

Deposition Testimony of:

Paul Tooms

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Page 9:03 to 9:09

00009:03 PAUL TOOMS
04 was called as a witness by the Plaintiffs and, being
05 first duly sworn, testified as follows:
06 DIRECT EXAMINATION
07 QUESTIONS BY MR. BRUNO:
08 Q. All right. Good morning, Mr. Tooms. My name
09 is Joseph Bruno. I'm here for the PLC.

Page 11:09 to 11:13

00011:09 Q. (By Mr. Bruno) Fair enough. All right. Do
10 you understand that you have been designated by British
11 Petroleum to answer in their place or in their stead
12 with regard to certain topics as outlined in this
13 30(b)(6) Notice?

Page 11:15 to 11:24

00011:15 A. I haven't read the Notice.
16 Q. (By Mr. Bruno) Right.
17 A. But I have been told I -- I'm a 30(b)(6)
18 Witness.
19 Q. All right. Do you -- what is your
20 understanding of what a 30(b)(6) Witness is? Let's --
21 let's try it from that side.
22 A. My understanding is that I answer questions on
23 behalf of the company, in certain areas where the
24 company has asked me to answer them.

Page 13:02 to 13:21

00013:02 Q. Why don't you look at Tab 14 for us. I see
03 your name first there, and so perhaps it may be a
04 better plan. And I apologize. Let's go to Page 2. I
05 just noticed that your name appears there first, so
06 forgive me.
07 All right. You'll see that the No. 4 is the
08 topic. And No. 4 topic is: "Potential costs, risks,
09 benefits and other analyses or evaluations of potential
10 methods to cap, control, contain, shut-in and/or kill
11 the Macondo Well after April 20, 2010."
12 Did I read that correctly, sir?
13 A. You did read that, yes.
14 Q. All right. And then if we look at the
15 response, on the next page, 3, you'll see your name
16 appears by the dot --
17 A. (Nodding.)
18 Q. -- and indicating "well-integrity analysis,"
19 so that would appear to us to be the -- one of the
20 subjects that you have been designated to speak on
21 behalf of British Petroleum, okay?

Page 13:23 to 14:15

00013:23 Q. (By Mr. Bruno) And then if we look at No. 5,
24 which is right below: "Evaluation, study and/or
25 analysis of any potential method or technique to cap,
00014:01 control, contain, shut-in, temporarily abandon, and/or
02 kill the Macondo Well after April 20, 2010, including
03 the possible" risk -- "risks, benefits or other
04 consequences thereof."
05 Did I read that correctly?
06 A. You did read that correctly.
07 Q. Thank you, sir. And if you would look under
08 the "RESPONSE," you'll see, once again, your name
09 appears under one of the little dots --
10 A. (Nodding.)
11 Q. -- and it says, again, "well-integrity
12 analysis"?
13 A. (Nodding.)
14 Q. Okay.
15 A. Thank you.

Page 14:23 to 15:09

00014:23 Q. Okay. Why don't we start with this: Why
24 don't we get a sense from you, sir, what is Well
25 Integrity Analysis?
00015:01 A. Sir, in the context of -- of what you just
02 read to me, the Well Integrity Analysis was to
03 understand whether the well was capable of containing
04 the pressures that it might see when we shut it in.
05 Q. All right. Does the phrase "Well Integrity
06 Analysis" have meaning beyond the context of British
07 Petroleum's response to this catastrophe? In other
08 words, is that phrase used in your business, with any
09 regularity or frequency?

Page 15:11 to 15:24

00015:11 A. Not so far as I'm aware. We use the term
12 "Well Integrity" --
13 Q. (By Mr. Bruno) I see.
14 A. -- but not "Well Integrity Analysis."
15 Q. All right. All right. Fair enough. So let
16 me -- may I learn from you what is the meaning of the
17 phrase "Well Integrity"?
18 A. To me, "Well Integrity" means the ability of
19 the well to contain the fluids and pressures for which
20 it was designed.
21 Q. Does it follow, Mr. Tooms, that you have to
22 know something about the fluids and pressures at the
23 location where the well is intended to be placed in
24 order to design the well?

Page 16:01 to 16:10

00016:01 A. You either have to know or you have to make
02 reasonable assumptions.
03 Q. (By Mr. Bruno) All right. Obviously, you
04 can't design the well to contain pressures and fluids
05 without knowing something about the pressures and
06 fluids; isn't that true?
07 A. There are times when if you'll drilling a -- a
08 wildcat well, you could not know the pressures and --
09 of the fluids that you're drilling into, so you have to
10 make assumptions.

Page 16:13 to 16:18

00016:13 Q. I'm sorry. Were you finished?
14 A. No, I wasn't. So -- but in the context of --
15 of this, this isn't a wildcat well.
16 Q. What is a "wildcat well"?
17 A. A "wildcat well" is a well where we have no
18 exploration data before we go drilling.

Page 17:19 to 17:20

00017:19 Q. So if I say "BP," will there be any confusion
20 as to which BP entity we're discussing?

Page 17:22 to 18:01

00017:22 A. Not for me.
23 Q. (By Mr. Bruno) Okay. All right. What is the
24 actual name of the BP entity for whom you are employed?
25 A. I work for the BP Exploration and Operating
00018:01 Company Limited.

Page 18:11 to 18:16

00018:11 All right. So for the purposes of this
12 record, let us agree that when I use the word "BP" that
13 I will be referring to -- to be precise, that's why we
14 have these realtime devices -- BP Exploration and
15 Operating Company Limited. Okay?
16 A. Yes.

Page 19:21 to 20:18

00019:21 Q. All right. Now, before I get there, I'd like
22 to learn a little bit about your employment. What is
23 your current title?
24 A. I have several titles in my role. I am the VP
25 for Engineering for Exploration and Production, which
00020:01 is also -- actually, Exploration and Production is --

02 is now known as Upstream.
03 Q. Forgive me. Let me make sure that I
04 understand it --
05 A. Okay.
06 Q. -- okay?
07 All right. The actual title used to be the
08 Vice President of Engineering for Exploration and
09 Production, and now the new title is Upstream?
10 A. Vice President ex -- Engineering for Upstream.
11 Q. All right. Vice President for Exploration for
12 Upstream.
13 A. You can use the words "Upstream" and eng --
14 "Exploration and Production" interchangeably.
15 Q. All right.
16 A. (Indicating.)
17 Q. May I learn, please, what BP defines as
18 "Exploration"?

Page 20:20 to 21:01

00020:20 A. I'm not sure I know what BP's definition is.
21 Q. (By Mr. Bruno) Well, let's use yours.
22 A. My definition of Exploration would be what's
23 commonly used in the industry, which is where you are
24 exploring or investigating potential oil fields where
25 you don't have any direct information yet, so such as a
00021:01 well.

Page 21:22 to 21:25

00021:22 Q. All right. So as the Vice President of
23 Engineering for Exploration and Production, did that
24 job include any responsibility for Drilling?
25 A. No, it did not.

Page 23:04 to 24:02

00023:04 Q. And the first one we got out was the Vice
05 President for Engineering Exploration and Production,
06 which is now called Upstream Engineering. That's what
07 I understood. Perhaps, I'm wrong. So tell me if I'm
08 correct or inaccurate.
09 A. That's correct, my -- my job title today --
10 Q. Okay.
11 A. -- is Vice President of Engineering for
12 Upstream Division.
13 Q. All right. Now, for how long have you been
14 Vice President for Upstream Engineering?
15 A. Sorry. I'm -- I'm trying to not to be
16 confusing here.
17 Q. No, I know. Because the name changed,
18 obviously, right?
19 A. Correct.

20 Q. When did the name change? Let's do that.
21 A. The name changed 1st of April this year.
22 Q. Okay. Now, so before April 1, 2011, were you
23 Vice President for Engineering Exploration and
24 Production?
25 A. Yes, I was.
00024:01 Q. And for how long?
02 A. Since January the 1st, 2010.

Page 25:01 to 26:10

00025:01 Q. All right. What is the name of the person who
02 was the Technology Vice President for Drilling &
03 Completions?
04 A. That was Barbara Yilmaz.
05 Q. I apologize, Bob --
06 A. Barbara Yilmaz, Y-i-l-m-a-z.
07 Q. Okay. Now, you were going to share with us
08 the other titles that you've held during this period of
09 time. What are those?
10 A. So I'm also known as the Head of Engineering
11 for Upstream, which includes our Upstream Engineering
12 Center, and the other title I have is that I'm the
13 Engineering Authority for Upstream, which includes
14 Wells, which you would know as Drilling. And prior to
15 April the 1st this year, I was Engineering Authority
16 for Exploration and Production, but it did not include
17 anything to do with Drilling & Completions.
18 Q. Okay. I guess I'm easily confused this
19 morning. You'll have to forgive me.
20 You are currently the Engineering Authority
21 for Upstream, which includes Wells. That's the new
22 nomenclature post-April, whatever it is.
23 A. (Nodding.)
24 Q. Okay? So am I understanding you to say that
25 for the first time in your career you are now
00026:01 responsible for Drilling & Completions or what we would
02 now call Wells?
03 A. I'm -- I'm responsible for -- for this -- I --
04 I'm responsible as the Engineering Authority for Wells.
05 I'm not as responsible for -- still not responsible for
06 Drilling & Completions as an overall discipline.
07 Q. Okay. All right. Well, what is the
08 distinction, then, between this Engineering Authority
09 and this other notion of the person being responsible
10 for Drilling & Completions?

Page 26:12 to 27:01

00026:12 A. An Engineering Authority ensures that
13 Standards are set, and if people need to deviate from
14 those Standards, would be required to give Dispensation
15 from those Standards or Practices.
16 Q. (By Mr. Bruno) Okay. Now, the Standards to

17 which you refer, those are BP Standards?

18 A. They are generally BP Standards, yes.

19 Q. All right. Might they include Standards
20 generally accepted within your industry?

21 A. Our Standards are written to -- to include
22 those Industry Standards, yes.

23 Q. All right. Might they also include
24 Governmental Regulation, regardless of the particular
25 Government that may have authority over your

00027:01 activities?

Page 27:03 to 27:13

00027:03 A. They might. Generally, our Standards are
04 written to be universal.

05 Q. (By Mr. Bruno) All right. In your current
06 role as the Engineering Authority, does that role
07 include being knowledgeable about Governmental
08 Regulations that may be applicable to Wells?

09 A. Not entirely. I have appointed an Engineering
10 Authority specifically for Wells so that we can give it
11 the attention, and so that there is somebody who can be
12 focused on things such as the -- the Government
13 Regulations.

Page 28:16 to 28:19

00028:16 about which you're speaking than I do. Was there
17 anyone at BP whose responsibility it was to be
18 knowledgeable about Governmental Regulation in the time
19 frame January 2010 until April 1, 2011?

Page 28:21 to 28:23

00028:21 A. I -- I wasn't -- I didn't have any oversight
22 of Drilling, so I -- I don't know the details of who
23 had quite what responsibility for what.

Page 29:13 to 29:17

00029:13 What was it, what information, what thought
14 process caused you to decide to appoint a gentleman to
15 be in charge of the Engineering Authority for the
16 specific purpose of being aware of Governmental
17 Regulation that may be applicable to Wells?

Page 29:19 to 30:12

00029:19 A. Well, I -- I didn't appoint him specifically
20 for the -- being aware of -- of Governmental
21 Regulation. He -- he may be aware of Governmental
22 Regulation. But the thought process that drove me to

23 appoint an Engineering Authority for Wells was simply
24 we have a very formal structure for discipline
25 Engineering in -- in BP, and since Wells was going to
00030:01 fall within that, we wouldn't keep the same structure
02 for Wells -- or would create the same structure for
03 Wells.

04 Q. (By Mr. Bruno) Well, do I understand that
05 before April 1, that there was a different structure
06 for Wells than there was for Exploration and
07 Production?

08 A. Yes, there was.

09 Q. All right. And do I also understand that the
10 structure for Exploration and Production was far more
11 detailed, thorough, and structured than the structure
12 for Wells or Drilling & Completions?

Page 30:16 to 31:03

00030:16 Q. (By Mr. Bruno) Well, you told me just a moment
17 ago, that -- that at least on the Exploration and
18 Production side, there was a lot of structure.

19 There was, in fact -- for example, my memory
20 is, after having taken the deposition of Ms. Skelton,
21 there were BP procedures which required that certain
22 procedures be put in writing, and I asked Ms. Skelton
23 if such a thing existed on the Drilling & Completions
24 side, and she said she didn't know. And I'm wondering
25 if that's the kind of difference that you are
00031:01 describing when you describe a difference in structure
02 between the Exploration and Production side and the
03 Drilling & Completions side of the business?

Page 31:05 to 31:10

00031:05 A. So if you're asking me did Drilling have a
06 different structure than we had, yes, Drilling had a
07 different structure than we had in the rest of the
08 Engineering -- discipline Engineering side of the
09 business. I can't say whether that structure was more
10 or less formal than mine.

Page 33:17 to 33:25

00033:17 Let -- let me ask you, then, this question:
18 Let's talk about the -- the Exploration and Production
19 side. Why on earth would there be any need to put any
20 procedure in writing?

21 A. Because we want to be clear about that
22 procedure.

23 Q. Sure. And you don't want to run the risk of
24 having your employees not understand a particular
25 procedure, right?

Page 34:02 to 34:03

00034:02 A. We want to ensure that we precisely convey the
03 message of that procedure.

Page 36:24 to 37:07

00036:24 I'm trying to figure out where the de -- the
25 idea came from. If you know, whose idea was it to
00037:01 include Wells in the Engineering Authority?
02 A. I don't know.
03 Q. All right. Do you know, sir, whether or not
04 the decision to do so had anything to do with the
05 catastrophe of April 20, 2010?
06 A. Yes, the restructuring of the organization had
07 to do with the catastrophe of April 2010.

Page 38:03 to 38:14

00038:03 Q. Okay. Then how is the structure that you put
04 in place any different from the structure that
05 pre-existed your structure?
06 A. Sir, my structure is more centralized, so I
07 have a single Engineering Authority to cover Wells
08 globally. I -- the -- don't know exactly how the
09 structure was before. They had Authorities, Technical
10 Authorities and Engineering Authorities, I believe, but
11 I don't know -- well, I'm -- I'm fairly sure that they
12 weren't centrally based.
13 Q. Okay. What is the harm in not having them be
14 centrally based?

Page 38:18 to 38:20

00038:18 A. I -- I don't think there necessarily is any
19 harm. It provides greater clarity to have the
20 structure the same across the company.

Page 39:04 to 39:09

00039:04 Q. M-h'm. Can I conclude from that that -- that,
05 in your view, the Exploration & Production structure
06 was satisfactory, in your mind? That is, after this
07 catastrophe and after the analysis and after the
08 change, there really was not a lot of changes made to
09 the Exploration & Production side?

Page 39:13 to 39:14

00039:13 A. There have been a number of changes made to
14 the Exploration & Production side.

Page 39:18 to 40:10

00039:18 Q. What changes in structure were made?
19 A. We set up a Safety & Operational Risk Division
20 under Mr. Bly. We organized the Upstream according to
21 Divisions.
22 Q. M-h'm. To whom do you report, Mr. Tooms?
23 A. Since April the 1st?
24 Q. Yes.
25 A. I report to Mr. John Baxter.
00040:01 Q. And what is his title?
02 A. He's Group Head of Engineering and Group Head
03 of Process Safety.
04 Q. And to whom does he report?
05 A. He reports to Mr. Mark Bly.
06 Q. And what is Mr. Mark Bly's new title?
07 A. I think he's EVP, so Executive Vice President
08 for S&OR, Safety & Operational Risk.
09 Q. And to whom does he report?
10 A. He would report to Bob Dudley.

Page 41:01 to 42:06

00041:01 I got the sense that by including Wells in the
02 Engineering Authority for Upstream, that was a dra --
03 a -- a change in structure, so that in the past, Wells
04 had its own Engineering Authority and the Exploration &
05 Production folks, they had their own Engineering
06 Authority, and the two didn't come together. Is that
07 accurate?
08 A. They didn't come together under me, that's for
09 sure, yes.
10 Q. Exactly. And now under you, there is some --
11 I don't know the appropriate words, but there's some --
12 there's some crossover or there's some points at which
13 the Drilling & Completions, the Wells, and the
14 Exploration & Production, the Upstream, they come
15 together.
16 I guess what I'm trying to understand --
17 A. Okay.
18 Q. -- is, before April 1, was there any
19 crossover, any connection, between those two Divisions
20 of the company?
21 A. Before April 1, there was no linkage, no
22 direct linkage, between the Engineering and what I call
23 Discipline Engineering and Upstream and the Engineering
24 in Wells --
25 Q. M-h'm.
00042:01 A. -- which was also known as Drilling &
02 Completions.
03 Q. Okay. Fine. And now that's changed?
04 A. That has now changed.
05 Q. All right. And they now have come together?
06 A. Correct.

Page 43:23 to 44:07

00043:23 Q. Okay. So are you suggesting that the
24 Exploration and Production business also had to change
25 its structure to accommodate this S&OR organization?
00044:01 A. Yes.
02 Q. Okay. Who would be the person that I should
03 speak to in order to understand who, in the Drilling &
04 Completions side of the business, had the
05 responsibility of being aware and knowledgeable about
06 all Governmental Regulations that would be applicable
07 to Drilling & Completions?

Page 44:09 to 44:15

00044:09 Q. (By Mr. Bruno) If you know.
10 A. At the time of --
11 Q. The --
12 A. -- Macondo?
13 Q. Yes, sir.
14 A. I would think that would be the Technology
15 Vice President, Barbara Yilmaz.

Page 46:10 to 46:14

00046:10 Q. (By Mr. Bruno) Well Integrity, the -- the --
11 however that phrase is understood and utilized in your
12 business, isn't that a Drilling & Completions term? I
13 mean, the folks who drill Wells and complete Wells,
14 aren't they concerned with Well Integrity?

Page 46:16 to 46:21

00046:16 A. The people that drill Wells would be concerned
17 with Well Integrity, the people that subsequently
18 operate Wells would be concerned with Well Integrity.
19 So it bridges --
20 Q. (By Mr. Bruno) Well --
21 A. -- the system.

Page 52:18 to 52:21

00052:18 Q. And -- and would you agree with the words of
19 Cindi Skelton, who said, "My understanding is it was
20 frequently stated in the company that Drilling managed
21 their own work"?

Page 52:23 to 52:23

00052:23 Q. (By Mr. Bruno) Would you agree with that?

Page 52:25 to 53:11

00052:25 A. Are you asking me if I'm agreeing that Cindi
00053:01 said that or --
02 Q. (By Mr. Bruno) No, no, no, no. I'm asking --
03 I'm telling you that she said it. I'm reading from her
04 deposition and asking whether or not you agree with her
05 sentiment that: "It was frequently stated in the
06 company that Drilling managed their own work."
07 Do you agree or disagree with that statement?
08 A. I wouldn't have used those words.
09 Q. What words would you have used, sir?
10 A. Drilling Engineering was done within
11 Drilling & Completions.

Page 53:16 to 54:03

00053:16 All right. Do you recall whether in 2009 --
17 and in 2009 -- we haven't quite covered this yet -- but
18 in 2009 you were also still involved in Engineering on
19 the Exploration and Production side; is that true?
20 A. In 2009 I was the Head of the Subsea
21 Discipline, and I didn't actually report directly to
22 the Engineering Group.
23 Q. What is the Subsea Discipline?
24 A. The Subsea Discipline is a -- it's something
25 that I was asked to -- to create, which is a -- to --
00054:01 to collect together the Engineers who -- who were
02 responsible for designing, building, and operating
03 subsea production equipment.

Page 57:01 to 57:04

00057:01 Q. That's correct. Okay. All we know is that as
02 of April 2011 somebody had the notion that the Drilling
03 Engineering should be as organized as the Exploration
04 and Production side; isn't that true?

Page 57:07 to 57:12

00057:07 Q. (By Mr. Bruno) At the very least?
08 A. I don't know it's ac -- that it's accurate.
09 I -- I would say that the -- as of April the 1st, 2011
10 we agreed that we would organize Drilling Completions,
11 now known as Wells, in the same format, the same -- the
12 same way as the rest of Engineering.

Page 58:12 to 58:13

00058:12 Q. All right. Well, let's go to the -- to the
13 article, which we've previously marked as Exhibit 6175.

Page 58:16 to 59:23

00058:16 Q. (By Mr. Bruno) You've testified that this is
 17 about two or three years old. And so at the time of
 18 this article, you were in the Subsea Discipline,
 19 correct?
 20 A. I was Head of the Subsea Discipline, correct.
 21 Q. All right. And you say -- let's see -- and
 22 we -- so we think this was about 2009 or thereabouts?
 23 A. It was 2008, 2009. I'm not sure.
 24 Q. Fair enough.
 25 And you say in this article: "Subsea is
 00059:01 relatively in the early stages."
 02 First of all --
 03 A. Where do I say that?
 04 Q. Page 7, left-hand column.
 05 A. Right. I see that, yes.
 06 Q. Okay. So that am I -- was I accurate? Did
 07 you, in fact, say: "Subsea is relatively in the early
 08 stages"?
 09 A. Yes, I did.
 10 Q. Okay. Tell us what that means.
 11 A. It meant, in terms of Engineering, that subsea
 12 was a relatively new Engineering, that we have only
 13 been doing -- working with subsea production and oil
 14 field equipment since, at best, the '70s, maybe 1980s,
 15 and, therefore, it's -- it's a discipline that's only
 16 30 years old, compared to other parts of the
 17 Engineering discipline, which are more than a hundred
 18 years old.
 19 Q. M-h'm. And what, in your opinion, is the
 20 significance of that fact?
 21 A. The significance was that the technology is --
 22 is continually evolving and changing, and you haven't
 23 set a universal set of Standards yet.

Page 60:20 to 60:23

00060:20 Q. But you would agree with me that in 2008,
 21 2009, when you made this statement, that it was very,
 22 very important to develop new technologies for Drilling
 23 & Completions in the subsea arena?

Page 60:25 to 61:13

00060:25 A. Actually, Drilling & Completions was probably
 00061:01 more standardized than the rest of the Subsea, so I'm
 02 not sure I would see it as -- as important as -- as --
 03 as it was here.
 04 Q. (By Mr. Bruno) Okay. Now, when you say
 05 "standardized," what do you mean?
 06 A. I mean, we had a -- a standard wellhead
 07 system, and we have -- most Drilling contractors have
 08 very similar BOP stacks and risers.

09 Q. Well, sir, do you know whether or not the BOP
10 stacks were specifically developed for use in subsea?

11 A. I do know that BOP stacks were specifically
12 developed for subsea use. BOP stacks were actually
13 developed long before we went subsea.

Page 64:01 to 64:24

00064:01 Q. Okay. You say: "Being subsea is a big
02 challenge." What did you mean by that?

03 A. Well, I think I go on to say in the next
04 sentence it's -- it's costly. You need to get it
05 right. It's -- so -- so I'm talking about Subsea
06 Production not Subsea Drilling here.

07 Q. M-h'm.

08 A. Being -- so if we install Subsea Production
09 equipment on the seabed, it could be many miles of
10 pipelines, manifolds, Christmas trees. These costs
11 billions of dollars you put upon the seabed, and if
12 they go wrong, it's about as easy to fix sometimes as
13 fixing the Hubble telescope. So it's very difficult
14 to intervene, which creates great challenges.

15 Q. Wouldn't the same be true of Drilling?

16 A. No.

17 Q. Why not?

18 A. Because in drilling subsea, most of the
19 equipment is readily retrieve -- it's designed to be
20 retrieved, so the wellhead itself is -- is not readily
21 retrievable, but the rest of the equipment, and even
22 the stuff inside the wellhead, is readily retrievable
23 and can be worked on and maintained on a routine
24 scheduled basis.

Page 67:17 to 68:16

00067:17 Q. Are the pore pressures and frac gradients as
18 close in the North Sea as they are in the Gulf of
19 Mexico?

20 A. In some cases, they are as close, yes.

21 Q. Generally, though, are they -- are they the
22 same or are they different?

23 MS. KARIS: Object to form.

24 A. I mean, from my experience, most fields and
25 even wells in the same field have different pore
00068:01 pressure and fracture gradient, so -- so we have wells
02 that are difficult in the North Sea. We have wells
03 that are difficult in the Gulf of Mexico.

04 Q. (By Mr. Bruno) No, I -- I understand certainly
05 that there may be a well or two wells in one area which
06 may be similar to a well in some other area. But I'm
07 asking you generally, isn't it not a fact that in the
08 Gulf of Mexico that the pore pressures and frac
09 gradients generally are very tight, and that is not the
10 case in other areas of the world? Again, speaking

11 generally now, not specifically.
12 A. Okay. So speaking generally, the pore
13 pressures and frac gradients in the Gulf of Mexico are
14 quite tight because it's a basin with rapid deposition,
15 and that's similar to other basins in the world with
16 rapid deposition, North Sea not being one of those.

Page 75:25 to 76:10

00075:25 Q. Wh -- why? I mean, certainly BP wanted the
00076:01 best technology, didn't it?
02 A. It depends what you mean by "best."
03 Q. Well, whatever, I guess, that word means in
04 the -- the BP world. I assumed it's not bad, but good,
05 and then comparatively, it was better, and then I guess
06 if you take the next comparison, it would be the best.
07 So I don't know if that's a difficult thing for most
08 folks to understand, but is your testimony this morning
09 that BP was not interested in obtaining the best
10 technology?

Page 76:12 to 77:02

00076:12 A. My testimony is that I -- I -- I struggle
13 to -- to identify what -- what -- what one means by
14 "best." You could interpret it in -- in -- in
15 different ways. I could use it as the most reliable, I
16 could have it as the most efficient, I could have it
17 as -- as the most technologically advanced. Those
18 three would be different.
19 Q. (By Mr. Bruno) Certainly. But there's still a
20 struggle to identify all of that technology; isn't that
21 true?
22 A. That's a -- a struggle for any form of
23 Engineering --
24 Q. Right.
25 A. -- around the world, is to -- to sort out the
00077:01 compromises between the -- the latest, the most
02 reliable, the most efficient.

Page 78:01 to 79:06

00078:01 Q. (By Mr. Bruno) So your testimony is that the
02 folks who are assigned to work on a particular project
03 for BP, they are told what with regard to what
04 technology should be employed to produce a well?
05 A. In terms of subsea?
06 Q. Subsea. We're on -- only talking about
07 subsea.
08 A. So in terms of subsea production equipment,
09 the -- the -- the -- the biggest driver would be
10 reliability.
11 Q. Okay. Now, wouldn't that be by definition,

12 then, the "best"?

13 MS. KARIS: Object to form.

14 A. No. I've -- I've al -- I think I've already
15 said I -- I -- I -- I can't come up with a definition
16 for what the "best" is. The "best" would be whatever
17 is appropriate for that particular project, given its
18 particular --

19 Q. (By Mr. Bruno) Okay.

20 A. -- thing. So something with the -- the "best"
21 reliability may not actually achieve the objective or
22 may not be feasible for -- for use on that project.

23 Q. How about the safest technology? Are the
24 Engineers told to select the safest technology with
25 regard to production of a particular field?

00079:01 A. The Engineers are -- are always told to use
02 safe technology.

03 Q. Well, "safe" is different from "safest." Are
04 they told to use the safest, or are they told to use
05 safe technology?

06 A. They're told to use safe technology.

Page 80:22 to 82:07

00080:22 Q. M-h'm. What role, if any, Mr. Tooms, does the
23 well design play with regard to the production of the
24 well?

25 A. In general, it has a significant role in the
00081:01 production of the well, in the size of the tubing, the
02 method of formation, completion, the -- the equipment
03 that one would put actually in the completion.

04 Q. So do you agree that the well design should
05 contemplate how that well is going to be produced?

06 A. If it's a production well, absolutely, yes.

07 Q. And do you believe that the well design should
08 contemplate well blowout?

09 A. In general, all the wells I've designed have
10 been -- been designed to ensure that we don't have a
11 blowout.

12 Q. All right. So you would agree with me, then,
13 that when you are thinking about how you want to design
14 this well, in the back of your mind is putting into
15 place components of the design that will diminish the
16 potential for well blowout, correct?

17 A. Correct.

18 Q. Do you also agree that in well design, one
19 should contemplate how one might control the well if
20 it, in fact, had blown out?

21 A. In -- in designing a well -- and this is --
22 this is in general terms, and it's a while since I
23 designed a well -- I would be designing the well to
24 prevent a blowout.

25 Q. I understand that was your testimony, but I
00082:01 was asking you a different question, and that is
02 whether the design would include thoughts about if the
03 well blew out, how best to control the well, if there

04 were some components that might be put into the design
05 to make it easier to control the well after a blowout.
06 A. I haven't done that, no.
07 Q. Should it be done?

Page 82:09 to 82:10

00082:09 A. I don't know.
10 Q. (By Mr. Bruno) Who should I ask?

Page 82:12 to 82:24

00082:12 A. It -- it -- it would be better to -- to do
13 your design to prevent the well's blowing out.
14 Q. (By Mr. Bruno) In the first instance?
15 A. (Nodding.) M-h'm.
16 Q. So are you saying that, in your opinion, it is
17 not necessary to have design features in a well that
18 make the well easier to control if it, in fact, blows
19 out?
20 A. I -- I didn't say that. I said "I don't
21 know," and the reason I said "I don't know" is because
22 such features might actually create a greater
23 likelihood of the well blowing out. These are
24 complicated Engineering designs.

Page 83:02 to 84:01

00083:02 (Exhibit No. 6178 marked.)
03 Q. (By Mr. Bruno) I take it because the language
04 here describes using "...the best available and safest
05 drilling technology to monitor and evaluate well
06 conditions and to minimize the potential for the well
07 to flow or kick..." you don't know, because you're not
08 in charge of this area, what BP does in order to comply
09 with such a Regulation?
10 A. Not in detail, no.
11 Q. All right. Well, when you give me that little
12 snippet, it makes me -- requires me to ask you what you
13 mean by "not in detail."
14 A. Well, as we've established, I'm the
15 Engineering Authority for Wells, so I have a general
16 overview.
17 Q. Now.
18 A. Yes.
19 Q. So today, at least, it's your responsibility
20 to make sure that someone in your organization does, in
21 fact, do this, correct, if this Regulation is
22 applicable?
23 A. It's part of my -- I'm -- I'm partly
24 accountable for -- for ensuring that we have designs
25 and engineered the well that -- such that we don't get
00084:01 blowouts, as -- as it says there.

Page 85:15 to 87:14

00085:15 What is the Operating Management System?
16 A. OMS is a system we use to manage our
17 Operations -- the framework for -- for managing our
18 Operations, which includes things like risk and
19 Standards and so forth, learning.
20 Q. Okay. It was a method that BP utilized in
21 order to appreciate the magnitude of risk, right?
22 A. Risk is included in -- in -- in the Operating
23 Management System, yeah.
24 Q. Would you agree with me that a -- drilling a
25 well subsea is one of the most dangerous things that
00086:01 your company does?
02 A. I -- I would hope that we try to make it less
03 dangerous, but it is -- it's -- it's got risk, yes.
04 Q. It's got high levels of risk with significant
05 impact to the environment, as well as loss of life;
06 isn't that true?
07 A. It's -- it's -- if you have an event, it could
08 have high impact, absolutely.
09 Q. I know that you have indicated to me that you
10 don't have specific knowledge about the drilling, but
11 let me ask this question, because it may have
12 consequences with regard to production: Do you know
13 what BP's procedures are -- with regard to having
14 barriers to prevent hydrocarbons from flowing out of a
15 well before production operations are?
16 A. As of now?
17 Q. No, as of 2008, 2009, 2010.
18 A. Well, I can't be certain what they were --
19 what -- what they were in those days.
20 Q. What are they now?
21 A. That we should maintain two barriers.
22 Q. And do you count the BOP as a barrier or as a
23 control device?
24 A. If the BOP is closed, I'd count that as a
25 barrier.
00087:01 Q. And that's true even if you have an open
02 annulus in the casing?
03 A. Well, if the BOP is closed, it's closed, and
04 that's regardless --
05 Q. Well --
06 A. -- of whether there's an annulus or not an
07 annulus. So, yes.
08 Q. So even today, after this catastrophe, BP
09 regards the BOP as a barrier and, more particularly, as
10 one of the two barriers that it believes necessary to
11 prevent hydrocarbons from escaping to the surface; is
12 that correct?
13 A. A closed and tested BOP would be regarded as a
14 barrier, yes.

Page 88:06 to 88:14

00088:06 Q. And forgive me. I should have re-asked the
07 question, anyway. Because in the context of the way I
08 asked it, you indicated to me BP's procedures today
09 require two barriers. You indicated to me that one of
10 those barriers is the BOP in its closed position;
11 therefore, I asked you the question: In a closed
12 position, BP is relying on the BOP to perform its
13 function. It's putting a great deal of emphasis on
14 that device to perform correctly --

Page 88:16 to 88:22

00088:16 Q. (By Mr. Bruno) -- isn't that true? Even
17 today, after this catastrophe.
18 A. So as I said, I would -- for -- for something
19 to be regarded as a barrier, it needs to be closed and
20 tested. So -- so, yes, once it's closed and tested, I
21 would be putting reliance on that as a barrier.
22 Q. All right.

Page 88:24 to 89:03

00088:24 Q. (By Mr. Bruno) Now, do you know, sir, whether
25 or not that is the standard in the industry; that is,
00089:01 to use the closed BOP as one of the two barriers to
02 prevent hydrocarbons from reaching the surface?
03 A. I don't know.

Page 95:06 to 96:12

00095:06 Q. Well, and -- and -- and the reason that I'm --
07 I'm asking the question the way I -- I did is because I
08 want to know today, after this catastrophe, if this is
09 accurate. BP has not changed its practice at all with
10 regard to requiring two verified barriers along a
11 potential flow path; is that accurate?
12 A. No. We are rewriting our Standard and -- and
13 issuing it as I speak, to -- to -- to be very clear
14 about exactly what barriers we require.
15 Q. All right. Then perhaps -- I'm sorry.
16 A. Which --
17 Q. I misunder --
18 A. Which is two barriers.
19 Q. I -- I -- I missed the last part. I thought
20 you told me that today it was still two barriers, and
21 maybe mi -- I misunderstood you. What is it today?
22 A. It is --
23 Q. What --
24 A. It -- I just said. It is two barriers today.
25 We are rewriting -- so you asked --
00096:01 Q. Ah.
02 A. -- has it -- has it stayed unchanged, our
03 policy. No, our policy is being rewritten to be quite

04 clear, and it is two barriers today.
 05 Q. All right.
 06 A. I don't know that that means it wasn't two
 07 barriers previously. It may well have been.
 08 Q. All right. But it hasn't been rewritten yet?
 09 A. It has been rewritten, yes.
 10 Q. Okay. So -- it's finished, it's final, the
 11 new policy is in place?
 12 A. It is being issued right now.

Page 96:15 to 96:17

00096:15 Q. When it gets issued and I read it, am I going
 16 to read that the policy is two verified barriers?
 17 A. Yes, you are.

Page 97:17 to 98:01

00097:17 In the new policy, does the new policy allow
 18 for a closed and tested BOP to act as the second
 19 barrier?
 20 A. I don't think the new policy specifically
 21 defines whether the BOP is -- is a barrier or not. It
 22 is a question of whether the barrier is tested.
 23 Q. I just said "tested."
 24 A. Yes.
 25 Q. Let me ask the question again, and I'll read
 00098:01 it. I said --

Page 98:04 to 99:08

00098:04 Q. (By Mr. Bruno) "In the new policy" -- and I'm
 05 reading directly from the -- the transcript -- "does
 06 the new policy allow for a closed and tested BOP to act
 07 as the second barrier?" That's the question.
 08 A. So -- so in answer to your question, yes, it
 09 would allow for a closed and tested BOP to be a
 10 barrier.
 11 Q. All right. Does the new policy give any
 12 consideration to the use of a liner with a tieback?
 13 A. In -- in terms of barriers, it --
 14 Q. Yes, sir.
 15 A. That -- that would just be a barrier that has
 16 to be tested.
 17 Q. Well, I understand that all barriers need to
 18 be tested. The question on the table is whether or not
 19 the new procedures allow, in the context of drilling,
 20 for the use of a liner to act as a barrier.
 21 A. Yes. Since it's a barrier and it would be
 22 tested, it would allow for it. It doesn't
 23 specifically, to my knowledge, say "liner."
 24 Q. Okay. I'm gathering that the new procedures
 25 give the -- the Drilling Group some room to decide what

00099:01 kinds of barriers they want to utilize; is that
02 accurate?
03 A. It's -- the new policy is trying to ensure
04 that our barrier policy is effective in all situations.
05 Q. Is the new policy specific to a -- a region,
06 or is the new policy applicable to the entire world?
07 A. It's global.
08 Q. It's global.

Page 99:10 to 100:16

00099:10 Q. Let's talk a little bit about the rupture
11 disks. Do you know when BP first started using rupture
12 disks in their well design?
13 A. I do, approximately, yes.
14 Q. All right. And when was that?
15 A. It was approximately 2002.
16 Q. Okay. And why was the rupture disk
17 incorporated into the well design?
18 A. It was incorporated because of a phenomenon
19 known as annular pressure buildup, APB.
20 Q. And that was the result of a particular
21 incident that occurred to one of BP's wells; isn't that
22 accurate?
23 A. Yes. We first observed it on -- on one of our
24 wells on the Marlin Platform.
25 Q. Okay. And because of this event, BP decided
00100:01 to use this device as a means of avoiding that
02 circumstance in the future, correct?
03 A. Correct.
04 Q. In other words, you lost a well because of
05 annular pressure buildup, and so the thinking was, "We
06 have to have pressure disks in all of our wells"?
07 A. No, that wasn't -- that -- that's a -- an
08 incorrect statement. We don't have pressure disks in
09 all of our wells.
10 Q. I'm sorry. I meant to say "rupture disks."
11 A. Well, I -- I -- same thing.
12 Q. Same thing?
13 A. We don't have rupture disks in all of our
14 wells.
15 Q. Do you have them in certain types of wells, as
16 a rule?

Page 100:18 to 101:11

00100:18 A. I -- I'm not sure of -- of the detail of -- of
19 what rules we have about when you -- whether there are
20 types of wells that you must have it. We would put it
21 in wells where the situation required you to have the
22 pressure relief capacity of a rupture disk.
23 Q. (By Mr. Bruno) Would that be generally all
24 subsea wells?
25 A. No.

00101:01 Q. Okay. Would it be all wells in the Gulf of
02 Mexico subsea?
03 A. No, not all.
04 Q. What types of wells would require the use of a
05 rupture disk?
06 A. Specifically types of wells that require
07 rupture disks would be wells where you have a -- an
08 annulus that could get heated up by the oil flowing
09 through it on -- on the production basis and cause
10 trapped pressure to increase and exceed the rating of
11 the casing strings in there.

Page 109:18 to 109:18

00109:18 (Exhibit No. 6180 marked.)

Page 109:25 to 110:01

00109:25 We're going to mark this as 6180. It's two
00110:01 pages.

Page 110:10 to 110:12

00110:10 Q. Okay. Have you ever seen these E-mails
11 before?
12 A. No, I have not.

Page 111:03 to 111:06

00111:03 Q. All right. It says that -- that: "...we are
04 planning to drill this well as a keeper..."
05 Do I gather that there are wells that BP knows
06 will be producing wells before they even drill them?

Page 111:08 to 111:11

00111:08 A. There are wells where -- there -- there's
09 always uncertainty when you drill into a reservoir, but
10 there's wells that we drill without design to be
11 producing wells before we drill them, yes.

Page 112:22 to 113:07

00112:22 Q. And that's because the -- the belief of the
23 number of barrels of oil in Macondo wasn't sufficient
24 to have its own production facility installed on the
25 seafloor?
00113:01 A. You -- you wouldn't install the production
02 facility on a seafloor. You'd install a production
03 facility on the surface.
04 Q. Well, I mean, all connected.
05 And so the idea was to tie this back to one of

06 the other producing facilities?
07 A. That's what I've learnt, yes.

Page 115:11 to 117:08

00115:11 Q. All right. Well, in the second option, it
12 says: "We can run a 9-7/8 production line." What is
13 that?

14 A. It's a -- I mean, I don't know what is --
15 where it's over in this case. I don't know which --
16 which part of -- of the reservoir it's over. I don't
17 know if this is even over the reservoir itself, but a
18 nine and seven-eighths production liner, that would be
19 something that's nine -- it's casing that's nine and
20 seven-eighth inch outside diameter. It would be
21 approximately eight and three-quarter inch inside
22 diameter, depending on the -- the weight and grade of
23 it.

24 Q. M-h'm.

25 A. The top of the casing would stop somewhere
00116:01 below the wellhead, which is why it's called the
02 "liner."

03 Q. M-h'm.

04 A. And -- and it would be -- it would be the --
05 the first casing outside of the production tubing. So
06 this casing would have to contain the -- the production
07 fluids in the event that you lost containment of your
08 tubing.

09 Q. Would this be regarded as a barrier under the
10 policies that you talked about just a few moments ago?

11 A. So I can speak to -- to -- to what it would be
12 required to do today, and, yes, that would require it
13 to be fully rated and tested as a barrier.

14 Q. Okay. But once fully rated and fully tested,
15 it would, in fact, be a barrier, right?

16 A. Yes.

17 Q. And satisfy the -- one of the two barrier
18 requirements of -- of BP, correct?

19 A. Yes. The only thing with a production liner
20 is that you have to -- to consider what's above the
21 production liner. So this may not be an entire
22 barrier. You still have to consider the rest of the
23 well as to whether that's a barrier or not.

24 Q. Right. And the -- the only way that -- if you
25 tied it back, it would be a full barrier above that,
00117:01 wouldn't it?

02 A. You might -- I -- I can only speak in general
03 terms, again, but you could tie it back or the -- the
04 casing that's above it may also be -- have enough
05 integrity to be a barrier.

06 Q. Now, here it says: "Ball-park capital request
07 would be" eight million, so apparently it's going to
08 cost \$8 million to put this production liner in, right?

Page 117:10 to 117:11

00117:10 A. I -- I don't know how much it would cost to
11 put the production liner in.

Page 117:20 to 118:11

00117:20 Q. All right. The third option, it says:
21 "9 7/8...production liner and" a tieback "to" the
22 "surface."
23 So that's kind of addressing what you just
24 suggested, that this -- that is, that it was in Option
25 No. 2, we don't know what's happening from the top of
00118:01 the liner to the -- to the wellhead, and this option
02 actually does tie it back all the way to the wellhead,
03 right?
04 A. It does.
05 Q. Okay. And he says: "...same capital request"
06 of \$8 million," he says: "...just don't know whether
07 we can pull this off logistically in the short time
08 frame." So apparently he's concerned about the time
09 that he has available in order to install a -- a
10 production with a tieback. Is that what he's saying
11 here?

Page 118:13 to 118:22

00118:13 A. I -- I -- I -- I don't know what he's saying
14 here.
15 Q. (By Mr. Bruno) Okay. All right.
16 A. The -- the -- if you're logistically in a
17 short time frame, it could -- could mean a number of
18 things.
19 Q. Well, let me ask you: If this kind of letter
20 was generated today, under your new Engineering
21 guidelines and procedures, would Engineering have a
22 role in these issues?

Page 118:24 to 119:10

00118:24 A. So if the same discussion --
25 Q. (By Mr. Bruno) Yes.
00119:01 A. -- as -- as you have here was happening today,
02 I would expect the Drilling Engineers -- and I see,
03 sorry, that Jasper's role here is Exploration Manager,
04 but I -- I would expect the Drilling Engineers to
05 discuss and -- and have the conversation with it and to
06 comply with our barrier policy.
07 Q. M-h'm.
08 A. If they didn't comply with our barrier policy,
09 then I would expect it to be referred upwards and
10 eventually to me.

Page 121:04 to 121:10

00121:04 Q. Okay. All right. Let's go to the end of
 05 the -- this thing here.
 06 Morrison writes back, and he says: "Today's
 07 reality with other pressures is that option (1) is all
 08 we can fund..."
 09 Now, he's saying that all he's got money for
 10 is the first option, right?

Page 121:12 to 122:03

00121:12 Q. (By Mr. Bruno) It says what it says.
 13 A. It says what it says, yeah.
 14 Q. Right. And in today's world, Mr. Tooms, would
 15 money play a role with regard to the Engineering
 16 decision as to whether or not the design complies with
 17 BP's requirements that there be two barriers?
 18 MS. KARIS: Object to form.
 19 A. Well, I -- I -- I actually don't know what
 20 he's saying here, but I -- I -- I don't necessarily
 21 take this to mean that they're not going to comply with
 22 BP's requirement to have two barriers.
 23 Q. (By Mr. Bruno) I didn't ask that. The
 24 question was very specific. I said: In today's world,
 25 would money play any role in determining whether or not
 00122:01 a well design complies with BP's barrier requirements?
 02 That's the question.
 03 A. No.

Page 122:17 to 123:01

00122:17 MR. BRUNO: Well, "Today's reality with
 18 other pressures is that option (1) is all we can
 19 fund..." That's what I'm reading verbatim.
 20 Do you agree that's what I -- what I read?
 21 MS. KARIS: Yes, but --
 22 MR. BRUNO: Fine.
 23 MS. KARIS: -- that's not what you asked.
 24 Q. (By Mr. Bruno) Okay. Now, do you agree with
 25 me, Mr. Tooms, that what Mr. Morrison is saying is that
 00123:01 that's all the money he has?

Page 123:03 to 123:13

00123:03 A. I -- I don't know whether it means it's all
 04 the money he -- he has. It may mean it's all the money
 05 he has in a time frame. It could mean a number of
 06 things.
 07 Q. (By Mr. Bruno) All right. Now, the last --
 08 let's see. Then we -- Jasper responds, he says:
 09 "Thanks Richard. Thought this would be the case. This
 10 will simplify our planning. Please call if your

11 capital situation changes and we could do the right
12 thing."
13 What on earth is he saying there?

Page 123:16 to 123:17

00123:16 Q. (By Mr. Bruno) If you know?
17 A. I don't know.

Page 124:15 to 125:12

00124:15 Q. (By Mr. Bruno) Okay. Well, then let's read
16 the last E-mail. And this is from David Sims to Mark
17 Hafle: "Mark, I've discussed the implications of this
18 with AL and told him not to order any 10 3/4..."
19 Do you know what he's referring to there?
20 A. No.
21 Q. Okay. "We will either run a production liner
22 before we leave or abandon the open hole and plan on
23 redrilling it when we come back to complete the well."
24 Do you know what that means?
25 A. I -- I know what it means to abandon an open
00125:01 hole and -- and redrill it when you come back, yes.
02 Q. And what does that mean? What -- what
03 physically are you doing when you abandon the open hole
04 and redrill it, what -- how does one do that?
05 A. There's -- there's various ways. Generally,
06 you set barriers in the -- in the hole and above the
07 open hole.
08 Q. What kind of barriers?
09 A. They could be cement, they could be bridge
10 plugs, they may even be cement retainers, but you --
11 you could say they -- a packet of ice, a number of
12 different barriers.

Page 126:10 to 126:15

00126:10 MR. BRUNO: I'm going to mark this as
11 6181.
12 Q. (By Mr. Bruno) Have you seen this document
13 before, sir?
14 A. I've -- I've seen it so far as I glanced at
15 it. I -- I haven't read it.

Page 128:22 to 129:05

00128:22 You see at 2.6, it says, "Deepwater Well
23 Control"?
24 A. I do, yes.
25 Q. All right. Now, do you see any reference to
00129:01 the BOP in that section?
02 A. (Reviewing Exhibit 6181.) There, no.
03 Q. No. And --

04 A. Not in -- not in that particular paragraph
05 that you've highlighted.

Page 129:14 to 130:07

00129:14 Q. Okay. Go right -- if you need some time to
15 verify, go -- go ahead. It's got the -- got the -- the
16 green "bp" symbol on it.
17 A. (Reviewing document.) I can't see the
18 signature pages or the covering letter that tells me
19 this is the final document, and -- so --
20 Q. Okay.
21 A. -- if -- if you want to tell me it's the final
22 document, then that's fine.
23 Q. All right. Well, the point is that under
24 Deepwater Well Control, what's indicated here is that
25 the company "...has the financial capability to drill a
00130:01 relief well and conduct other emergency well control
02 operations."
03 So it would seem that, at least in terms of
04 what's been reported in this document, the well control
05 equipment that BP proposes to use in the event of a
06 blowout, is to drill a relief well. Isn't that what
07 it's -- stated here?

Page 130:09 to 131:14

00130:09 A. I don't know why it states what it states in
10 the way it states it. I presume that's something to do
11 with the Regulatory.
12 Q. (By Mr. Bruno) Okay. And then, finally, in
13 the "Blowout Scenario," it says, "A scenario for a
14 potential blowout of the well from which BP would
15 expect to have the highest volume of liquid
16 hydrocarbons is not required for the operations
17 proposed in this EP."
18 Do you know what that means?
19 A. I can -- I can read what it says, and I can
20 understand the general meaning from it, but I don't
21 know what it means.
22 Q. Okay. Fair enough.
23 MR. BRUNO: Let's go to Tab No. 6, which
24 we're going to mark as 6182.
25 (Exhibit No. 6182 marked.)
00131:01 Q. (By Mr. Bruno) Have you ever seen this
02 document?
03 A. Yes, I have.
04 Q. Can you tell us what it is?
05 A. It's the Group Practice for Layers of
06 Protection Analysis published on June 2008.
07 Q. And what's its purpose?
08 A. Do you know, it's been a long time since I've
09 read this particular document.
10 Q. (Indicating.)

11 A. It's -- it's to lay out the methodology by
12 which we do Layers of Protection Analysis.
13 Q. Well, is a Layer of Protection Analysis done
14 for a well like the Macondo before it's drilled?

Page 131:16 to 132:11

00131:16 A. I don't know what was done in -- in -- in
17 terms of Layers of Protection Analysis for Macondo.
18 Q. (By Mr. Bruno) Well, based upon what you know
19 of this document, should one have been done?
20 A. So basically what I know of this document, I
21 don't think this document requires that a Layer of
22 Protection Analysis is done for drilling wells. It
23 should say in here what the -- I think it says under
24 "Scope." So if you were to look at Paragraph 1, I
25 think it says that it's "...applicable to Major
00132:01 Projects," and it "...may be applied to other
02 facilities." So, "No," is the answer. It wasn't
03 required to be done.
04 Q. Okay. So what kinds of things is -- is this
05 supposed to be used for?
06 A. It's supposed to be used for Major Projects
07 and -- and onshore and offshore hydrocarbon and
08 chemical process facilities, excluding subsea
09 facilities.
10 Q. And what does this thing accomplish when it's
11 utilized?

Page 132:13 to 132:15

00132:13 A. It's -- it's a tool that we use in our
14 Management to Process Safety on our Production
15 facilities.

Page 133:03 to 133:06

00133:03 Q. (By Mr. Bruno) Now, Mr. Tooms, you had some
04 involvement in the attempts to cap the well, did you
05 not?
06 A. I did.

Page 141:01 to 141:02

00141:01 MR. BRUNO: Volume 2 at Tab 12. We're
02 going to mark this as Exhibit 6184.

Page 141:18 to 142:24

00141:18 Q. And do you see there -- again, this is --
19 these are Talking Points for press relations, and
20 there's a caption "Measuring the flow rate."

21 And it says: "BP has, and will continue, to
22 support the government's work to determine the rate of
23 flow from the well. Since the Deepwater Horizon
24 accident, the flow rate estimate has been established
25 by the" United Command." Excuse me.

00142:01 "Throughout the process, BP has made it a
02 priority to quickly and consistently provide the
03 National Oceanic and Atmospheric Administration (NOAA)
04 and the Coast Guard with requested information for the
05 joint command structure to make as accurate an
06 assessment as possible of the rate of flow.
07 "The rate of flow from the riser is determined
08 in a number of ways and by a number of variables. For
09 instance, while the original riser was 19.5 inches in
10 diameter prior to the Deepwater Horizon accident,
11 damage sustained during the accident distorted the
12 diameter at the end of the pipe by about 30 percent.
13 In addition, a drill pipe currently trapped inside the
14 riser has reduced the flow area by an additional 10
15 percent. Thus, some third party estimates of flow,
16 which assume a 19.5 inch diameter, are inaccurate.
17 "As well, there is natural gas in the riser.
18 Data on the hydrocarbons recovered to date suggests
19 that the proportion of gas in the plume exiting the
20 riser is, on average, approximately 50 percent."

21 Do you see that?

22 A. I do see all of that, yes.

23 Q. And did I read that accurately?

24 A. Yes, you did.

Page 143:20 to 143:23

00143:20 Q. You had no calculations as to flow rate. Why
21 not?
22 A. Because we didn't know how to calculate the
23 flow rate.

Page 144:11 to 144:16

00144:11 Q. All right. Now, your testimony is that BP did
12 not know how to calculate flow rate, right?
13 A. That's what I said, yes.
14 Q. But BP did know how to demonstrate that other
15 people's calculations of flow rate was incorrect; isn't
16 that true?

Page 144:18 to 144:21

00144:18 A. We understood how complex multiphase flow was,
19 and we could point out to other people who had assumed
20 that they could do a simplistic calculation where their
21 inaccuracies were, yes.

Page 146:12 to 146:17

00146:12 (Exhibit No. 6185 marked.)

13 Q. (By Mr. Bruno) Now, isn't it a true statement
14 that because you had no way to calculate flow, that
15 there was absolutely no way for you to understand
16 whether or not the cofferdam was actually going to work
17 as a containment device?

Page 146:19 to 146:23

00146:19 A. No, that's not a true statement.

20 Q. (By Mr. Bruno) Well, if you didn't know how
21 much flow there was, then you had no idea as to whether
22 or not the flow would overwhelm the cofferdam; isn't
23 that correct?

Page 146:25 to 147:18

00146:25 A. We -- the cofferdam was the first device that
00147:01 we could put into the water to contain as much of the
02 flow as it could contain.

03 Q. (By Mr. Bruno) M-h'm.

04 A. So it -- it didn't -- it -- it -- it -- what
05 am I trying to say? I can't actually -- can't remember
06 your question, sorry. Could you --

07 Q. I said: The inability to calculate flow made
08 it impossible for you to ascertain whether or not the
09 cofferdam would work?

10 A. No. So that's incorrect, because cofferdam --
11 the definition of "cofferdam working" would be that
12 cofferdam could collect --

13 Q. M-h'm.

14 A. -- the amount of flow that could be handled on
15 the vessel above, which was, if I remember rightly,
16 about 7,000 barrels a day.

17 Q. And because the flow was much higher than
18 that, the cofferdam didn't work?

Page 147:20 to 149:07

00147:20 A. I don't know that the flow was much higher
21 than that. I know that the cofferdam didn't work.

22 Q. (By Mr. Bruno) All right. And then the top
23 kill. The top kill -- again, another method -- you had
24 no way of ascertaining whether or not that was going to
25 work, because you had no idea about the flow; isn't

00148:01 that true?

02 A. No, that's not entirely true.

03 Q. Well, explain for us, then, how the top kill
04 was supposed to work.

05 A. Okay. So this is quite -- quite a long topic,
06 I guess, but the top kill was supposed to work by

07 pumping in heavy fluid at a rate that would outrun the
 08 fluid coming out of the well and with -- with some back
 09 pressure on it provided by whether it was the BOP rams
 10 or the kink or -- or the drill pipe in it, and -- and
 11 the higher the rate that you could pump into the well,
 12 the higher the rate of the well flow it would -- it
 13 would kill.

14 So broadly speaking, you're trying to pump
 15 fluid in -- in -- into the well at such a rate that
 16 will create back pressure to arrest the flow of
 17 hydrocarbons coming out of it and push the -- push the
 18 fluid, your heavy fluid back into the well.

19 Q. Well, didn't you hire a Norwegian company to
 20 model the outcomes depending upon the flow rates of
 21 hydrocarbons?

22 A. We did.

23 Q. And --

24 A. Sorry. Should I -- I should say BP did. I --

25 Q. BP.

00149:01 A. -- I -- I didn't personally.

02 Q. No. That's fine. That's fine. We understand
 03 that.

04 A. (Nodding.)

05 Q. And you knew that the top kill was unlikely to
 06 succeed with flow rates greater than 15,000 barrels a
 07 day; isn't that true?

Page 149:09 to 151:09

00149:09 A. No. We knew that at -- at a given pumping-in
 10 limit, which I -- and, again, I can't remember the
 11 exact -- exact number, but around 45 barrels an hour --
 12 sorry, 45 barrels a -- an hour, a minute, I don't
 13 know -- at a certain pump rate that we're pumping in,
 14 that the -- that that should kill a flow of
 15 approximately up to 15,000 barrels a day. That was
 16 just one variable from modeling.

17 And we also were aware if you increased the
 18 flow rate of what you were pumping in at, then it would
 19 kill a high flow rate coming out. And all this was
 20 based on modeling assumptions about the -- a certain
 21 arrangement of plumbing in the well.

22 Q. (By Mr. Bruno) Well, if you look at Page 16 of
 23 this article and the first -- I'm sorry, the second
 24 full paragraph, and it's at 2207144.

25 A. Where?

00150:01 Q. The last digit's a is 44.

02 MR. KRAKOFF: This right here
 03 (indicating).

04 Q. (By Mr. Bruno) Okay?

05 A. So can I just -- or so this is the --

06 Q. You see where it says "Top Kill and Junk
 07 Shot"?

08 A. This is the staff -- the staff working papers
 09 from the -- yeah.

10 Q. Okay. Well, first of all, have you seen this
11 document before? I know you have. It's a -- it's an
12 E-mail that --

13 A. I've -- I've seen it and I've skimmed it
14 and -- but I'm not overly familiar with it.

15 Q. All right. Well, let's just read it together,
16 then. It says: "BP's top kill team began its work in
17 the immediate aftermath of the initial failed efforts
18 to actuate the BOP stack.¹²⁵ Leading up to the
19 operation, both BP and federal engineers modeled
20 different scenarios based on different rates at which
21 oil might be flowing from the Macondo well." It says:
22 "Paul Tooms, BP's Vice President of Engineering" -- is
23 that an accurate description of your title, by the way?

24 A. Well, it's not entirely accurate because I'm
25 Vice President of Engineering for Exploration and
00151:01 Production.

02 Q. Right.

03 -- "told Commission staff that BP hired a
04 Norwegian company to model different outcomes depending
05 on the flow rate of hydrocarbons.¹²⁶ Herecalled that,
06 given the plan pumping rates, the top kill was unlikely
07 to succeed with oil flow rates greater than 15,000
08 bbls/day.¹²⁷"

09 Is that a true statement or a false statement?

Page 151:11 to 151:16

00151:11 A. That's what I said, yes, as far as I recall.

12 Q. (By Mr. Bruno) Okay. All right. So once
13 again, we know that because there was not any ability
14 to calculate flow rates there was really no ability to
15 ascertain whether or not the top kill was going to
16 work?

Page 151:18 to 151:22

00151:18 A. Sorry, can you -- can you actually state the
19 question again?

20 Q. (By Mr. Bruno) Sure. Because BP had no way of
21 calculating flow rates, it had no way of ascertaining
22 whether or not the top kill was going to work?

Page 151:24 to 153:02

00151:24 Q. (By Mr. Bruno) Is that true?

25 A. We had -- we thought we had an idea of flow
00152:01 rates. So we had some idea of whether we thought top
02 kill would -- would work or not.

03 Q. Sorry, Mr. Tooms. I thought you told me a few
04 moments ago that you had no idea of flow rate --

05 A. I said --

06 Q. -- and you couldn't calculate flow rate. So

07 how did you get a flow rate if you couldn't calculate
08 flow rate?

09 A. I said -- I said we couldn't calculate flow
10 rate. We had NOAA and Unified Command, which we were a
11 part, telling us the flow rate was initially a thousand
12 barrels a day and then 5,000 barrels a day. So we had
13 some idea from that.

14 And we had some idea from when we were
15 collecting oil with the riser insertion test tool,
16 known as the RIT. But when we were collecting it, the
17 maximum rates on that, the -- the -- the flow looked
18 like it was seriously diminished coming out of the --
19 into the riser. So we have an idea. We didn't -- we
20 couldn't say what the flow rate was, but we had an
21 idea.

22 Q. What were your ideas?

23 A. Our idea was that it was less than the -- the
24 number we put in here, 15,000 a day.

25 Q. Sure. In fact, BP knew that the likelihood of
00153:01 success of the top kill was -- was -- was not good;
02 isn't that true?

Page 153:04 to 153:11

00153:04 A. I think that if -- if BP had thought the top
05 kill was unlikely to succeed we wouldn't have proceeded
06 with it in the way that we did.

07 Q. (By Mr. Bruno) Well, in fact, it was vital for
08 BP to convey to the public that it was doing something
09 on a daily base -- on a daily basis in order to contain
10 this spill in order to have a positive impact on the
11 stock price; isn't that true?

Page 153:14 to 153:17

00153:14 A. No, I don't believe that's true.

15 Q. (By Mr. Bruno) Okay. If the public had the
16 perception that BP could not control this well, is it
17 your opinion that the stock price would go up or down?

Page 153:20 to 154:21

00153:20 A. My opinion is that we were -- we were trying
21 whatever we could do to stop the flow of oil from this
22 well.

23 Q. (By Mr. Bruno) All right.

24 A. If we stopped oil flowing from the well, one
25 would hope that BP's stock price would go up.

00154:01 Q. Let's go to the front of the document, if you
02 don't mind. Let's kind of walk through it very quickly
03 before we break for lunch.

04 At Page 2, sir, in the second paragraph, it
05 says: "The Macondo well tapped into a reservoir more

06 than 13,000 feet below the sea floor, containing
 07 roughly 110 million barrels of oil." Is that accurate?
 08 A. The reservoir was more than 13,000 feet below
 09 the seafloor. We don't know how many -- how much oil
 10 it contains. There's a huge number of variables to --
 11 to -- to work that out. 110 million barrels -- roughly
 12 110 million barrels of oil, I think, is a -- a
 13 reasonable state -- it's actually not accurate, but
 14 it's a -- it's a reasonable statement.
 15 Q. A reasonable number. Okay. That's fine. I
 16 appreciate that.
 17 At Page 5, "Early Containment Efforts":
 18 "Other than the lengthy process of drilling a relief
 19 well, BP had no available, tested technique to stop a
 20 deepwater blowout."
 21 Is that a true statement, sir?

Page 154:23 to 155:21

00154:23 A. Can I actually just read around that to
 24 understand the context better?
 25 Q. (By Mr. Bruno) Oh, please do. Yeah, read
 00155:01 the -- around, above, below, whatever you need to.
 02 A. (Reviewing Exhibit 6185.)
 03 I think it's -- I think it's an accurate
 04 statement that we didn't have a -- a variable tested
 05 technique to stop the deepwater blowout of this size of
 06 this one with the configuration of the -- the -- the
 07 way that the -- the well had -- had failed.
 08 Q. Has BP undertaken a scientific and/or
 09 technological investigation in order to -- to determine
 10 how in the future it might be able to stop a deepwater
 11 blowout like this?
 12 MR. KRAKOFF: Objection. Can I confer on
 13 privilege?
 14 A. Yeah. As -- we -- we have work going on
 15 that's at the request of our Legal Department to -- to
 16 do some of that work.
 17 Q. (By Mr. Bruno) Okay. I understand that. But
 18 I don't think the privilege extends that far, but let
 19 me ask it this way: If the Legal Department hadn't
 20 asked you to do it, are you telling me that you
 21 wouldn't have done it?

Page 155:25 to 156:09

00155:25 A. Well, it's -- it wouldn't be for me to do it
 00156:01 or not do it in -- in this event.
 02 Q. (By Mr. Bruno) Do you believe it should be
 03 done?
 04 A. Do I believe that the industry should have
 05 ways of controlling deepwater wells in the -- in the
 06 light of the Macondo incident, yes.
 07 Q. Well, do you believe that you shouldn't be

08 permitted to drill a deepwater well without having the
09 technology to deal with a deepwater blowout?

Page 156:11 to 156:22

00156:11 A. I -- I don't really have an opinion on that.
12 Q. (By Mr. Bruno) If you go to Page 4, and
13 forgive me for popping around like this but I'm trying
14 to give it some chronology that makes some sense. But
15 on Page 4, top of the -- top paragraph, it says:
16 "According to Billy Stringfellow, a Transocean Subsea
17 Superintendent, BP delayed interventions with remotely
18 operated vehicles for approximately 20 hours because it
19 was concerned that the pressure created by closing the
20 BOP stack and shutting in the well might force
21 hydrocarbons into the surrounding rock and 'create an
22 underground blowout.'" Is that a true statement?

Page 156:24 to 158:07

00156:24 A. (Reviewing document.)
25 So I -- the answer is I don't know. It's --
00157:01 it's clearly his testimony.
02 Q. (By Mr. Bruno) M-h'm.
03 A. I -- I -- I'm trying to read this to
04 understand when -- what period he's talking about.
05 But, no, I don't -- I don't know whether it's true or
06 not true.
07 Q. Well, at what point were you concerned about
08 well integrity?
09 A. I was concerned about well integrity I think
10 on April the 25th or 26th, when I -- when I actually
11 arrived in Houston and learned about the possible -- or
12 possibilities of the -- of the arrangement inside the
13 well.
14 Q. All right. Now, why were you concerned about
15 Well Integrity at that point in time?
16 A. Well, I'm always concerned about Well
17 Integrity. The -- why did I become concerned? Because
18 now I was involved in source control, I was leading the
19 Engineering Department, and I was aware, as we've
20 already discussed, the well had rupture disks in it.
21 There was a theory that the hanger might have lifted
22 off the -- off the wellhead housing, which would expose
23 those rupture disks to whatever pressure we shut that
24 well in at, so it was at -- it was only at that point
25 that -- that I became concerned about Well Integrity.
00158:01 Q. M-h'm. Was it only the potential for the lift
02 that gave you concerns about the rupture disks?
03 A. Yes. If the hanger hadn't lifted off the --
04 off its seat, which -- which I -- I believe it hadn't,
05 then the rupture disks couldn't be exposed to the
06 pressure, and, therefore, the integ -- the rest of the
07 integrity of the well should have been good.

Page 161:14 to 162:18

00161:14 Q. And, therefore, between the tube and the
15 outside wall of the casing, they would have access to
16 the rupture disks. And you told me "No."
17 A. And now I'm hearing, that in the context of
18 Macondo, one of the thoughts that you had was that the
19 hydrocarbons, because they were going outside of the
20 drill pipe and inside of the casing, they had access to
21 the rupture disks, which seems to be, to me, to be the
22 same scenario.
23 A. No. I -- I think I answered you accurately in
24 the earlier testimony. We can go through it again, if
25 you -- if you -- if you wish.

00162:01 But we were specifically, then, at your
02 request, talking about general production wells.
03 Q. M-h'm.
04 A. This is not a general production well. This
05 was a well that was still effectively under
06 construction and had not got completion tubing in it.
07 So on this well, we did already have
08 hydrocarbons in the production casing, so -- because
09 there was no production tubing for them to be in.
10 And so, therefore, there was only a single
11 barrier left to breach before they would contact the
12 rupture disks, and I should add the casing -- the --
13 the intermediate casing that the rupture disks were
14 contained in. And if I can add further, on a -- on a
15 normal well, other than Macondo, whether you had
16 rupture disks or not, that would be of concern, as to
17 whether the casing had the integrity to withstand
18 the -- the pressure of -- of oil.

Page 165:04 to 165:06

00165:04 Q. (By Mr. Bruno) So I understand from your
05 testimony that at no time did you believe the rupture
06 disks had been dislodged?

Page 165:08 to 165:17

00165:08 A. I always considered that there was a
09 possibility that the rupture disks might have been
10 dislodged. This is -- this was a most unusual event.
11 So if the hanger had come off its seat, although I
12 couldn't explain how they might have become dislodged,
13 I considered the possibility that they might have
14 become dislodged.
15 Q. (By Mr. Bruno) Well, you considered it, but
16 you concluded that they hadn't been dislodged?
17 A. Correct.

Page 165:20 to 165:21

00165:20 Q. All right. So then at no time did you ever
21 believe that the rupture disks had been dislodged?

Page 165:23 to 166:12

00165:23 A. Belief? There were times during the event,
24 because we had difficulty explaining what was going on,
25 I did have times when I certainly considered that they
00166:01 might have been dislodged.

02 Q. (By Mr. Bruno) And what --

03 A. I couldn't -- I couldn't explain how they
04 might have become dislodged. You say "dislodged,"
05 but -- but -- but ruptured.

06 Q. Ruptured. Well, what were those
07 circumstances? Please share with us when you had that
08 feeling or that thought.

09 A. The -- it is the only time I had that thought
10 was that they had already become dislodged was -- or
11 they already might have become dislodged was when we
12 were trying to understand why top kill had not worked.

Page 167:10 to 167:22

00167:10 Q. Okay. It's clear, is it not, that the BOP did
11 not act as a barrier?

12 A. It didn't act as a shutoff device when the
13 well started flowing.

14 Q. Which means it didn't act as a barrier?

15 A. Well, it acted as a barrier at times when we
16 had determined that it was a barrier; in other words,
17 if we had closed the BOP and tested the -- the BOP
18 rams, at those times, it was a barrier.

19 During the event itself, when the well -- when
20 the -- when the BOP was shut in, it didn't shut the
21 well off and become a barrier.

22 Q. All right. So it wasn't a barrier?

Page 167:24 to 168:08

00167:24 A. It was a barrier earlier on. It wasn't a
25 barrier during the event.

00168:01 Q. (By Mr. Bruno) Okay. So when was it a
02 barrier?

03 A. It was a barrier when it was closed on a
04 static well and pressure tested.

05 Q. And when was that?

06 A. At various times during the well, I presume.

07 Q. You presume. You don't know that to be a
08 fact?

Page 168:10 to 169:02

00168:10 A. I think we've already established I wasn't
11 part of the Drilling Department at the time of the
12 Macondo, and I had nothing to do with drilling this
13 well.
14 Q. (By Mr. Bruno) I appreciate that. But you've
15 just volunteered that a -- it was tested. So one has
16 to assume that you had some information, some knowledge
17 which allowed you to -- to tell us that just now. So
18 that's what got me confused.
19 I mean, if you don't know, you don't know. I
20 get -- I can un -- I can deal with "I don't know." I
21 can deal with "I wasn't there." But I'm confused when
22 you say, "At various times during the well," I presume
23 you're telling me that it was tested.
24 So do you have some factual information that
25 you'd like to share with the group that would show us
00169:01 that the well was -- that the BOP was tested before the
02 catastrophe?

Page 169:05 to 169:19

00169:05 A. I know from my discussions with the -- the
06 Investigation Team subsequent to the event that the BOP
07 underwent routine pressure tests.
08 Q. (By Mr. Bruno) M-h'm. Now, when you talk
09 about these "pressure tests," is that with pipe,
10 drilling pipe inside the BOP, or without any pipe being
11 inside the BOP?
12 A. I don't know the specifics of it. You
13 generally do it in -- in -- in both formats.
14 Q. All right. And we -- and that was my next
15 question: You would agree with me that testing, in
16 order to be a valid test, has to be done with pipe in
17 the BOP and without pipe in the BOP --
18 A. There --
19 Q. -- isn't that true?

Page 169:21 to 170:12

00169:21 A. There's -- there's Regulatory requirements for
22 how you test your BOPs, and we would test our BOPs in
23 conformance with those.
24 Q. (By Mr. Bruno) Well, I'm wondering --
25 A. Well, I'd say we -- we would test ours,
00170:01 because actually, Transocean tested --
02 Q. Sure.
03 A. -- theirs. But -- okay.
04 Q. I'm wondering, Mister -- Mr. Tooms, in -- in
05 view of your strenuous testimony, I thought this
06 morning, that the tested BOP, only the tested BOP can
07 act as a barrier. I'm wondering if, based upon what
08 you've just told me, we have a BOP that was, in fact,
09 tested, according to your testimony, that didn't work?

10 So if we have a circumstance where we have a tested BOP
11 that does not work, does that logically mean that we
12 can rely on a tested BOP to act as a barrier --

Page 170:17 to 170:18

00170:17 Q. (By Mr. Bruno) -- and -- and satisfy BO --
18 BP's policy that there be two -- two -- two barriers?

Page 170:21 to 171:04

00170:21 Q. (By Mr. Bruno) Yeah.
22 A. Let me put it in a -- a dif -- slightly
23 different context. If I have a valve on a pipe and I
24 want to consider that a barrier, if I close that valve
25 and test it, it's then a barrier. If I open the valve
00171:01 and close it again, without testing it, it's not a --
02 what I would formally describe as a barrier.
03 Q. Would you agree with me that there are others
04 who would call that a control device and not a barrier?

Page 171:06 to 171:06

00171:06 Q. (By Mr. Bruno) Particularly Shell Oil?

Page 171:08 to 171:13

00171:08 A. A -- a -- something can be a control device,
09 and it can also act as a barrier, so it can be both.
10 Q. (By Mr. Bruno) Well, the problem with
11 utilizing a control device as a barrier is that it must
12 assume that the control device will function perfectly;
13 isn't that true?

Page 171:15 to 171:23

00171:15 A. It assumes that whilst it is in the state of
16 being a barrier, that it --
17 Q. (By Mr. Bruno) Right.
18 A. -- will continue to function as a barrier.
19 Q. As opposed to a static barrier, which, by its
20 own existence, does what it's supposed to do; it is a
21 barrier, a piece of steel or metal or whatever, rock.
22 A. If you put a piece of steel over the top of
23 your well, it's very hard to drill the well.

Page 173:22 to 175:18

00173:22 Q. The Team that was considering the capping
23 stack.
24 A. It was my Team that initially considered the
25 capping stack, yes.

00174:01 Q. All right. It's your Team. So tell us, then,
02 what were the concerns that you had about utilizing the
03 capping stack?

04 A. I had a number of concerns of utilizing the --
05 the -- the -- the -- the -- the capping stack, if -- if
06 you're referring to the final device that we used, in
07 that it required some very difficult operational
08 techniques such as unbolting the flange on top of the
09 flex joint.

10 There's a seal on top of the flex joint that
11 we -- we thought was quite prone to getting washed out
12 if we tried to install a capping stack on it at the
13 time.

14 The flex joint itself, if I remember
15 rightly -- or -- or -- or aspects of it, was only rated
16 to 5,000 psi, and we knew our shut-in pressures would
17 exceed that. And then there was the whole issue of
18 placement of -- of the capping stack.

19 So there were a number of -- of -- of -- of --
20 of issues.

21 And then others were particularly concerned
22 that if we took out a restriction to flow in terms of
23 the riser kink, that the -- that the flow might become
24 much greater. And that if that happened, and we were
25 unable to install the stack, that we would be in a

00175:01 worse situation.

02 Q. How did you know what the shut-in pressure
03 was?

04 A. We didn't absolutely know what the shut-in
05 pressure was, but we knew accurately what the various
06 reservoir pressures were. There's multiple sands down
07 there, and we had measured -- well, the -- the Team who
08 had drilled the well had measured those pressures
09 accurately when they drilled the well.

10 Q. Well, wouldn't those shut-in pressures assist
11 you with determining flow rates?

12 A. No, I don't think so. The reservoir pressure,
13 yes, but the shut-in pressure, no.

14 Q. Well, you had the reservoir pressure, didn't
15 you?

16 A. I did.

17 Q. And why wouldn't the reservoir pressure assist
18 you with flow rates?

Page 175:20 to 176:07

00175:20 A. Well, I as -- it -- it -- it would assist, but
21 it -- it wouldn't enable you on its own. There are
22 many other -- many, many other variables that you need
23 to know, other than the reservoir pressure to determine
24 the flow rate.

25 Q. (By Mr. Bruno) Well, I understand that. But
00176:01 it was certainly a piece of information that could be
02 utilized in order to estimate the flow rate.

03 A. I don't know of a single person who would be

04 able to, with the reservoir pressure, estimate flow
05 rate.
06 Q. Well, did your Team ever, in fact, estimate
07 flow rates? In other words, come up with a number?

Page 176:09 to 176:11

00176:09 A. Not during the event, no.
10 Q. (By Mr. Bruno) Not even an estimate?
11 A. No.

Page 180:10 to 180:12

00180:10 Mr. Tooms, if you'd just take a quick peek at
11 this document for us.
12 A. (Reviewing Exhibit 6186.) Right.

Page 181:21 to 182:11

00181:21 Q. All right. Now, this document, you had
22 indicated to us before while you were looking at it on
23 the computer screen that it appeared to be a
24 document -- and I didn't want to put words in your
25 mouth -- of limited scope, that it was utilized only in
00182:01 the Gulf of Mexico?
02 A. It -- it's -- it's a -- it's a document that's
03 written specifically for the Gulf of Mexico, yes.
04 Q. All right. Now, even though it's written for
05 the Gulf of Mexico, it's a rather general document, is
06 it not? I mean, it dis -- it -- it discusses a policy
07 for Operating Procedures, which essentially is how to
08 and when to write a written procedure; isn't that
09 accurate?
10 A. That seems to be what it -- it generally says,
11 yes.

Page 183:16 to 184:16

00183:16 Q. Yeah, 1.0. "The scope...shall include" -- at
17 Page -- well, there's no number, but it's Bate Page 54,
18 and it's double-sided. It says: "The Purpose of this
19 document is to define the Accountabilities,
20 Responsibilities and Control Processes for Development,
21 Review, Update, Approval and Authorization of Operating
22 Procedures/Practices (OP) within the DW GoM SPU."
23 And then it talks about the scope: "The scope
24 of this Operating Policy within the GoM SPU shall
25 include (where appropriate) all Operating
00184:01 Procedures/Practices in the areas of..." and then it
02 talks about Production Operations, Marine Operations,
03 Well Operations, Interventions, Logistics Operations,
04 Plant Inspection, Testing and Maintenance, Laboratory
05 Activities, and Emergency Response." Do you see that?

06 A. I -- I do see that, yes.
07 Q. All right. Well, so that tells us when these
08 procedures are to be utilized?
09 A. I actually don't take it to -- to -- to be
10 that specific. It's -- it's -- it -- to me, it's
11 saying procedures within those areas are included in
12 the scope of this document. It's --
13 Q. Okay.
14 A. -- not -- not telling me when I need to write
15 the procedure. At least I couldn't see anywhere in my
16 rapid reading of it that it said that.

Page 186:06 to 186:11

00186:06 Q. Okay. All right. So we do now know when to
07 use the document. It tell us in the purpose of the
08 scope. And all I'm getting at is, is that is this the
09 kind of a document that should be utilized, in your
10 opinion, on the Drilling & Completions side, as well as
11 on the Exploration & Production side?

Page 186:13 to 187:16

00186:13 A. Well, sort of following the -- what we just
14 discussed, the -- you know, the -- the purpose and --
15 and scope of the document, I -- I -- I don't see that
16 it's saying that this document should be used --
17 Q. (By Mr. Bruno) No, it doesn't.
18 A. -- on the --
19 Q. I would --
20 A. -- on the -- on the --
21 Q. I would grant you that. That wasn't my
22 question. I'm not suggesting that this document
23 applies to Drilling & Completions.
24 A. M-h'm.
25 Q. We've already established through long and
00187:01 exhaustive --
02 A. M-h'm.
03 Q. -- testimony that the Drilling & Completions
04 side of the business, particularly in the Gulf of
05 Mexico, was separate and apart from the Exploration &
06 Production side of the business. In fact, you've told
07 us that it was separate all over the world.
08 And so the question on the table is whether or
09 not -- given the fact that this document exists and
10 given the fact that this document is applicable to the
11 Exploration & Production side of the business in the
12 Gulf of Mexico, does it make any logical sense
13 whatsoever to conclude that such a document should have
14 been in use on the Drilling & Completions side in the
15 Gulf of Mexico, so that folks would have an idea when
16 they should write a written procedure?

Page 187:18 to 187:22

00187:18 A. Well, I -- I -- I go back to the -- the -- the
19 piece of your argument about, why -- why you should
20 have them and that it -- that -- that you're suggesting
21 that this dictates when you should write a procedure,
22 and I -- I'm finding it doesn't tell me that in there.

Page 191:23 to 191:24

00191:23 Q. Well, as an Engineer speaking today, when
24 should an Operating Procedure be written?

Page 192:01 to 192:03

00192:01 A. In general you write an Operating Procedure
02 when you have an operation going on that needed a
03 procedure.

Page 193:25 to 194:03

00193:25 Q. All right. Do you know if there's any effort
00194:01 being undertaken to evaluate Operational Procedures as
02 a result of the catastrophe?
03 A. I don't know.

Page 194:19 to 194:19

00194:19 (Exhibit No. 6187 marked.)

Page 198:04 to 199:07

00198:04 Insofar as "Lessons Learned," with regard
05 to -- and I neglected to ask this before -- for the
06 future do you believe that there should be some gauges
07 or devices which would allow the calculation of flow in
08 the event of a blowout, obviously at the sea bottom?

09 A. I think I would refer back to my earlier
10 answer, that it would be useful if one could know
11 particularly pressures, and it would also be useful if
12 you could know flow. But if that was to compromise the
13 integrity of the system, then that would have to be
14 evaluated.

15 Q. Well, how would the installation of such
16 gauges compromise the integrity of the system?

17 A. Very easily. To -- to stick a gauge on a BOP
18 stack, or -- or anything else of that matter, that's
19 meant to contain high pressure requires a great deal of
20 engineering, and we try and avoid penetrations into the
21 BOP stack as much as possible. Any pen -- any
22 penetration has the potential to become a leak path
23 which may happen during normal operations, and we

24 wish -- wish to avoid that.
25 Q. M-h'm. All right. And who was involved in
00199:01 closing the VBR to seal on the drill pipe?
02 A. A number of people, but from BP's side James
03 Dupree and Harry Thierens, to -- to my knowledge.
04 Q. Okay. Was it ever done?
05 A. We -- yes, we did close VBRs. In fact,
06 initially we closed them inadvertently because the BOP
07 stack was -- was wired up wrong; so, yes.

Page 200:03 to 203:08

00200:03 Q. Of course. Now, the top kill junk -- junk
04 shot, who was in charge of that?
05 A. I can't recall exactly who was in charge of
06 it. I can recall that I think Bill Kirton was involved
07 in it, and Mark Mazzella had an involvement. There may
08 have been others.
09 Q. Okay.
10 A. There may have been somebody else actually in
11 charge.
12 Q. All right. How about top kill well kill?
13 A. So top kill was initially Mark Patterson and
14 then I think Harry Thierens got involved in that, too,
15 and others may have been involved.
16 Q. Now, under the column which is entitled "Data
17 which would increase the probability of success," we
18 see pressure downstream of BOP. And what they're
19 referring to, of course, we talked about this morning
20 and that is it would be extremely helpful to know the
21 flow out of the -- out of the leak in order to
22 ascertain the likelihood of success for a top kill well
23 kill; is that correct?
24 A. Actually, what I -- what I wanted to -- to
25 measure that -- I think -- I think this is my document.
00201:01 I think that actually says on there, on the bottom of
02 it --
03 Q. M-h'm.
04 A. -- "Paul Tooms."
05 What I wanted to know there was actually what
06 it says was the pressures.
07 Q. Oh. So you weren't interested in flow?
08 A. The -- at this stage knowing the pressures at
09 various points in the system, given that all we were
10 trying to do was get this well closed in and -- and
11 evaluate the best option for getting the well closed
12 in, the -- the major issue is to understand pressures
13 and the -- therefore, the -- where the restrictions to
14 flow were in the system.
15 Q. All right. And then "Riser hot tap," who was
16 in charge of that?
17 A. I think that came under my Team, and I had my
18 Pipeline Technical Authority, who's Les Owen, in -- in
19 charge of that.
20 Q. Okay. The next one is "Drill pipe capping."

21 Who would have been in charge of that?
22 A. I don't know. It was -- that was the -- the
23 piece of drill pipe that was sticking out of the seabed
24 with a little bit of oil dripping out of it.
25 Q. All right. "Riser removal"?
00202:01 A. That was within my Team, and -- and I had
02 various people assigned to it. I can't remember who it
03 was.
04 Q. And then last is "LMRP removal" and the "BOP
05 installation."
06 A. At this stage, I was the proponent of that.
07 Q. Now, is -- which one of these would
08 characterize the capping stack?
09 A. So the -- the one that's close -- the most
10 closely related to capping stack -- well, two of them,
11 really -- is the No. 7 and 8. So in order to install
12 anything, we had to do the riser removal first, and
13 No. 8 were the -- had to do with the removing the
14 levering riser package and installing a BOP or
15 installing a capping stack on top. They were closely
16 related.
17 Q. At this time, when this document was written,
18 in May -- it's May 5 -- let me just verify that --
19 May 5, were you contemplating developing a new capping
20 stack?
21 A. We were. I mean, there are -- there are
22 options on -- that were being considered that aren't on
23 my list here.
24 Q. Okay.
25 A. So we had -- which we already discussed, we
00203:01 had a concept called the "swing valve," we had the
02 con -- concept called the "capping stack," and later we
03 had -- I don't remember quite when it was developed,
04 something called the "Slocum overshot." And I didn't
05 include the ball bearings.
06 Q. Okay.
07 A. Nor have I -- sorry. Nor have I included the
08 relief wells in here.

Page 204:08 to 204:11

00204:08 Q. Okay. This is one of those natively produced
09 things, and it's the same version, we'll just mark this
10 one as 6189.
11 (Exhibit No. 6189 marked.)

Page 205:07 to 206:15

00205:07 Q. What was its purpose?
08 A. It had two purposes. Actually, this first
09 document had really a -- a fairly singular purpose, and
10 that was to share my views of the Engineering biases
11 that we should have in BP.
12 Q. The Engineering biases that you should have as

13 opposed to which one -- what -- what you shouldn't
14 have?

15 A. Well, we have -- yeah. As -- as I say, biases
16 is the word I used, and it's -- it's biases that --
17 that --

18 Q. Okay.

19 A. -- that we should have in BP.

20 Q. All right. The word has a different
21 connotation in -- in -- in the United States, so let's
22 just leave it alone.

23 You say: "Continue to follow the strategy and
24 plan as laid out in Malta..."

25 What are you referring to?

00206:01 A. So in approximately 2007, in Malta, we had a
02 major Engineering conference, and at that time the
03 Engineering strategy and plan was -- was shared with
04 the wider role and endorsed by Technology Vice
05 President for HSE and Engineering, and also endorsed by
06 the CEO of -- of Upstream -- or Chief Executive of
07 Upstream.

08 Q. All right. "...re-inforced in Boston." What
09 does that mean?

10 A. In Boston that would have been in 2009, and we
11 had a -- another Engineering conference -- actually, it
12 was a joint conference of the Engineering and safety
13 groups, and we reinforced the -- the strategy and plan,
14 and said we're not changing the strategy or plan, we're
15 keeping to the same strategy and plan.

Page 214:24 to 216:20

00214:24 Q. What interpersonal skills are you referring
25 to? That would be dealing with the Government?

00215:01 A. There was a very strong body of opinion that
02 wanted to keep us flowing the well rather than putting
03 the capping stack on, and it required quite a deal of
04 persuasion. And --

05 Q. That's because of the concern for broaching?

06 A. I don't know what the concern was.

07 Q. They didn't share it with you?

08 A. There seemed to be several concerns.

09 Q. Was broaching one of them?

10 A. Broaching could only occur once you shut the
11 capping stack in.

12 Q. Right. And they were threatening to make you
13 reopen it, weren't they?

14 A. The -- there -- there was an approach,
15 certainly, from Thad Allen to ask us if we would
16 consider reopening the well after --

17 Q. M-h'm.

18 A. -- we'd shut it in.

19 Q. Because they were concerned about the
20 potential for broaching; isn't that --

21 A. I --

22 Q. -- accurate?

23 A. -- I never really understood why they wanted
24 us to reopen it.
25 Q. Okay. Because you had satisfied yourself that
00216:01 the risk of broaching was small and nonexistent, right?
02 A. We had satisfied ourselves that the well
03 appeared to have integrity, and in the event that it
04 didn't have integrity, that we could deal with that,
05 too.
06 Q. How were you going to deal with it if the well
07 didn't have integrity?
08 A. I think there's a document somewhere, and --
09 that I produced that -- that showed how we would stop a
10 broach from either occurring or continuing.
11 Q. Okay. What's the next document helping you
12 convey?
13 A. The -- the -- these are the quotations?
14 Q. M-h'm.
15 A. That -- it was encouragement to our Engineers
16 that, if they acted professionally and -- and did
17 things -- do things right, that they indeed can have an
18 impact and -- and be recognized for it.
19 Q. Okay. And the next document, which is
20 entitled "2010 Production Division - S&O Risk Summary."

Page 216:23 to 217:22

00216:23 A. I'm not sure I actually particularly used this
24 document, but it's -- it's -- it's what it says it is.
25 Q. (By Mr. Bruno) Do you understand it?
00217:01 A. I understand an eight by eight risk matrix.
02 Q. M-h'm. And where does an event like this fall
03 on this matrix?
04 A. An event like --
05 Q. Macondo.
06 A. H'm -- I -- it -- it's clearly very high
07 severity, and I'm not sure where -- where the frequency
08 would -- would lie.
09 Q. The next one is just a "BACK UP."
10 The next slide with some indications on it are
11 "Performance Management in Context: The Performance
12 Improvement Cycle..."
13 Tell us what this is about.
14 A. This is the -- the OMS, the depiction of our
15 Operating Management System, and it was to show how
16 Operating Management -- our OMS system integrates with
17 the -- everything else that goes on.
18 Q. Okay. Well, will this help us understand what
19 the process was to consider making changes to the
20 organization after the catastrophe in April?
21 A. I don't think so particularly, no.
22 Q. Okay. Well, what does it help us understand?

Page 217:24 to 218:25

00217:24 A. It wasn't intended to help you understand
25 anything. It was intended to remind my Engineers
00218:01 that -- that -- or -- or reinforce my Engineers that
02 OMS was -- the Operating Management System was
03 integrated with everything we do --
04 Q. (By Mr. Bruno) M-h'm.
05 A. -- regardless of everything else I said.
06 Q. All right. Next slide. It's described as
07 "Simple, reliable, effective Engineering in BP." It
08 says, "Reduce / Avoid complexity."
09 What are you conveying there?
10 A. We have a requirement for -- it -- it -- for
11 our continuous improvement, we have a requirement to
12 have a -- strive for inherently safer design. And what
13 I'm conveying there is simple solutions are often
14 inherently safer than complex solutions, even though
15 complex solutions may at first sign give you the
16 impression they're safe with lots of bells and
17 whistles. But "Simple elegant solutions are generally
18 inherently safer."
19 Q. Well, did you have a view that, before the
20 catastrophe, that there was some tendency not to use
21 simple, elegant solutions?
22 A. I -- I had a view that there's -- there's
23 times when Engineers, particularly Engineers external
24 to BP, like using -- or -- or tend to use complex
25 solutions, yeah.

Page 222:02 to 226:15

00222:02 Q. All right. "Operators should understand their
03 process and safe operating limits - Engineers need to
04 act as coaches."
05 Well, what are you conveying here?
06 A. So any piece of equipment you have, whether
07 it's a BOP, a Drilling derrick, a separator on a
08 platform or the pipeline, has a -- a range of
09 conditions that it can operate in, whether they're
10 pressure or flow rate or whatever. And there's
11 normally a design limit and safe operating limit and
12 normal operating limit, it may be an upper limit, it
13 may be a lower limit. I'm saying that we -- the
14 Engineers need to help ensure that the people who are
15 actually operating the equipment, who may not be
16 professional Engineers, understand what the limits of
17 their equipment is.
18 Q. And how did you suggest that that be
19 accomplished?
20 A. Well, it -- it goes with the influencing
21 skills, as well, I guess, but we've changed the
22 organization so that the Engineers have a more direct
23 link to the Operations Teams, so my suggestion is that
24 the Engineers need to make sure that when operators
25 want to make a change or anything, that they get in the
00223:01 habit of discussing things with Engineers first.

02 Q. The -- the -- the change that you're
03 referencing, is that the change made in early '10 or
04 the change recently made or both?

05 A. I'm referencing any change that operators want
06 to make to their equipment on the platform, or if they
07 see that their -- their operation is -- is -- is -- has
08 changed in state, so you've got different pressures in
09 the pipe or the pipe's getting hot, the pipe's getting
10 cold, that their -- that their instincts should be to
11 go and consult with an Engineer who understands the
12 operating limits of the equipment.

13 Q. Now, I was referencing the changes in the
14 organization. You said: "...we've changed the
15 organization so that the Engineers have a more direct
16 link to the Operations Teams..."

17 A. Oh.

18 Q. And what I was asking you about was whether or
19 not you were referencing the organizational change that
20 occurred in early '10, or the organizational change
21 that occurred in early '11, or both?

22 A. We -- we made that organizational change to --
23 to get more Engineers into the Operations Teams in
24 the -- in the regions, or SPUs, as they were then
25 called. We did that late 2009, and -- and continued
00224:01 into -- it was just starting to take place in early
02 2010.

03 Q. M-h'm. All right. So that's what you were
04 referencing?

05 A. That's the change that I was referencing in --

06 Q. In the slide?

07 A. -- in my question, yes.

08 Q. Okay. All right. Now, you say, the next
09 page, "Engineering with Rigour Engineers must know
10 the discipline, be able to do the maths."

11 Obviously, Engineers should know what they're
12 talking about, I suppose is what you're saying there,
13 huh?

14 A. Yes. The -- in -- in any large company or
15 with large projects, a -- a num -- a -- a large amount
16 of our detail Engineering is done by companies other
17 than BP, and there's a tendenc -- there had been a
18 tendency for us to rely upon contractors and -- and
19 rely upon their models. And I'm saying I want my
20 Engineers to be able to do the math, so they can
21 validate whether what they've been told is correct or
22 not, or makes sense.

23 Q. Were you thinking about anything specific when
24 you talked about this?

25 A. I was specifically thinking about the time
00225:01 that I had spent in 2009, sitting, working in one of
02 the Engineering contractor's works -- houses, and I was
03 surprised at how much latitude we gave to our
04 contractors.

05 Q. Were you thinking about anything in particular
06 relative to the Macondo catastrophe?

07 A. Not in this context, no.

08 Q. Were you thinking about anything in the
09 Macondo that related in any way to this PowerPoint?

10 A. Well, I -- so I did have -- in terms of this
11 particular slide or this -- this presentation, in terms
12 of the presentation, I clearly did have -- I was
13 relating this to Macondo, and I was relating it to
14 how we had done our Engineering on the Macondo, which I
15 personally was -- was -- was quite proud of.

16 Q. You're talking about post-catastrophe?

17 A. Post-incident, yes.

18 Q. Not pre?

19 A. Not pre.

20 Q. You say: "Write it down in sentences -
21 Reports, not" PowerPoints "- 'bullets can kill'."

22 You're -- when you say 'bullets,' you're referring to
23 the bullets in a PowerPoint slide, I take it?

24 A. It's a play on words, but --

25 Q. Yes.

00226:01 A. -- but it's -- yes.

02 Q. Right. Were you -- what's your concern here?
03 I mean, how can bullets kill?

04 A. Well, as we've already done in this testimony,
05 we've -- if you just get a phrase on a PowerPoint slide
06 and you don't have the context around it, and -- so and
07 then it can be interpreted in -- in very many different
08 ways.

09 Q. M-h'm.

10 A. And I have found that if you write something
11 in a complete sentence, rather than just a -- a phrase
12 that's useful, as this PowerPoint slide was for making
13 a presentation, if you write it in a complete sentence,
14 then you think deeply about what you're providing, much
15 more so than a bullet.

Page 226:20 to 227:01

00226:20 Q. All right. And lastly, you talk about "EA's."
21 What are EA's?

22 A. EA's are Engineering Authorities.

23 Q. All right. Are those writings?

24 A. H'm?

25 Q. Are those writings? An Engineering Authority,
00227:01 is it something written down?

Page 227:03 to 228:11

00227:03 Q. (By Mr. Bruno) Or are you referring to
04 something else?

05 A. An -- an Engineering Authority is a person and
06 is designated as -- as the Authority for the piece of
07 business that -- that he or she is looking after,
08 and -- and they have -- they have certain decision
09 rights.

10 Q. And did these folks exist pre-catastrophe?
11 Did you have Engineering Authorities before the blowout
12 on the Macondo Well?

13 A. Yes, we did.

14 Q. Were they called Engineering Authorities?

15 A. Yes, they were.

16 Q. And how -- was there an Engineering Authority
17 on the Drilling side of the business?

18 A. As we've already discussed -- the -- the
19 Engineering in the Drilling side of the business was
20 structured differently, but I do believe that they had
21 people that they referred to as Engineering
22 Authorities, but they would be different, slightly
23 different from my Engineering Authorities.

24 Q. On your side of the business, you know, in
25 fact, that they were referred to as Engineering
00228:01 Authorities?

02 A. On my side of the business, I had Engineering
03 Authorities.

04 Q. And you really don't know how they were
05 described or categorized on the Drilling side of the
06 business, before the catastrophe; isn't that right?

07 A. I don't -- I really don't know what their --
08 what their roles were on the Drilling side of the
09 business.

10 Q. And you don't even know if they were called
11 Engineering Authorities, do you?

Page 228:13 to 228:14

00228:13 A. You're correct, I don't really know if they
14 had Drilling Engineering Authorities.

Page 229:03 to 229:22

00229:03 Q. Good afternoon, Mr. Tooms. My name is Scott
04 Cernich, from the Department of Justice, and I
05 represent the United States of America.

06 This is my colleague, Jessica McClellan, also
07 from the Department of Justice.

08 Could you -- could we start by telling me
09 where you were on April 20th, 2010?

10 A. Yes. April 20th, I would have been finding my
11 way back from Madrid, and I got stuck in the volcanic
12 ash event that we had in Europe about that time, and I
13 would, I think, overnight been crossing the -- the --
14 the Channel from France to England.

15 Q. And then how did you become involved in the
16 Macondo response?

17 A. I learned of the -- of the incident on the --
18 on the news, and as soon as I got back home, I -- I
19 can't remember that I E-mailed, but I contacted my --
20 my boss, Gordon Birrell, and offered my services.

21 Q. And could you describe -- describe your -- or

22 what happened from there?

Page 229:24 to 231:25

00229:24 A. So that -- at that point, having offered my
25 services, we weren't sure of the extent of the event,
00230:01 the -- it -- it wasn't possible for me to fly across to
02 the U.S. because of the volcanic ash, and I had
03 anticipated that I might get called in because of my
04 former drilling knowledge, and we decided at -- at that
05 point I would remain in the U.K. and help from the U.K.
06 end.

07 Q. (By Mr. Cernich) And what -- what was your
08 role from the U.K.?

09 A. So as we discussed in my earlier testimony,
10 I've had various titles, but I was Head of the Upstream
11 Engineering Center, which actually at the time was the
12 EPT Engineering Group. I was there to provide
13 Engineers, get -- and get them connected to the event
14 as they were needed.

15 Q. And at some point you went to Houston; is that
16 correct?

17 A. Yes. I think it was on -- I think it was on
18 the Sunday, which would have been about the 25th, I
19 flew across to Houston.

20 Q. And did you stay in Houston the remainder of
21 the Summer?

22 A. I -- I was in Houston through October,
23 although I did come out for short breaks from time to
24 time.

25 Q. Did you have a title on the Response Team?

00231:01 A. I don't know if I ever had a formal title. I
02 was -- I headed up the Engineering Group.

03 Q. But at some point you became the Leader of
04 BP's Technical Flow Assessment Team; is that correct?

05 A. After the response, I was nominated as the
06 Leader of the Flow Assessment Team, and that was at --
07 at the request by my lawyer friends in BP.

08 Q. And how long after the response was that?

09 A. It was certainly after the well was shut-in
10 and -- and cemented, but I can't remember when.

11 Q. It was after the relief well had intersected
12 the -- the Macondo Well?

13 A. I can't be sure exactly when it was. It
14 was -- there -- there was a -- a duration between the
15 cementing of the -- of the well, when I think everybody
16 was fairly sure the well was dead, and then there was
17 the formality of tagging it with the relief well, and
18 I -- I don't remember exactly when in that period.

19 Q. And who were the lawyer friends you mentioned?

20 A. The -- I'm just trying to think of his name
21 now. Bob Stout.

22 Q. Is he a BP attorney?

23 A. Yes.

24 Q. In-house?

25 A. Yes.

Page 232:17 to 232:21

00232:17 Q. And as -- and as of November 22nd, 2010, you
18 still had responsibilities for flow evaluation and flow
19 assessment; is that correct?

20 A. I still did, although my involvement was
21 becoming much more limited.

Page 233:19 to 236:01

00233:19 Q. (By Mr. Cernich) Who else was on the Technical
20 Flow Assessment Team?

21 A. Well, that -- that -- Trevor Hill was -- was
22 on the Team.

23 Q. And who is Mr. Hill?

24 A. He's my Flow Assurance Technical Authority.

25 Q. Is he still employed by BP?

00234:01 A. Yes, he is.

02 Q. And Mr. Hill worked with you during the
03 response, as well, correct?

04 A. He did.

05 Q. And he performed flow -- flow rate estimates
06 during the response, did he not?

07 A. No, he did not.

08 Q. Who -- who else was on the Technical Flow
09 Assessment Team?

10 A. Andy Hill, I think is on it.

11 Q. And who is Mr. Hill?

12 A. He has specialities in -- in geomechanics and
13 surveying.

14 Q. He's a BP employee?

15 A. He's a BP employee.

16 Q. And what was he doing before he became a
17 member of the Technical Flow Assessment Team?

18 A. He was assisting with the surveillance of the
19 well after it was shut-in.

20 Q. From a geophysics perspective?

21 A. From a geophysics perspective and from
22 acoustic monitoring to look for any signs of gas
23 release and -- and so forth, yeah.

24 Q. Did BP perform any seismic surveys of the well
25 area after the well was shut-in?

00235:01 A. Yes, we did. We performed an unprecedented
02 number of seismic surveys after the well was shut-in.

03 Q. And did you contract with someone for those
04 services?

05 A. Yes.

06 Q. And who did you contract with?

07 A. I don't recall. Andy Hill would have --
08 would -- would have organized it. If -- if I spend
09 long enough thinking about it, I might be able to drag
10 up the name, but I -- I can't recall at the moment.

11 Q. Do you know who -- who maintains the data from
 12 those seismic surveys?
 13 A. Who -- what, who keeps the data or who --
 14 Q. Correct.
 15 A. No.
 16 Q. Would Mr. Hill know?
 17 A. Yes, he would know.
 18 Q. Was there anyone else on the Technical Flow
 19 Assessment Team?
 20 A. Yes, there was. There was Cindy -- and I
 21 can't remember her second name at the moment, which is
 22 embarrassing, who was the -- look -- looks after
 23 Explor -- is the Exploration VP for Gulf of Mexico.
 24 Q. Cindy Yeilding?
 25 A. Cindy Yeilding. Thank you.
 00236:01 Q. And is she a Geologist?

Page 236:03 to 236:06

00236:03 A. I think she is a Geologist, yes. I think.
 04 Q. (By Mr. Cernich) Anyone else on that Team?
 05 A. There may have been. I don't recall any
 06 others at the moment, but --

Page 236:22 to 236:24

00236:22 Q. And --
 23 A. Actually, I can re -- recall another one. Bob
 24 Merrill, M-e double r -i- double l, I think.

Page 237:01 to 237:08

00237:01 Q. (By Mr. Cernich) And Mr. Merrill is a
 02 Reservoir Engineer; is that correct?
 03 A. He certainly looks after Reservoir
 04 Engineering. I believe him to be a Reservoir Engineer.
 05 Q. And you mentioned earlier making people
 06 available for that Team. Did you make the decision as
 07 to who would serve on that Team?
 08 A. No.

Page 238:13 to 238:17

00238:13 Q. (By Mr. Cernich) And prior to being engaged by
 14 counsel to do flow assessment work, it's your
 15 testimony -- testimony that you never prepared any flow
 16 estimates?
 17 A. I never prepared any flow estimates.

Page 239:17 to 240:12

00239:17 Q. (By Mr. Cernich) And who prepared that

18 estimate?

19 A. That was Farah Saidi, and it was a very
20 approximate, back-of-the-envelope calculation, based on
21 broad-based assumptions.

22 Q. Okay. And what were those assumptions?

23 A. She made assumptions about K factor, about the
24 geometry of the -- of the capping stack, which she
25 didn't know for certain. Temperatures. Those -- those
00240:01 are the types of assumptions that I remember her
02 making. She would also have made assumptions about
03 gas/oil ratio and so forth, but they were probably
04 better defined.

05 Q. And what was that estimate?

06 A. I can't recall absolutely what the estimate
07 was, but she gave me a range as an indicator, and I
08 think that that range at the time was 35- to
09 40-something-thousand barrels a day, but it came from
10 her with a lot of caveats about the fact that she --
11 this was a ballpark figure that had no bearing and that
12 I shouldn't use it for any substantive calculation.

Page 243:25 to 244:01

00243:25 Q. (By Mr. Cernich) And that's why BP employs
00244:01 Flow Rate Engineers like Mr. Hill?

Page 244:03 to 244:17

00244:03 A. Mr. Hill is actually a Flow Assurance Engineer
04 which part of his expertise includes flow rate.

05 Q. (By Mr. Cernich) I -- I meant to say Flow
06 Assurance Engineers. And flow -- flow -- correct me if
07 I'm wrong, but Flow Assurance Engineers, their -- their
08 jobs are to essentially keep -- keep the oil flowing
09 through the pipes for BP; is that right?

10 A. The -- the major component of their work is --
11 is to ensure that the -- the pipe -- the oil keeps
12 flowing and doesn't get hydrates and wax and those sort
13 of things, yeah.

14 Q. And they are -- and in order to do that job,
15 they have to have some significant expertise in
16 multiphase flow; is that correct?

17 A. That's correct.

Page 244:24 to 245:10

00244:24 Q. Okay. And how many -- how many of these Flow
25 Assurance Engineers were involved in the response to
00245:01 the Macondo Well?

02 A. I know of -- and this is thinking quickly, I
03 know of six. There may be more.

04 Q. And one of those was Mr. Tavor Hill; is
05 that --

06 A. Correct.
07 Q. -- correct?
08 And do you recall any of the other Flow
09 Assurance Engineers?
10 A. Farah Saidi, Norm McMullen --

Page 245:20 to 245:21

00245:20 A. Adam Ballard, he was on the -- looking at the
21 collection devices.

Page 247:01 to 247:02

00247:01 Q. You mentioned back of the envelope
02 calculations. Does that envelope exist?

Page 247:04 to 247:19

00247:04 A. The -- we kept any -- any information that
05 we -- anything we wrote down, we -- we kept.
06 Q. (By Mr. Cernich) Did you share any of those
07 with the -- with the Government Scientist you were
08 working with?
09 A. I do remember talking to Tom Hunter, and he
10 worked for -- well, he's -- he was formerly in charge
11 of the national labs and then was -- had left the
12 Government's employee and was then a consultant, I
13 think, for Doug Chu, and -- and he had done a similar
14 calculation. So we just discussed and said the numbers
15 were approximately the same. They overlapped.
16 Q. They -- they overlapped? If I remember
17 correctly, the Government estimate from the capping
18 stack shut-in was 53,000 barrels per day. So did your
19 calculations overlap with the Government estimates?

Page 247:21 to 248:08

00247:21 A. The estimates that I was talking about were
22 the ones that Tom Hunter had done on the back of an
23 envelope, which I hope still exists, which he came up
24 and had a number that was lower than the 53,000 barrels
25 a day. I don't remember what it was, but all I
00248:01 remember is -- and that was the -- the point in which I
02 stopped worrying about the precise numbers, was that
03 Ms. Saidi's number and Tom Hunter's number were in the
04 same ballpark.
05 Q. (By Mr. Cernich) You said they overlapped.
06 A. I did.
07 Q. So that means the number that Mister -- that
08 Dr. Hunter gave you was 40 something thousand?

Page 248:10 to 248:14

00248:10 A. I don't recall. I recall that Doc -- Dr. Tom
11 Hunter had a range on his numbers and Farah had a range
12 on her numbers, and those two ranges overlapped. And
13 I -- and as I said, I don't believe that Farah's range
14 was above 40 something thousand barrels a day.

Page 259:01 to 259:21

00259:01 Q. Now, I'm trying to recall earlier, we talked
02 about -- or you talked about, with Mr. Bruno, flow rate
03 as it related to the planning of the -- the top kill.
04 And I -- I just want to make sure I understand. Is
05 it -- is it your position that flow rate estimates
06 would -- would have been of no use in planning the top
07 kill effort?
08 A. Not at all.
09 Q. So they would have -- so accurate flow rate
10 estimates would have been helpful?
11 A. Accurate flow rate estimates would have been
12 helpful in planning top kill.
13 Q. And a -- a -- a flow rate estimate above a --
14 a certain threshold may have -- may have convinced you
15 that the -- the top kill effort would have been
16 fruitless; is that correct?
17 A. That's a -- kind of a -- kind of a theoretical
18 deal. We -- we had no way at that stage, beyond what
19 we were getting from NOAA, of making any accurate
20 assessment or, in our opinion, accurate assessment of
21 flow rate in the -- in -- in the subsea arena.

Page 260:08 to 260:12

00260:08 Q. Isn't it correct that you went over a chart of
09 flow rates with Mr. Lynch prior to the top kill?
10 A. I would expect that I -- that -- that -- it's
11 quite possible I went over a chart with Mr. Lynch of
12 flow rates prior to top kill, yeah.

Page 260:17 to 260:24

00260:17 Q. What were the -- there were flow rates on a
18 chart; is that correct?
19 A. There were various charts being -- being --
20 being produced. I can recall one chart with -- with
21 flow rates on it, which was produced by Ole Rygg, which
22 was flow rate versus pumping in rate.
23 Q. And do you know where those charts are now?
24 A. No, I do not.

Page 262:06 to 262:08

00262:06 Q. And how were those -- those flow rates in

07 the -- the chart, how were those -- how were those
08 prepared? How were those calculated?

Page 262:10 to 262:25

00262:10 A. I -- I don't know for sure, because I didn't
11 calculate them. I -- I think they were a range of flow
12 rates that -- with no calculation behind them, just --
13 just a -- just a range of numbers assumed.
14 Q. (By Mr. Cernich) And the numbers assumed by
15 whom?
16 A. Well, since it was all Ole Rygg who had, it --
17 it -- the chart that I'm thinking of, prepared the
18 chart, either they've assumed a -- a range of flow
19 rates to assess how effective top kill would be against
20 individual flow rates.
21 Q. And you engaged Mr. Rygg specifically for that
22 purpose?
23 A. I didn't engage Mr. Rygg at all.
24 Q. Who did engage Mr. Rygg?
25 A. The people in charge of the Top Kill Team.

Page 263:23 to 264:14

00263:23 Q. (By Mr. Cernich) Okay. Okay. And do you
24 recall at what -- at what flow rate the top kill would
25 not be effective?
00264:01 A. It -- it -- it -- it's been a while since I
02 saw those charts. The -- a -- a -- the -- what I do
03 recall is that the modeling, again, it was the -- the
04 whole top kill effort had to be modeled using two-phase
05 flow models, which is quite difficult and has quite
06 a -- a range on it.
07 So there wasn't a -- it wasn't a black and
08 white picture as to where -- or a cut and dry picture
09 as to where it would or wouldn't work.
10 But what I do recall is that somewhere around
11 the 15,000 barrels a day flowing rate versus the
12 pumping-in rate that Ole had assumed that we might
13 achieve. It was something around 15,000 barrels a day
14 was the -- the break over point.

Page 265:16 to 265:18

00265:16 Q. But doesn't the -- the industry have multiple
17 models that it uses all the time to model multiphase
18 flow?

Page 265:20 to 266:11

00265:20 A. We have -- we have some models that model
21 multiphase flow, and -- and they are -- I wouldn't say
22 imprecise, but they -- but they -- they have -- they

23 give you a very variable answer, and they are difficult
24 to -- to use. There's not very many people that are
25 capable of actually running the models. And they can
00266:01 give you a wide range of answers, depending upon the
02 exact assumptions you've put in.
03 Q. (By Mr. Cernich) But BP has people in-house to
04 run those models, correct?
05 A. We have one or two, not very many.
06 Q. And some of those models would -- are PROSPER?
07 Is that one?
08 A. I don't think PROSPER is a multiphase model.
09 OLGA would be the --
10 Q. OLGA?
11 A. -- the primary one that we would use.

Page 267:02 to 267:13

00267:02 (Exhibit No. 6192 marked.)
03 Q. (By Mr. Cernich) Do you know what it is?
04 A. It's BP's Preliminary Response to Flow Rate
05 and Volume Estimates that -- that -- that were issued
06 by the Government, in the -- as it says, in the Staff
07 Working Paper No. 3.
08 Q. Did you prepare this document?
09 A. I did not.
10 Q. Do you know who did?
11 A. It was prepared, I think, by the -- well, it
12 was prepared by members of the Privilege Flow Rate
13 Team.

Page 267:21 to 267:23

00267:21 MR. CERNICH: This was a document that BP
22 submitted to the Presidential Oil Spill Commission in
23 October of 2010.

Page 268:08 to 268:09

00268:08 A. Yeah, we submitted it to the Presidential
09 Commission and asked them to keep it confidential.

Page 268:16 to 269:10

00268:16 Q. Okay. I'd like to direct you to the -- to the
17 fourth paragraph there that starts, "BP has
18 reviewed..." And if we move a couple of sentence in,
19 it says, "As discussed below, the August 2nd, DOE/FRTG
20 Estimate" -- and the FRTG is the -- the Flow Rate
21 Technical Group; is that correct?
22 A. That's the acronym, I think, that was used by
23 the -- the -- for the -- for the Government organized
24 Flow Rate Technical Group.
25 Q. And so it says, "...the August 2nd DOE/FTRG

00269:01 Estimate and other similar" est -- "estimates are
02 flawed. They rely on incomplete or inaccurate
03 information..."
04 Do you -- do you know what "incomplete or
05 inaccurate information" that refers to?
06 A. I think the document goes to actually explain
07 what some of the incomplete and in -- in -- in --
08 inaccurate information is. I -- I'd kind of need to
09 read through the -- the -- the -- the document to
10 refresh myself.

Page 270:03 to 270:10

00270:03 Q. Well, we can -- we -- I -- I plan on actually
04 walking through the -- the document, but just a -- a
05 couple of questions. Are -- are you aware of any --
06 aside from the certain field samples that were
07 collected and observations that were made by the Woods
08 Hole Oceanographic Institute, didn't all of the data
09 that was used by the FRTG and the DOE Teams come from
10 BP?

Page 270:12 to 270:23

00270:12 A. I believe that most of the data must have come
13 from -- from us, because we supplied the data on the
14 well. I don't know that they used all the data that we
15 supplied them.
16 Q. (By Mr. Cernich) Are you aware of any data in
17 particular that they didn't use?
18 A. I don't -- well, I -- I can see from the --
19 the headings we got in here that they didn't consider
20 the effects of two phase flow, they didn't use the
21 temperature of the flow, but they --
22 Q. Did you give them a model for a multiphase
23 flow?

Page 271:03 to 271:19

00271:03 conditions, and they -- they chose which bits of data
04 to use, and so on, so -- so there were -- there's
05 numerous pieces of data that -- where -- where we gave
06 them information that they didn't necessarily choose to
07 use.
08 Q. Okay. Great. Well, then let's -- let's go
09 through that. You mentioned multiphase flow. Did --
10 did BP provide the DOE or the FRTG Teams with a
11 multiphase flow model?
12 A. I don't believe we did, but I -- I can't be
13 certain.
14 Q. Has BP done work on multiphase flow models
15 from the Macondo Well?
16 A. We've -- we've done mult -- multiphase flow

17 modeling, absolutely, yes.

18 Q. But you didn't provide that -- any of that to
19 the -- to the Government Teams?

Page 271:25 to 272:11

00271:25 A. Well, I -- I can answer in that we gave the
00272:01 Government during the event the modeling -- the -- the --
02 results of the modeling that -- that -- that we'd made
03 during the event. And certainly before it was
04 privileged. You asked whether I gave them -- whether
05 we supplied them with models, I think we would expect
06 the Government would use their own multiphase flow
07 models.

08 Q. (By Mr. Cernich) Are you talking about the --
09 when you mention the -- the model that was run during
10 the event, are you talking about the modeling of the --
11 the choke line at the well shut-in?

Page 272:13 to 273:02

00272:13 A. The model of the choke line at the well
14 shut-in. Sir, I don't -- I don't understand.

15 Q. (By Mr. Cernich) Well, okay. Then -- then
16 what modeling were you referring to that you provided
17 to them?

18 A. We gave them information on the -- the
19 modeling that we did of what flow could look like up
20 the wellbore, and -- and modeling of flow coming out of
21 the reservoir. We -- we -- we shared that with the
22 Government scientists.

23 Q. All of it?

24 A. Before the -- before the event, we gave them
25 whatever information they asked for.

00273:01 Q. Right. You gave them what they asked for.
02 But nothing more, correct?

Page 273:04 to 273:09

00273:04 A. No, that's not correct. We frequently shared
05 information with them even though they hadn't asked for
06 them.

07 Q. (By Mr. Cernich) Did you provide every piece
08 of information that was relevant even if it wasn't
09 asked for?

Page 273:12 to 274:04

00273:12 A. I -- I can't know that we gave them every
13 piece of information that -- that -- that might at the
14 time have been relevant or -- or -- or subsequently
15 become relevant. All I know is that we were very open
16 with the -- with the -- the members the national labs

17 and the -- and the people who came from the Government
18 to -- to speak with us. And -- and -- sorry, I'll --
19 I'll continue. And not forgetting, of course, that we
20 were members of the Unified Command, and -- and Unified
21 Command had access to everything that we did.

22 Q. (By Mr. Cernich) Okay. If -- I'd like to
23 direct you to Page 2 of the document, please. And at
24 the top of the page, the -- the first full sentence
25 there that begins "BP fully..." It says: "BP fully
00274:01 intends to present its own estimate as soon as the
02 information is available to get the science right."
03 Do you know whether the information is
04 available to get the science right?

Page 274:08 to 274:16

00274:08 A. If you'll restate the question, I'll --
09 I'll -- I think I have an answer, but I just forgot
10 what the question was.
11 Q. (By Mr. Cernich) This says: "BP fully intends
12 to present its own estimate as soon as the information
13 is available to get the science right." And I was just
14 asking whether the information is available currently
15 to get the science right.
16 A. I don't know the answer.

Page 274:18 to 275:08

00274:18 Q. (By Mr. Cernich) okay. Now, I'll take you to
19 the next paragraph, which says: "As part of BP's work
20 to estimate reliably how much oil was discharged, it
21 would be useful to understand the bases for the
22 estimates and analyses already in the public record.
23 Even though BP and other parties have requested this
24 information, many of the important details underlying
25 those estimates and analyses have not" made -- "been
00275:01 made public. For example, neither the" under -- "for
02 example, neither the DOE nor the FRTG has released all
03 of the data and calculations" necessarily -- "necessary
04 to understand and evaluate the bases for the August"
05 2nd "DOE/FRTG Estimate."
06 Has BP released all of the data and
07 calculations necessary -- necessary to understand and
08 evaluate the bases of its estimates?

Page 275:12 to 275:20

00275:12 A. I can't answer.
13 Q. (By Mr. Cernich) Has BP released any
14 information required to understand the calculation
15 underlining any of BP's estimates?
16 MS. KARIS: Again, instruct the witness
17 not to answer with respect to any privileged work.

18 A. So I think this -- this -- this document is --
19 is -- is helpful in that it shows some of the -- BP's
20 understanding.

Page 285:04 to 285:09

00285:04 THE WITNESS: I believe, and I certain --
05 I certainly intended to say that to my knowledge no
06 flow rate calculations were done for me while the
07 well -- during the incident while the well was flowing.
08 I've clarified that a calculation was done after the
09 well was shut in.

Page 286:01 to 286:04

00286:01 Q. But you did know at that point before the top
02 kill, you did know that the flow rate was at least what
03 you were collecting through the riser insertion tube;
04 is that correct?

Page 286:06 to 286:11

00286:06 A. We -- we knew how much we were collecting. We
07 also knew that the well was slugging. So if I
08 collect -- if we collected a certain amount of oil over
09 a 24-hour period and if the measurements of that
10 collection were accurate, we -- we could assume that
11 we -- the well was flowing that much.

Page 287:19 to 288:05

00287:19 Q. Okay. Now, is it correct that you -- I don't
20 know if "complain" is the right -- the right word to
21 use, but you -- that you made comments to the oil spill
22 Commission that the DOE's Team -- Science Team slowed
23 down BP's efforts to shut in the well; is that correct?

24 A. Now, I'd have to refresh myself as to -- to
25 what the -- exactly what the comments I made were, but
00288:01 I -- I did make some comments similar to that, yeah.

02 Q. Okay. And do you think the DOE Science Team
03 might have been able to move more quickly if it had had
04 every piece of data, even the data that it didn't
05 specifically request from BP during the response?

Page 288:08 to 290:02

00288:08 A. So far as I'm aware, we gave the -- the
09 Science Team -- which consisted of two groups, one was
10 scientists that were largely reporting to Secretary
11 Chu, and the other group was the National Labs, who
12 were largely Engineers -- we gave them full access to
13 information that they needed to assess whether you

14 could shut the well in.

15 Q. (By Mr. Cernich) Okay. Well, let's go ahead
16 and -- and walk through some of the -- some of the
17 critiques in the paper here. I'd like to direct you
18 to -- well, actually first, here, it says: "The
19 science team supporting Secretary Chu apparently
20 estimated a flow rate of 52,700 bopd" -- that's barrel
21 of oil per day -- "on July 14 based on pressure
22 readings taken from the capping stack at a time when
23 the flow of fluid was solely passing through the
24 capping stack's kill line.5/"

25 Am I correct that it was actually the choke
00289:01 line that they used to make that estimate?

02 A. I can't recall whether it's the choke or the
03 kill line.

04 Q. Do you recall what -- what line BP's estimate
05 that Ms. Saidi made, whether it was the choke line or
06 the kill line?

07 A. I think -- and -- and I -- I'm not certain on
08 this, but I think her estimate used both the kill and
09 the choke line and -- and looked at the ratio between
10 the two, but I can't -- I can't remember.

11 Q. Okay. And then moving down to A.1: "Failure
12 to Consider the Complexity of the Capping Stack
13 Structure." And in here it talks about the -- the K
14 factors that were used again. We discussed K factors a
15 bit earlier. And I believe you told me that -- that
16 you didn't know what K factors BP used to calculate
17 flow through the capping stack?

18 A. Correct.

19 Q. Do you know if BP's done anything to refine
20 the K factors that were use -- that are used to
21 calculate flow through the capping stack?

22 A. That would fall under the same privilege
23 that -- that we've already discussed.

24 Q. Okay. And then in A.2., the critique is that
25 the DOE/FRTG Teams failed to consider the effects of
00290:01 two-phase flow. Can you tell me how BP considered
02 two-phase flow in its analysis?

Page 290:06 to 291:25

00290:06 A. And I can tell -- tell you in general that --
07 that all of our calculations that we did used --
08 considered two-phase flow.

09 Q. (By Mr. Cernich) Did any of the -- go ahead.

10 A. I was going to say, it has a -- a large
11 bearing on how you calculate flow rates. If it was
12 single-phase flow, it would have been much easier to
13 have estimated a flow rate.

14 Q. And -- and can you explain to me, how it has
15 that large bearing?

16 A. Because in two-phase flow, you have gas and
17 oil flowing at the same time, and they mix and un --
18 unmix. The gas flows at a different rate to the oil,

19 and it just becomes extremely complicated. I think
20 that -- as I said earlier, we -- even with --
21 we spend -- we spend many, many millions on trying to
22 develop multiphase flow meters for our subsea wells.
23 Even then, when we know the range of flow that we're
24 dealing with and we know the fluid properties and we
25 know the size of the pipe, we still find it difficult
00291:01 to get an accurate and reliable measurement of flow.
02 So it's a -- it's very complex once it gets into the
03 multiphase.
04 Q. And does that -- that multiphase flow tend to
05 increase the flow, or does it tend to decrease the
06 flow?
07 A. It is just complex.
08 Q. So there's no trend in multiphase flow, as far
09 as an increase or decrease in flow?
10 A. Well, it's too complex for me to -- to be able
11 to answer that because to answer something complex like
12 that in a simple way, I'd have to be a real expert in
13 flow measurement, and I'm not at that level.
14 Q. And I think earlier you said that there were
15 only a couple of people in BP who were capable of doing
16 this multiphase flow modeling; is that correct?
17 A. Certainly during my experience during Macondo
18 we -- we only had a handful of people who could run,
19 for instance, the OLGA model.
20 Q. And who were those people?
21 A. Farah Saidi, I think, was one. I think Adam
22 Ballard was -- was another.
23 Q. And so Adam Ballard and Farah Saidi were
24 running OLGA multiphase flow models during the
25 response?

Page 292:02 to 292:14

00292:02 A. Farah Saidi certainly was running multiphase
03 flow levels for us during -- during the response.
04 Q. (By Mr. Cernich) Right. Do you know if those
05 have been produced as part of this litigation?
06 A. We've made everything available that -- that
07 we -- that we did during the event.
08 Q. You turned those models over to counsel?
09 A. I didn't.
10 Q. Now, if the -- the modeling was done on a
11 computer, do you have any idea how that was -- how that
12 was produced?
13 A. How it was produced to?
14 Q. To counsel or to the parties in the case?

Page 292:16 to 296:18

00292:16 A. No, because I have -- had nothing to do with
17 how any of the data or information has been handed
18 over. All any of us did who were involved in the

19 incident was follow instructions that were given to us
20 by lawyers to make sure that we didn't destroy any
21 documentation.

22 Q. (By Mr. Cernich) And the custodians of those
23 OLGA models would have been Ms. Saidi or Mr. Ballard?

24 A. As I say, I -- I don't know what modeling
25 Mr. Ballard, if he did any modeling, on the -- the
00293:01 flow. I don't know if he did, and I don't know who the
02 custodian of the -- of the -- the OLGA models are.

03 Q. Okay. We'll move on to the -- to No. 3, the
04 temperature. And this paper suggests that the likely
05 temperature was at least 200 degrees. Do you know
06 where that 200-degree number comes from?

07 A. It comes from we know what the reservoir
08 temperature was, and they had done thermal modeling
09 of -- of the well. I don't recall exactly which model
10 we used to -- to account for that temperature.

11 Q. And what was the -- what was the reservoir
12 temperature?

13 A. I don't recall. Significantly higher than 200
14 degrees.

15 Q. And who did the temperature modeling?

16 A. I don't recall.

17 Q. And you said you don't recall what model was
18 used?

19 A. No, I don't.

20 Q. Would it have been PROSPER potentially?

21 A. It could have been.

22 Q. ECLIPS?

23 A. It could have been.

24 Q. And do you know when that modeling was done?

25 A. We did temperature modeling very early on in
00294:01 the -- in the response because we had wondered whether
02 we could use that as a way of predicting flow rate.

03 Q. Did you provide that modeling to the
04 Government Teams?

05 A. I don't know whether we provided the modeling.
06 We certainly provided the -- the temperatures to the
07 Government Teams, and we would have given them our
08 findings.

09 Q. And you communicated this 200-degree number to
10 them during the response?

11 A. So during -- so you asked me if we did do
12 thermal modeling. As I said, we did it early on. I --
13 I don't know what numbers we communicated. We -- we --
14 what we would have communicated were the numbers that
15 we measured on the top of the riser during the
16 response.

17 Q. And those were substantially lower than 200
18 degrees, weren't they?

19 A. I don't know what the numbers were. I can't
20 recall.

21 Q. Okay. And moving to -- to Section B. There
22 were substantial early impediments to flow, 1.A, there:
23 "In the early days of the incident, the blind shear

24 ram, certain variable bore rams, and annular preventers
25 were actuated within the BOP, impeding the flow out of
00295:01 the well by reducing the cross-sectional area through
02 which the fluid could flow."
03 Did -- did you do any studies with regard to
04 the -- the flow across the rams and the BOP?
05 A. No, I did not.
06 Q. Do you know who, if anyone, has done any
07 studies on that?
08 A. No, I don't, because I don't even know if
09 we've had the full analysis of the -- the BOP
10 inspection yet.
11 Q. Have you looked at any analyses of the BOP?
12 A. I've seen the DNV Report on the BOP. I didn't
13 read it in great detail, but I saw the -- the amount of
14 erosion and so on that had occurred in the BOP and --
15 and saw which rams were -- were shut and -- and so I
16 could see from that that -- that -- that there were
17 substantial early impediments to flow, or else there
18 wouldn't have been erosion.
19 Q. And you drew that conclusion from only looking
20 at the DNV Report?
21 A. I could -- prior to the DNV Report, we had
22 seen certain aspects of the -- the riser kink drill
23 pipe that we cut off, and during the well capping or
24 preparations for the well capping, we had se -- also
25 seen some -- some of the state of the BOP. So I --
00296:01 I -- I had that knowledge earlier than that.
02 Q. But you're not a -- a metallurgy expert or a
03 failure analysis expert, so you wouldn't be able to
04 offer any opinions regarding -- expert opinions
05 regarding the -- the flow across the BOP; is that
06 correct?
07 A. I'm -- I'm not proposing myself as an expert
08 to -- to tell you what the flow is across the BOP. I'm
09 not sure we have any experts that -- that would be able
10 to tell you.
11 Q. And then I'd like to direct you to b., 1.b:
12 "There was a large kink in the riser at the top of the
13 BOP through which the fluid had to flow. The kink
14 acted as a choke and impediment to flow, especially
15 early in the incident."
16 Didn't your Team conclude that the kinked
17 riser actually was not a substantial impediment to
18 flow?

Page 296:20 to 297:17

00296:20 A. No, we didn't come to that conclusion.
21 Q. (By Mr. Cernich) Did you come to the
22 conclusion that it was a substantial impediment to
23 flow?
24 A. We came to the conclusion that -- that --
25 that -- that it certainly was some sort of impediment
00297:01 to flow, but maybe not the only impediment to flow.

02 Q. Before the -- before the -- the riser was cut
03 off of the -- the top of the LMRP, did you do any sort
04 of estimates to determine what you thought the increase
05 in flow would be when the -- when the riser was cut off
06 of the top of the LMRP?

07 A. Yes. There was considerable work on -- on
08 estimating what flow increase might happen if we remove
09 various elements of the -- the riser, the BOP, and so
10 forth.

11 Q. And -- and what was your estimate for the
12 removal of the -- the riser pipe?

13 A. I -- I can't recall. I -- if you showed me
14 the document, I -- I -- I would be able to re -- remind
15 myself. It -- it was in the order of 5 to 30 percent
16 increase in flow, but that's what I recall.

17 Q. Okay. Could I direct you to Tab 20 in your

Page 299:09 to 302:04

00299:09 (Exhibit No. 6194 marked.)

10 Q. (By Mr. Cernich) And this is an E-mail from
11 Mike Mason, dated Saturday, May 15th, 2010, to John
12 Turnbull, copied to Patrick O'Bryan, yourself, and a
13 couple of other people, "Subject: "Macondo SIWHP &
14 Build-up Rate Final Report.doc." And -- excuse me --
15 it says: "This is version A of the above referenced
16 report it will be updated as version B after we get
17 SIWHP conclusions from the National Laboratories and
18 additional data from one of the contributors."

19 Do you know who the -- who that "one of the
20 contributors" Mr. Mason is referring to might be?

21 A. H'm, no.

22 Q. Okay. And then the attachment is a -- is an
23 earl -- what appears to be an earlier version of the --
24 of the memo that we were looking at a moment ago.

25 And -- and I turn to this one because this one, you --
00300:01 you definitely did receive by E-mail, at least
02 according to the -- the E-mail.

03 And I as -- I would imagine your -- your
04 response would be similar, that you -- you've seen
05 this -- you've seen this before. There are multiple
06 drafts, it appears -- or at least I've seen multiple
07 drafts. But do you recall seeing this -- this
08 document?

09 A. As -- as I said before, I -- I -- I've
10 certainly seen either this document or the other
11 document. I don't know which one.

12 Q. Okay. And if I could please direct you to
13 Page 5 of 8, and at the bottom of that page is
14 "Current" -- "Current Available Pressure Measurements
15 and" -- "and Well Conditions," and there's a diagram
16 there of what appears to be a -- a -- or at least a --
17 a very sim -- simplified diagram of the -- the well,
18 with the -- the BOP and the LMRP on top and the -- and
19 the kinked riser.

20 And it says that the -- next to the -- the
21 riser there's an arrow, and above that it says: "By
22 removing the approximately 400 psi restriction, flow
23 rate will increase by approximately 5 to 10 percent."

24 Does that refresh your memory as to what you
25 had predicted as the increasing flow rate upon removal
00301:01 of the riser pipe?

02 A. Yes. We -- in -- another place, we did -- we
03 did a considerable amount of work on trying to estimate
04 the ratio of increasing flow rate versus -- versus
05 pressure, with some very extensive modeling over wide
06 ranges of -- of flow rate and -- and assumptions, to
07 see if we could -- because we couldn't measure flow --
08 whether we could measure the proportion -- or whether
09 we could predict, within a reasonable bound, the
10 proportional increase in flow.

11 So this -- this looks like this is taken from
12 that work. I don't know whether it's final or not, but
13 it's in the range I said, so that's that same 5 to 10
14 percent.

15 Q. Okay. But -- so it's not -- it's not 30
16 percent?

17 A. Well, I said it's between -- I -- I said it
18 was certainly, to my recollection, between 5 and 30
19 percent.

20 Q. That -- that -- that modeling you were
21 describing earlier, was -- was all of that information
22 provided to the -- to the Government Teams that were
23 working on flow?

24 A. I know the findings were. I -- I don't recall
25 whether we -- whether we shared with them all of our
00302:01 models.

02 Q. Which would mean you -- you may not have also
03 shared your assumptions that went into those models,
04 correct?

Page 302:06 to 303:07

00302:06 A. I -- it -- it's simply I don't recall. We --
07 we discussed very openly with the -- with the National
08 Labs what we were doing. In fact, actually, as you can
09 see from this, we -- we involved them -- I think this
10 is one of the first involvements with the National
11 Labs. We -- we involved the National Labs in doing
12 calculations.

13 Quite often they preferred to organize
14 themselves and -- and -- and be very independent, and
15 so even if they had three labs working on the -- on,
16 for instance, the shut-in wellhead pressure prediction,
17 which you would think was a simple thing to do, but
18 proved to actually be quite complicated -- they -- they
19 ran -- to my knowledge, they -- they ran those
20 calculations entirely independently, so they may not
21 have wanted to see the data from us at this point.

22 Q. (By Mr. Cernich) Do you recall anyone telling

23 you that they didn't want to receive data from you?
24 A. I -- I recall -- and I can't remember her
25 name. She was the alternate to Tom Hunter. And I
00303:01 recall her telling me that they wanted to -- to do
02 their work in strict compartments and not to share
03 their work even between the National Labs. They wanted
04 to have three independent analyses.
05 Q. But after the fact, it -- it wouldn't have
06 been useful to share that information with them, to --
07 to check the work or the estimates?

Page 303:09 to 304:23

00303:09 A. I'm not -- not understanding the question.
10 Q. (By Mr. Cernich) I'll move on.
11 Could I -- could you turn to Tab 21, please?
12 Now, it's my understanding that you all did
13 certain diagnostic work before the -- the top kill,
14 with some pumping and closing various lines and
15 pressure meters, to try to get a sense of the
16 restrictions across the -- the BOP and what you were --
17 what your -- your plan for the -- the top kill might
18 be; is that correct?
19 Or if I'm not characterizing that correctly,
20 could you -- could you enlighten me?
21 A. So we're on the -- on -- on the same page,
22 we -- bef -- before starting top kill, we took pressure
23 measurements. It was the first opportunity we had to
24 get pressure measurements at various points in the BOP
25 stack with any degree of accuracy, and so we -- we --
00304:01 using, I think, two gauges, used -- took a variety of
02 pressures at different points in the BOP stack.
03 Q. Okay. And then during the -- the top kill
04 method, the top kill operation itself, you collected
05 additional data, correct?
06 A. During top kill itself, we -- we -- we
07 recorded pressure data full-time, yes.
08 Q. Can you -- I -- I'd like to direct you to
09 this -- this E-mail that's Tab 21.
10 MR. CERNICH: And I'm going to mark this
11 as Exhibit 6195.
12 (Exhibit No. 6195 marked.)
13 Q. (By Mr. Cernich) And this is an E-mail from
14 someone named Rupen Doshi, dated Thursday, May 27,
15 2010, to various -- various people, some people at BJ
16 Services, and then there's a copy to you, and it says:
17 "Gentleman, Just want to make it clear that NO ONE is
18 to get the data files from the Top Kill method that is
19 being pumped from yesterday or today except for Paul
20 Toom's group. This order comes directly from Bill
21 Kirton and Charles Holt. Any requests for this data
22 has to go to Paul Tooms." And can you explain to me
23 why Mr. Rupen is -- is providing that instruction?

Page 304:25 to 307:03

00304:25 A. I -- I can explain to you why I think he's
00305:01 providing that instruction, and you -- you may need to
02 ask Rupen Doshi or Bill Kirton and Charl -- Charlie
03 Holt. But collecting data, even -- even something as
04 straightforward as pressure data, in 5,000 feet of
05 water isn't -- isn't actually straightforward. There
06 can be various reasons why you actually have to add
07 corrections to the data, validate that the gauges are
08 reading correctly, and so on.

09 And so the -- the decision was made quite
10 clearly that what we wanted to do here was, because I
11 had the gauge experts in my Group, was that the whole
12 data would come through a single point to be validated
13 before it was reissued out, because if we had people on
14 the vessels that were pumping and -- and making
15 decisions, if they were to use unvalidated data, in
16 fact, uncorrected data, we could get ourselves in a --
17 in a bad place.

18 Q. (By Mr. Cernich) So did you instruct Mister --
19 Mr. Rupen to -- to provide this -- this instruction?

20 A. No. Actually Bill Kirton instructed Rupen
21 to -- to do it this way.

22 Q. And was this data eventually -- eventually
23 distributed outside of BP?

24 A. If I recall correctly, and -- and certainly
25 during the top kill, the data was -- was provided live
00306:01 to the Government even before we validated it. So --
02 so, yes, it was -- this -- this was maintaining
03 operational control. It wasn't trying to keep data
04 secret.

05 Q. Okay. Thank you.

06 If I could direct you back to Tab 49, I
07 believe, to the exhibit --

08 THE COURT REPORTER: 6192.

09 Q. (By Mr. Cernich) -- BP flow paper previously
10 marked as Exhibit 6192 and back to Page -- Page 4
11 there, where we were -- I was walking through the
12 "Substantial Early Impediments to Flow.

13 And c. says: "The drill pipe broke and pieces
14 lodged in the BOP and kink, and a section of the riser
15 was crushed, all of which lessened the area through
16 which the oil and any debris could flow and thus
17 impeded flow by significant amounts."

18 Do you know what debris is referred to in this
19 paragraph?

20 A. It's any debris, and it would include --
21 and -- and this is my words, not necessarily the words,
22 whoever wrote this, but it would include pieces of
23 cement, as I think as was subsequently seen in the
24 DVN -- DNV Report, the bowl from the cement -- from the
25 float shoe. It would certainly include or could
00307:01 include all the rubber that came out of the annular
02 preventers. That's the sort of debris that I believe

03 they're talking about here.

Page 307:05 to 307:08

00307:05 Q. (By Mr. Cernich) And then the -- but do -- are
06 you -- are you -- do you know whether any of that --
07 that debris was actually found in the -- the BOP and to
08 have obstructed flow?

Page 307:10 to 307:14

00307:10 A. I know that some debris was found
11 subsequently, but I -- I don't know -- I -- I don't
12 know what debris was ultimately there.
13 Q. (By Mr. Cernich) Was any cement found in the
14 BOP?

Page 307:16 to 307:22

00307:16 A. I don't know.
17 Q. (By Mr. Cernich) Okay. At some point the --
18 the drill pipe broke off from the bottom of the BOP; is
19 that correct?
20 A. Certainly when we lifted the BOP at the end,
21 there was no drill pipe hanging from the bottom of it.
22 Q. And so it presumably fell down into the well?

Page 307:24 to 309:05

00307:24 A. I presume so.
25 Q. (By Mr. Cernich) Oh, and the -- all of the --
00308:01 the work that you-all were doing with regard to -- I
02 know you've testified that you weren't doing any -- any
03 flow rate estimates. But the -- the work and the
04 modeling that you were doing during the response, all
05 that assumed that the drill pipe was -- was an
06 important pediment to flow -- impediment to flow; isn't
07 that correct?
08 A. No. We considered -- we considered modeling
09 with and without drill pipe in -- in the -- in the
10 well. We could see from our meas -- BO -- BOP pressure
11 measurements, what limited ones we have, that -- that
12 it looked likely that we had drill pipe across the BOP,
13 but we -- we didn't know -- we -- we modeled it every
14 which way we could model.
15 Q. Right. But the models that you did that
16 assumed the -- the drill pipe was still suspended down
17 into the -- the wellbore from the -- from the BOP,
18 showed lower flow rates than if the drill pipe was not
19 actually hanging down from the bottom of the BOP into
20 the -- into the wellbore; is that correct?
21 A. It's -- from -- from my recollection, the --
22 the -- the modeling, I mean, had so many variables in

23 it -- it -- it -- it was -- it was -- modeling is a --
 24 is a -- is an art form. The -- so there were -- there
 25 were many points where you could have impediment to
 00309:01 flow. If you had -- the case you're referring to, I
 02 think, is if the drill pipe was hanging inside the BOP,
 03 and the BOP was closed around it and -- and causing the
 04 fluid to go through the drill pipe, then that would be
 05 a significant impediment to flow.

Page 309:07 to 310:11

00309:07 Q. (By Mr. Cernich) Okay. I'd like to direct you
 08 to Page -- Page 5, the bottom of Page 5, where it says
 09 that "The August 2nd DOE/FRTG Estimate of Flow on April
 10 22nd Is Inconsistent with the Measured Reservoir
 11 Pressure."

12 And if I'm summarizing this correctly, the --
 13 the DOE and FRTG Teams assumed a -- a bottomhole
 14 pressure after well shut-in of -- of 10,200, and it's
 15 BP's contention that this number is a -- is
 16 approximately 10,600, which would result in a reservoir
 17 depletion of 1,250 psi. It -- am I getting this
 18 correct?

19 A. Just let me -- (reviewing document) -- right.
 20 So -- sorry, could you restate what -- the -- the --
 21 the question?

22 Q. I just wanted to make sure I was
 23 characterizing this -- this -- this contention and
 24 this -- this point by MBP's paper correctly.

25 A. Well, I can't remember how you characterized
 00310:01 it, so --

02 Q. Okay.

03 A. -- could you just --

04 Q. H'm --

05 A. -- just say how you characterized it.

06 Q. That the -- that the -- the contention is that
 07 the that DOE used too low of a -- of a bot --
 08 bottomhole -- a shut-in wellhead -- or I'm sorry,
 09 bottomhole pressure of 10,200, whereas BP has -- BP
 10 using industry standard techniques, predicted that the
 11 bottomhole pressure was, in fact, 10,600 psi.

Page 310:13 to 313:07

00310:13 A. That's what I -- I -- I take it to -- I --
 14 I -- that's -- I'm reading -- I'm reading the same as
 15 you.

16 Q. (By Mr. Cernich) Okay.

17 A. And that's how I take it from this.

18 Q. All right. And then if I direct you to
 19 Paragraph 4 there, it says, "Failure to Account
 20 Accurately For Reservoir Conditions."

21 And -- and I'd like to direct you to -- to the
 22 third paragraph there, and it says, "Data reviewed by

23 BP's engineering and science team suggests that some of
24 the assumptions the Government has used regarding
25 reservoir properties are unrealistic. For example, at
00311:01 least one Government study estimated that the well had
02 a productivity index of 50" barrels of oil per day per
03 psi, "and relied on" the "assumption -- "that
04 assumption to estimate...pressure difference between
05 the reservoir and" the "wellbore (i.e. ... drawdown."
06 Are -- are you aware that BP provided that
07 productivity index number of 50 to the -- to the
08 Government Team?

09 A. At -- at various times during the -- the
10 integrity testing and -- and discussions about -- about
11 the -- the reservoir, we used a number of different
12 values for -- for -- for -- for a number of variables,
13 quite often to try and predict what we thought would be
14 the extreme case at one end of the spectrum or the
15 other. So we may well have provided a productivity
16 index of 50 at some stage, but I don't know that that
17 means that we thought that it was 50. I think we were
18 just using it as an example.

19 Q. Did -- did you provide all of the underlying
20 geological and reservoir data to the DOE or FRTG Teams
21 that would have allowed them to calculate a more --
22 more realistic productivity index, if it's BP's con --
23 contention that this productivity index is not
24 realistic?

25 A. So far as I am aware, we tried to be as
00312:01 helpful as possible to the -- the -- the -- the -- the
02 Government Teams -- and I don't know quite which
03 Government Team, but the -- the Government Teams, in
04 providing them the data so they could understand the
05 reservoir, and to help them come to the conclusion that
06 the -- the well was -- had integrity.

07 So it was in our interest to give them as much
08 data as we could, and as far as I'm aware, we gave them
09 the full data.

10 Q. And in the end, it was actually reservoir
11 modeling work that was performed by a -- a Government
12 Scientist that convinced everyone that it was -- it was
13 feasible to -- to leave the well shut-in; is that
14 correct?

15 A. The way it's been reported in the press is
16 that -- that somebody on an iPhone managed to convince
17 Secretary Chu that -- that -- that our modeling was
18 indeed, correct, yes.

19 Q. Well, I don't know if that's -- that's exactly
20 the -- the correct characteriz -- characterization,
21 either.

22 But BP -- BP was assuming, prior to the --
23 prior to well shut-in, that there was more aquifer
24 support in the reservoir here than -- than ultimately
25 was modeled, correct?

00313:01 A. We made a range of assumptions, so -- so I --
02 I'm -- I'm having to speak from memory now. We made a

03 range of assumptions about what level of aqui
04 support -- aquifer support there might be, the size of
05 the reservoir, the compressibility of the reservoir,
06 and -- and all the variabilities that would -- that
07 would affect shut-in wellhead pressure.

Page 313:09 to 313:15

00313:09 Q. (By Mr. Cernich) And in order to -- but in
10 order to decide ultimately that the -- that the well
11 would have integrity, and you were allowed to leave it
12 closed in, you had to assume, essentially, that there
13 was negligible water support in the reservoir in order
14 to create a model that would allow you to leave the
15 well shut-in; is that correct?

Page 313:17 to 313:24

00313:17 A. I actually don't recall quite what assumptions
18 fitted the model. There -- there were -- you could
19 assume a -- a small reservoir, a large reservoir,
20 and -- and then change the amount of aquifer support.
21 It -- it's -- it's not precise.
22 Q. (By Mr. Cernich) But BP probably had a -- a
23 pretty good idea of how big this -- this reservoir was,
24 correct?

Page 314:01 to 314:02

00314:01 A. There was a lot of discussion as to the size
02 of the reservoir.

Page 314:06 to 314:16

00314:06 MR. GODWIN: Okay.
07 A. So --
08 MR. GODWIN: Go ahead.
09 A. -- BP had -- I've actually forgotten quite the
10 question. The -- there -- there were -- no, we didn't
11 know the -- the -- the -- accurately the size of the
12 reservoir. You -- at this stage, we were only really
13 estimating by seismic, and what you can't tell is how
14 connected the -- the various sands are, just through
15 seismic, so there were a lot of different estimates as
16 to the size of the reservoir.