

Deposition Testimony of:
Edward Gaude

Date: September 19, 2011

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00011:16 QUESTIONS BY MR. WILLIAMSON:
17 Q. Please state your name.
18 A. My full name is Edward Charles Gaude.
19 Q. Okay. And who do you work for?
20 A. I work for Cameron International.
21 Q. How long have you worked for Cameron?
22 A. I went to work there ten years ago, June
23 the 4th, 2001.
24 Q. And what do you do for Cameron?
25 A. My current job responsibility is the
00012:01 Director of Engineering for Drilling Control
02 Systems.
03 Q. And how long have you held that job?
04 A. That title is relatively recently.
05 Before that, I was Engineering Manager for
06 Drilling Control Systems. It's essentially the
07 same job.
08 Q. How long have you had this more or less
09 functionally the same job?
10 A. Since about 2004, approximately.
11 Q. M-h'm. The -- what did you do between
12 '01 and '04?
13 A. When I first went to work for Cameron, I
14 was a Project Engineer with responsibility for
15 certain assigned rigs. After that, after about
16 six months, I became the Aftermarket Engineering
17 Manager, and we dealt with systems that had
18 already been built and were in the field.
19 Q. Okay. Have you ever done New Builds?
20 A. Yes, I have.
21 Q. Okay. Since '04, mostly?
22 A. Mostly.
23 Q. Okay. And when you say "Engineering
24 Controls," what does that mean to Cameron?
25 A. That's the control systems that operate
00013:01 the blowout preventers.
02 Q. Okay. What does that mean? Can you
03 describe it?
04 A. It's -- basically, the preventers are
05 controlled hydraulically. We have hydraulic
06 systems, control pods that are mounted on the
07 stack. We have electronic equipment mounted on
08 the stack. We have topside equipment that
09 consists of power units, diverter control panels,
10 driller's control panels, toolpusher's panels
11 that are electric, power distribution cabinets,
12 cable reels, that type of equipment.

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00015:07 Q. Okay. Who is your boss?
08 A. Mr. David McWhorter.
09 Q. Okay. And -- all right. How long has

10 Mr. McWhorter been your boss?

11 A. Since he came -- returned back to
12 Cameron. I believe that was in 2005.

13 Q. Okay.

14 A. I may be wrong on that, but I believe it
15 was 2005.

16 Q. So most of the time that you've been the
17 Director of Engineering Controls, Mr. McWhorter
18 has been your boss as Director of Engineering?

19 A. That's correct.

20 Q. Okay. The -- and Engineering Controls
21 would include both the hydraulic systems that
22 power the actual blowout preventer components,
23 that's one part of controls?

24 A. (Nodding.) That's correct.

25 Q. And then one part of controls would
00016:01 actually be the electrical units that are on the
02 rig itself by which you operate or actuate the
03 various blowout preventer functions, correct?

04 A. That's correct.

05 Q. And then one part of the blowout
06 preventer controls would be the subsea
07 electronics, the electronic batteries, the
08 solenoids, SEMs, that you have on the blowout
09 preventer at the wellhead?

10 A. That's correct. That would be considered
11 the electronics, as well as the surface
12 electronics.

13 Q. Okay. Do all of Cameron's systems use
14 MUX cables to connect their Subsea Electronic
15 Modules to the rig electronics?

16 A. Yes, I believe they do, yes.

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00021:04 Q. Okay. Who was responsible for how those
05 MUX cables are laid out on the rig in terms of
06 where they go or how they get subsea? And would
07 that be a customer-specified configuration, or
08 does Cameron make recommendations on that?

09 A. Cameron does not make recommendations on
10 where the -- the MUX reels that contain the
11 multiplex cables are positioned on the rig.

12 Q. All right. By the way, were you involved
13 with the DEEPWATER HORIZON BOP itself when it was
14 being configured?

15 A. No, sir, I was not.

16 Q. Okay. Were you involved with the
17 DEEPWATER HORIZON once it was built, designed and
18 built? I'm talking about the blowout preventer
19 system. I assume you had no connection with the
20 DEEPWATER HORIZON other than the blowout
21 preventer. Did you have any connection with the
22 rig the DEEPWATER HORIZON?

23 A. Not before I came to work for -- for

24 Cameron.
25 Q. All right. And did you have any
00022:01 connection with the DEEPWATER HORIZON Rig other
02 than blowout preventer or the blowout preventer
03 components?
04 A. Only the -- only the control system.
05 Q. Right. And what was your involvement
06 with the DEEPWATER HORIZON control system? The
07 blowout preventer control system on the DEEPWATER
08 HORIZON, what was your involvement in it?
09 A. After I came to work for -- for Cameron,
10 my involvement would have been to answer any
11 customer questions or participate in any
12 requested upgrades for the system that may have
13 occurred, would have been my primarily
14 involvement.
15 Q. Sure. To your knowledge, did BP ever
16 request a single upgrade to the -- to the
17 DEEPWATER HORIZON blowout preventer that enhanced
18 the safety profile of the blowout preventer from
19 2001 when you joined Cameron up until April 20th,
20 2010?
21 A. I'm not -- I cannot recall from --
22 from -- from memory the upgrades or anything that
23 was requested in that regard.

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00023:25 Q. Okay. Are there three different control
00024:01 systems on the HORIZON for activating the blowout
02 preventer, Control Stations?
03 A. I believe that is correct.
04 Q. Okay. One's on the rig floor, one is on
05 the Bridge, or the Toolpushers, and one's the
06 CCU?
07 A. I believe that's correct, yes, sir.
08 Q. Okay. And all three of those will work
09 the functions of the blowout preventer?
10 A. To -- to my knowledge, you can function
11 the -- the blowout preventer with any of those.
12 Q. Okay. Now, where do the controls go when
13 they physically leave those three locations?
14 Where do the con -- we have to get those
15 electrical signals to the MUX cables, correct?
16 A. Yes.
17 Q. The MUX cables reels are in the moon
18 pool, correct?
19 A. Yes, sir.
20 Q. The moon pool is a hazardous area,
21 correct?
22 A. To my knowledge, the moon pool is a
23 hazardous area.
24 Q. And they leave the MUX cable reels -- the
25 MUX cables leave the MUX cables reels and go to
00025:01 the top of riser where they then go down the

02 riser to the blowout preventer on the wellhead,
03 correct?
04 A. Yes, sir.
05 Q. Okay. I want -- I'm interested in how
06 the signals get from the rig floor, the
07 Toolpusher station, and the CCU to the MUX cable
08 reels. Is -- do you understand my -- do you
09 understand the question I'm asking?
10 A. Yes, sir.
11 Q. Okay. How does that happen? Can you
12 describe the configuration of that?
13 A. Let me -- if I could preface, primarily,
14 I'm -- my -- my in-depth background is the
15 hydraulic part of the system.
16 Q. Fair enough.
17 A. I understand the electrical part of it,
18 and I'll try to answer this as best I can.

Page 25:22 to 26:02

00025:22 Q. Who's the person in your Department who
23 knows most about the electrical component
24 functioning of the blowout preventer controls?
25 A. The primary person that I -- that I would
00026:01 talk about any electrical issues would be Richard
02 Coronado.

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00026:11 Q. Fair enough. And now I interrupted you
12 and your answer. You were saying your primary
13 emphasis is hydraulics, but you could give me
14 some general idea of the configuration of the
15 electrical system that I was asking about. I
16 interrupted you. Let me go -- let's go back to
17 that question so you can finish it.
18 A. Right.
19 Q. You know, how do the signals get from the
20 three Control Stations, CCU, rig floor,
21 Toolpusher station, how do those signals get to
22 the MUX cables reels?
23 A. I believe, to the -- to the best of my
24 knowledge, those signals go to a distribution
25 cabinet. From there, they go to the cable reel,
00027:01 and then the cable reel, the cables are attached
02 to the riser with clamps, and then they -- they
03 connect on the stack.
04 Q. Fair enough. I was told, I thought, at
05 some deposition, that there's actually two
06 distribution cabinets, an A and a B. Is that
07 right?
08 A. That would be a typical arrangement,
09 would be a -- for to have an A and a B.

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00027:20 Q. And then from the distribution cabinets,
21 both A and B distribution cabinets, they then go
22 to the junction boxes on the MUX cable reels?
23 A. That would be a typical arrangement,
24 correct.
25 Q. Okay. Why? Why have two distribution
00028:01 cabinets?
02 A. It's for redundancy.
03 Q. Why?
04 A. It's required by API 16D in the
05 Specifications to -- for the system to be
06 redundant.
07 Q. Okay. Why?
08 A. That would be so that if you had a --
09 a -- a -- something that would cause one of them
10 to not operate, you would still have half the
11 system would be operable.
12 Q. Okay. Because if the system is working
13 properly, if you lose the yellow MUX cable,
14 you'll still have the blue MUX cable to operate
15 the Blue Pod, correct?
16 A. Yes, sir.
17 Q. And if you lose the blue MUX cable,
18 you'll still have the yellow MUX cable to operate
19 the Yellow Pod, correct?
20 A. That's correct.
21 Q. And the Yellow Pod and the Blue Pod are
22 supposed to be completely independent systems?
23 A. They're -- they're -- they're supposed to
24 be independent systems.
25 Q. Okay. And they're supposed to be there
00029:01 for a completely redundant, the way you
02 understand it, under API 16 Manufacturing
03 Standards?
04 A. Yes, sir, that is a requirement.
05 Q. Okay. And have y'all ever thought about
06 whether there's any single point failure in the
07 MUX cable configuration that Cameron has on the
08 DEEPWATER HORIZON?
09 A. My -- could you define "single point
10 failure," please.
11 Q. Okay. Well, maybe I shouldn't do that,
12 since I'm a lawyer. Maybe I should ask you: Do
13 you -- ever heard the term "single point
14 failure"?
15 A. Yes, I have.
16 Q. As an Engineer, what is a "single point
17 failure"?
18 A. That would mean that if -- a single point
19 of a failure, if a failure occurred to a
20 particular device, or whatever it might be, that
21 that would cause a system to not be operable.
22 Q. Okay. Someone gave me an example: If

23 you have a laptop and you have everything on your
24 laptop backed up on a hard drive, but you have
25 them in the same backpack, and somebody steals
00030:01 the backpack, that's kind of a single point
02 failure. Would that be an elementary example?

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00030:05 Q. (By Mr. Williamson) Would that be a
06 simplistic example of a single point failure,
07 namely, one event can cause both sys -- systems
08 to fail?

Page 30:10 to 30:22

00030:10 A. No, sir, I would not treat your example
11 that way.
12 Q. (By Mr. Williamson) Okay. Fair enough.
13 Well, is that a -- if you have one event that can
14 cause both systems to fail, would you say that's
15 a single point failure?
16 A. If you had one event that could cause
17 both systems to fail?
18 Q. Correct.
19 A. And "systems" would be --
20 Q. The two redundant systems.
21 A. That would -- that would, obviously,
22 render the system inoperative.

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00031:15 Q. Right. Is that what you would call a
16 "single point failure"?

Page 31:20 to 32:08

00031:20 Q. (By Mr. Williamson) Okay. The -- did
21 Cameron ever examine this system to see if
22 there's a single point failure in connection with
23 the MUX cable configuration or location?
24 A. I'm not aware of analyses that were done,
25 but if it was, it was probably prior to the time
00032:01 that I came to work --
02 Q. Okay.
03 A. -- for Cameron.
04 Q. Did you ever give any instructions or
05 warnings or comments to your customers in
06 between 2001 and 2010 about the fact that the MUX
07 cable configuration might constitute or have
08 within it a single point of failure?

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00032:10 Q. (By Mr. Williamson) Did you ever have
11 such a conversation with your customers?
12 A. I have not personally had a conversation
13 in that regard with our customer.
14 Q. Okay. The -- I'd like to hand you what's
15 been marked as Exhibit 5094. Do you have that in
16 front of you?
17 A. If it says "Vastar Resources, Inc.," I
18 do.

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00032:22 Q. Okay. Well, turn to the Page 6.

Page 33:04 to 33:10

00033:04 Q. Bottom right-hand corner.
05 A. Yes, sir. Page 6; is that correct?
06 Q. Correct.
07 A. All right.
08 Q. Okay. Do you see there's different
09 bullet points on this number?
10 A. Yes, as signified by dots on the left.

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00033:14 Q. Okay. I will tell you R&B Falcon later
15 got bought out by Transocean, and if you'll
16 notice the Bates stamp number in the bottom
17 right-hand corner, those are -- we know that
18 because of the lawyers. That's a
19 Transocean-produced document. In other words, I
20 got my copy from the Transocean files, okay?

21 A. Okay.

22 Q. That's just for your information. Okay.
23 If we turn to Page 6, you see the various bullet
24 points?

25 A. Yes.

00034:01 Q. If you'll count down about one, two,
02 three, four -- I think it's five bullet points,
03 you'll see a sentence that starts: "The CSR's
04 are located below the SBR's." Do you see that
05 paragraph?

06 A. Yes, sir. That would be No. 6.

07 Q. All right. Okay. Okay. First of all,
08 this is a Technical Position Paper for the
09 HORIZON blowout preventer, correct?

10 A. H'm. That seems to be the title of it.

11 Q. Right. Back in 2000, when the -- when
12 the blowout preventer was being designed,
13 fabricated, built, delivered, installed, and put
14 into service, that happened between '99 and 2001,
15 approximately, correct?

16 A. That sounds -- that sounds correct, from
17 my memory.

18 Q. Fair enough. Let's go. First of all,
19 "The CSR's" -- that's the casing shear rams,
20 correct?

21 A. That's -- that's a typical acronym that
22 refers to casing shear rams, CSR, yes, sir.

23 Q. Okay. And it says, "The CSR's are
24 located below the SBR's." And the SBRs is
25 Cameron's acronym for the shearing blind rams?

00035:01 A. I believe that's correct.

02 Q. Okay. All right. And that's true, on
03 the DEEPWATER HORIZON, the casing shear rams are
04 located beneath the blind shear rams, correct?

05 A. That's what it says in this document.

06 Q. Well, didn't you go out to BP for several
07 days after this incident?

08 A. I was at the Crisis Center --

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00035:23 Q. Okay. So you're out there for 12 hours a
24 day for 11 days, right?

25 A. Approximately, that's correct.

00036:01 Q. With regard to the HORIZON blowout
02 preventer, that's what you were there for?

03 A. Yes.

04 Q. You weren't there to sell other products,
05 you weren't there to talk about other rigs, you
06 were there to work and answer questions about the
07 HORIZON blowout preventer?

08 A. That's correct.

09 Q. All right. And are you telling me you
10 don't know whether the casing shear rams are
11 above the blind shear rams or they're below the
12 blind shear rams?

13 A. Well, I'm reading this document that you
14 gave me.

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00036:19 Q. Do you know whether or not the casing
20 shear rams are above the blind shear rams or
21 below the blind shear rams, based upon you
22 working in the Crisis Center?

23 A. I believe that they were below the blind
24 shear rams.

25 Q. Right. Okay. So this document says --
00037:01 is correct when it says, "The CSR's are below the
02 SBR's," correct?

03 A. I believe that's correct, yes, sir.

04 Q. All right. Okay. I really wanted to get
05 to the next sentence: "The purpose for this
06 arrangement is to protect the sealing

07 capabilities of the SBR. By first shearing with
08 the CSR's and then raising the tail" --
09 Do I have that right? Is that "tail"?
10 -- "the SBR's are able to close in the
11 well with less risk of damaging the seal." Did I
12 read that sentence correctly?
13 A. I believe you did.
14 Q. Okay. Is it true based upon what you
15 know about Cameron blowout preventers?
16 A. I'm not a blowout preventer expert, the
17 function of blowout preventers via the control
18 system. I do have some general knowledge of our
19 blowout preventers, but I'm not a blowout
20 preventer expert.
21 Q. Okay. So the Director of Engineering for
22 blowout preventer controls for Cameron for the
23 last seven years is not a blowout preventer
24 expert --

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00038:01 Q. (By Mr. Williamson) -- to use your words?
02 A. That's correct.
03 Q. Okay.
04 A. Yes.
05 Q. All right. Now, having said that, as the
06 Director of Engineering Controls for Cameron who
07 made this blowout preventer, have you ever heard
08 of an Emergency Disconnect System?
09 A. Yes, I have.
10 Q. Isn't that part of the control systems?
11 Namely, we have an Emergency Disconnect System?
12 A. That's correct.
13 Q. Cameron normally refers to that as an
14 EDS?
15 A. That would be a typical acronym that --
16 that refers to an Emergency Disconnect --
17 Q. Okay.
18 A. -- Sequence.

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00038:23 Q. Okay. In an Emergency Disconnect System,
24 you can have more than one different mode or
25 modality, correct?
00039:01 A. Typically, there would -- there -- there
02 could be one or more EDS sequences.
03 Q. Okay. One type of EDA -- EDS sequence
04 would be where you would operate the blind shear
05 rams and then disconnect the LMRP, right?
06 A. That can be one.
07 Q. And then you would also have to do some
08 ancillary functions in fall -- in terms of
09 retract the stingers, close the choke line and

10 kill lines, things like that?
11 A. There can be some other functions
12 involved in it.

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00039:15 Q. Isn't that what was referred to on the
16 HORIZON as EDS-1?
17 A. I would have to look at the EDS sequences
18 to be able to know if it was specifically EDS-1.
19 Q. Okay. Okay. Again, same question: You
20 spent 12 [sic] days at the center to answer
21 questions about the blowout preventer, and you do
22 not know what the EDS-1 system was on the HORIZON
23 blowout preventer?
24 A. That's correct. I can't recall from
25 memory.
00040:01 Q. Okay. I will tell you, another EDS
02 sequence that I think's on the HORIZON was called
03 EDS-2 --
04 A. (Nodding.)
05 Q. -- which also disconnected the coke --
06 choke and kill lines and did the stingers, but it
07 closed the casing shear rams first and then
08 closed the blind shear rams. Were you aware of
09 that type of sequence for an EDS system?
10 A. I -- I believe the -- that sequence was
11 one of the sequences.

Page 41:16 to 41:23

00041:16 Q. (By Mr. Williamson) Sure. This paper,
17 the paragraph I read to you, says, and I quote,
18 "By first shearing with the CSR's and then
19 raising the tail, the SBR's are able to close in
20 the well with less risk of damaging the seal,"
21 correct?
22 A. That's -- that's what it -- that's what
23 it says in the statement.

Page 42:12 to 42:16

00042:12 Q. I'm not asking you that question. I'm
13 slight -- my question is slightly different: By
14 the time we get to using the blind shear ram with
15 pipe in the hole, we're in an emergency
16 situation. Can we agree on that?

Page 42:18 to 43:09

00042:18 A. Well, the EDS is operated for various
19 reasons, but typically you have a situation that
20 you need to -- to do an automated disconnect.

21 Q. (By Mr. Williamson) Yeah. Well, when you
22 do an automated disconnect and you literally cut
23 pipe in the hole, the pipe that is below the
24 blowout preventer is going to fall down into the
25 hole, right?
00043:01 A. If it -- if it's not on bottom, that
02 would be correct.
03 Q. And then you're going to have to fish it
04 to get it out, correct?
05 A. Yes, sir, that would be correct.
06 Q. And if you fish for it -- what they call
07 fish, which means you go run tools to try to
08 retrieve that, correct?
09 A. I'm generally familiar with those terms.

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00043:23 Q. My only point is: You do not do that,
24 you do not shear drill pipe in the blind shear
25 ram in order to seal the well, except in
00044:01 emergency situations. Can we agree on that?
02 A. Shearing -- shearing pipe is -- is always
03 something that -- that's -- that's a serious
04 situation --
05 Q. Sure.
06 A. -- and, you know, you have to take that
07 into consideration.
08 Q. Sure. As a matter of fact, Cam --
09 Cameron actually names their system the Emergency
10 Disconnect System, that's what Cameron names
11 it --
12 A. (Nodding.)
13 Q. -- right?
14 A. I believe that's correct, yes, sir.
15 Q. Okay. Is that a good name for it?
16 A. It -- it would be an appropriate name, I
17 think.
18 Q. Okay. Well, all I'm trying to get to is,
19 whether you agree that by first shearing with the
20 CSRs and then raising the tail, the blind shear
21 rams are able to close in a well with less risk
22 of damaging the seal on the blind shear rams. Do
23 you agree with that statement?
24 A. That would be correct, that it would be
25 basically closing on an open hole at that point.
00045:01 Q. Okay. And whoever wrote this paper for
02 Vastar Resources in 2000 that somehow found its
03 way into Transocean's files, they apparently
04 agreed with you, right, based upon the bullet
05 point we just read?

Page 45:07 to 45:11

00045:07 A. Well, in the -- in the statement that we

08 read here and the situation that you posed of
09 closing basically on an open hole would be less
10 risk of damaging the seals, that would be
11 correct.

Page 53:05 to 53:10

00053:05 Q. Sure. I'm trying to figure out if the
06 pressure temperature sensor information from the
07 blowout preventer went to the rig floor or went
08 to the Toolpusher Unit.
09 A. It was displayed on the Toolpusher's and
10 the Driller's control panels.

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00053:14 Q. Okay. The -- and how would it be
15 displayed? Is it just a little number off to the
16 side? Is it continuously displayed? Does the
17 Driller have the ability to turn it on and off?
18 A. It's displayed on some form of meter, but
19 in terms of is it there all the time, or do you
20 turn it on or off, I can't speak specifically to
21 that without referring to some information that I
22 don't have in front of me.
23 Q. Okay. What information?
24 A. Well, it would --
25 Q. What document am I going to need you to
00054:01 look at in order to get an answer to that
02 question?
03 A. I'm not certain what to -- what to look
04 for. It could be the -- the -- the panel itself,
05 or it could be the -- the wiring diagrams that
06 would be associated with the -- how the panel is
07 given information.
08 Q. Okay. So the panel schematics or the
09 panel wiring diagrams are going to tell us
10 whether or not the pressure temperature --
11 temperature sensor information -- number one,
12 they'll tell us if it goes to the rig floor and
13 the Toolpusher, right?
14 A. Yes.
15 Q. And, number two, they'll tell us how it's
16 displayed there?
17 A. And one other thing that would have to be
18 involved in that would be the software that would
19 take the information and explain how it -- how to
20 display it on the panel.

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00058:12 Q. And in that regard, do the -- the Cameron
13 systems, I think, have batteries that are subsea

14 located within the SEMs, correct?
15 A. If you're referring to the system that
16 was on the HORIZON, yes, sir.
17 Q. Okay. Well, do -- do all your systems
18 have battery subsea -- subsea blowout preventers,
19 and you're talking about the emergency activation
20 systems. Do all of the Cameron system have
21 batteries that are located subsea?
22 A. No, sir.

Page 59:01 to 59:10

00059:01 Q. The one on the HORIZON, that was on the
02 HORIZON on April 20th, had subsea batteries that
03 were utilized to activate certain emergency
04 functions, correct?
05 A. That was concerning the Deadman System
06 but not the EDS system.
07 Q. Fair enough. The AMF system on the
08 HORIZON depended upon subsea batteries located in
09 the SEMs?
10 A. That's correct.

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00059:19 Do you have an alternative -- does
20 Cameron have an alternative AMF system, subsea,
21 that does not rely upon subsea batteries?
22 A. So would it be in -- in the time frame of
23 the production of HORIZON, or currently?
24 Q. Before April -- let's take 4/20/2010 --
25 we'll take up to April 20th, 2010, did Cameron
00060:01 have an AMF system that did not depend upon
02 subsea --
03 A. Not to --
04 Q. -- batteries?
05 A. -- not to my knowledge.
06 Q. All right. Since April 20th, 2010, has
07 Cameron had a subsea AMF system that does not
08 depend upon subsea batteries?
09 A. Yes, there is a situ -- a -- a system
10 available that doesn't require batteries.
11 Q. What's the name of that system?
12 A. It's generically referred to as a
13 "hydraulic deadman."
14 Q. Okay. And how long have y'all had that
15 system?
16 A. Ah, I would say approximately within the
17 last year.
18 Q. And why did you develop it?
19 A. We didn't develop it --
20 Q. Who did?
21 A. -- initially. One of our -- one of our
22 customers, I'm not sure exactly which one, came

23 up with that idea and -- and worked out the
24 details of it, and we have supplied it to them.
25 And, also, we can -- if people request it in a
00061:01 quote, we can quote that system, or both systems,
02 either the --
03 Q. Okay.
04 A. -- electronic system with batteries or a
05 hydraulic system.
06 Q. Okay. Why did your customer come up with
07 a system that does not rely upon subsea
08 batteries?
09 A. To my knowledge -- to my knowledge, they
10 came up with that system in order to be able to
11 retrofit equipment in the field.
12 Q. Why? Why do they want to retrofit
13 equipment in the field?

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00061:15 A. So they could provide a feature of AMF to
16 that system.
17 Q. (By Mr. Williamson) Why? Why
18 would you -- why wouldn't you just want to keep
19 on using the battery system? What's the
20 advantage of using a hydraulic Deadman System
21 instead of a battery Deadman System?
22 A. There's the -- they both perform the same
23 function.
24 Q. True.
25 A. But there's not -- there's -- there's --
00062:01 there's tradeoffs for each one. There's not a
02 clear advantage.
03 Q. Okay. You don't think there's any
04 advantage to one over the other?
05 A. They -- they -- when properly used,
06 they'll -- they'll both perform a function that
07 they were intended for.
08 Q. M-h'm.
09 A. As -- as I said, there's tradeoffs
10 between one or the other.
11 Q. Okay. Which one's better, or do you have
12 an opinion?
13 A. They will both perform of -- a -- a given
14 function.

Page 63:06 to 64:14

00063:06 Okay. The HORIZON BOP, I'm going to ask
07 some questions about how it works. The HORIZON
08 BOP had a subsea accumulator bank, correct?
09 A. I believe that's correct, yes, sir.
10 Q. Okay. And it actually had bottles on the
11 BOP stack that were dedicated for the emergency
12 BOP functions, correct?

13 A. That's correct.
14 Q. So if you used EDS-1 or EDS-2 or AMF or
15 autoshear, all of -- or high pressure blind shear
16 ram functions, all of those utilize the subsea
17 accumulator bank. Does that sound right to you?
18 A. That would not be correct.
19 Q. Okay. Okay. Let's just take them one by
20 one. EDS-1, did it use the subsea accumulator
21 bank?
22 A. Yes.
23 Q. EDS-2, would it use the subsea
24 accumulator bank?
25 A. Yes.
00064:01 Q. High pressure blind shear ram function,
02 would it use the subsea accumulator bank?
03 A. Yes.
04 Q. Autoshear, would it use the subsea
05 accumulator bank?
06 A. Yes, it would.
07 Q. And AMF, would it use the subsea
08 accumulator bank?
09 A. Yes.
10 Q. Okay. I thought that's the ones I
11 covered. Is -- is there one I had in there that
12 didn't use the subsea accumulator bank?
13 A. There are functions within EDS-1 and 2
14 that don't use the subsea accumulator bank.

Page 66:01 to 66:05

00066:01 Q. Okay. And would the normal functioning
02 normally have a lower pressure than the high
03 pressure function?
04 A. That would be a good -- that would be a
05 good assumption, yes.

Page 66:20 to 66:24

00066:20 Q. All right. And you're saying when you
21 actually do the EDS-1 and EDS-2, there are
22 certain functions that use surface hydraulic
23 power?
24 A. Yes, sir.

Page 69:13 to 72:19

00069:13 All right. Here's what I'm getting to.
14 Let's go back to accumulate -- I'm trying to
15 figure out how the hydraulic systems work for
16 various functions, okay, on the HORIZON BOP.
17 Understand the area of inquiry?
18 A. Yes, sir.
19 Q. Okay. Apparently there were eight

20 80-gallon accumulators, bottles, on the lower BOP
21 stack on the HORIZON, correct?
22 A. That sounds correct, yes, sir.
23 Q. And they're precharged from the surface,
24 correct?
25 A. They're precharged on the surface --
00070:01 Q. Right. Before --
02 A. -- but not from the surface.
03 Q. Okay. And the precharge is, what,
04 nitrogen?
05 A. I believe they were using nitrogen, but
06 I -- it -- it can be nitrogen or helium, and I
07 can't say that I know exactly for sure what gas
08 they were using.
09 Q. Okay. They were using some gas. And the
10 precharge of -- of the gas, that's what used --
11 that powers the delivery of the hydraulic fluid,
12 right?
13 A. Yes, sir.
14 Q. Okay. And then the hydraulic fluid is
15 also contained within these bottles, correct?
16 A. Yes, sir.
17 Q. Okay. And the hydraulic fluid, of
18 course, powers the piston, correct?
19 A. That's -- that's correct.
20 Q. So these accumulator bottles, in effect,
21 act for storing energy that can then be used to
22 deliver to the BOP?
23 A. Yes, sir. That's the purpose of an
24 accumulator.
00071:01 Q. All right. In that sense, they're sort
02 of like a battery. They're a storage unit of
03 energy?
04 A. Yes. They store hydraulic fluid under
05 pressure.
06 Q. And if the hydraulic fluid leaks, if you
07 have a leak subsea, does that affect the
08 hydraulic fluid in the subsea accumulator bank?
09 A. If you have a leak downstream of the
10 stored accumulators and -- and it's connected in
11 such a way that that leak would take fluid out of
12 the hydraulic portion of that accumulator, then
13 as it -- as fluid would leak out the pressure
14 available would go down.
15 Q. Okay. Well, I'm trying to figure out
16 that question. Yes, if you have a leak, the
17 pressure will go down. I'm trying to figure out:
18 If you have, for example, a shuttle valve leak or
19 a pilot valve leak subsea, will that affect the
20 amount of hydraulic fluid in the accum -- subsea
21 accumulators?
22 A. It would only affect it if -- if that
23 valve is directly connected to the accumulators'
24 hydraulic side that has pressure.
Q. Well, I'm trying to figure out if it is.

25 For example, they had a shuttle valve leak or a
00072:01 pilot valve leak on the Yellow Pod when this
02 particular BOP was splashed on the HORIZON. Were
03 you aware of that?
04 A. Could you say that again, please, sir?
05 Q. They had a pilot valve leak on the Yellow
06 Pod after they splashed the HORIZON at Macondo.
07 Were you aware of that?
08 A. No, sir.
09 Q. Okay. Have you ever heard that?
10 A. H'm, no, sir, I don't believe I have.
11 Q. Okay. Have you heard of any leak on the
12 Macondo after they splashed it?
13 A. After the stack was splashed but before
14 the event?
15 Q. Correct.
16 A. No, sir.
17 Q. Okay. I'm trying to figure out if that
18 leak would diminish the amount of hydraulic fluid
19 in the subsea accumulator bank?

Page 72:21 to 73:06

00072:21 A. Again, you're -- you're referring to a
22 valve located where, that would be inside of the
23 Control Pod?
24 Q. (By Mr. Williamson) Well, it would be a
25 pilot valve on the Yellow Pod.
00073:01 A. It should not affect the subsea bottles
02 that are mounted on the lower stack.
03 Q. Okay. What about if it was the shuttle
04 valve, would that affect the bottles on the lower
05 stack?
06 A. I don't know.

Page 74:06 to 74:09

00074:06 Q. Okay. All right. Now, I was back to --
07 well, let me show you what was marked as Exhibit
08 7010 in another deposition. Do you have that in
09 front of you? I gave it to you a while ago.

Page 74:21 to 74:23

00074:21 A. It looks like it is -- is referring to
22 some question and providing some -- some answer
23 regarding the Deadman System.

Page 75:09 to 75:20

00075:09 Q. Okay. What about the high pressure blind
10 shear ram close, it uses the subsea accumulators?
11 A. It would use the accumulators that are

12 mounted on the lower stack that were referred to
13 as the eight 80-gallon accumulators.
14 Q. Okay. And -- okay. And that's the same
15 accumulator system that would be available that
16 would be utilized if you had EDS, if you utilized
17 the EDS function, correct?
18 A. It would be used with -- within an EDS
19 function, yes. The subsea bottles on the stack
20 would be --

Page 75:25 to 78:01

00075:25 Q. The AMF control system I've read on
00076:01 multiple occasions -- and there's documents that
02 say this -- that you have to have three
03 conditions for the AMF to fire, correct?
04 A. I believe that's correct, yes, sir.
05 Q. One is you lose electrical power from the
06 rig, correct?
07 A. Yes.
08 Q. You lose your MUX cable connection, in
09 other words, in some form, right?
10 A. That would certainly be a way to lose
11 electrical power.
12 Q. Okay.
13 A. That would be one way.
14 Q. Right. The -- by the way, if you lose
15 your MUX cables, both MUX cables, you've lost all
16 Operator control of the BOP on the HORIZON,
17 correct?
18 A. If you lose both MUX cables, you'd lose
19 the ability to control from push buttons on any
20 of the panels.
21 Q. Push buttons anywhere. You'd no longer
22 have the ability to control or operate the BOP if
23 you lose both MUX cables?
24 A. That's correct.
25 Q. Okay. And there is an alternative to
00077:01 that, isn't there? You can have an acoustic
02 system, for example, can't you?
03 A. Acoustic system can -- could -- can be
04 installed on -- on subsea stacks, that's --
05 Q. Okay.
06 A. -- correct.
07 Q. Cameron sells one, right?
08 A. We offer that and can quote that to
09 customers.
10 Q. Right. Have you put any on?
11 A. Yes, sir.
12 Q. And have you had good luck with them?
13 A. As far as I know. I don't know of any
14 problems with it.
15 Q. Okay. Is it a reliable system?
16 A. The -- the feedback that I get, I'm not
17 hearing anything negative about it.

18 Q. Okay. Have you sold several of them?

19 A. That would be a fair statement, yes, sir.

20 Q. Okay. So in the ten years you've been
21 with Cameron, y'all have sold several acoustic
22 systems for actuating a BOP, and you haven't
23 gotten any negative feedback in terms of its
24 functionality or its reliability. Do I have that
25 right?

00078:01 A. Not to my knowledge.

Page 78:21 to 78:24

00078:21 Q. Okay. So you have no -- as the Director
22 of Engineering Controls has no idea whether
23 there's been complaints about the acoustic system
24 or not?

Page 79:01 to 79:24

00079:01 A. I don't have personal knowledge of it.

02 Q. (By Mr. Williamson) And that's what I'm
03 saying. Okay. But you believe that's a reliable
04 system?

05 A. As I stated, I'm not aware of any
06 complaints.

07 Q. I'm asking something a little different.
08 Y'all sell this system, don't you? Your
09 Department sells this system, doesn't it?

10 A. Our company sells this system.

11 Q. Right. And that's a piece of equipment
12 that comes through your Department; correct?

13 A. That's correct.

14 Q. And your Department's responsible for it,
15 correct?

16 A. We specify the -- and control the
17 documents that define the equipment that we
18 purchase.

19 Q. Would you sell it if you didn't think it
20 was a reliable piece of equipment?

21 A. No, sir.

22 Q. Okay. Do you think it's a reliable piece
23 of equipment, an acoustical control system for
24 blowout preventers?

Page 80:01 to 80:06

00080:01 A. There has been no functional issues that
02 I'm aware of with -- with those systems.

03 Q. (By Mr. Williamson) And, therefore, you
04 think it's a good system?

05 A. It -- it'll -- it'll perform its intended
06 purpose.

Page 90:14 to 90:18

00090:14 Q. (By Mr. Williamson) Okay. Go ahead and
15 tell me why you need a ROV hot stab to the test
16 ram. Go ahead and give me your Engineering
17 hydraulic opinion. Why do you want an ROV hot
18 stab to the test ram?

Page 90:20 to 91:07

00090:20 Q. (By Mr. Williamson) Tell me the
21 advantages of that.
22 A. The advantage would be that would be a
23 secondary means to operate the test ram.
24 Q. Okay. What would be the advantage to
25 having an ROV hot stab to a sealing ram, to a ram
00091:01 that might actually seal in the well in an
02 emergency? What would be the advantage to that?
03 A. Having an ROV connected to a ram that
04 would seal, would be -- the advantage would be
05 that you can -- you that could operate it. If
06 you have it hooked to the closed side, you could
07 operate it closed.

Page 92:01 to 92:05

00092:01 Q. Therefore, you need the secondary system
02 when the primary system does not operate,
03 correct?
04 A. That's the purpose of secondary
05 equipment.

Page 93:03 to 93:15

00093:03 Q. (By Mr. Williamson) Okay. What is the
04 purpose of a blowout preventer? Why does it
05 exist?
06 A. It's a tool used in drilling.
07 Q. For what?
08 A. For closing -- closing, sealing.
09 Q. "Closing, sealing" of what?
10 A. Containing pressure that's in the
11 wellbore.
12 Q. Okay. It's a tool that's used to close
13 and seal and contain the pressure in the
14 wellbore, correct?
15 A. (Nodding.) Generically, that's correct.

Page 95:01 to 95:18

00095:01 Q. On the AMF, you have to lose three things
02 in order to actuate the AMF system on the
03 HORIZON. You have to lose electrical power from

04 the rig, which is the MUX cable system, right?
05 A. That's correct.
06 Q. Now, you can lose electrical power that
07 goes to the MUX cable. There's more than one way
08 to lose electrical power, correct?
09 A. That's correct.
10 Q. Okay. One way would be the MUX cables
11 themselves fail, correct?
12 A. Yes.
13 Q. Okay. Then what else has to happen to
14 activate the AMF?
15 A. Well, within that same MUX cable, you
16 have communication lines, so you have -- lose
17 power -- electrical power, communication, and
18 then you have to lose hydraulic power.

Page 95:22 to 97:03

00095:22 Q. -- if you lose the MUX cables, because
23 I've noticed in y'all's materials, it says you
24 have to lose electrical power, and you have to
25 lose communication between the two Pods. And
00096:01 then you have to lose hydraulic power. Those are
02 the three things I've noticed in mur -- your
03 written materials, correct? And --
04 A. I believe that's correct, yes.
05 Q. Okay. I want to talk about
06 communication. When you lose the MUX cables, if
07 you were to lose both MUX cables, do you
08 automatically lose communication between the two
09 Pods?
10 A. Yes.
11 Q. Okay. So when you lose the MUX cables,
12 you lose electrical power, which is one
13 requirement, and you also lose communication
14 between the two Pods, which is a second
15 requirement.
16 A. To the best of my knowledge, that's
17 correct.
18 Q. Okay. Then the third requirement was you
19 have to lose hydraulic power, correct?
20 A. That's correct.
21 Q. Now, you have -- if I -- in my
22 understanding, and it may be wrong, because -- is
23 that there's two different hydraulic lines that
24 run from the surface down to the subsea. There's
25 a rigid conduit, and there's another one; is that
00097:01 right?
02 A. There can be another one. It's generally
03 referred to as a "hot line" --

Page 97:23 to 98:02

00097:23 Q. Okay. How many hours did you get --

24 spend getting ready for the deposition today?
25 A. More -- more than I would like, but --
00098:01 Q. Sure. Four or five days?
02 A. Yes, sir.

Page 99:18 to 100:05

00099:18 what you've told me, it will -- the trigger for
19 the AMF will not be fired until you lose
20 hydraulic power, correct?
21 A. That's correct.
22 Q. And I'm trying to figure out, when you
23 lose the MUX cables, do you automatically lose
24 haul -- hydraulic power?
25 A. No, you do not.
00100:01 Q. Does the system say "pressurized up"? In
02 other words, do you still have hydraulic pressure
03 in the rigid conduit, in the hot line even after
04 you lose the MUX cables?
05 A. You could, you could.

Page 101:21 to 101:23

00101:21 Q. Right. Do you -- do you -- you have
22 hydraulic pressure in the accumulator banks --
23 A. Yes.

Page 102:01 to 102:18

00102:01 Q. Does that hydraulic pressure remain in
02 the accumulator bank even if you lose the hot
03 line and the rigid conduit?
04 A. Yes, it would.
05 Q. Okay. If -- I'm trying to figure out:
06 If you lose the hot line and the rigid conduit,
07 then the transducer would sense a loss of
08 hydraulic power and the AMF would fire, correct?
09 A. I'd have to look at the diagram to show
10 you exactly.
11 Q. What diagram?
12 A. Hydraulic flow diagram of the Control Pod
13 and the BOP stack.
14 Q. Describe the document you want to look
15 at. Hydraulic flow diagram, describe it to me,
16 so I can go find it.
17 A. It's a stack flow diagram in the Control
18 Pod diagram.

Page 102:25 to 105:07

00102:25 hot -- if the MUX cables -- assume with me during
00103:01 this series of questions that the MUX cables have
02 been destroyed. Can you make that assumption

03 with me?
04 A. All right.
05 Q. We've lost electrical and the
06 communication, in other words. Those two legs
07 have been satisfied. Do you understand?
08 A. Okay.
09 Q. If you lose the hot line, is that going
10 to trigger the AMF?
11 A. It should not by itself.
12 Q. Okay. If you lose the rigid conduit,
13 will that trigger the AMF?
14 A. Typically not by itself, it wouldn't.
15 Q. Okay. If you lose the rigid conduit and
16 the hot line, you literally just walked up and
17 cut them in two, will that trigger the AMF?
18 A. I'd have to look at the diagram to make
19 sure where it's sensing it, but typically
20 speaking, they would.
21 Q. Okay. Now, what if you don't lose the
22 rigid conduit and you don't lose -- well, let me
23 phrase it this way: Where do the rigid conduit
24 and the hot line go to on the surface of the rig?
25 Where are they connected to?
00104:01 A. Well, the hot line is typically --
02 there's something called a hot line real.
03 Q. Okay.
04 A. That contains a spool of the hot line
05 hose.
06 Q. Okay.
07 A. And it's connected somewhere to a
08 pressure source, so that it's sending pressure
09 down from the -- it's tied in on the -- I'm not
10 sure without looking at the diagrams, but it's
11 tied into the pressure source on the surface, and
12 that -- the pressure goes down that -- that line.
13 It's -- it's clamped to the riser also.
14 Q. Okay. And where is the rigid conduit
15 attached on the rig?
16 A. It's an integral part of the riser.
17 Q. Okay.
18 A. Those are tubes that are --
19 Q. On the rig, when it leaves the riser and
20 comes to the rig, where does it go?
21 A. Typically there's a flexible line that
22 comes off the top of the riser and then it will
23 go to a rigid piping that goes over to our
24 system.
25 Q. To a pressure source?
00105:01 A. Yes, sir.
02 Q. Is it the same pressure source for the
03 hot line, or there's two different pressure
04 sources?
05 A. It's the same pressure source. May be a
06 different place that it's connected, but it's
07 coming from the same source.

Page 106:20 to 107:05

00106:20 Q. Okay. When you lose electrical power on
21 the rig, the hydraulic power unit does not
22 automatically depressurize, correct?
23 A. That's correct, it does not.
24 Q. And so the AMF would not sense a loss of
25 hydraulic power merely because you lost
00107:01 electrical power on the rig, correct?
02 A. Just because you lose electrical power on
03 the -- on the rig where the pumps can't run, the
04 system would stay charged up, barring any usage
05 or leaks.

Page 107:14 to 108:19

00107:14 Q. Okay. So there's two possibilities: One
15 is you have some sort of a leak at which time the
16 system would gradually -- the pressures will
17 gradually drop, correct?
18 A. That would be one way to get the pressure
19 that would bleed down.
20 Q. Right. And, of course, if that happened,
21 there would be no electric pump to pressurize it
22 back up. So at some point in time, the blowout
23 preventer would sense the loss of pressure and
24 fire the AMF, correct?
25 A. Under the situation that you described,
00108:01 that if the system were pressurized up and at
02 some point in time if the pressure bleeds down to
03 -- to a level that would -- the sensor would --
04 would actuate the AMF, if the electrical power
05 and the communication were also severed at that
06 point. If all three conditions were met.
07 Q. Okay. And then another possibility, I
08 guess, would be you could actually destroy the
09 HPU itself at which time you would have a loss of
10 hydraulic integrity, correct?
11 A. You would lose the ability to pump
12 hydraulic fluid if you lost the HPU.
13 Q. And you would also lose -- if you lost
14 the HPU, would you destroy the hydraulic
15 integrity of the closed system? In other words,
16 would the AMF sense a pressure drop?
17 A. Probably not because the HPU is just a --
18 typically a pumping unit. It pumps into
19 accumulators.

Page 109:05 to 109:15

00109:05 Q. So even if you lose the HPU and even if
06 you lose electrical power, there will not be an
07 immediate loss of hydraulic power that the AMF

08 would sense because the accumulators will still
09 be charged up, and the rigid conduit and the hot
10 line will still be charged up?

11 A. If there's nothing -- if there's nothing
12 that would create a situation that would bleed
13 the pressure off, once you put it into those
14 accumulators, it -- it's going to be checked in
15 and stay there.

Page 109:19 to 110:18

00109:19 What you're saying is assuming you lose
20 electrical power in the MUX cab -- both MUX
21 cables, then that's going to satisfy two of the
22 conditions for the AMF trigger, correct?

23 A. Electrical power and communication are
24 two, that's correct.

25 Q. Okay. Then next, we're going to have to
00110:01 have a transducer in the Control Pods that will
02 sense a loss of hydraulic power for the AMF to
03 actually fire, correct?

04 A. I believe that's correct.

05 Q. Okay. But hydraulic pressure will not
06 automatically be lost when you lose electrical
07 power, correct?

08 A. That's correct.

09 Q. Because as long as the accumulator stack
10 that's on the surface, that's on the rig, as long
11 as it maintains pressure integrity and as long as
12 the rigid conduit and the hot line maintain
13 pressure integrity, the AMF will not fire,
14 correct?

15 A. If -- if you still have hydraulic
16 pressure that's above the threshold of actuation
17 of the AMF, it won't fire.

18 Q. Right.

Page 111:05 to 111:16

00111:05 Q. Okay. What I'm trying to figure out is
06 the AMF would not necessarily fire at that point
07 in time if the hydraulic system remained intact,
08 correct?

09 A. Any one of the three triggers that are
10 required to actuate the AMF --

11 Q. I'm not asking about all three triggers.

12 A. Okay.

13 Q. I've got limited time. So I want to make
14 sure I get to the point.

15 A. If you don't lose the hydraulics, it
16 wouldn't actuate.

Page 112:04 to 112:07

00112:04 Q. (By Mr. Williamson) Do you see this
05 design characteristic of the AMF system as a
06 problem?
07 A. No, sir.

Page 114:04 to 117:06

00114:04 QUESTIONS BY MR. PFEFFER:

05 Q. Mr. Gaude, my name is Dave Pfeffer. I'm
06 an attorney with the Department of Justice
07 Aviation and Admiralty in the Civil Division.

08 First question I have for you is, just to
09 clarify, as -- as Director of Cameron's Controls
10 Division, are you familiar with all the
11 components of the Mark II Control Pods?

12 A. Yes.

13 Q. Okay. And you are fam -- are you
14 familiar with the operations that the Control
15 Pods are programmed to carry out in an AMF
16 sequence?

17 A. Generally. I don't know specifically,
18 every -- every part of it, but in general, yes.

19 Q. Can you just explain generally what role
20 the -- the Control Pods play in the AMF sequence?

21 A. Well, the Control Pods contain the SEM,
22 the Subsea Electronic Module, that houses the --
23 the control componentry for the electronics.
24 It -- it -- it has within it something referred
25 to as an AMF controller card. It would be in

00115:01 that sealed-up housing that's mounted inside of
02 the Control Pod in what we refer to as the MUX
03 section of the Control Pod.

04 Q. And those are the components that trigger
05 the AMF operation if the three conditions that
06 you discussed earlier are all met?

07 A. Yes.

08 Q. All right. If the -- if the AMF
09 conditions are satisfied, do you know how the
10 Mark II Control Pods are programmed to respond to
11 that AMF situation?

12 A. Well, the AMF con -- the AMF system will
13 then boot itself up using battery power, and it
14 will execute the prescribed functions in sequence
15 that it's programmed to execute --

16 Q. Okay. Is it --

17 A. -- or operate.

18 Q. Is there a general AMF sequence that
19 Cameron installs in its con -- for its AMF cards?

20 A. They would not be the same. They can --
21 they can vary depending on the customer
22 requirements.

23 Q. Have you looked at the sequence for the
24 AMF process on the DEEPWATER HORIZON Control
25 Pods?

00116:01 A. I have before, seen it, yes.
02 Q. Okay. Do you recall what the sequence
03 is?
04 A. I could not go through it step by step.
05 Q. Okay. If you turn to Tab 2. This is
06 Exhibit 7010. We were just looking at this a few
07 minutes ago. Do you recall looking at this in
08 prior questioning from the PSC?
09 A. I don't -- yes. I've seen this document
10 before.
11 Q. Okay. It looks like it's an E-mail from
12 Carter Erwin. He's a Cameron employee, is he
13 not?
14 A. That's correct.
15 Q. And in -- in -- in his E-mail, he states
16 that at seven seconds, the "...High Pressure
17 Blind/Shear Ram..." closes, or begins to close.
18 Is that accurate?
19 A. Based on the information that's in
20 this -- this E-mail, it says, "At T = 7
21 seconds...", one of the functions that operates
22 is "...High Pressure Blind/Shear Ram Close."
23 Q. Okay. And then it says at 37 seconds,
24 the high pressure blind/shear ram close
25 deactivates; is that correct?
00117:01 A. That's correct.
02 Q. So would I understand from those timings
03 that it would take approximately 30 seconds for
04 the blind shear ram to close in an AMF sequence?
05 A. That's the time that -- that is allowed
06 in this sequence.

Page 117:24 to 118:03

00117:24 Q. Okay. With respect to the DEEPWATER
25 HORIZON, at least with what Carter Erwin states
00118:01 in this E-mail, it takes approximately 30 seconds
02 on -- for the DEEPWATER HORIZON and the --
03 A. That's what's programmed in the sequence.

Page 121:25 to 122:13

00121:25 Q. (By Mr. Pfeffer) At some point during the
00122:01 AMF sequence, the blind shear rams should close;
02 is that correct?
03 A. In -- in that sequence, the blind shear
04 rams should close.
05 Q. And there's a solenoid valve on each Pod
06 that's triggered in order to function those blind
07 shear rams in the AMF sequence; is that correct?
08 A. I believe that's correct, yes.
09 Q. And on the DEEPWATER HORIZON BOP, the
10 solenoid that was assigned to activate the blind
11 shear rams is No. 103. Do you recall that?

12 A. I believe -- I believe I recall that as
13 being 103.

Page 122:18 to 123:10

00122:18 Q. Can you explain how the SEMs signal the
19 solenoid to function the blind shear rams during
20 the AMF sequence?

21 A. Well, the -- the AMF, if -- if it's armed
22 and it actuates the sequence, you can -- you can
23 get a -- a signal from -- from all four SEMs.
24 And there's two SEMs in each Pod, and then they
25 would actuate the high pressure shear close
00123:01 valve, the No. 103 that you referred to, in each
02 Pod, and then that would operate the function.

03 Q. Okay. When you say that the -- the blind
04 shear rams would be actuated, that's -- that's
05 the question, I guess, I'm getting to. So let's
06 just talk about the solenoid in particular.

07 A. Okay.

08 Q. Okay. The solenoid has two coils, if I
09 understand that correctly? Is that --

10 A. That's correct.

Page 124:10 to 127:25

00124:10 Q. Well, I'm asking you about the
11 functionality of it. You have two SEMs in the
12 Control Pod, correct?

13 A. Yes.

14 Q. You have two coils in the solenoid,
15 correct?

16 A. Yes.

17 Q. Okay. Does each SEM sep -- separately
18 interact with one of those coils?

19 A. Yes.

20 Q. Okay.

21 A. Yes.

22 Q. So just if you labeled it as SEM A and
23 SEM B, SEM A operates on one coil, SEM B operates
24 on the other coil, correct?

25 A. Yes.

00125:01 Q. Are the Control Pods programmed to
02 energize both those coils at the same time during
03 the AMF operation?

04 A. Yes.

05 Q. And is that activation simultaneous?

06 A. It's simultaneous in --

07 (Phone ringing.)

08 A. -- in and of how fast the circuit
09 energizes it. For all practical purposes, you
10 know, you can -- you can say it's instantaneous,
11 but there may be some slight delay due to the
12 circuitry.

13 Q. (By Mr. Pfeffer) And when you say a
14 "slight delay," what is a slight delay?
15 A. I don't -- I can't define that.
16 Q. Each of the -- well, each of the coils is
17 energized by separate wires that run to each
18 coil; is that correct?
19 A. I believe that's correct, yes.
20 Q. All right. And there's a black wire and
21 a white wire, correct?
22 A. I believe that's the coloration of the
23 wires -- wires in the coil.
24 Q. Why are the Control Pods programmed to
25 simultaneously energize both coils in the
00126:01 solenoid?
02 A. That's so -- so you can have multiple
03 maximum opportunity for the system to work.
04 Q. Can you explain what you mean by that?
05 A. Well, you've got two -- two separate ways
06 to -- to energize and operate. You've got two
07 Control Pods, you've got two SEMs in each Pod, so
08 you've actually got four independent ways that
09 any one SEM in any -- either Pod can actuate the
10 function.
11 Q. When you -- I -- I believe the phrase
12 that you -- did you say "multiple maximum
13 opportunity for the system to work," are you
14 referring to redundancy when you say that?
15 A. That would be -- that would be a way to
16 say that, yes.
17 Q. And if you only have one of the coils
18 energized rather than both energized at once,
19 does that create less force on the valve than if
20 you had both?
21 A. Yes.
22 Q. Okay. So having both coils energized at
23 the same time creates more force on the valve and
24 gives you a better opportunity to open the valve,
25 correct?
00127:01 A. The valve -- no, I wouldn't -- the valve
02 is designed to operate on one coil by itself. It
03 doesn't require both coils for the valve to
04 operate.
05 Q. Okay. If a single solenoid -- let's just
06 say one of the solenoid coils was energized to --
07 to apply force on the valve. If the -- if the
08 energization of that coil is lost, what happens
09 to the valve?
10 A. Its spring returns to the vent position.
11 Q. So it -- it closes?
12 A. No. It won't allow pressure to go
13 through it.
14 Q. Okay. So no more hydraulic pressure will
15 go into the blind shear ram --
16 A. The pressure --
17 Q. -- if --

18 A. -- from the solenoid valve doesn't go
19 directly to the blind shear ram.
20 Q. Okay. I guess what I'm asking is: If
21 you -- if you only have one solenoid coil
22 energized, and that power is lost so that the
23 solenoid coil is no longer energized, can the
24 blind shear ram continue to close?
25 A. No.

Page 128:04 to 128:19

00128:04 (Exhibit No. 5097 marked.)
05 Q. (By Mr. Pfeffer) Do you recognize this
06 document?
07 A. I believe I've seen this before, yes.
08 Q. Okay. Were you involved in developing
09 the procedure in this document?
10 A. Not specifically, no.
11 Q. Okay. What -- what is the procedure, and
12 what is this document?
13 A. It says it's a refurbishment procedure
14 for the -- for the 223 -- the two different part
15 number valves. One is a 223290-15 and a
16 223290-63.
17 Q. Have you ever performed the procedure
18 that's described in this document?
19 A. Not personally.

Page 128:25 to 132:04

00128:25 Q. Okay. If you would, turn to -- I believe
00129:01 it's the sixth page. It describes the function
02 test as the label at the top.
03 A. Is this 6 of 14, is that the page you're
04 referring to?
05 Q. Yes, sir.
06 A. All right.
07 Q. It says "Function Test" as -- at the top.
08 Are we on the same page?
09 A. I believe so, yes.
10 Q. The function test for this refurbishment
11 procedure for Cameron solenoid valves has two
12 components. Do I read that correctly?
13 A. You're referring to Section 6?
14 Q. 6.1 and 6.2.
15 A. Okay. All right.
16 Q. And 6.1 explains that the function -- the
17 function test with one activated coil should be
18 performed. Is that accurate?
19 A. Yes.
20 Q. Okay. And then 6.2 has a function test
21 with both activated coils; is that correct?
22 A. That's correct.
23 Q. Okay. In the function test, why test

24 with one coil individually and then test with
25 both coils?

00130:01 A. The -- the test with one coil is to
02 verify that the valve will function correctly
03 with one coil activated. And the reason for
04 activating both coils is to make sure that the
05 valve still functions correctly with two coils
06 activated.

07 Q. Is there a reason that a valve might
08 function with one coil, but not with both coils?

09 A. Yes.

10 Q. Okay. And what is that reason?

11 A. The reason that the valve may not
12 function if both coils were actuated together
13 would be that if the coils were wired opposite
14 each other, in other words, call it reverse
15 polarity. And -- and if that were the case when
16 they were both energized simultaneously, the
17 electric magnetic fields would oppose each other
18 and essentially cancel out, and the valve would
19 not operate.

20 It either would not shift initially or if
21 it was already shifted and you did that, it would
22 then go to the vent position.

23 Q. Okay. So just -- just to take a step
24 back and make sure I understand that concept,
25 each -- when each coil is energized, it creates a
00131:01 magnetic field?

02 A. That's correct.

03 Q. And that field operates on the valve to
04 push it open?

05 A. Yeah. It -- it -- it pulls a valve in a
06 way that it will let the hydraulic pressure
07 that's acting against it go through the valve
08 and -- and perform its intended function.

09 Q. Okay. And in an AMF function, both coils
10 in the solenoid are simul -- or should be
11 simultaneously activated; is that correct?

12 A. That would be correct if both SEMs were
13 to energize them.

14 Q. And that's the normal operation of the
15 AMF; is that correct?

16 A. That would be correct.

17 Q. Okay. So if -- if I understand your
18 dis -- explanation of reverse polarity correctly,
19 you want to make sure that the magnetic fields
20 created by each of those coils are the same -- in
21 the same direction?

22 A. That's correct.

23 Q. Okay. And if one coil is in -- is wired
24 to create the reverse magnetic field of the
25 other, then the fields cancel each other out?

00132:01 A. That's correct.

02 Q. And in that case, the valve would not
03 pull open?

04 A. That's correct.

Page 134:17 to 137:19

00134:17 Q. All right. Well, to state it more
18 simply, does Cameron have a position as to
19 whether the coil should be wired such that the
20 coils have the same polarity when energized?
21 A. They -- the -- they need to be wired in
22 accordance with the proper way to maintain
23 function of the valve.
24 Q. Okay.
25 A. And they need to have the same wiring
00135:01 configuration on each coil so that they don't
02 oppose each other.
03 Q. So the position of Cameron is that the
04 coil should, when energized, be wired such that
05 they'll have the same polarity?
06 A. That's my understanding, that's correct.
07 Q. During the AMF sequence, is it DC power
08 that's supplied to the solenoid coils?
09 A. Yes.
10 Q. And do you know if Cameron's Mark II
11 Control Pods are programmed to modulate that
12 voltage in any way?
13 A. It doesn't modulate the voltage. It
14 modulates the period that the voltage is
15 available.
16 Q. Okay. Can you explain that concept to
17 me?
18 A. It's like if you went to a light switch,
19 and you turn it on and you turn it off.
20 Q. M-h'm.
21 A. You turn it on and you turn it off, it
22 would be that type of modulation.
23 Q. Okay. So when you talk about modulation,
24 are you talking about one coil being energized at
25 times when the other coil is not energized?
00136:01 A. No.
02 Q. You're talking about turning the coils on
03 and off essentially at the same time?
04 A. That's correct.
05 Q. So I don't know -- have you heard the --
06 do you -- are you familiar with the term a "phase
07 shift"?
08 A. No.
09 Q. Have you ever heard that term before?
10 A. H'm, I don't know that I have
11 specifically. I might have.
12 Q. Okay. So just to make sure I understand,
13 in the Mark II Control Pods programming for the
14 AMF Procedure, the -- both coils and solenoid
15 should energize simultaneously from beginning to
16 end. That's basically how it's programmed; is
17 that correct?

18 A. Yeah, the -- the -- the SEMs will
19 individually energize their designated coil when
20 the function actuates.

21 Q. Okay. And are the SEM -- are the SEMs
22 programmed to -- to -- to actuate that function
23 at the same time, once all three of the
24 conditions necessary for AMF are lost?

25 A. Yes.

00137:01 Q. And there's no -- there's no program in
02 the AMF card that would say: "Activate Coil A
03 for 20 seconds, and then activate Coil B for 20
04 seconds, separately"?

05 A. No. There's not -- not a separate
06 actuation.

07 Q. And is the DC power that's applied to
08 each coil applied at the same level, or is one
09 coil -- does one coil receive a -- a larger
10 amount of power than the other?

11 A. No. They would get the same -- same
12 voltage.

13 Q. And that voltage doesn't increase or
14 decrease over the -- the period of activation?

15 A. It -- it -- it can. It could -- could
16 possibly fluctuate some.

17 Q. Okay. Is fluctuation of that power
18 programmed into the AMF cycle?

19 A. No.

Page 138:15 to 140:04

00138:15 Q. -- you're not aware of any specific
16 reason why the voltage supplied to one coil
17 versus the other would fluctuate?

18 A. No. They're coming from the same source.

19 Q. Okay. And just to make sure I
20 understand, is -- is there a program delay
21 between SEM A and SEM B for the purpose of
22 activating Coil 1 and Coil 2 in the solenoid
23 during the AMF sequence?

24 A. There is not a program delay.

25 Q. Okay. Why is the AMF sequence -- sequence
00139:01 programmed to function so that the coils are
02 simultaneously energized from beginning of the
03 sequence to the end of the sequence?

04 A. Say that again, please.

05 Q. Why is the AMF sequence programmed to
06 function so that the coils are simultaneously
07 energized from the beginning of the sequence to
08 the end of the sequence?

09 A. That's -- that's just how it was done. I
10 don't -- I don't -- I don't really know,
11 specifically, other than it's done at the same
12 time. It starts and stops at the same time.

13 Q. And if the coils in a solenoid are
14 miswired, resulting in a reverse polarity between

15 the two coils when energized, can the blind shear
16 rams be closed?

17 MR. BAAY: Objection, form.

18 A. If a valve is reverse-wired, as you
19 stated it, that valve would not -- that one valve
20 would not shift, would not operate.

21 Q. (By Mr. Pfeffer) Okay. So let's just
22 stick with the valve. If you have reverse
23 polarity in the solenoid, can the valve shift
24 during the AMF sequence?

25 A. No.

00140:01 Q. And if the valve cannot shift during the
02 AMF sequence, can the blind shear rams close?

03 A. The -- the valve can't shift if both
04 coils are actuated it's -- at the same time.

Page 140:10 to 140:15

00140:10 Q. Okay. Let me try it a different way.

11 Is there a way in which the blind shear
12 rams can close during the AMF sequence without
13 the valve and the solenoid shifting?

14 A. A solenoid valve has got to shift in
15 order to function the blind shear ram.

Page 140:20 to 140:25

00140:20 Q. So in the instance of the DEEPWATER
21 HORIZON blowout preventer, that would be Solenoid
22 Valve No. 103.

23 A. That's correct.

24 Q. Okay. So if the valve for Solenoid 103
25 cannot shift, can the blind shear ram close?

Page 141:05 to 141:10

00141:05 A. No. No. There's two control Pods,
06 there's two Valve 103s. There's one in each Pod.

07 Q. (By Mr. Pfeffer) Okay. I understand. I
08 understand what --

09 A. If -- if one doesn't work, the other one
10 can work and function.

Page 141:13 to 141:24

00141:13 Q. No. That -- that's -- that makes sense.
14 Let me ask it this way: If -- if a valve -- the
15 valve for the -- the solenoids that control the
16 blind shear ram cannot shift, can the blind shear
17 ram close?

18 A. If neither of the two valves shifts, then
19 you're not going to successfully close the blind
20 shear ram.

21 Q. Okay. So the valve shifting is a
22 necessary component of closing the blind shear
23 ram?
24 A. That's --

Page 142:02 to 142:02

00142:02 A. -- that's correct.

Page 142:07 to 143:07

00142:07 In order for the AMF to function, one of
08 the requirements is that you have to lose power.
09 A. Electrical power, that's correct.
10 Q. Okay. And so in the AMF see -- sequence,
11 the power is supplied by batteries that are in
12 the Control Pods?
13 A. The batteries actuate the AMF in the --
14 in the Pod.
15 Q. Okay. And if I understand correctly,
16 there's one 27-volt battery in each Control Pod;
17 is that correct?
18 A. I believe that's correct, yes.
19 Q. All right. So it's a 27-volt battery
20 bank? Would that be more accurate?
21 A. It's an association of batteries that
22 will produce 27 volts.
23 Q. Okay. And then there are two separate
24 9-volt batteries that are assigned to each AMF
25 card in the -- in the Control Pod?
00143:01 A. In -- for each SEM.
02 Q. For each SEM?
03 A. Card, yes.
04 Q. What does the 27-volt battery supply
05 power to?
06 A. It -- it powers the solenoid valves
07 themselves.

Page 144:04 to 144:09

00144:04 Q. Is there a level of voltage in either the
05 27-volt or 9-volt batteries that's necessary to
06 carry out the AMF?
07 A. Yes, there -- there will -- there would
08 be a -- a -- a minimum level of voltage that
09 would be required --

Page 144:12 to 144:22

00144:12 Q. Do you know what that voltage is?
13 A. I -- I do not know specifically what
14 the -- that voltage would be.
15 Q. If the batteries don't have that minimum

16 voltage necessary to carry out the AMF, is there
17 any way that the AMF can complete its sequence?
18 A. No, not that I'm aware of.
19 Q. And the name of the manufacturer that
20 makes the batteries used in the Mark II Control
21 Pods is SAFT? Is that correct?
22 A. I believe that's correct.

Page 144:24 to 144:25

00144:24 at Tab No. 8, and this has been previously marked
25 as 3170, but because it's kind of hard to read, I

Page 145:08 to 145:10

00145:08 Q. Do you know -- do you recognize this
09 document?
10 A. It -- it looks familiar, yes.

Page 145:19 to 146:23

00145:19 does it describe the labeling components on a
20 SAFT battery as a -- pursuant to the Cameron
21 protocol?
22 A. It appears to, yes, sir.
23 Q. If you take a look just below the diagram
24 where it says "NOTES," and there's "1, 2, 3, 4."
25 That's on the left side. Do you see that?
00146:01 A. Yes.
02 Q. And No. 2 states it's the "DATE" the
03 "CODE SHALL CONSIST OF FOUR DIGIT NUMBER"
04 following -- "FOLLOWED BY A SINGLE LETTER
05 INDICATING MONTH, YEAR AND WEEK OF MANUFACTURE.
06 EXAMPLE: 0990D = SEPTEMBER, 1990 4TH WEEK."
07 Did I read that correctly?
08 A. I believe so, yes.
09 Q. Okay. And if you look at -- just to the
10 right of there, there's -- it says "DETAIL 'A'.
11 And above where it says "DETAIL 'A'," there's a
12 "LABEL STOCK DETAIL"?
13 A. All right.
14 Q. Okay. Do you see where that No. 2 that
15 we just read is indicated on that label?
16 A. Yes.
17 Q. And so my question is: On any of the
18 SAFT batteries that Cameron supplies for its Mark
19 II Control Pods, the labe -- will the labels be
20 consistent with that detail?
21 A. I believe any -- any -- any batteries
22 that are supplied pursuant to this document would
23 be labeled as such.

Page 147:18 to 148:22

00147:18 Q. Yes. Previously marked as Exhibit 3171.
19 Okay. And does this look consistent with a -- a
20 label that would be on a SAFT battery supplied
21 for a Mark II Control Pod?
22 A. It does appear -- it does appear that
23 way.
24 Q. Okay. On the right column of this
25 example of a battery label, under "CAMERON P/N,"
00148:01 if you go three lines down from there, it says
02 "0509D." Do you see that?
03 A. Yes, I do.
04 Q. Okay. Would that -- in accordance with
05 Exhibit 3170 that we just looked at, would that
06 0509D signify the date -- or the month, year, and
07 week of which this battery was manufactured?
08 A. I believe it -- it -- that would be
09 correct.
10 Q. So in this example, 0509D, do I
11 understand correctly that that would be May of
12 2009, fourth week?
13 A. It appears to be correct.
14 Q. Is that your understanding of the manner
15 in which the SAFT batteries are labeled for
16 Cameron's Mark II Control Pods?
17 A. That's what's defined on this document.
18 Q. Is that your understanding --
19 A. Yes.
20 Q. -- as Director of the Controls Division?
21 A. It would be my understanding that they
22 would be marked that way.

Page 150:10 to 150:21

00150:10 Q. Okay. Are you aware if there is a -- a
11 process called the "low voltage drop out feature"
12 on -- in the AMF card? Have you ever heard that
13 term?
14 A. Not specifically, I can't say that I
15 have.
16 Q. Do you know if the AMF cards in the
17 Control Pods are programmed to respond in the
18 event a 9-volt battery contains less than a
19 minimum voltage for the AMF?
20 A. No.
21 Q. Do you know if the AMF card has a

Page 151:11 to 151:12

00151:11 easier, if you take a look at Tab No. 10. It's
12 previously been marked as Exhibit 3173. It's an

Page 154:04 to 154:14

00154:04 Do you have an understanding of how the
05 AMF cards are programmed to carry out the AMF
06 sequence in the event of a -- a low battery?
07 A. I'm -- I'm not a software programmer. I
08 don't have direct knowledge of how that
09 programming works or functions for that card
10 in -- in -- in detail of a programmer.
11 Q. Are you aware of any safety feature in
12 the AMF sequence that would restart the AMF
13 process if one of the batteries in the Control
14 Pod was low?

Page 154:16 to 154:16

00154:16 A. No, I'm not.

Page 155:22 to 156:04

00155:22 Q. Okay. And you're not -- are you aware of
23 any way in which that could occur with respect to
24 the batteries that Cameron uses in its Control
25 Pods?
00156:01 A. I'm -- I'm only generally knowledgeable
02 that batteries, this type of battery, when you
03 use it, voltage can go down, and then when you
04 stop using it, it can recover some voltage.

Page 156:09 to 159:01

00156:09 Q. Okay. And the -- and the batteries on
10 the Mark II Pods are not rechargeable, correct?
11 A. They're referred to as primary batteries.
12 They're not rechargeable.
13 Q. Okay. And Cameron has since developed
14 the Mark III Control Pod; is that correct?
15 A. That's correct.
16 Q. Were you involved in the development of
17 that product?
18 A. Yes.
19 Q. Okay. And are the solenoids in the
20 Mark III Pods different from the solenoids that
21 were used in -- with relation to the Mark II
22 Pods?
23 A. Solenoid valves or the coils?
24 Q. The coils.
25 A. The coils are different.
00157:01 Q. Okay. How are the coils different in a
02 Mark III?
03 A. The Mark III is a -- a single wound coil.
04 It's not a dual -- not a bifilar wound coil as
05 the Mark II. It's a -- it's pressure compensated
06 in and of itself. Excuse me. And then it's also
07 in an oil bath pressure compensated chamber

08 bathed in a dielectric fluid.

09 Q. And if I understand -- stood you earlier,
10 the -- part of the purpose for a two-coil system
11 is to provide a redundancy; is that correct?

12 A. H'm, not -- not exactly from my memory.
13 It was the fact that you had one SEM that
14 operated one coil, and the other SEM operated the
15 other coil.

16 Q. And the -- and this having two SEMs that
17 work with the separate coils provides a
18 redundancy in the AMF sequence; is that correct?

19 A. Well, it provides two different ways for
20 it to operate.

21 Q. So if one doesn't work, the other one
22 would work?

23 A. Yeah.

24 Q. Okay.

25 A. If one SEM didn't work, the other SEM
00158:01 would -- would -- could function.

02 Q. So is there a -- a reason why Cameron
03 went from a two-coil solenoid to a one-coil
04 solenoid, even though it would reduce the
05 redundancy in that particular valve?

06 MR. JONES: Object to form.

07 A. I don't -- I don't agree with that
08 statement.

09 Q. (By Mr. Pfeffer) Okay. Is there a reason
10 you went from two coils to one coil?

11 A. It was -- the least -- the least prone
12 device in the solenoid valve to cause a problem
13 is the -- is the coil. If you keep water out of
14 the valve, the -- the coil is not something
15 that's -- that's a -- that's a problem. If you
16 get water in the valve, then you have a problem
17 with the -- with the coil.

18 So we went to a situation where we have
19 the coil in an oil bath. It's a pressure
20 compensated dielectric fluid, and then the coil
21 itself is -- is pressure compensated.

22 So we have a -- a coil that we were able
23 to come up with that was a -- a stronger coil for
24 the size due to it being a single wound coil.

25 And in terms of the valve, that's the -- that's
00159:01 the main difference in the coil.

Page 159:15 to 159:23

00159:15 QUESTIONS BY MR. DART:

16 Q. Good morning, Mr. Gaude. My name is
17 Henry Dart. I'm Special Counsel to the Louisiana
18 Attorney General Office, and I represent the
19 State of Louisiana.

20 I've handed you a document that we've
21 marked as Exhibit 5098. Have you ever seen that
22 document before today?

23 A. Not before today, no, sir.

Page 160:24 to 161:17

00160:24 A. No, sir.
25 Q. Okay. There's a statement in here that
00161:01 says, "There are 2 EDS sequences - HP shear and
02 Casing." Do you know what that means?
03 A. Generically, yes, sir, I do.
04 Q. What -- what does it mean?
05 A. You would have one sequence that you
06 would use if you had casing in the hole and the
07 other if you just had drill pipe.
08 Q. All right. And there's another statement
09 that says the "Sequence needs to be pre-selected
10 (Casing or Pipe)." What does that mean?
11 A. It means you should be aware of what your
12 Drilling Program -- your program is, and you
13 know, depending on what you may have in the hole
14 across the preventers, you would select -- you
15 would -- you would operate that function so that
16 it's -- it's preset up. So when you actuate the
17 function, it will -- it will do that sequence --

Page 162:12 to 162:25

00162:12 Q. As between casing or pipe?
13 A. Sequence needs to be preselected casing
14 or pipe. It means that you need to have selected
15 which function is going to operate when you
16 execute that function.
17 Q. Okay. And -- so that's an automatic
18 selection?
19 A. No. Someone has to consciously decide
20 what they want to do and push that button to have
21 that function that when you do operate the EDS,
22 that -- that -- that's the one it will operate.
23 Q. Okay. So there's a casing select button
24 and a tubing select button?
25 A. To my knowledge, that would be correct.

Page 166:10 to 166:14

00166:10 I think Mr. Williamson was asking you
11 about whether both the conduit and the hot
12 line -- lines had to be severed in order to
13 trigger the AMF.
14 A. The -- yes, the loss of both.

Page 183:07 to 183:14

00183:07 Q. Okay. And I want to be clear on what
08 your involvement was prior to the date of the

09 incident. Did you have any involvement with the
10 DEEPWATER HORIZON prior to April 20, 2010?

11 A. Yes.

12 Q. And that was, as I understand it, serving
13 as a general resource for control system issues?

14 A. That's correct.

Page 184:09 to 184:17

00184:09 Q. Did you have any occasion that caused you
10 to go to the DEEPWATER HORIZON?

11 A. No. No, I have not been on that rig.

12 Q. All right. And the -- in the year prior
13 to the incident, how many times do you recall
14 being involved in something related to the
15 DEEPWATER HORIZON, in some problem related to the
16 DEEPWATER HORIZON?

17 A. None that I can recall.

Page 192:24 to 194:13

00192:24 Q. So as you sit here, you don't know what
25 the answer was as to how Cameron calculates its
00193:01 accumulator calculations?

02 A. I don't remember a -- a meeting
03 discussing that topic, but we do understand how
04 we do that today.

05 Q. Okay. And how do you do it?

06 A. Well, there's -- there's more -- there's
07 a maximum anticipated surface pressure, there's
08 maximum anticipated wellhead pressure, there's a
09 maximum expected wellbore shear pressure.
10 There's a number of terms that -- that have come
11 out since the new Regulations were starting to be
12 written. And that was the reason why I was
13 asking this question, because we were seeing
14 different terminology and wanted to make sure
15 that we understood what things meant and what
16 people were asking for.

17 Q. All right. Specifically your question is
18 you wanted to know what the standard
19 consideration was for wellbore pressure when
20 doing your accumulator calculations; is that
21 right?

22 A. Yes.

23 Q. And so as you sit here, what is the
24 answer to that? What does Cameron use as the
25 standard consideration for its wellbore pressure

00194:01 in its --

02 A. We use --

03 Q. -- calculations?

04 Go ahead.

05 A. Are you finished?

06 Q. I'm finished.

07 A. I'm sorry. We use whatever method our
08 customers want us to impose. If it's not
09 required in -- you know, if it's not required
10 in -- in a specification such as API or any other
11 BOEMRE type specs, we rely on our customers to
12 tell us what they want to include for a wellbore
13 pressure in terms of the calculation.

Page 194:15 to 194:19

00194:15 Q. (By Mr. Baay) I'll hand you Exhibit 5150,
16 which is Bates stamped CAM_CIV_0371789. If
17 you'll flip to the last page of that exhibit, I'm
18 going to ask you some questions about your
19 E-mail.

Page 194:24 to 196:16

00194:24 A. Okay.
25 Q. -- of the chain should be an E-mail from
00195:01 you to James Moore and Herbert Read on May 10,
02 2010. Do you see where I'm looking?
03 A. Yes.
04 Q. Okay. And what you say is: "Jay" Jane --
05 "Jack Moore has asked what procedures we have
06 that prevent us from having out of date batteries
07 in stock?"
08 And so my question for you is: What --
09 do you agree that Jack Moore is the reason you
10 asked this question of Jay?
11 A. It would appear that that -- from what's
12 written there, that would be the -- the reason,
13 based on the way it's worded.
14 Q. Okay. Did you have an understanding as
15 to why he was asking that question?
16 A. On the face of it, he -- it's -- he
17 wanted to ask, you know, what procedures exist.
18 Q. Right. And what was the answer you
19 learned as to Cameron's procedures on preventing
20 the stocking of out-of-date batteries?
21 A. I don't specifically remember what the
22 response was to it.
23 Q. If you flip back to the first page,
24 there's another E-mail in the chain from you on
25 May 11, 2010 to Kim DeRouen.
00196:01 A. Yes.
02 Q. Who is Kim DeRouen?
03 A. Kim DeRouen was a -- the Manager of our
04 Purchasing Department at one time.
05 Q. Okay. And you state in that E-mail:
06 "Jack" -- in the second sentence -- "Jack Moore
07 asked how we manage this shelf life" -- "shelf
08 life issue internally to make sure we don't send
09 out batteries that are already exceeded their

10 life."
11 A. (Nodding.)
12 Q. And the same question: Do you recall
13 getting an answer to that; how Cameron prevents
14 sourcing out-of-date batteries?
15 A. I don't remember -- I don't remember this
16 specifically. I don't.

Page 196:21 to 197:04

00196:21 Q. Did -- as you sit here today, do you have
22 knowledge as to what Cameron's procedure is for
23 preventing the stocking of out-of-date batteries?
24 A. I don't know in detail what that would
25 be. I'm not responsible for inventory or how we
00197:01 control our inventory, so I'm not --
02 Q. Were you at the time he asked you this
03 question?
04 A. No.

Page 197:14 to 197:20

00197:14 Q. Do you recall working on a project with
15 Cameron to update their batteries in the 2004,
16 2005 time frame?
17 A. I remember that, yes.
18 Q. Okay. And was that project related to
19 placing rechargeable batteries in the Mark III
20 Control System?

Page 198:06 to 198:09

00198:06 A. I was the Engineering Manager of our
07 Group at that time, and that was something that
08 we were working on to develop our Mark III
09 System --

Page 198:17 to 199:13

00198:17 A. -- my job as the -- as the Manager at
18 that time, was to manage the efforts of everyone
19 to get any and all tasks done and completed by
20 our Group.
21 Q. Did Cameron have a rechargeable battery
22 prior to putting the Mark III into its inventory?
23 A. We did not have a rechargeable battery
24 available in the Mark II system.
25 Q. Did it have -- in any system, did it have
00199:01 a rechargeable battery available for use?
02 A. Not prior to that time.
03 Q. So the Mark III was introduced when, to
04 your knowledge?
05 A. Around 2005.

06 Q. Okay. So prior to 2005, Cameron didn't
07 offer a control system that was functioned by a
08 rechargeable battery. Is that true?
09 A. That's correct.
10 Q. Is the Mark III -- as we sit here, is the
11 Mark III the only Cameron control system that
12 uses a rechargeable battery?
13 A. Yes, I believe that's correct.

Page 199:15 to 199:22

00199:15 Q. (By Mr. Baay) I'll hand you Exhibit 5151,
16 which is Bates-stamped CAM_CIV_0364040. This is
17 an E-mail from Mac Kennedy, who you described
18 earlier as someone who was -- reported to you at
19 Cameron; is that true?
20 A. That's correct.
21 Q. And his E-mail is May 30, 2010, and
22 you're on the cc line; is that right?

Page 200:01 to 200:06

00200:01 A. Yes, but I would like to make one --
02 one -- one correction. I believe at that time
03 frame, Mac did not report to me.
04 Q. Okay.
05 A. Now, there was a period of time that he
06 reported to Mel Whitby.

Page 200:19 to 201:04

00200:19 Q. Okay. If you go down to No. 6. He says,
20 "Within 15 days of the date of this report,
21 requires that all operators report to the
22 Interior department the BOP and well control
23 system configuration."
24 Did I read that accurately?
25 A. Yes, you did.
00201:01 Q. And do you have knowledge, in your line
02 of work with Cameron, that Operators like BP are
03 involved in the details of setting the BOP
04 configurations for the rigs that they lease?

Page 201:06 to 201:15

00201:06 A. I'm not -- I'm not expert on -- on that.
07 I think somewhere there must be some agreement
08 between the -- the owner of the drilling rig, who
09 possesses the equipment, and the -- the oil
10 company, in terms of their program that they want
11 to drill, that it -- it's got to fit what they
12 want to do. And if it doesn't fit, I know that
13 there's occasions that people modify things, or

14 make changes to equipment so that it will fit the
15 program that they have.

Page 201:17 to 202:23

00201:17 In your experience, have you seen instances --
18 instances where the Operator does step in and
19 specify a configuration for the BOP?
20 A. I can't say that I've actually personally
21 seen that.
22 Q. Okay. But what you are saying is you're
23 aware that that occurs?
24 A. I am aware that there is a mutual
25 consensus of what equipment needs to be between
00202:01 the contractor and the -- and the own -- the
02 Operator.
03 Q. And as you read No. 6, do you agree that,
04 according to the Government, the Operators, under
05 the new Regs, must report to the Interior
06 Department, the well control system configuration
07 for the BOP?
08 A. That's -- that's -- that's what it says.
09 Q. And No. 8 makes the statement: "Prior to
10 deploying the BOP, operators must verify that any
11 modifications or upgrades to the BOP are approved
12 by the Interior Department and 'that
13 documentation showing that the BOP has been
14 maintained and inspected according to the
15 requirements.....'"
16 Do you agree, based on that statement
17 that Mr. Kennedy makes, that, according to the --
18 the new Regulations put in place, the Government
19 looks to the Operator to verify modifications and
20 upgrades?
21 A. (Reviewing document.) That's what --
22 that's what's stated in that sentence that's in
23 this E-mail.

Page 203:24 to 207:16

00203:24 Q. (By Mr. Baay) I hand you Exhibit 5152,
25 and it's Bates-stamped CAM_CIV_0322469. This is
00204:01 an E-mail from Ray Jahn. Do you know who that
02 gentleman is?
03 A. It's Ray "Yahn."
04 Q. Jahn?
05 A. Yes.
06 Q. And he seems to be a -- or he's
07 identified as a Manager for Engineering II and
08 Drilling Controls?
09 A. That's correct.
10 Q. Is this someone you work with?
11 A. He reports to me.
12 Q. Okay. How long has that been the case

13 that he's reported to you?

14 A. Ah, approximately eight or nine years.

15 Q. Does he have a certain expertise or
16 specialty within your Group?

17 A. He's a -- a -- electrical.

18 Q. Would you put him on the same level as
19 Mr. Coronado?

20 A. They both have things that they're
21 responsible for doing. Richard has a longer
22 experience with the company, and a more wider
23 experience, as he deals with software and the
24 electrical stuff.

25 Q. Mr. Ray copies -- Ray, I should say,
00205:01 copies you and Mr. Coronado on this E-mail; is
02 that true?

03 A. Yes. Richard and myself are cc'd.

04 Q. M-h'm. And that subject is "Testing AMF
05 Sub Sea.[" And he says in second to the last
06 sentence there of that E-mail: "I hate to say
07 this but the April 20 incident helped speed up
08 our discussions with Saft."

09 As we learned this morning, SAFT was your
10 battery provider, battery manufacturer; is that
11 right?

12 A. Yes.

13 Q. Now, what were these discussions he was
14 referring to?

15 A. (Reviewing document.) Let me look at the
16 rest of the E-mail. I don't --

17 Q. Sure. Help yourself.

18 A. (Reviewing document.) I don't -- I don't
19 know what discussions we were having at that time
20 with SAFT. I -- I don't -- I don't know what
21 that -- he's referring to there.

22 Q. Well, I think I neglected to state the
23 date, it's May 27, 2010 --

24 A. M-h'm.

25 Q. -- is the date of this E-mail; is that
00206:01 right?

02 A. Right. I saw that date.

03 Q. Okay. And you don't recall what the
04 discussions were at that time?

05 A. Not with SAFT, no, I don't.

06 Q. All right. The second -- the next
07 sentence, he says, "I realize this is a touchy
08 topic but we are trying to do...our best and it
09 does seem to be dragging out."

10 Do you know why he described it as a
11 "touchy topic"?

12 A. Well, anything that has to do with
13 anything that could have related to the HORIZON
14 at that point, even though it was our other
15 ongoing business, was kind of not under scrutiny,
16 but it was -- it was always -- the wonder was is
17 that, you know, can we continue on with our --

18 the rest of our business, you know, even though
19 dealing with the same types of products, the
20 issues.

21 Q. Let me read you this first sentence.
22 Maybe it will trigger your memory as to what the
23 discussions were. He says, "I have been asked
24 the question from DM3 and Sevan about when to
25 change out the rechargeable batteries."

00207:01 A. Okay.

02 Q. Does that refresh your memory as to what
03 the discussions were with SAFT?

04 A. Not with SAFT, but I do remember that
05 that might have been a question that came from
06 one of these customers.

07 Q. Okay. What specifically was the
08 question?

09 A. It says -- evidently the way I interpret
10 the question is that somebody is asking, even
11 though the batteries are rechargeable at -- at
12 some point in time, would you recommend replacing
13 them with new rechargeable batteries.

14 Q. Okay. Do you recall what Cameron's
15 answer was to that?

16 A. No, I don't know specifically.

Page 210:03 to 211:01

00210:03 Q. (By Mr. Baay) If a -- let me ask it
04 again. Your opinion is that if a solenoid is
05 wired such that it does have reverse polarity,
06 that it will not function correctly; is that
07 right?

08 A. That is my opinion, yes.

09 Q. My question is: What do you base that
10 opinion on, absent anything learned through your
11 Counsel?

12 A. Well, that's part of what we test for
13 when we do a qualification test when we build a
14 new valve, is we -- we operate it on individual
15 coils, and we operate it on both coils for the
16 specific purpose to verify that it still stays
17 energized and shifted, as opposed to changing
18 state and going back and returning to the vent
19 position.

20 Q. Okay. So your answer is you're relying
21 on tests that you have personally conducted?

22 A. That's correct. No, I have not
23 personally conducted tests, no.

24 Q. Okay. So you personally have not done
25 these tests you're referring to?

00211:01 A. No.

Page 211:08 to 211:25

00211:08 Q. Okay. And so how did you gain the
09 knowledge to support your opinion that you
10 provided this morning? Is it through a report
11 that was provided to you or conversations you've
12 had with people doing the testing?

13 A. No. It's something that we've -- we've
14 included that in our test procedures for as long
15 as I can remember for the purpose of -- of -- of
16 determining that, because it -- we had -- it had
17 become an issue at some point where a valve in
18 the field had been wired incorrectly and it
19 didn't operate, and the -- the outcome of that
20 was, is that at some point a long time ago, the
21 procedure actually got corrected to include
22 that --

23 Q. Okay.

24 A. -- to be able to catch that when that
25 happens.

Page 212:02 to 212:14

00212:02 written procedure on that. My question is: How
03 were you aware of the tests of those valves? Was
04 it a written report, or did someone come and --
05 and report these results to you? Do you
06 understand my question?

07 A. No, sir.

08 Q. Okay. You're telling me that you've
09 had -- you had instances where a solenoid was
10 wired incorrectly in the field?

11 A. That's what I --

12 Q. Right so far?

13 A. That's what I recall from memory, that's
14 correct.

Page 212:18 to 212:22

00212:18 Q. Okay. What did Cameron do as a result of
19 finding miswired solenoids? How did they learn
20 to correct the problem?

21 A. How to correct the problem on a miswired
22 solenoid would be to build the valve correctly.

Page 212:24 to 216:04

00212:24 I'm asking for your opinion that you
25 provided this morning that a miswired solenoid

00213:01 will have an electromanic field that will --
02 electromagnetic field that will cancel each other
03 out, right?

04 A. Yes.

05 Q. And I'm asking for the basis of your
06 opinion.

07 A. That's my -- that's my opinion and my
08 knowledge of how it would work.

09 Q. I know it is. I want to know why that's
10 your opinion. What have you done, what have you
11 seen, what have you read, what has someone told
12 you that allows you to form that opinion?

13 MR. JONES: Other than --

14 Q. (By Mr. Baay) Other than what your
15 lawyers have told you?

16 A. I haven't personally done any physical
17 testing.

18 Q. Okay. What have you done that allows you
19 to form that opinion? What is the -- do you
20 understand my question when I say what is the
21 basis for your opinion? What are you relying on
22 to make that statement?

23 A. My personal knowledge of what would
24 happen if you -- if you had it wired backwards.

25 Q. Where did you gain that personal
00214:01 knowledge?

02 A. Experience.

03 Q. Okay. And what experience? That's what
04 I'm asking.

05 A. Experience, common sense.

06 Q. You're -- you're going to have to
07 describe for me your experience. Did you -- were
08 you in the -- in a conversation with someone who
09 was part of these tests? What is your personal
10 experience in -- in witnessing a miswired
11 solenoid not activating correctly?

12 A. I don't know that I have personally
13 witnessed it, outside of things that were done
14 in -- in the presence of Counsel.

15 Q. Okay. So absent tests that were
16 performed in the presence of Counsel, you don't
17 have a basis for your opinion?

18 A. Other than my personal knowledge, what I
19 believe to be correct, I have not physically seen
20 a test done.

21 Q. Okay. Why do you believe it to be
22 correct?

23 A. It -- it would be -- in my mind, you have
24 to defy the law of physics for it to work if --
25 if it was wired backwards.

00215:01 Q. Okay. So part of the basis for your
02 opinion is your understanding of physics?

03 A. That's what I said.

04 Q. Okay. But you have never done anything
05 to validate that --

06 A. Not personally.

07 Q. -- personal --

08 A. Not personally.

09 Q. But let me finish my question. It makes
10 the record a little neater.

11 A. Okay.

12 Q. You've never done anything personally to
13 validate -- validate your belief or your opinion
14 on this issue?

15 A. I have not done anything physically to
16 validate that, no.

17 Q. Well, you -- so you haven't done anything
18 physically. Have you done anything else to
19 validate your belief that a miswired solenoid
20 will not have sufficient shifting force?

21 A. Say that again, please.

22 Q. Sure. You qualify -- you seem to qualify
23 your answer. You said you have not done anything
24 physically to test your opinion or validate your
25 opinion.

00216:01 Have you done anything else to confirm
02 your belief on this issue, validate it, test it,
03 understand it?

04 A. No.

Page 216:11 to 217:02

00216:11 Q. And as I understood it, you don't have an
12 opinion one way or the other -- well, first, let
13 me ask you this: Before you were shown it today
14 by some lawyers in this room, had you ever read
15 Transocean's description as to why it believed
16 the Blue Pod battery functioned correctly on
17 April 20th, 2010?

18 A. I don't believe so.

19 Q. Okay. Do you have any opinions, based on
20 what you now know to be Transocean's opinion as
21 to why the battery functioned?

22 A. No.

23 Q. And you also don't have any opinions, as
24 I understood it, as to when the blind shear
25 ram on the DEEPWATER HORIZON was actually

00217:01 functioned?

02 A. No, I do not.

Page 218:03 to 218:05

00218:03 Q. Hello, Mr. Gaude. I'm Denise McKenzie,
04 and I'll be asking you questions on behalf of BP.
05 Chris Coulson is here with me.

Page 221:08 to 221:08

00221:08 we're going to mark that as Exhibit 5153.

Page 221:10 to 221:21

00221:10 MS. MCKENZIE: And it has Bates
11 numbers CAM_CIV_ 0370628 to CAM_CIV_ 0370656, and

12 the title is "TEST PROCEDURE FOR DEADMAN BATTERY
13 PACK LONGEVITY TEST."
14 Q. (By Ms. McKenzie) Correct?
15 A. That's what it reads.
16 Q. Have you seen this document before?
17 A. Yes, I have.
18 Q. So the batteries discussed in
19 Exhibit 5153, they were not tested in a SEM,
20 correct?
21 A. I don't believe so.

Page 222:09 to 223:18

00222:09 MS. MCKENZIE: And we're marking
10 Tab 53 as Exhibit 5154, and it has Bates numbers
11 CAM_CIV_0083914 to 916.
12 Q. (By Ms. McKenzie) And it's an E-mail from
13 Jahn, Ray to you and Erwin, Carter, correct?
14 A. It appears to be, yes.
15 Q. Could you turn to Page 916 of that
16 E-mail?
17 A. Okay.
18 Q. And do you see in the first paragraph, it
19 says, "One of the pods...had to function the
20 Deadman system 6 or 7 times while" trouble --
21 "troubleshooting. The two batteries (p/n
22 2232362-01) that power the SEM at the start of
23 the Deadman sequence were depleted during the
24 course of functioning 6 or 7 times." Do you see
25 that?
00223:01 A. Yes, I do.
02 Q. Now, this E-mail refers to the new
03 deadman batteries, correct?
04 A. (Reviewing document.) I don't know if it
05 does or not, from -- from that E-mail.
06 Q. Well, in the first sentence of the
07 E-mail, it says, "Danny...just completed the" --
08 "completed the installation of the new Deadman
09 batteries..."
10 Does it say that?
11 A. Yes.
12 Q. So doesn't this E-mail refer to the new
13 deadman batteries?
14 A. It -- it seems like it refers to new
15 batteries.
16 Q. Okay. So isn't it true that, based on
17 this E-mail, Cameron batteries failed earlier
18 than expected?

Page 223:20 to 224:17

00223:20 A. No.
21 Q. (By Ms. McKenzie) And why do you say
22 "No"?

23 A. I don't know how long these batteries
24 were in the -- in -- installed.
25 Q. Okay. Let's turn to Tab 25.
00224:01 (Exhibit No. 5155 marked.)
02 MS. MCKENZIE: We're marking Tab 25
03 as Exhibit 5155. The Bates numbers for ex -- for
04 this exhibit are CAM_CIV_0371709 to 717.
05 Q. (By Ms. McKenzie) And it's an E-mail from
06 you to Jahn, Ray. Do you see that?
07 A. Yes.
08 Q. Okay. Please turn to Page 710. And the
09 first paragraph there, the third sentence says,
10 "Now they are saying the batteries don't even
11 last" -- "don't even last...but only 3 months."
12 Do you see that?
13 A. (Reviewing document.) I see that
14 sentence.
15 Q. Does that refresh your memory about
16 whether the Cameron bat -- batteries fail earlier
17 than expected?

Page 224:19 to 227:07

00224:19 A. No, it does not. That was -- that's from
20 2005. I -- I don't -- I don't have any memory of
21 what this was about.
22 Q. (By Ms. McKenzie) Okay. Did Cameron
23 perform any testing of the new -- new deadman
24 batteries?
25 A. I'm not sure I understand your question.
00225:01 When you -- which -- what -- what "new batteries"
02 are you referring to?
03 Q. Can you refer to Page 712 of that same
04 E-mail?
05 A. 712. Okay. (Reviewing document.)
06 Q. And in the second -- second paragraph, it
07 says, "Cameron did exten" -- "extensive testing
08 on the old Friwo batteries and these were given
09 to Saft for them to run on the new style
10 batteries."
11 So with respect to the new style
12 batteries referred to in that E-mail, did Cameron
13 perform any testing of the new deadman batteries?
14 A. We did in conjunction with SAFT.
15 Q. Okay. When did Cameron perform testing
16 in conjunction with SAFT of the new deadman
17 batteries?
18 A. I can't give you a specific date. I
19 would a -- I would -- I would -- my assumption
20 would be that it's going to be somewhere in --
21 in -- in -- in the vicinity of a date that's on
22 this E-mail, some -- give or take some months
23 either side of it.
24 Q. When you say "in conjunction with SAFT,"
25 what do you mean? Did Cameron actually perform

00226:01 the testing, or did SAFT perform the testing?

02 A. I'm not sure if we did any independent
03 testing, but it was basically testing that was
04 done by the manufacturer of the batteries in
05 order to get another style battery to take the
06 place of the battery that they were obsoleting
07 from their product line.

08 Q. So Cameron did not perform any of its own
09 testing of the new -- new batteries for the
10 deadman, right?

11 A. We did in conjunction with SAFT.

12 Q. Well, SAFT -- well, you just testified
13 that SAFT performed the testing. Correct?

14 A. We worked with SAFT on the testing, and
15 reviewed the results of the testing with -- that
16 they had done. I'm not sure -- I can't remember
17 if we did any testing in our shop separate from
18 SAFT, or it was done by reviewing the work that
19 SAFT had done.

20 Q. When you say you've "worked with SAFT,"
21 what do -- what do you mean?

22 A. They're the ones that had to come up with
23 an alternate battery to the one that was being
24 obsoleted, that was no longer going to be
25 manufactured. So they proposed different styles

00227:01 of batteries that they -- or that tests were run
02 on to verify the capacity of those batteries
03 would equal to or be better than the ones that
04 had been previously supplied that they could no
05 longer supply.

06 Q. So SAFT is the one that performed the
07 tests, not Cameron, correct?

Page 227:09 to 228:19

00227:09 A. Well, we look at testing that's done that
10 we're intimately involved with, with reviewing
11 the tests and knowing what the tests are, as
12 being tests that we do, as well as what our --
13 the person doing it would be doing.

14 Q. (By Ms. McKenzie) So SAFT performed the
15 tests, and Cameron reviewed the results. Is that
16 what you're saying?

17 A. Yes, we did that.

18 Q. But Cameron did not actually perform the
19 tests, correct?

20 A. I can't 100 percent say that we did not
21 do some testing. I don't remember if we did or
22 not.

23 Q. If Cameron -- go on.

24 A. Well --

25 Q. Did you finish your answer?

00228:01 A. I've -- I -- I lost the -- I lost the
02 thought.

03 But we -- we had to come up with a --

04 they had to provide an alternate battery to the
05 one that wasn't going to be -- no longer
06 available. So we worked out a test procedure
07 with them. A lot of testing was done to verify
08 the capacity of the batteries.

09 I don't remember for sure if we did any
10 testing independent of them or not, or it was all
11 done in conjunction with SAFT. That's what my
12 memory tells me.

13 Q. If Cameron had performed some testing,
14 would you have provided a -- a written summary of
15 the results or a report or some kind of
16 information that you would have given to the
17 customers?

18 A. I don't know what was done at that time,
19 so I couldn't tell you.

Page 228:24 to 228:24

00228:24 Tab 8 as Exhibit 5156. It has Bates numbers

Page 229:01 to 229:21

00229:01 Q. (By Ms. McKenzie) And it's entitled
02 "Cameron Summit Meeting Action Item Report,
03 correct?

04 A. Yes, I agree that's the title.

05 Q. Could you please turn to Page 148 of
06 Exhibit 5156?

07 A. Was that 148?

08 Q. Yes. 148.

09 A. Okay.

10 Q. And if you'll look at Item 24, where it
11 says "Dead Man Battery Life." Do you see that?

12 A. That appears to be No. 24, "Dead Man
13 Battery Life."

14 Q. And it says, "Questions have been raised
15 regarding the expected life of the batteries for
16 the dead man systems." Do you see that?

17 A. Yes.

18 Q. Did Cameron issue any warning to its
19 cust -- customers about there being a problem
20 with respect to the expected life of the
21 batteries for the Deadman System?

Page 229:23 to 231:20

00229:23 A. I'm not sure what's in this Engineering
24 Report, but we do have recommendations regarding
25 the battery life.

00230:01 Q. (By Ms. McKenzie) Well, here it says
02 issues "...have been raised regarding the
03 expected life of the...dead man" battery

04 "system."

05 Does this refresh your recollection about
06 whether the deadman batteries failed earlier than
07 expected?

08 A. No, it does not.

09 Q. So as a result of Item 24, did Cameron
10 conduct any updated battery longevity test?

11 A. I'm not aware if we did or we did not at
12 that time --

13 Q. Do you know --

14 A. -- for --

15 Q. Do you know who would be aware if Cameron
16 performed any updated battery tests based on the
17 concerns about the expected life of the
18 batteries?

19 A. Not from that time frame of 2001, October
20 of 2001, no.

21 Q. Can we turn back to Tab 51.

22 THE COURT REPORTER: Exhibit 5153.

23 Q. (By Ms. McKenzie) And can you turn to
24 Page 630.

25 A. All right.

00231:01 Q. At Page 630, if you go to -- under
02 Section 2.0, and here it says during the
03 monitoring mode, the current drain on the 9-volt
04 battery is 1.75 milliamps, right?

05 A. (Reviewing document.)

06 I'm sorry. Where are you -- you said
07 2.0.

08 Q. Yes. I'm under Section 2.0, "Drain on
09 the Battery Back." Do you see that?

10 A. Okay.

11 Q. Okay. And the second full paragraph.

12 A. It begins with "A long-term..." Is that
13 the one?

14 Q. Yes.

15 A. Okay.

16 Q. And so I'm asking whether during the
17 monitoring mode the current drain on the 9-volt
18 batteries is 1.75 milliamps; is that correct?

19 A. That's what is stated in this -- in this
20 report.

Page 232:08 to 232:17

00232:08 Q. So if we looked at the third paragraph,
09 it says, "A short term, high current (up to
10 5.5 A) drain during Emergency Shutdown
11 Sequences." Do you see that?

12 A. Yes.

13 Q. So the current drain on the 9-volt
14 battery during the Emergency sut -- Shutdown
15 Sequence is 5.5 amperes, correct?

16 A. That -- that's the information in this
17 report, yes.

Page 233:14 to 234:10

00233:14 Q. Why did Cameron evaluate the current
15 drain on a 9-volt battery?
16 A. I don't know the basis of the test,
17 and -- and why all the specific items were done
18 in the test. That's not my area of expertise.
19 We have electrical people that do that. So I'm
20 not -- I can't answer that.
21 Q. Well, the reason I'm asking is because --
22 what's the purpose of the 27-volt battery?
23 What's its -- what its function?
24 A. It provides voltage for the solenoid
25 valves --
00234:01 Q. Isn't that --
02 A. -- operating.
03 Q. Isn't important to know what the drain is
04 on the 27-volt battery because it provides
05 voltage for the solenoid valve?
06 A. Yes.
07 Q. So wouldn't there be someone at Cameron
08 that would understand the drain on a 27-volt
09 battery during the monitoring mode and during the
10 Emergency Shutdown Sequence?

Page 234:12 to 234:19

00234:12 A. It's possible, yes.
13 Q. (By Ms. McKenzie) Is it only possible
14 or --
15 A. Same -- same person that I mentioned
16 would -- would be the most likely person to be
17 aware of it.
18 Q. And that's Richard Coronado?
19 A. Yes.

Page 234:21 to 235:06

00234:21 Q. (By Ms. McKenzie) I'm handing you a
22 document that's been marked as Exhibit 5157.
23 Exhibit 5157 is Bates-stamped TRN-MDL-00304715 to
24 TRN-MDL-00304761, and it is entitled "SUBSEA
25 ELECTRONIC MODULE WIRING DIAGRAM," correct?
00235:01 A. That is the title of the document.
02 Q. Are these wiring diagrams Representative
03 of what was implemented on the DEEPWATER HORIZON?
04 A. Well, this document reflects the -- the
05 definition of -- of the system at the revision
06 level that's on the document.

Page 235:11 to 235:14

00235:11 Q. But do you know if it's representative of
12 what was implemented on the DEEPWATER HORIZON
13 prior to the incident?
14 A. No, I do not.

Page 236:19 to 237:07

00236:19 Q. How would we know whether this document
20 dated 2005 is the one that's on the HORIZON in
21 2010? How would we know that?
22 A. How would you know --
23 Q. Uh-huh.
24 A. -- that this -- what's contained here and
25 what -- what's defined here is exactly how it's
00237:01 built?
02 Q. Yes.
03 A. You can go point by point, wire by wire,
04 and check every connection, every component,
05 every wire point. And if you match this up to
06 what's physically in existence, then you could
07 say that they're equal.

Page 237:14 to 237:22

00237:14 Q. We have this wiring diagram --
15 A. Yes.
16 Q. -- that's dated 2005.
17 A. Yes.
18 Q. Is there some record of any modifications
19 to the -- to the system such that there would be
20 a difference between what was implemented in 2010
21 and what the design shows in 2005?
22 A. Not that I'm aware of.

Page 242:20 to 243:03

00242:20 Q. Okay. So if we could turn to Page 23
21 of 47, and that's actually Bates No. 737, but
22 it's Page 23 of 47 on the wiring diagram. And if
23 you look at the rectangle on the right-hand side.
24 You see that?
25 A. Yes.
00243:01 Q. Does that represent the AMF card of the
02 SEM?
03 A. I believe that -- I believe it does.

Page 243:06 to 244:20

00243:06 Q. (By Ms. McKenzie) Okay. I'm handing you
07 a -- a document that's been marked as Exhibit
08 5158. And I will represent to you that this is a
09 pholet -- photo taken by DNV. It has Image
10 No. 1554, and it's a photo of an AMF card from

11 the DEEPWATER HORIZON.

12 Now, if you can look on the right-hand
13 side of that photo, it says "DEADMAN Version 1.6
14 Cameron," correct?

15 A. (Reviewing photograph.) Could you point
16 to it?

17 Q. (Indicating.)

18 A. You said the right-hand side. That's
19 what threw me off.

20 Q. You know -- turn it upside down. Turn
21 it, turn it, turn it like this.

22 A. Oh, okay. Version --

23 Q. And it says, "DEADMAN Version1.6
24 Cameron," correct?

25 A. Okay. I see it.

00244:01 Q. Do you see it?

02 A. M-h'm.

03 MS. MCKENZIE: (Indicating.)

04 Q. (By Ms. McKenzie) So keep that out. I'm
05 going to hand you another document.

06 (Exhibit No. 5159 marked.)

07 Q. (By Ms. McKenzie) Okay. This document --

08 I'm handing you a document that's been marked as
09 Exhibit 5159. And it has Bates Nos.

10 CAM_CIV_0370225. And if you look on the lower
11 right-hand side, in that little rectangle, it
12 says, "Deadman-System," Version "1.6." Do you
13 see that?

14 A. I see where it says Revision 1.6.

15 Q. Yes.

16 A. "Rev 1.6."

17 Q. Yes. Does the schematic shown in Exhibit

18 5159 represent the AMF card shown in Exhibit
19 5158?

20 A. I have no idea.

Page 245:07 to 245:10

00245:07 Q. (By Ms. McKenzie) Do you know whether
08 there is a more recent version of the schematic
09 shown in Exhibit 5159?

10 A. I'm not aware if there is or not.

Page 247:08 to 247:14

00247:08 Q. Do you have any information about the
09 intended function and operation of this AMF
10 board?

11 A. I know what it's supposed to do.

12 Q. What is it supposed to do?

13 A. It's supposed to initiate the -- the
14 deadman sequence.

Page 248:25 to 251:08

00248:25 Q. There's -- there's two SEMs inside the
00249:01 Pod, and each SEM has an AMF card, correct?
02 A. Yes.
03 Q. So then if we have two Pods, a Yellow
04 Pod --
05 A. M-h'm.
06 Q. -- and a Blue Pod, we should have four
07 AMF cards, correct?
08 A. That's correct.
09 Q. Okay. Now, during normal -- normal
10 circumstances, is there any way for an individual
11 to look at an indicator on a -- on a control
12 panel and determine whether or not all four AMF
13 cards are armed?
14 A. Yes.
15 Q. And how -- how would an in -- individual
16 do that?
17 A. When you -- when you arm the -- the AMF,
18 you get a -- a light that shows that it's armed.
19 And you have -- you have a Pod selected, and you
20 have a SEM selected. In other words, if
21 you're -- you're on Blue Pod A, and the light is
22 lit up, that tells you that -- that the Blue Pod
23 A -- AMF is -- is armed.
24 If you want to see if the other SEMs are
25 all armed, you would then go to the -- there's --
00250:01 there's buttons for each SEM that you can arm the
02 SEM. So you go to those buttons. You don't push
03 the "enable" button, you push the button for that
04 SEM. And if the light stays on, it's armed. If
05 the light were to go out, that would show that it
06 would -- it's not a -- it's not a -- functional.
07 You would do that for the other three, and you
08 can check them that way.
09 Q. So on the control panel, there's an
10 indicator for each AMF card?
11 A. There's a -- there's an indicator that
12 show you which SEMs are active, that you have
13 selected a Pod and an active SEM for normal
14 operation.
15 If you have a deadman armed, and the
16 light comes on to arm the deadman, then that
17 shows that that SEM that you -- that's -- the
18 selected SEM, it confirms that it's lit up, that
19 it is okay; that that SEM AMF is good,
20 functional. It's armed.
21 If you want us to check the other three,
22 you go to those buttons individually. Without
23 pushing the "enable" button, you hold the button
24 down. If the light stays on, that one is
25 functionally good. If the light goes out, it's
00251:01 not.
02 And you would go and do the other three

03 that way. And you can -- you can determine
04 that -- that all four are armed and available.
05 Q. So is it generally -- generally the case
06 that, when the deadman is active -- activated,
07 all four are armed?
08 A. Yes.

Page 257:06 to 258:05

00257:06 Q. Do you have any information about whether
07 Cameron could monitor that battery voltage with
08 the -- with the Mark II system?
09 A. Monitor battery voltage with the Mark II
10 system?
11 Q. M-h'm.
12 A. What -- monitor it where?
13 Q. Mon -- mon --
14 A. I'm sorry to ask you a question, but --
15 Q. No, no, that's fine. Monit -- monitor it
16 in the -- in the Pods.
17 A. Well, there may be a way that you could
18 measure the voltage if you -- if you take a
19 connector loose and you know the pins to check
20 across it, that you could put a volt ohmmeter on
21 it and measure the voltage.
22 Q. Could you do that subsea while the Pods
23 are subsea?
24 A. No.
25 Q. Why is it that you think you couldn't do
00258:01 it while the Pods are subsea?
02 A. Because you would have exposed parts of
03 that connector. It's not a wet made connector,
04 so you'd have exposed parts to seawater, which
05 wouldn't -- wouldn't be good.

Page 258:20 to 258:25

00258:20 Q. So based on your understanding, there's
21 no way to measure the battery voltages subsea in
22 a Mark II Control System; is that --
23 A. That --
24 Q. -- what you're saying?
25 A. That is my understanding of it, yes.

Page 262:03 to 262:15

00262:03 Q. (By Ms. McKenzie) M-h'm. Are you aware
04 that the DNV found that at the -- after the
05 incident, the 27-volt battery had a voltage
06 reading of 1.04 volts?
07 A. I'm not specific on -- I'm not aware of
08 specific numbers.
09 Q. Well, suppose the 27-volt battery had

10 a -- a voltage reading of 1.04 volts.
11 A. Okay.
12 Q. And the 9 -- two 9-volt batteries had
13 sufficient power. So I'm asking, in that
14 scenario, would the Deadman be able to operate
15 the solenoid valve?

Page 262:17 to 262:19

00262:17 A. In my opinion, that would not be
18 sufficient voltage to operate the solenoid
19 valves.

Page 262:25 to 263:05

00262:25 When you said there were -- that there
00263:01 would not be sufficient voltage to operate the
02 solenoid valve, do you mean that the 27-volt
03 battery would not have sufficient voltage to
04 operate the solenoid valve?
05 A. That's correct.

Page 263:13 to 263:16

00263:13 Q. And what is that -- what is the voltage
14 necessary to operate a new valve?
15 A. The valve, according to our test
16 procedures, should operate it on 20 volts.

Page 269:08 to 269:12

00269:08 Q. (By Ms. McKenzie) In your experience at
09 Cameron, have you ever heard of a situation where
10 an insufficient 9-volt battery continuously tried
11 to boot up a PLC?
12 A. No.

Page 271:01 to 271:04

00271:01 Q. So is Cameron the only entity that can
02 update that software on the deadman?
03 A. I believe on deadman, that would be true,
04 yes.

Page 272:24 to 273:10

00272:24 Q. (By Ms. McKenzie) Can you turn back to
25 Tab 25. And Tab 25 is Exhibit 5155, and it's an
00273:01 E-mail from you to Jahn, Ray, and it says -- I'm
02 reading the second sentence: "If Transocean
03 feels strongly enough about needing
04 re-chargeable" sys -- "about needing a

05 re-chargeable system then we would try to quote
06 one." Do you see that?
07 A. Yes, I do.
08 Q. And this E-mail is dated August 25th,
09 2005, correct?
10 A. That's the date on the top of the E-mail.

Page 273:16 to 274:01

00273:16 Q. (By Ms. McKenzie) Does this refresh your
17 recollection about whether Cameron could have
18 designed a rechargeable battery system for the
19 Mark II control system?
20 MR. JONES: Object to form.
21 A. It doesn't -- I really don't have any
22 memory of this at all, so, no.
23 Q. (By Ms. McKenzie) As of August 2005,
24 could Cameron have designed a rechargeable
25 battery system for the -- for the Mark II control
00274:01 system?

Page 274:03 to 274:07

00274:03 A. I -- I don't know.
04 Q. (By Ms. McKenzie) Would you have written
05 this E-mail if you didn't believe that Cameron
06 could have provided rechargeable batteries for
07 the Mark II control system?

Page 274:09 to 274:22

00274:09 A. This -- this E-mail is written not
10 knowing whether it could be done or not. It was
11 stated that we -- we could -- we could
12 investigate it, and if we -- if we could, we
13 could quote it, if they -- if they felt strongly
14 enough about it.
15 Q. (By Ms. McKenzie) Can you -- can you look
16 down to the middle of page where it says, "Ed - I
17 think it can be done. It would take a bit of
18 work though." Do you see that?
19 A. Yes.
20 Q. Does that refresh your memory about
21 whether Cameron could have provided rechargeable
22 bar -- batteries as of August 2005?

Page 274:24 to 275:06

00274:24 A. It doesn't tell me that you could do it.
25 It just says that there would be a number of
00275:01 details that you would have to look at and work
02 through those details and determine if you can
03 accomplish all of them or not.

04 Q. (By Ms. McKenzie) Well, is it usually
05 your habit to provide a quote about a system if
06 it can't be designed?

Page 275:08 to 275:24

00275:08 A. No, we won't -- we don't quote something
09 if we don't feel like we can do it.
10 Q. (By Ms. McKenzie) What -- well, here
11 you're saying that "We would try to quote one."
12 Isn't that correct?
13 A. Yes.
14 Q. So didn't you think as of August 2005
15 that you could provide rechargeable batteries for
16 the Mark II system?
17 A. No. It says "try to quote one," meaning
18 that if we work through the details and determine
19 that we could do it then we could quote it.
20 Q. Did you provide a quote for a Mark II
21 system that has rechargeable batteries?
22 A. I don't recall if we -- I don't believe
23 we did, but I'm not 100 percent certain of that.
24 I don't remember. I'd have to say I don't know.

Page 276:07 to 278:21

00276:07 Q. Okay. Could you please turn to Tab 44.
08 (Exhibit No. 5165 marked.)
09 Q. (By Ms. McKenzie) And Tab 44 is being
10 marked as Exhibit 5165. It has Bates numbers
11 CAM_CIV_0374340, and it goes to CAM_CIV_0374349.
12 It's dated September 15th, 2010.
13 And the first sentence says, "Please
14 review findings in the attached document
15 regarding FPR # 226314 and solenoid part number
16 223290-63," correct?
17 A. Yes.
18 Q. Could you refer to the bottom of the
19 first page, bottom of the Page 4340, and the
20 heading "Coil Termination Point Inspection."
21 Do you see that?
22 A. Yes.
23 Q. Okay. And that reads: "7 of the
24 nineteen solenoids had wires crossed, reverse
25 polarity, on coil B pins 3 and 4. Specifically,
00277:01 the white wire was soldered to 4 and the black
02 wire soldered to 3."
03 Do you see that?
04 A. Yes.
05 Q. Does this refresh your memory about
06 whether Cameron tested the solenoid valves for
07 the reverse po -- polarity -- polarity?
08 MR. JONES: Object to form.
09 A. I can't tell by this document what was

10 going on. Would -- I'd have to -- I'd have to
11 read this and I'd have to study it and I'd have
12 to look at some other documents to even have a
13 clue of the details associated with -- what
14 prompted this E-mail.

15 Q. Can you turn to Page 41, which is the
16 next page. It's on the same document.

17 A. Okay.

18 Q. Do you see under -- under the first
19 paragraph, it says "In an effort..."? Do you see
20 that on the second page, "In an effort..."?

21 A. Okay.

22 Q. "In an effort to prove the affect of a
23 solenoid with reverse polarity between the two
24 coils on its function the following actions were
25 taken."

00278:01 A. Okay.

02 Q. Does this refresh your memory about
03 whether Cameron performed any tests regarding
04 reverse -- reverse paralel -- polarity?

05 A. No. I mean, I can read this E-mail, but
06 it doesn't -- doesn't jog my memory.

07 Q. Do you see the -- the paragraph starting
08 with "The above test proves..." after the
09 itemized list?

10 A. Yes.

11 Q. It reads: The -- "The above test proves
12 reverse polarity between coil A and coil B
13 results in two different magnetic fields which
14 cancel each other out."

15 Do you see that?

16 A. Yes, I do.

17 Q. So that confirms your testimony earlier
18 that the reverse polarity would cancel each
19 other -- reverse polarity in two different
20 magnetic fields would cancel each other out,
21 correct?

Page 278:23 to 279:06

00278:23 A. It does say the same thing that I said.

24 Q. (By Ms. McKenzie) And just to -- to make
25 sure that I'm clear: Does this statement mean

00279:01 that when you have reverse polarity between Coil
02 A and Coil B that the solenoid valve will not
03 function?

04 A. Can I take a moment to --

05 Q. Yes.

06 A. -- read this, this little part?

Page 279:09 to 279:14

00279:09 A. What I read that it -- that this is --

10 this is saying in this report is that they

11 operated the valve with the single coils
12 activated, both A and B, and they performed the
13 test with both coils activated in the -- the
14 valve with the vent condition.

Page 281:10 to 281:14

00281:10 Q. In the tests that Cameron performed, did
11 you observe any failures of the acoustic system
12 to operate the BOP?
13 A. Not if the equipment was installed
14 correctly, no.

Page 286:11 to 286:16

00286:11 QUESTIONS BY MR. VON STERNBERG:
12 Q. Mr. Gaude, good afternoon. My name is
13 Jerry von Sternberg, and along with Angelle
14 Adams, we're a couple of lawyers that represent
15 Halliburton in this matter.
16 A. (Nodding.)

Page 289:05 to 291:22

00289:05 Q. But the question I have for you in
06 reference to Mr. Coronado is: Would he be the
07 person to talk to about Transocean's voltage
08 dropout feature that they've discovered or
09 allegedly discovered on their AMF cards?
10 MR. JONES: Object to form.
11 A. I mean, Richard is the person that I have
12 named that would -- would be knowledgeable about
13 the AMF system.
14 Q. (By Mr. von Sternberg) Okay. And what is
15 his title again? I'm sorry.
16 A. He's an Engineering Manager.
17 Q. Okay.
18 A. That --
19 Q. And he's in charge of the software
20 development; is that --
21 A. That's his --
22 Q. -- correct?
23 A. -- primarily function is the Software
24 Engineering Group.
25 Q. Okay. All right. In Mr. McWhorter's
00290:01 deposition, one of the things he did say that you
02 might know about were complaints by customers in
03 regards to the solenoids in the Mark II System.
04 Do you have any idea whether there have
05 been complaints by any of their customers with
06 regards to the solenoids in the Mark II System?
07 A. Any -- any product that you've used for a
08 long period of time, there's going to be things

09 that come up where people submit products in
10 terms of an FPR that there's been some issue that
11 they've had with something, and -- and we
12 investigate that. So I would say, "Yes," there's
13 been -- there's been issues brought up regarding
14 solenoid valves in the past.
15 Q. Okay. Now, the solenoids that are in the
16 Mark II System, you guys don't necessarily
17 manufacture those anymore; is that right?
18 A. That's not correct. We do make them in
19 terms of replacement parts --
20 Q. All right.
21 A. -- for people.
22 Q. Because you still have Mark II Systems
23 out in the --
24 A. That's correct.
25 Q. Okay. Do you have any idea how many Mark
00291:01 II Systems are still operating?
02 A. Something in the number of 30 rigs --
03 Q. Okay.
04 A. -- would be my best estimate.
05 Q. Okay. Now, if a -- a customer like
06 Transocean came into the door today and asked for
07 BOP, you wouldn't put the Mark II System on the
08 BOP, would you?
09 A. No, we would not quote that to them.
10 Q. Okay. You're no longer marketing that as
11 an active system; is that right?
12 A. That's correct.
13 Q. And when did you stop actively marketing
14 the Mark II System?
15 A. Probably about '05, 2005.
16 Q. Okay. So anyone who came to purchase a
17 BOP 2005 and after, would automatically have the
18 Mark III System; is that correct?
19 A. Not automatically, no.
20 Q. Okay. But you wouldn't offer them the
21 Mark II System?
22 A. No.

Page 292:16 to 293:09

00292:16 (Exhibit No. 5173 marked.)
17 Q. (By Mr. von Sternberg) This is a Cameron
18 document, is it not?
19 A. It is.
20 Q. Cameron Controls, to be specific; is that
21 right?
22 A. That's correct.
23 Q. And it's entitled "EMERGENCY"
24 DISCONNEN -- "DISCONNECT SEQUENCES, MUX BOP
25 CONTROL" SYSTEMS, THE "'DEEPWATER HORIZON'." Is
00293:01 that right?
02 A. That's correct.
03 Q. Okay. And like I said, since I don't

04 have a lot of time, I won't go specifically
05 through it in much detail, but both the ED 1
06 sequence -- EDS-1 sequence at 4.0, and the EDS-2
07 sequence at 5.0 are described in this document,
08 are they not?
09 A. That appears to be correct.

Page 294:19 to 295:17

00294:19 (Exhibit No. 5174 marked.)
20 Q. (By Mr. von Sternberg) And you recognize
21 this document, sir?
22 A. Yes, I do.
23 Q. Okay. And it's one that was approved by
24 you back on September 8th of 2004; is that right?
25 A. Yes --
00295:01 Q. And it --
02 A. -- that appears to be correct.
03 Q. And it was drawn by someone who is under
04 your command, Ray Jahn. Is that how you
05 pronounce his name?
06 A. Yes.
07 Q. Okay. This is the "AMF/Deadman Battery
08 Replacement, EB 891 D." Is that correct?
09 A. Yes, it is.
10 Q. And it's "REVISION 01"? Do you know --
11 A. That's correct.
12 Q. -- do you know if there's an updated
13 revision of this document, or do you think this
14 is the one that's currently in place?
15 A. I couldn't tell you without going into
16 our system and seeing if there is a different
17 revision.

Page 295:21 to 297:21

00295:21 (Exhibit No. 5175 marked.)
22 Q. (By Mr. von Sternberg) Okay. Have you
23 had a chance to look at the front page?
24 A. Yes, I did glance at it.
25 Q. Okay.
00296:01 A. Yes.
02 Q. It looks like the front page is a
03 transmittal sheet of which you're one of the
04 recipients; is that right?
05 A. Yes.
06 Q. And it's written by Brad Johnson?
07 A. Yes.
08 Q. And what -- what is his position? Or at
09 least what was his position back in 2008 when
10 this was written?
11 A. I believe from the -- at the bottom
12 there, it says he's a Product Manager for
13 Controls.

14 Q. So he -- he's a salesman, basically?

15 A. No. Product Manager -- well, it does
16 have some sales component to it, but he was -- a
17 Product Manager would be someone who's
18 responsible for keeping up with the product line,
19 staying in touch with clients, customers, what
20 are their needs, what are the things coming up in
21 the future. He could go to meetings and explain
22 to people about our products, and that type of
23 thing. So it's a fairly broad category. It
24 wouldn't be considered a straight sales, although
25 it does have a sales side to it.

00297:01 Q. Okay. And in this particular document,
02 it looks like he's mentioning that there's going
03 to be a meeting with Transocean regarding the
04 attachment; is that right?

05 A. Yes, that's what it's -- what it says in
06 there.

07 Q. Okay. And then the attachment is a MUX
08 Presentation of the Mark III, is it not?

09 A. (Reviewing document.)

10 Q. And you -- you might want to switch the
11 book around to get a better view of it.

12 A. Yeah, okay. I believe that's correct.
13 It's -- it's something to -- to show the new
14 system.

15 Q. All right. If you go -- you'll have to
16 count through, because there's no Bates numbers
17 on this. It's the cover page of the actual
18 Presentation.

19 A. Okay.

20 Q. And then go Page -- to Page 11, please.
21 Just count to 11.

Page 298:13 to 301:02

00298:13 MR. JONES: Page 25.

14 MR. VON STERNBERG: 25. Thank you,
15 David.

16 Q. (By Mr. von Sternberg) So it says -- in
17 the middle of this document, it says "PODS,"
18 right?

19 A. Yes.

20 Q. And then it talks about the Mark II - 2nd
21 Generation started in 1998. Is that a correct
22 statement?

23 A. That's what's stated in here, yes, I
24 agree.

25 Q. Okay. And then the current generation
00299:01 began development in 2004; is that right?

02 A. Yes.

03 Q. Okay. And it talks about both Mark III
04 Models, the 80 and the 120; is that correct?

05 A. Yes.

06 Q. Okay. This document is dated June 4th

07 of 2008, and that's what this document says that
08 the current generation of the Pods is the Mark
09 III as of that time; is that right?
10 A. Yes.
11 Q. Okay. And if you'll go -- this is not
12 very easy because there's no numbers on here.
13 Look for the one that -- it's just three more
14 pages down --
15 A. I'm there.
16 Q. -- "Mark I MUX Package." You see that?
17 A. Yes.
18 Q. Now, these -- are these pictures of the
19 solenoid valves? That's the Mark I. Those would
20 be the older ones, right? Is there a picture of
21 the Mark III in here, do you know?
22 A. Well --
23 Q. Don't worry about it, I'm running out of
24 time anyway, so --
25 A. There is.
00300:01 Q. Okay.
02 A. Further back.
03 Q. All right. Great. Now, go to the one
04 that starts with "Mark III MUX Section."
05 A. Okay.
06 Q. And you see that this confirms that it's
07 got rechargeable batteries for the AMF/Deadman
08 System; is that right?
09 A. Yes.
10 Q. Okay. And then if you go further about
11 five more pages down on yours, it says, "Mark III
12 SEM Features."
13 A. All right.
14 Q. You see it says, "Pie connectors
15 eliminated"?
16 A. Yes.
17 Q. Can you describe that change for us? How
18 does that work?
19 A. The -- the Mark I and Mark II systems,
20 the SEMs had pie connectors on it that were -- as
21 it -- the name implies, it looks like a pie. You
22 can plug six individual connectors into it that
23 would operate six solenoid valves --
24 Q. Okay. And what's --
25 A. -- in it.
00301:01 Q. -- the new connection system?
02 A. There is no connection system.

Page 301:14 to 304:04

00301:14 Q. And then if you'll go down further to the
15 "Solenoid Valve Features," about three or four
16 pages in.
17 A. Are you at this drawing here? Okay.
18 Q. There you go.
19 A. All right.

20 Q. And "Coil section is compensated with
21 dielectric." Is that what you were talking about
22 earlier today?
23 A. Yes, sir. The -- the -- the coil in and
24 of itself is pressure compensated. It's filled
25 and then -- then that is inside of a housing
00302:01 that's also oil filled and pressure compensated.
02 Q. And then now the new version has a single
03 coil design --
04 A. Yes.
05 Q. -- which states here it's "higher pull-in
06 force." Is that correct?
07 A. Yes, sir.
08 Q. And each of the SEMs activates the single
09 coil. You still have two SEMs in each Pod,
10 right?
11 A. Well, no. We don't call -- they're --
12 they're I/O boards in the new system.
13 Q. Okay.
14 A. Okay. But --
15 Q. Is it still redundant? You still have
16 two different boards?
17 A. Those two SEMs talk to a common
18 controller, and then that controller operates the
19 solenoid.
20 Q. Okay. Now, without -- I think I passed
21 it. I don't need you to look at -- look for it,
22 but you've got new control boards, too, now for
23 the control panels on board the vessel, right?
24 They're -- they're push operated instead of
25 button operated?
00303:01 A. Our standard is touch screens.
02 Q. Right.
03 A. That's correct.
04 Q. And then on the touch screen, you can see
05 whether or not the batteries have charge?
06 A. Yes. On the rechargeable battery system,
07 there's several pieces of information that you
08 can get from that screen. I probably can't quote
09 them all accurately, but --
10 Q. That --
11 A. -- there's --
12 Q. That's fine.
13 A. There's three, four, five --
14 Q. That's fine.
15 A. -- outputs that you get.
16 Q. Did you attend the meeting with
17 Transocean in 2008 in reference to the discussion
18 of the Mark III?
19 A. I -- I believe -- I believe that that was
20 conducted at -- I'm -- I'm pretty sure it was at
21 our facility --
22 Q. Okay.
23 A. -- that we hosted them to come over. It
24 was a -- I believe this was an opportunity where

25 we were showing them our new stuff, and it may
00304:01 have been at their request, and I'm not sure how
02 the meeting was arranged, whether we -- we asked
03 them over or they asked us, or how that came
04 about.

Page 312:14 to 312:19

00312:14 QUESTIONS BY MR. BERKA:

15 Q. Good afternoon, Mr. Gaude. My name is
16 Chris Berka. I'm one of the attorneys for
17 Anadarko --
18 A. (Nodding.)
19 Q. -- in this case.

Page 313:05 to 316:22

00313:05 Q. Okay. Did you work at all yourself on
06 any of the planning for the DEEPWATER HORIZON
07 prior to the commissioning?
08 A. No, I did not.
09 Q. Have you ever seen any documents in any
10 of the Cameron files that relate to the role
11 played by BP during the time the BOP for the
12 DEEPWATER HORIZON was being planned and built
13 originally?
14 A. No.
15 Q. Have you ever talked to anybody about the
16 role that BP played in the planning and -- for
17 the configuration of the BOP?
18 A. No, sir.
19 Q. Okay. Now, I understand that after you
20 began working for Cameron, there were occasions
21 where, from time to time, you were consulted
22 about the possibility of upgrades to the BOP on
23 the DEEPWATER HORIZON; is that correct?
24 A. I'm not sure of all the details of what
25 we've been req -- asked to do, or requested to
00314:01 do. But with -- with any rigs that we build,
02 there's -- there's been a series of communication
03 over time that we've had with that rig, in
04 support of it.
05 Q. Okay. Well, between the -- the time that
06 you began working for Cameron and the date of the
07 incident, do you recall, yourself, ever talking
08 to anybody at BP about the DEEPWATER HORIZON?
09 A. H'm. No, sir, I do not.
10 Q. Specifically, do you recall talking to
11 anybody at BP about a possible upgrade from the
12 Mark II to the Mark III System?
13 A. Not with BP, that I'm aware of --
14 Q. Okay. Now, I --
15 A. -- personally.
16 Q. Okay. Other than the DEEPWATER HORIZON,

17 during the time between when you started working
18 at -- at Cameron and the date of the incident in
19 April of 2010, did you have communications with
20 any Representatives of BP on the subject of
21 upgrades at any rigs other than the DEEPWATER
22 HORIZON?

23 A. What time frame? Could you please repeat
24 that?

25 Q. Well, my understanding is you started in
00315:01 2001 --

02 A. That's correct.

03 Q. -- working for Cameron.

04 A. Yes.

05 Q. So this would be approximately a
06 nine-year period of time.

07 A. Okay.

08 Q. During that nine-year period of time, any
09 communications you had with anybody from BP about
10 upgrades at any rigs other than the DEEPWATER
11 HORIZON?

12 A. We did an upgrade on the THUNDER HORSE
13 rig.

14 Q. Any others?

15 A. H'm. That's the only one that I can I
16 think of --

17 Q. What --

18 A. -- at this moment.

19 Q. What was the upgrade at the THUNDER HORSE
20 rig?

21 A. Basically, we were asked to build some
22 subsea pods, and subsea controls, and control
23 panels to replace some existing equipment that
24 they had that had been built by another company.

25 Q. What was that equipment?

00316:01 A. It was three subsea pods, and all the
02 associated RCBS, and other ancillary equipment
03 that goes on the BOP stack. It was some control
04 panels, and any of the electrical hardware that
05 was required to communicate between the surface
06 control panels and the subsea control pods.

07 Q. When did that upgrade occur?

08 A. I -- I -- I believe, to the best of my
09 knowledge, that was in '04.

10 Q. And what was the -- was that a Mark II
11 system at the time?

12 A. Yes.

13 Q. Was it subsequently upgraded to a
14 Mark III?

15 A. Not in that time frame.

16 Q. Later?

17 A. I be -- I believe that that upgrade is
18 something that's taken place, or has been quoted.

19 Q. When was it quoted?

20 A. I believe it was this year.

21 Q. In 2011?

22 A. I believe so.

Page 317:12 to 317:15

00317:12 QUESTIONS BY MR. WILLIAMSON:

13 Q. Mr. Gaude, my name is Jimmy Williamson.

14 I am here to ask you a few more questions, fair?

15 A. Okay.

Page 317:20 to 318:16

00317:20 Q. You know who BP is, right?

21 A. Yes, sir.

22 Q. BP is a big customer of Cameron's, aren't
23 they?

24 A. I believe so, yes.

25 Q. And BP buys production equipment, like
00318:01 well completion equipment, from Cameron, doesn't
02 it, and has for a number of years?

03 A. I know that BP is a customer of
04 Cameron's. I'm not -- I'm not well-versed on all
05 the products that they may buy from Cameron,
06 but --

07 Q. Okay. Here's my question: You have been
08 Director of Engineering Controls since 2004,
09 correct?

10 A. I've been Engineering Manager, then
11 Director, the same function, yes.

12 Q. Right. The -- okay.

13 Who at BP has approached you since 2004
14 and said to you, "I want to make the HORIZON
15 blowout preventer safer?" Who has done that from
16 BP?

Page 318:19 to 318:24

00318:19 A. I can't say that I've had any personal
20 contact with any BP personnel regarding HORIZON.

21 Q. (By Mr. Williamson) All right. Who
22 have -- from BP has ever contacted you and said,
23 "Is there a way to make the HORIZON blowout
24 preventer safer?"

Page 319:01 to 319:06

00319:01 A. I haven't personally been contacted by
02 anyone from BP that I can remember.

03 Q. (By Mr. Williamson) Okay. Has BP, to
04 your knowledge, ever asked you for a quote that
05 says, "We want to make the blowout preventer
06 safer" --

Page 319:09 to 319:20

00319:09 A. I cannot remember that occurring.
10 Q. Has BP ever asked you for a quote and
11 said, "We want to upgrade the blowout preventer
12 on the HORIZON"? BP ever approached you about
13 that?
14 A. Not me personally.
15 Q. All right. Has anyone from Cameron,
16 Mr. McWhorter, Mr. Moore, the other people of
17 Cameron, ever said to you, "BP wants to make the
18 HORIZON blowout preventer best available
19 technology"? Have you ever had that conversation
20 with anyone at Cameron since 2004 --

Page 319:22 to 320:05

00319:22 Q. (By Mr. Williamson) -- where a Cameron
23 employee comes to you and says, "BP wants this
24 blowout preventer to be better and safer"?
25 A. Not to my knowledge.
00320:01 Q. Okay. So to your knowledge, as you sit
02 here today, as the Engineering Manager for the
03 Control Systems, for blowout preventers, BP has
04 never approached you regarding making this
05 particular blowout preventer safer?

Page 320:07 to 320:17

00320:07 A. I have -- as I -- as I stated, I have not
08 personally had any contact with any BP personnel
09 that I know of in -- regarding the HORIZON.
10 Q. (By Mr. Williamson) Okay. Now, well, I'm
11 going to ask a slightly different question. Has
12 anyone from BP or who at BP has approached you
13 and said, "We want to know the limitations of our
14 system so that we can make sure we operate within
15 our design envelope"? Who at BP has ever
16 approached you to have that conversation in the
17 last seven years?

Page 320:19 to 321:05

00320:19 A. I haven't had any conversations with BP
20 personnel personally.
21 Q. (By Mr. Williamson) On those subjects?
22 A. On those subjects, or any subject.
23 Q. Okay. Whew, on any subjects, BP has not
24 bothered to call you at all to ask any questions
25 about the HORIZON?
00321:01 A. Not me directly.
02 Q. Okay. Tell me who at Cameron, which of
03 your Cameron co-employees has said to you, "BP

04 wants to understand the design envelope of its
05 blowout preventer"?

Page 321:10 to 321:21

00321:10 A. To my knowledge, I haven't been asked a
11 question like that.
12 Q. Okay. If BP, one of your customers, came
13 to you and wanted to know about the Control
14 Systems, and wanted to know about the AMF, they
15 wanted to know about the deadman, they wanted to
16 know about the EDS, they wanted to know about the
17 subsea accumulator banks, they wanted to know
18 about the blind shear rams and how they were
19 actuated, would you have been willing and happy
20 to cooperate in making sure to answer BP's
21 questions?

Page 321:23 to 323:03

00321:23 A. When we get asked questions about our
24 equipment, obviously, we -- we have some privacy
25 issues with -- if there's a relationship with,
00322:01 say, BP and Transocean about that rig, and
02 they're going to be using it, you know, we
03 don't -- we don't just answer any question about
04 one person's piece of equipment that we've sold
05 to them to somebody that's not doing some project
06 or work with them as a course of business.
07 But if -- if there's a relationship
08 between the Operator, say BP, and Transocean,
09 then we -- we -- we -- we're glad to answer
10 questions about our equipment, if somebody has a
11 question or a concern or suggestion. We -- we --
12 we cooperate with all of our customers --
13 Q. (By Mr. Williamson) All right.
14 A. -- to the best of our ability.
15 Q. So if Transocean did not object and BP
16 wanted to know about the HORIZON blowout
17 preventer, you would have been happy to answer?
18 A. We would -- we would -- we would do
19 whatever we could to answer their questions or
20 respond to their requests.
21 Q. Sure. And BP's lawyer today asked you a
22 bunch of very detailed questions about the
23 electrical system and the battery system on the
24 AMF, correct?
25 A. Yes, sir.
00323:01 Q. Okay. How many of those questions did BP
02 ask before the DEEPWATER HORIZON sank into the
03 Gulf of Mexico?

Page 323:05 to 323:10

00323:05 A. I've been personally not been asked
06 any -- any questions in that regard.
07 Q. (By Mr. Williamson) And to your
08 knowledge, none of your 60 people who work for
09 you have been asked those questions either, as
10 far as you know?

Page 323:12 to 324:07

00323:12 A. I can't speak for every one of those
13 people.
14 Q. (By Mr. Williamson) As far as you know?
15 A. As far as I know, no.
16 Q. Okay. The -- but BP has been interested
17 in the THUNDER HORSE, a rig and platform they
18 own?
19 A. Yes.
20 Q. Okay. And they went to the trouble to
21 upgrade the THUNDER HORSE in 2004, based upon
22 your memory, correct?
23 MS. MCKENZIE: Objection to form.
24 A. As I stated, we -- we did replace some
25 equipment that was on that rig, at that time
00324:01 frame.
02 Q. (By Mr. Williamson) Did you think you
03 made it better or you made it worse?
04 A. We -- we made it better, I -- in -- in my
05 opinion.
06 Q. If you made it better, that's an upgrade,
07 isn't it?

Page 324:09 to 324:09

00324:09 A. Yes.

Page 324:24 to 325:01

00324:24 Q. And right now, BP has chosen for their
25 own blowout preventer to upgrade to Mark III
00325:01 Control Systems from Cameron, correct?

Page 325:03 to 325:09

00325:03 A. I believe that their -- that their --
04 that the upgrade is concerning the Control Pods.
05 Q. (By Mr. Williamson) Okay. And have they
06 gone to Mark III Control Pods, or do you know?
07 A. I believe that they're changing the MUX
08 sections out to Mark III. I'm not sure if
09 they're changing the mod section out. The Pod --

Page 325:11 to 325:19

00325:11 A. The Pods are made such that you can put a
12 Mark III MUX section on a -- a Mark II hydraulic
13 section for that given size Pod.
14 Q. Do you think the Mark III MUX sections
15 make the blowout preventer on the THUNDER HORSE
16 better or worse?
17 A. Both -- both systems are fit for purpose.
18 They'll do the job that they're intended, if
19 they're operated and maintained correctly.

Page 327:04 to 328:20

00327:04 Q. All right. And by the way, I guess also
05 BP -- or I'm sorry. Cameron has available a
06 tandem booster that can be used for the blind
07 shear ram, correct?
08 A. I believe that is a configuration of a
09 blowout preventer. You can have a tandem booster
10 on it.
11 Q. Okay. And a tandem booster almost
12 doubles the effective cutting force of the blind
13 shear ram, correct?
14 A. I believe it is close to twice the piston
15 area.
16 Q. And, therefore, close to twice the force
17 that can be applied to that piston?
18 A. At the -- at a given equal pressure, that
19 would be correct.
20 Q. Right. The -- did BP ever approach you
21 about fitting a tandem booster on the blind shear
22 ram on the HORIZON?
23 A. Not me, personally. That wouldn't be --
24 the blowout preventer questions probably wouldn't
25 come to me in any event, but --
00328:01 Q. Okay. Well, would the system of fitting
02 the hydraulic control system to a tandem booster,
03 wouldn't that come into your Department?
04 A. Yes.
05 Q. So, therefore, you would know about it?
06 If BP had wanted a quote or an upgrade to a
07 tandem booster on a blind shear ram system on the
08 HORIZON, you would probably know about it?
09 A. Yes.
10 Q. And you don't know of any such request by
11 BP?
12 A. Not that I can recall.
13 Q. Okay. The -- we'll switch subjects.
14 The AMF system is sometimes called the
15 Deadman System, correct?
16 A. (Nodding.) Yes.
17 Q. Okay. And it's called the Deadman System
18 because it's a stand-alone system that should not
19 need any human intervention, correct?

20 A. That's correct.

Page 329:03 to 331:23

00329:03 Okay. Tell me about what the autoshear
04 does, so I make sure I have it right.
05 A. If you have an unplanned disconnect of
06 the LMRP from the lower stack, the autoshear will
07 close the designated function which typically
08 would be shear ram.
09 Q. Fair enough. Let me start over.
10 A. Okay.
11 Q. If you have an EDS, Emergency Disconnect
12 System, that will disconnect the LMRP from the
13 BOP stack, correct?
14 A. Okay. Yes.
15 Q. Okay. That's what it's designed to do?
16 A. (Nodding.)
17 Q. It will retract the stingers, and the
18 LMRP will disconnect and stay with the riser when
19 you activate the EDS, correct?
20 A. Okay. Yes.
21 Q. Okay. And the autoshear is designed that
22 if the LMRP accidentally disconnects from the BOP
23 stack, then the autoshear will fire the blind
24 shear ram, correct?
25 A. If the autoshear is armed, any disconnect
00330:01 of the LMRP will energize it, activate it --
02 Q. Okay. Okay.
03 A. -- planned or unplanned, if it's armed.
04 Q. Okay. Is that how the E -- well, no, the
05 EDS actually fires the blind shear ram before it
06 disconnects the LMRP, doesn't it?
07 A. Typically, that would be the shear rams,
08 as we discussed earlier, the EDS-1 and 2. One
09 does the shear ram. One does the casing and the
10 shear.
11 Q. Right. Here's my question. I want to
12 now turn to the AMF. On the AMF, does it
13 disconnect the LMRP? When you fire the AMF
14 system, or when the conditions for the AMF system
15 are fired, will it disconnect the LMRP from the
16 BOP stack?
17 A. The system on the HORIZON did not
18 disconnect the LMRP.
19 Q. Okay. I assume, depending on customer
20 preference, the AMF could be wired either way.
21 It can be wired where it would disconnect the
22 LMRP, or it can be wired where it would not
23 disconnect the LMRP?
24 A. I hesitate because I'd have to consider
25 the -- the hydraulic connections to be able to
00331:01 get the hydraulics to the -- to the upper LMRP,
02 to -- to -- to be able to disconnect the
03 connector and retract the stingers that are on

04 the LMRP.
05 Q. Okay.
06 A. There -- there's some considerations that
07 would have to be given in order to determine
08 whether you can successfully accomplish that or
09 not, but --
10 Q. Okay. Are most -- the -- therefore, I
11 take it from your answer, most of Cameron's AMF
12 systems do not disconnect the LMRP from the BOP
13 stack?
14 A. That would be a correct statement.
15 Q. Okay. Why not?
16 A. Because that's -- that's the agreed upon
17 configuration. That's what people -- that's what
18 they bought.
19 Q. Okay.
20 A. It hasn't been requested. To my
21 knowledge, to my personal knowledge, it hasn't
22 been requested that we -- we -- we have a
23 disconnect of the LMRP through the deadman, AMF.

Page 332:11 to 332:23

00332:11 Q. Okay. Do you consider safety when you're
12 making these designs?
13 A. Everything that we design is a part of
14 safety equipment.
15 Q. I know. And so do you consider -- if a
16 customer requests an EDS system that you think is
17 less safe than another alternative, do you
18 consider safety when you make that design?
19 A. We design those systems to agreed upon
20 configuration with the customer.
21 Q. I'm trying to figure out, if the customer
22 wants something that you think is less safe, do
23 you design it anyway?

Page 332:25 to 334:13

00332:25 A. We -- we design it -- the system for,
00333:01 like -- as I said, we design it in conjunction
02 with the customer.
03 Q. (By Mr. Williamson) Therefore --
04 A. If they --
05 Q. -- if the customer wants it, you design
06 it?
07 A. Generally speaking, without any
08 conditions on it, on your statement, yes, we
09 design what the customer wants.
10 Q. And don't really -- if the customer is a
11 customer like BP or Transocean, you don't really
12 let safety considerations keep you from designing
13 what the customer wants?
14 A. No, I wouldn't agree with that.

15 Q. Okay. Okay. What safety considerations
16 did you take into account when designing the
17 HORIZON blowout preventer?

18 A. That's a pretty general question. You'll
19 have to be more specific.

20 Q. Sure. Let's talk about the Emergency
21 Disconnect Systems, EDS-1, EDS-2, autoshear, and
22 the AMF.

23 Those are the emergency systems on the
24 blowout preventer, correct?

25 A. That's right.

00334:01 Q. Those are the systems that, hopefully,
02 will be available in the event of emergency,
03 correct?

04 A. Yes.

05 Q. And there's no question that April 20th,
06 2010, with flames going to the crown, that's an
07 emergency. We can agree on that, surely?

08 A. Yes.

09 Q. Okay. Any doubt about that in your mind?

10 A. No.

11 Q. Okay. What consideration does Cameron
12 give to safety when designing those Emergency
13 Disconnect Systems?

Page 334:15 to 335:04

00334:15 A. We give consideration to safety with all
16 of our systems.

17 Q. (By Mr. Williamson) Sure.

18 A. And we build it -- we design it in
19 accordance with the industry required Standards.
20 And there at --

21 Q. Did --

22 A. -- current -- at -- at that time,
23 there -- there was no industry requirement to
24 have a -- a Deadman System. That was an optional
25 piece of equipment.

00335:01 Q. Have you ever thought about what will
02 happen if a rig loses its MUX cables and the
03 riser does not disconnect? Have you ever
04 considered that -- that alternative?

Page 335:06 to 335:20

00335:06 A. If the unit -- if you -- would you please
07 restate that?

08 Q. (By Mr. Williamson) Sure. You lose your
09 MUX cables, and you, therefore, lose Operator
10 control of the blowout preventer, correct?

11 A. Yes.

12 Q. And the riser does not disconnect, so the
13 autoshear will not activate, correct?

14 A. That's correct.

15 Q. Okay. And you still have hydraulic
16 integrity, so the AMF will not fire, correct?
17 A. That's correct.
18 Q. Have you ever considered what emergency
19 activation system you need for that set of
20 circumstances?

Page 335:22 to 337:04

00335:22 A. Not personally, no.
23 Q. (By Mr. Williamson) Okay. As Manager of
24 the Control Systems for Cameron, have you ever
25 thought about it?
00336:01 A. Yes.
02 Q. Okay. And what have you done to address
03 that situation with blowout preventer design?
04 A. We haven't made a system that -- that
05 would do that.
06 Q. You haven't made a system --
07 A. No.
08 Q. -- that will address that problem?
09 A. I don't consider that a problem.
10 Q. Okay. Why not?
11 A. Well, you stated that if you lose the
12 two -- if you don't have communication and power
13 through your MUX cables, that -- why would you
14 not activate the deadman? You --
15 Q. Because you still have hydraulic
16 integrity.
17 A. You have hydraulic integrity, but you can
18 also gain those systems back --
19 Q. Okay.
20 A. -- in the example that you gave me.
21 If -- if you -- if you eliminate enough of the
22 systems, you can have a false actuation of the
23 deadman.
24 Q. Okay. And y'all have thought about that,
25 a false actuation of the deadman?
00337:01 A. Yes.
02 Q. Okay. Well, in the hypothetical I just
03 gave you, that is what happened on the HORIZON on
04 April 20th, right?

Page 337:06 to 337:16

00337:06 Q. (By Mr. Williamson) You didn't -- let's
07 just take it. You didn't have a riser
08 disconnect, correct?
09 A. No. The -- the LMRP did not separate
10 from the lower stack.
11 Q. Okay. And you did have a loss of
12 electrical, and a loss of all Operator control,
13 correct?
14 A. That's correct.

15 Q. And BP and Transocean had made a decision
16 not to have acoustic systems available, correct?

Page 337:18 to 338:22

00337:18 A. An acoustic system was not part of the
19 HORIZON stack.
20 Q. (By Mr. Williamson) Was that Cameron's
21 decision, or was it BP and Transocean's decision?
22 A. It's optional equipment, so it was not
23 elected to be installed on that rig.
24 Q. I didn't ask that question. I asked:
25 Was it Cameron's decision, or was it BP's and
00338:01 Transocean's decision?
02 A. It was not Cameron's decision.
03 Q. Okay. Whose decision was it to not put
04 an acoustic system on?
05 A. The purchaser of the rig --
06 Q. Okay.
07 A. -- the system from us.
08 Q. Okay. And who was that?
09 A. Was that RB Falcon? I'm not sure who it
10 was at that time.
11 Q. Who participated in the configuration of
12 this particular BOP, or do you know?
13 A. I don't know specifically, because it
14 changed hands. I -- I --
15 Q. Okay. And speaking of that, would you
16 look at Exhibit No. 5166, while we're on acoustic
17 systems?
18 A. Okay.
19 Q. You say you haven't seen this particular
20 document before, even though it came out of
21 Cameron's system?
22 A. H'm. I don't recall that I have seen it.

Page 339:12 to 340:12

00339:12 Q. In fact, this particular purport --
13 report, if you'll look on Page 6 of the Report,
14 it tracks 16,324 days of acoustic system use,
15 right?
16 A. H'm. I'll need to -- where on that
17 chart are you -- which -- what are --
18 specifically are you looking at Table 2?
19 Q. Table 2, "BOP days w/acoustic system,"
20 the "Total." Do you see that?
21 A. I see the chart, the table.
22 Q. Do you see "16324"?
23 A. "BOP days w/acoustic system." Okay.
24 Yes, I see that column.
25 Q. All right. And the "Total" on that
00340:01 column is -- this particular little study, is
02 tracking 16,324 days of BOP use with an acoustic

03 system, right?
04 A. It a -- it appears to be that's what's
05 they're depicting.
06 Q. Okay. And that would be several years,
07 correct?
08 A. Yes.
09 Q. Okay. 365 days a year, that's going to
10 be about 45 years of BOP use with an acoustic
11 system?
12 A. Yes.

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00340:22 M-h'm. And I'll just put it in context
23 for you. If you turn to Table 4 -- the Table 2
24 Total is 69 failures. And if you turn to Table
25 4, 29 of those occurred upon the rig, 38 occur on
00341:01 the wellhead, and 2 occur during running the BOP.
02 Do you see that on Table 4?
03 A. Yes.
04 Q. All right. And if you actually turn to
05 that 38, you'll find that 19 -- 18 of those
06 occurred during installation, 19 occurred during
07 a regular test or operation. That's Table 5. Do
08 you see that?
09 A. Ah, you got ahead of me.
10 Q. Okay. Turn to Table 5.
11 A. All right.
12 Q. Do you see that?
13 A. I see Table 5.
14 Q. So we have 19 times -- in 45 years of
15 acoustic system operation, we have 19 documented
16 times that the acoustic system failed when it was
17 called upon in regular use, not in test mode, not
18 on the rig floor, but in regular use, according
19 to this study, right?

Page 341:21 to 341:22

00341:21 A. That is the information that's in this
22 document.

Page 342:06 to 342:09

00342:06 Q. But if we look at Exhibit 5166 that was
07 cited to you by BP a few minutes ago, it shows 19
08 failures in regular use, over what are 45 years
09 of acoustic system operation, right?

Page 342:11 to 342:17

00342:11 A. That appears to be the information that
12 we've walked through in this document.

13 Q. (By Mr. Williamson) Okay. What do you
14 think, if you were on the DEEPWATER HORIZON at
15 10:00 o'clock p.m. on April 20th, 2010, would you
16 want an acoustic system available to try to
17 actuate the BOP?

Page 342:19 to 344:12

00342:19 A. You know, an additional system to -- to
20 be able to control the blowout preventers, if
21 available, would -- could be beneficial.

22 Q. (By Mr. Williamson) Okay. The --
23 All right. I want to make sure I return
24 for a second to the subject of the subsea
25 batteries. Understand the subject matter?

00343:01 A. Yes, sir.

02 Q. As I understand, the subsea batteries
03 that were on the HORIZON, you could not, when
04 that Unit was subsea, in other words, when the
05 blowout preventer was on the wellhead, you could
06 not monitor the status of those batteries, and
07 you could not recharge the batteries. Am I
08 correct about that?

09 A. You are correct.

10 Q. Okay. And the new system that Cameron
11 has had available since about 2004, 2005, the
12 batteries are rechargeable, correct?

13 A. That's -- that's correct.

14 Q. And B -- Transocean, I'm sorry, I said
15 "BP." Transocean approached Cameron about making
16 these batteries rechargeable in 2005, correct?

17 A. There was an E-mail that depicted some
18 questions that were asked about it. I don't know
19 the extent of the questions or the context of the
20 questions, but there was an E-mail that I did see
21 that -- that had some questions about it, some
22 comments.

23 Q. Okay. So everybody -- let's make no
24 mistake about this, everybody, Cameron, BP, and
25 Transocean knew in 2005 that those subsea
00344:01 batteries had a limited life, correct?

02 A. The -- the Lithium batteries that are
03 used in a Mark I, Mark II Deadman System have
04 limitations of life, based on the information
05 that we had provided.

06 Q. Right. I'm trying to make sure we get a
07 time frame to go with that.

08 By 2005, five years before the DEEPWATER
09 HORIZON explosion, BP, Transocean, and Cameron
10 knew those batteries were limited in their life
11 span, correct?

12 A. Yes.

Page 344:14 to 345:17

00344:14 Q. (By Mr. Williamson) And in 2005, five
15 years before the DEEPWATER HORIZON explosion, BP,
16 Transocean, and Cameron knew that those batteries
17 could not be monitored subsea, correct?

18 A. That was not -- that was not part of the
19 system. That would be correct, that -- that
20 people would be aware of that.

21 Q. And in 2005, five years before the
22 HORIZON explosion, BP, Transocean, and Cameron
23 all knew that those batteries that were on the
24 HORIZON could not be recharged while the unit was
25 subsea, correct?

00345:01 A. That would be correct.

02 Q. Okay. Oh, and in 2005, five years before
03 the HORIZON, BP, Cameron, and Transocean all knew
04 that an alternative was available from Cameron
05 whereby those batteries would be rechargeable,
06 correct?

07 A. I -- I can speak that I'm -- I'm certain
08 that Transocean were -- were aware of it, because
09 they're one of our direct customers. I can't
10 speak for the knowledge that BP might have in
11 that regard.

12 Q. Okay. Transocean knew it and Cameron
13 knew it, and you don't know what BP knew?

14 A. That's correct.

15 Q. All you know is that BP never asked you
16 about it, personally?

17 A. Not to my knowledge.

Page 346:12 to 347:06

00346:12 Q. All right. And where does one -- okay.
13 I -- there's been testimony that the regulator
14 pressure is normally set to 1500 psi on the
15 HORIZON annulars. Does that sound right to you?

16 A. It could be. It could be.

17 Q. Okay. Sometimes, in order to effect a
18 seal, you'd have to raise the pressure above 1500
19 psi. There's been testimony to that effect.
20 Does that sound like that's possible, based on
21 how you know the system operates?

22 A. I would agree with that.

23 Q. Okay. If you have to raise the pressure
24 to more than 1500 psi, would that indi --
25 indicate to you that you had some wear on the

00347:01 annular elastomers?

02 A. I can't -- I couldn't say that I would
03 agree with that, because I'm not an annular
04 designer or expert. I just know that our control
05 system needs to have the capability to regulate
06 pressure above 1500 on annulars.

Page 347:22 to 348:14

00347:22 Q. You have annulars, and I assume, because
23 of the nature of an annular, you have to keep
24 pressure on that annular in order to keep the
25 seal. Is that true?
00348:01 A. If you take pressure off an annular, it
02 will energize and -- and open, normally.
03 Q. Okay. My question is: If you lose
04 hydraulic power on the rig floor, will that
05 relieve the hydraulic pressure that's feeding the
06 annular?
07 A. No.
08 Q. Okay. What will provide, then, the
09 annular pressure? How will it continue, if you
10 lose hydraulic integrity on the rig floor, if you
11 lose your hot line and your rigid conduit?
12 A. Well, there's -- there's fluid that's
13 trapped in the accumulators that are on the LMRP
14 that could continue to supply hydraulic pressure.

Page 351:02 to 351:13

00351:02 Q. Okay. But I assume the annulars do not
03 have any sort of locking mechanism, the way the
04 rams do, correct?
05 A. They do not.
06 Q. The rams have an ST lock system, that if
07 they're closed and locked, you can't actually
08 open them back unless you apply hydraulic
09 pressure, correct?
10 A. That's correct.
11 Q. Okay. The annulars don't have such a
12 locking mechanism, correct?
13 A. No, they do not.

Page 358:03 to 358:08

00358:03 I'd like to you look at my copy of Exhibit 3960.
04 You had said earlier, that if you had the Stack
05 Flow Diagram, that you could tell us certain
06 information. Is that the Stack Flow Diagram
07 you're referring to?
08 A. That is a Stack Flow Diagram.

Page 360:18 to 363:11

00360:18 Q. Okay. Well, I don't know the
19 terminology. You have me at an advantage. I
20 don't know the terminology well enough, or the
21 diagrams well enough, the plumbing, in order to
22 correctly identify the valves, so I'm going to
23 ask you a more generic question, you know,

24 what -- are there valves or leaks in the system
25 that would compromise the integrity of the subsea
00361:01 accumulators?

02 A. Yes.

03 Q. Where? Where would be the leak points?

04 A. Well, the leak point would be downstream
05 of the accumulators.

06 Q. All right. And what would that consist
07 of?

08 A. It would consist of anything that's
09 downstream of the accumulators.

10 Q. Sure. Take me through what's downstream
11 of the accumulators, according to Exhibit 3960.

12 A. There's a -- it looks like there's two
13 regulators. And then downstream of the
14 regulators, you have two control valves.

15 You have a check valve that traps the
16 pressure in. If it were to leak, the pressure
17 could go back out.

18 You've also got another regulator over
19 here, that any leaks in any of those points,
20 would leak down these accumulators, or leak in
21 the piping, fittings, hosing, anything that's in
22 these lines that would leak, could bleed these
23 accumulators down.

24 Q. All right. So if I'm understanding, the
25 subsea accumulators will feed into two or three
00362:01 different regulators, and a check valve, I think
02 you'd said, and then, from there, where do they
03 go? Do they go directly into the piston?

04 A. No. They go through a -- they go through
05 a shuttle valve prior to going to the closing
06 piston on the ram.

07 Q. Speaking of that, are all of those
08 regulators -- do the casing shear rams and the
09 blind shear rams have the same regulator, or do
10 they each have their own regulator?

11 A. (Reviewing diagram.) It's kind of hard to
12 follow this with all the writing on it. Will you
13 give me a moment, please?

14 They'd have a separate regulator.

15 Q. Okay. And each of those regulators would
16 also constitute a potential leak point?

17 A. Yes.

18 Q. By the way, the regulator that's on the
19 blind shear ram, I assume that it's -- normally
20 can be set on this particular system to 4,000
21 psi, correct?

22 A. It -- it states that it is set at 4,000
23 on the diagram.

24 Q. Okay. Cameron does have 5,000 psi
25 accumulator systems available, correct?

00363:01 A. The accumulator system is already 5,000
02 psi.

03 Q. Okay. Cameron has -- is there anything

04 on this system that's rated to 4,000 psi, because
05 I was understanding the ram bodies were rated at
06 4,000 psi?

07 A. The regulators were set at 4,000. And
08 it's -- it's my understanding that there's --
09 that the rams were not usable -- you couldn't use
10 them at five, so the regulators were set at
11 4,000.