
10 test the 27-volt batteries in the AMF system?
11 A. No, sir.

Page 241:15 to 242:21

00241:15 Q. Okay. So you don't think it's
16 important that your users know that the
17 batteries can't be charged and can't be

18 monitored?
 19 MR. NICHOLS:
 20 Objection, form.
 21 A. They knew the batteries couldn't
 22 be charged.
 23 EXAMINATION BY MR. WILLIAMSON:
 24 Q. Okay. Let's go there. BP knew
 25 that those batteries couldn't be charged once
 00242:01 the blowout preventer's subsea?
 02 A. I believe that to be true.
 03 Q. And Transocean knew that, also?
 04 A. I believe that also to be true.
 05 Q. And Cameron, of course, knew it,
 06 also?
 07 A. Yes, sir.
 08 Q. Okay. And you had some
 09 customers ask if they could get the voltage
 10 to those batteries, right?
 11 A. There was a question asked, yes,
 12 sir.
 13 Q. Who asked it?
 14 A. I believe it was Mike Fry.
 15 Q. Okay. With Transocean?
 16 A. That is correct.
 17 Q. Okay. When?
 18 A. I don't know the exact date.
 19 Q. Okay. Obviously before the
 20 DEEPWATER HORIZON sank?
 21 A. I believe that to be true.

Page 246:04 to 246:11

00246:04 Q. Okay. Does Cameron also make a
 05 system that will monitor whether or not
 06 there's gas in the blowout preventer?
 07 A. Not that I'm aware of.
 08 Q. Okay. So Cameron cannot detect
 09 the presence of hydrocarbons in the blowout
 10 preventer? There's no system that does that?
 11 A. Not that I'm aware of.

Page 248:20 to 248:21

00248:20 (Exhibit No. 3640 marked for
 21 identification.)

Page 249:25 to 250:03

00249:25 Q. What is a bidirectional ram
 00250:01 assembly?
 02 A. It's designed to hold the
 03 pressure from the top or the bottom.

Page 251:13 to 255:23

00251:13 Q. All right. Below that it says
14 "Project BP THUNDER HORSE."
15 You've heard of that, of course?
16 A. Yes, sir.
17 Q. Because you've been on that rig,
18 right?
19 A. Yes, sir.
20 Q. Okay. And it says that there's
21 a blowout preventer stack that's an 18 3/4,
22 15,000 five-cavity stack, right?
23 A. That's what it says, yes, sir.
24 Q. And then it says: "Two double
25 TL BOP with standard ST locks."
00252:01 Did I read that correctly?
02 A. Yes, sir.
03 Q. What are those?
04 A. Double is a -- a ram cavity
05 which holds four bonnets, two on each side.
06 Q. Okay. Well, does that mean that
07 that's what's in the stack is two double TL
08 BOPs?
09 A. Yes, it means there's two double
10 BOPs stacked up to give you part of your five
11 cavity.
12 Q. Right.
13 Would that be double blind shear
14 rams?
15 A. No, sir.
16 Q. Okay. Tell me the -- I'm trying
17 to understand what this means, then.
18 A. It means you would have -- the
19 BOP can be a single or double --
20 Q. Okay.
21 A. -- or even a triple. But that
22 tells you how many ram cavities you have
23 between flange to flange.
24 Q. Okay. What's the difference
25 between the single and a double?
00253:01 A. The single will have one ram
02 cavity and the 18-3/4-inch bore, and a double
03 will have two ram cavities and the
04 18-3/4-inch bore.
05 Q. And the advantage of a double
06 is?
07 A. Takes up less place than two
08 singles on top of one another.
09 Q. Okay. So you -- in effect, you
10 have two operating rams, but they're only in
11 one space?
12 A. You have two rams that are
13 forged in one body, I guess you would say.
14 Q. Does one of them open east/west
15 and the other one opens north/south, or how

16 does that work?
17 A. No, sir. They both open the
18 same way.
19 Q. And they're on top of each
20 other?
21 A. Yes, sir. If you look at the
22 picture, do you see the bottom two sets of ST
23 locks?
24 Q. Yeah.
25 A. Them two there would be
00254:01 considered a double because they're both in
02 the same body.
03 Q. And what is the advantage of a
04 double TL BOP?
05 A. You don't have an extra flange
06 connection between the two singles. If you
07 got two singles and you stack them up, you
08 have to bolt them together. So you get
09 another gap where you have a flange, a ring
10 gasket.
11 Q. Okay. Can you tell what's in
12 the double in terms of whether it's a blind
13 shear ram, a casing shear ram, a variable
14 bore ram? Does this give you any information
15 on that?
16 A. No, sir, it's just cavities.
17 Q. So you could have anything in
18 the double?
19 A. That is correct.
20 Q. All right. Next, single TL BOP
21 with tandem boosters, right?
22 A. Yes, sir.
23 Q. What are tandem boosters?
24 A. Tandem boosters have two pistons
25 inside of them.
00255:01 Q. They're for shear rams?
02 A. Yes, sir.
03 Q. For blind shear rams?
04 A. Yes, sir.
05 Q. Okay. So on -- so BP, on its
06 rig, has a blind shear ram with a tandem
07 booster.
08 Do I understand that correctly?
09 A. Yes, sir.
10 Q. Okay. Was there a tandem
11 booster on the blind shear ram on the
12 DEEPWATER HORIZON?
13 A. Not that I can recall.
14 Q. And a tandem booster gives you
15 more sharing capacity?
16 A. I believe that to be true.
17 Q. It delivers a lot more power in
18 terms of being able to shear pipe.
19 I won't ask you the exact
20 numbers because you say you don't know, but

21 it delivers a lot more power to shear pipe,
22 correct?
23 A. It delivers more, yes, sir.

Page 256:14 to 258:23

00256:14 Q. If you fire the auto shear, if
15 the conditions arise where the auto shear
16 gets activated, the auto shear will utilize
17 the subsea accumulator bank for its hydraulic
18 power.
19 Do I have that right?
20 A. I believe that to be true, yes,
21 sir.
22 Q. Is that also true for the EDS?
23 If you fire EDS-1, the EDS function that
24 fires the blind shear rams, does the EDS-1
25 use the subsea accumulator bank for its
00257:01 hydraulic power?
02 A. If EDS-1 fires the high pressure
03 shear, then, yes, sir, it uses it.
04 Q. Okay. If you fire the high
05 pressure BSRs, okay, you push the high
06 pressure BSR function, will that utilize the
07 subsea accumulator bank for its hydraulic
08 power?
09 A. I believe that to be true, yes,
10 sir.
11 Q. Okay. If you fire the AMF
12 system, the conditions for AMF are satisfied
13 and the AMF fires, will it use the subsea
14 accumulator bank for its hydraulic supply?
15 A. Yes, sir, I also believe that to
16 be true.
17 Q. Okay. So every emergency
18 activation system on the blind shear rams
19 uses the subsea accumulator supply.
20 Do I have that right?
21 A. Yes, sir, I believe that to be
22 correct.
23 Q. Therefore, the shearing ability
24 that you can deliver to the blind shear rams
25 is directly dependent upon the amounts of
00258:01 shearing power you have in the subsea
02 accumulator bank, correct?
03 A. Do you mean by the amount of
04 fluid you have in the --
05 Q. Well, I mean, by the amount of
06 pressure you'll deliver to the pistons.
07 A. Okay. Yes, sir.
08 Q. Because the subsea accumulator
09 bank, I thought you told me yesterday, was
10 rated to 5,000 psi in terms of what's
11 actually in the bottles?
12 A. Plus the hydrostatic.

13 Q. Correct. 5,000 psi available,
 14 and in order to have 5,000 psi available, you
 15 have to have 5,000 psi plus the hydrostatic
 16 pressure at 5,000 feet below sea level,
 17 correct?
 18 A. The depth you're at, yes, sir.
 19 Q. Right. In this case we're at
 20 5,000 feet.
 21 You understand I'm asking about
 22 Macondo?
 23 A. Yes, sir.

Page 260:20 to 261:05

00260:20 Q. Does -- can Cameron deliver more
 21 than 4,000 psi to the pistons off the subsea
 22 accumulator bank? Does Cameron have
 23 accumulator capacity or accumulator tools
 24 that will do that?
 25 A. The accumulators are precharged
 00261:01 with normally 5,000 psi fluid.
 02 Q. Okay. But then the regulator
 03 determines how much of that can be delivered
 04 to the pistons?
 05 A. That's correct.

Page 263:09 to 263:20

00263:09 Q. I'm trying to figure out if I
 10 can do them different. I'm trying to figure
 11 if I can do EDS-1 where it closes the blind
 12 shears and I can do AMF where it closes the
 13 casing shears, then the blind shears. Can I
 14 program the software that way?
 15 A. Yes, sir, you can program the
 16 software pretty much any way you want it.
 17 Q. Okay. And that would give you
 18 two different methods of trying to seal the
 19 well if you did it the way I just said?
 20 A. That would be correct.

Page 264:04 to 264:13

00264:04 Q. Right. I'll rephrase my
 05 question.
 06 When the blue pod from the
 07 DEEPWATER HORIZON was retrieved onto the deck
 08 of the ENTERPRISE, the ship the ENTERPRISE,
 09 you were there, correct?
 10 A. That is correct.
 11 Q. And you filled out Exhibit
 12 No. 3619, correct?
 13 A. Yes, sir.

Page 265:21 to 265:25

00265:21 Q. Okay. Were there any other
22 problems identified with the blue pod other
23 than the discharged batteries?
24 A. I believe we had a regulator
25 leaking if I recall correctly.

Page 266:03 to 266:14

00266:03 Q. All right. The way this system
04 was set up on AMF, AMF was supposed to
05 activate when you lost communication between
06 the pods, when you lost electrical power from
07 the surface, and when you lost hydraulic
08 integrity from the surface, right?
09 A. If it was armed, yes, sir.
10 Q. And if you lost electrical
11 power, by definition, you would lose
12 communication between the pods, correct?
13 A. If you lost electrical power to
14 both pod -- or both pods, yes, sir.

Page 268:16 to 268:18

00268:16 Q. Okay. With the rig on fire
17 after two explosions, you don't know if
18 Cameron's AMF system was activated?

Page 268:21 to 268:21

00268:21 A. That would be correct.

Page 276:16 to 277:22

00276:16 Q. Sure. Does Cameron have another
17 AMF system that does not work off batteries?
18 A. Yes, sir.
19 Q. Okay. What does it work off of?
20 A. Hydraulics.
21 Q. Okay. And how long has Cameron
22 had a AMF system that works solely off
23 hydraulics?
24 A. I'd say probably three, four
25 years.
00277:01 Q. Okay. And what is the advantage
02 of that system?
03 A. It still works off of the
04 electrical power coming from solenoid valves
05 and hot line and conduit pressure. I mean,
06 it's just a different means of doing the same
07 thing.

08 Q. Well, what's the advantage of
 09 having a system that -- an AMF system that
 10 works off of hydraulics and doesn't work off
 11 batteries?
 12 A. I believe it would probably be
 13 easier for a subsea engineer to service.
 14 Q. Okay. And I guess you eliminate
 15 the chance of having a discharged battery,
 16 correct?
 17 A. You would eliminate, yes, sir.
 18 Q. But I guess BP didn't buy that
 19 system either?
 20 A. Not that I'm aware of.
 21 Q. Neither did Transocean?
 22 A. Not that I'm aware of.

Page 278:25 to 280:16

00278:25 Q. Okay. All right. To make sure
 00279:01 I sum it up, Mr. LeNormand, as I understand
 02 it, Cameron did have an acoustic trigger
 03 system and does have an acoustic trigger
 04 system available for blowout preventers,
 05 right?
 06 A. That is correct.
 07 Q. And as far as you know, Cameron
 08 hasn't had any significant problems with the
 09 operation of that system?
 10 A. As far as I know.
 11 Q. Cameron does have tandem
 12 boosters, correct -- available, correct?
 13 A. Yes, sir, that is correct.
 14 Q. And they will increase the
 15 shearing power of the blowout preventer,
 16 correct?
 17 A. I believe that to be true.
 18 Q. Okay. Cameron has Mark III
 19 control systems available, which you believe
 20 are an upgrade over Mark II, correct?
 21 A. Yes, sir, I believe.
 22 Q. Okay. So if I wanted the best
 23 available blowout preventer technology, based
 24 on what you know, you would recommend me to
 25 get Mark III, correct?
 00280:01 A. Yes, sir.
 02 Q. You would recommend that I look
 03 into things like an acoustic trigger,
 04 correct?
 05 A. I would recommend that, yes,
 06 sir.
 07 Q. You know, you would recommend I
 08 look at things that would give me the most
 09 shearing capacity, things like tandem
 10 boosters or double-V blades, correct?
 11 A. I would recommend that, yes,

12 sir.
13 Q. Okay. Because if you wanted the
14 best available technology, that's the sort of
15 options you would want to look at, correct?
16 A. Yes, sir.

Page 282:07 to 282:11

00282:07 BP first. Did BP spend one
08 dollar that you know about that made the
09 blowout preventer on the DEEPWATER HORIZON
10 safer than it was in 1999?
11 A. I'm not aware of that, no, sir.