

# Deposition Testimony of:

## **Tom Knox**

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Page 330:20 to 331:02

00330:20 And as -- as you've probably  
21 been reminded more times than -- than --  
22 more -- more times than you'd like yesterday,  
23 you're -- you're the corporate representative  
24 for BP. You understand that you've been  
25 designated by BP to talk about several topics  
00331:01 as their representative, correct?  
02 A. I do.

Page 331:12 to 332:10

00331:12 Q. Am I correct the riser collapsed  
13 on April 22nd, 2010?  
14 A. Yes.  
15 Q. Okay. And you testified -- am I  
16 correct that you testified yesterday that BP  
17 found altogether six holes in the riser?  
18 A. There were six holes that appeared  
19 in the riser while the riser was attached to  
20 the BOP. When the riser was recovered to the  
21 surface, there was a crack on the underside of  
22 the riser which had not previously been  
23 present.  
24 Q. Okay. And the first hole became  
25 visible in the riser kink on April 28th, if I  
00332:01 understood correctly?  
02 A. That's my recollection.  
03 Q. Okay. The second hole appeared  
04 either April 28th or 29th?  
05 A. Approximately at that time. I  
06 don't have a strong memory of the timeline.  
07 Q. Okay. And holes 3 and 4 appeared  
08 when after that; do you recall?  
09 A. Sometime afterwards. But I don't  
10 remember the dates.

Page 332:15 to 332:18

00332:15 Q. All right. And the last two  
16 holes, 5 and 6 appeared, am I correct,  
17 immediately after the top kill attempt which  
18 began on May 26th?

Page 332:20 to 332:22

00332:20 A. The last two holes became apparent  
21 towards the end or at the end of the top kill  
22 procedure.

Page 337:13 to 337:18

00337:13 Q. And you're presented here as the  
14 corporate representative for this topic on  
15 obstructions in the riser, right?  
16 A. That is correct.  
17 Q. And the RIT would constitute  
18 obstruction in the riser, in your opinion?

Page 337:21 to 338:01

00337:21 A. At this stage I personally  
22 wouldn't consider the -- the RIT an  
23 obstruction to flow.  
24 Q. But B -- BP didn't do any  
25 calculations as to whether it obstructed flow  
00338:01 or to what extent, right?

Page 338:04 to 338:05

00338:04 A. I'm not aware of any such  
05 calculations being done.

Page 339:03 to 340:11

00339:03 Q. Give you a moment to look over  
04 that, but it's an e-mail from you, sir, on  
05 July 11th, 2010. I looked through the  
06 exhibits of yesterday and I didn't see it in  
07 there. Forgive me if it was used.  
08 Have you had a moment to  
09 refresh your memory about this?  
10 A. I have.  
11 Q. Okay. In the first, you're  
12 writing to Mr. Trevor Hill: Can we have a  
13 chat in the morning about the top kill data?  
14 It has been annoying me for a little while and  
15 I couldn't work out why. I had another look  
16 tonight and I have convinced myself that it  
17 was always doomed to failure.  
18 And then you have several --  
19 another paragraph, another couple sentences in  
20 a paragraph after that. But can you just  
21 describe to me what you're writing there?  
22 A. Indeed. The date was July the  
23 11th. By July 11th, the riser had been  
24 removed from the BOP stack, it had been  
25 recovered to the surface and brought to shore  
00340:01 and we had conducted a number of internal  
02 intrusive inspections of the riser. This  
03 e-mail refers to my analysis of the physical  
04 condition of the riser post-recovery and my  
05 comments relate to my view of that current  
06 condition of the riser.  
07 Q. Why did you come to the conclusion

08 that the -- the top kill -- are you referring  
09 to the top kill, first of all, when you say  
10 that it was always doomed to failure in that  
11 e-mail?

Page 340:13 to 341:07

00340:13 A. I'm referring to the condition of  
14 the riser as recovered and what impact that  
15 might have had on the top kill operation.  
16 Q. And why did you come to the  
17 conclusion that it was always doomed to  
18 failure, then? Can -- can you expand upon  
19 that a little bit?  
20 A. I will try to.  
21 The internals of the riser at  
22 the time of recovery and inspection showed  
23 significant erosion damage such that the flow  
24 path through the riser was now quite open and  
25 there was a large surface area for flow. And  
00341:01 as I looked at it, I came to the conclusion  
02 that in that condition it would not provide  
03 sufficient restriction to flow to hold back  
04 top kill flows.  
05 MR. FLATTMANN: I'm going to mark  
06 that as exhibit 9534.  
07 (Exhibit Number 9534 marked.)

Page 341:19 to 341:19

00341:19 (Exhibit Number 9535 marked.)

Page 342:07 to 342:22

00342:07 Q. The first -- the first -- I guess  
08 this is a string of e-mails and the first  
09 e-mail that you're writing to -- to Mr. John  
10 Martin, July 1st, 2010, says: Thank --  
11 thanks. I don't think the R&M boys can help.  
12 I've spoken to them but they have no model and  
13 can only provide guidance on flow rates above  
14 which erosion occurs. But we are talking  
15 about long-term so low rate erosion. I will  
16 try to see if I can get a calculation of flow  
17 rate through the bursting disc.  
18 Can you tell me, just give me  
19 a reference point for this e-mail? What --  
20 what are you referring to and -- or -- or the  
21 question posed to you that you're responding  
22 to?

Page 342:25 to 343:15

00342:25           A.     This related to modeling inside  
00343:01 the wellbore. I had been asked, because I  
02 came from refining, to see if anyone in the  
03 group had any understanding of how to look for  
04 potential erosion in the case the wellbore  
05 bursting discs had failed.  
06       Q.     So you're looking at erosion for  
07 the -- for the discs themselves?  
08       A.     Not -- not for the discs. The  
09 discs are a pressure release system and the  
10 incident team had asked, un -- under the  
11 conditions where a bursting disc had failed,  
12 would top kill flow -- could top kill flow  
13 have led to damage of the bursting disc  
14 holders and if so, what -- how much that could  
15 be.

Page 345:03 to 346:17

00345:03           Q.     Good morning, Mr. Knox. My name  
04 is Bram Alden with Munger, Tolles & Olson LLP,  
05 we're representing Transocean with my  
06 colleague, Greg Phillips.  
07               I'm going to start by asking  
08 a few followup questions on two of the  
09 documents we looked at yesterday and one we  
10 were looked at this morning. If you can turn  
11 to tab 26 in the binder I handed you. I  
12 believe this, yesterday, was marked as  
13 exhibit 9532.  
14               Now, in this e-mail, what do  
15 you mean when you say the top kill data was  
16 annoying you?  
17       A.     Post-recovery of the riser, I was  
18 tasked with my team to investigate the  
19 physical condition of the riser and make a  
20 number of measurements on the riser to look at  
21 the flow through it. I had been studying all  
22 of that inspec -- inspection data for some  
23 time trying to assess the flow path as it  
24 existed on recovery. And the -- the flow path  
25 at that time had shown significant erosion,  
00346:01 damage to the riser and damage to the strings  
02 that were within the riser. And I had been  
03 trying to assess where the flow was moving in  
04 the riser.  
05       Q.     And why was the data annoying you?  
06       A.     Largely, at this stage there --  
07 there was significant damage to the riser and  
08 I was looking at all of the history before  
09 that to understand, try and understand that  
10 damage and I couldn't rationalize at this  
11 point the damage to the top kill process as it  
12 had occurred.  
13       Q.     You also say you had another look

14 tonight. What did you look at?  
15 A. The inspection data that had been  
16 recovered as part of the -- the inspection  
17 processes that we were allowed to conduct.

Page 347:15 to 347:23

00347:15 Q. Just a few minutes ago when the  
16 lawyer for the State of Louisiana was  
17 questioning you, you said that you believed  
18 the top kill was doomed to failure because of  
19 erosion. The riser, quote, wouldn't provide  
20 sufficient restriction to flow to hold back  
21 top kill flows.  
22 What do you mean by top kill  
23 flows?

Page 348:02 to 348:15

00348:02 A. What I'm commenting on here is  
03 that given the ability now to investigate the  
04 internals of the riser after recovery, I  
05 didn't believe that the condition of the riser  
06 as it was found had sufficient restriction now  
07 to -- to cope with those flows.  
08 Q. What flows?  
09 A. The -- the top kill flows.  
10 Q. Are they flows of hydrocarbons?  
11 A. The top kill flow was a flow of  
12 drilling mud.  
13 Q. So the riser didn't have  
14 sufficient restriction to hold back the  
15 drilling mud?

Page 348:19 to 349:10

00348:19 A. What I'm saying here is that at  
20 the point that the riser was recovered and in  
21 the condition at which it was recovered, in my  
22 view the cross-sectional area was sufficiently  
23 large that it would not provide enough back  
24 pressure.  
25 Q. To hold back what?  
00349:01 A. The mud.  
02 Q. In your e-mail you also write:  
03 The upside is that I don't think we could get  
04 enough mud into the well to kill it, so think  
05 that the well is not been damaged.  
06 Did I read that correctly?  
07 A. Yes, you did.  
08 Q. What do you mean that BP couldn't  
09 have gotten enough mud into the well to kill  
10 it?

Page 349:14 to 349:21

00349:14 A. I'm commenting on the fact that,  
 15 given the condition of the riser as recovered,  
 16 the riser would not provide enough back  
 17 pressure to flood the well and, therefore, a  
 18 significant portion of the mud came out the  
 19 riser.  
 20 Q. How much mud would have been  
 21 needed to kill the well?

Page 349:24 to 351:11

00349:24 A. I have absolutely no idea.  
 25 Q. And what do you mean when you  
 00350:01 write, quote, so think that the well is not  
 02 been damaged?  
 03 A. At this point there was a question  
 04 from Unified Command to understand if, during  
 05 top kill, bursting discs had gone and mud  
 06 flowed into the well, there was an open  
 07 question about would that then damage the  
 08 bursting disc holders and breach the wellbore.  
 09 Q. So are you saying that you thought  
 10 that the well -- the burst discs had not  
 11 burst?  
 12 A. I could not comment on whether  
 13 they had burst or not. But I had also been  
 14 asked to investigate, should they have burst,  
 15 would erosion of those holes occur.  
 16 Q. And when you say that there was an  
 17 open question about whether the bursting  
 18 disc -- disc -- disc holders had been damaged,  
 19 is your answer that they had not been, in this  
 20 e-mail?  
 21 A. No, it is not.  
 22 Q. So what do you mean by, think that  
 23 the well has not been damaged, or is not been  
 24 damaged?  
 25 A. At this point I have reached a --  
 00351:01 a conclusion that a significant portion of the  
 02 mud has exited the system via the kink and  
 03 that the potential flows back into the well  
 04 are low.  
 05 Q. The potential flows of mud back  
 06 into the well?  
 07 A. Potential flows of mud put back  
 08 into the well.  
 09 Q. And if the potential flows of mud  
 10 back into the well had been high, the well  
 11 would have been damaged?

Page 351:14 to 351:24

00351:14 A. No, I'm not saying that, either.  
 15 The -- if the bursting discs had failed, which  
 16 was not certain and I don't believe -- believe  
 17 it was just the scenario, then a detailed  
 18 analysis of those bursting discs and what  
 19 could happen to them would need to be carried  
 20 out.  
 21 Q. I'm just trying to understand what  
 22 part of the well could have been damaged when  
 23 you say that it -- it is -- it is not been  
 24 damaged?

Page 352:03 to 352:09

00352:03 A. The -- the part of the well --  
 04 the -- that I'm talking about here is -- is  
 05 the only part of the well that I was involved  
 06 in and that's looking at potential erosion  
 07 damage to bursting disc holders.  
 08 Q. And so those bursting disc holders  
 09 had not been damaged?

Page 352:12 to 352:17

00352:12 A. The only way to ascertain if they  
 13 were, in fact, damaged for certain is to enter  
 14 the well and visualize them and look at them.  
 15 Q. So you didn't know if they had  
 16 been damaged but you thought they had not  
 17 been?

Page 352:21 to 353:06

00352:21 A. I didn't know if they had been  
 22 damaged. And --  
 23 Q. And you thought they had not been?  
 24 A. I didn't know that they were  
 25 damaged. And looking at the condition of the  
 00353:01 riser, I felt that the flow of mud into the  
 02 well was unlikely to be sufficient to cause  
 03 damage.  
 04 Q. To the bursting disc holders, just  
 05 to be clear?  
 06 A. To the bursting disc holders.

Page 353:14 to 353:24

00353:14 Q. What was Mr. Hill after?  
 15 A. The two questions that I had been  
 16 asked was to, one, understand and report back  
 17 on the physical condition of the recovered  
 18 riser and drill string and if there was



19 anything that could be deduced from that  
 20 condition.  
 21 And the second piece was to  
 22 understand, if anything, what we might then do  
 23 about trying to answer the second question  
 24 about bursting disc holders.

Page 355:13 to 355:15

00355:13 Q. You said that the detailed  
 14 analysis of the current condition of the riser  
 15 was of importance to the incident team.

Page 355:17 to 356:02

00355:17 A. When the riser was removed from  
 18 the top of the BO stack -- BOP stack, there  
 19 were two pieces of drill string protruding  
 20 from the upstream end. All assumptions at  
 21 this point had the drill -- the riser either  
 22 being empty or, at most, one piece of drill  
 23 string present. The presence of two drill  
 24 strings challenged a number of assumptions and  
 25 I believe some of those assumptions had  
 00356:01 implications for intervention options.  
 02 Q. What were those assumptions?

Page 356:05 to 356:12

00356:05 A. The assumptions that had been made  
 06 that were that. As the riser was attached to  
 07 the BOP, it either had no drill string present  
 08 or one drill string present and, therefore,  
 09 when the riser was removed and two drill  
 10 string pieces were observed, then the previous  
 11 assumption that either it was empty or had one  
 12 drill string were incorrect.

Page 356:19 to 357:18

00356:19 Q. Okay. Then in the same e-mail you  
 20 write, quote, I am not convinced that we have  
 21 looked at the data already and thoroughly  
 22 enough or through the right lens, close quote.  
 23 Who is we in that sentence?  
 24 A. I -- I meant myself and my team.  
 25 Q. Okay. And what data were you  
 00357:01 referring to?  
 02 A. Well, we have looked at the  
 03 recovery of the riser and we've looked at the  
 04 current condition. We have not been able to  
 05 link all of this up to how these pieces of  
 06 material arrived, where they were. They just

07 were there unexpectedly.  
 08 Q. And when you say that the data  
 09 hadn't been looked at through the light -- the  
 10 right lens, what does that mean?  
 11 A. It means that at the time, as with  
 12 everyone else, I had assumed that there was,  
 13 at most, one piece of drill string in this.  
 14 And so any -- any of the work that we had done  
 15 around erosion damage appearing externally was  
 16 based on one piece of drill string. Now that  
 17 there were two, any model that had been based  
 18 on those assumptions needed to be revisited.

Page 357:20 to 358:23

00357:20 If you could turn to tab 13,  
 21 please. On the second page of this e-mail  
 22 string -- and I'm sorry -- this has already  
 23 been marked as exhibit 9151. If you flip to  
 24 the second page, do you see the e-mail from  
 25 Ray Merewether dated May 25th on which you  
 00358:01 were cc'd? It starts towards the bottom.  
 02 A. Is this the one that starts, I'd  
 03 like to ask people to try to demolish the  
 04 following argument?  
 05 Q. Exactly.  
 06 Do you see where it says,  
 07 this morning I had given up on doing anything  
 08 with the mud kill data and began to think  
 09 about the junk shot?  
 10 A. I do.  
 11 Q. Now, if you flip back to the first  
 12 page, do you see the e-mail that you wrote to  
 13 Mr. Merewether and others?  
 14 A. I do.  
 15 Q. So we discussed this yesterday.  
 16 Your e-mail reads, quote, Dear all, the junk  
 17 shot is no longer on the flow sheet. It is  
 18 not an option under consideration. Regards,  
 19 Tom.  
 20 Did I read that correctly?  
 21 A. You did.  
 22 Q. And that was false at the time it  
 23 was said; was that -- is that correct?

Page 359:01 to 361:03

00359:01 A. I don't consider it to be false.  
 02 Q. And how is it true?  
 03 A. On a daily basis there were  
 04 briefings on what the plans the next 24 hours  
 05 were so that we understood what was going to  
 06 be executed. That also then informed everyone  
 07 about what pieces of information and what they

08 had to do in that 24-hour period.  
09 At the meeting, which local  
10 time was 3:00, a process flow sheet for  
11 decision-making over the coming period was  
12 presented. And it was outlined that the next  
13 intervention attempt would be top kill, that  
14 it would not be the junk shot, that the junk  
15 shot would, in fact, if considered, be run  
16 through the flow process with Unified Command  
17 and would not be put into action without  
18 clearance and permission given by all  
19 concerned.  
20 Q. Who put out this flow sheet?  
21 A. This flow sheet was presented live  
22 online through a -- a web-X conference. And  
23 the meeting was run by Roberta Wilson.  
24 Q. Sorry. Roberta Wilson?  
25 A. That's right.  
00360:01 Q. And who's that?  
02 A. Roberta Wilson acted as  
03 coordinator within the engineering team of the  
04 Unified Command.  
05 Q. Was she a BP employee?  
06 A. She was.  
07 Q. Do you know why the junk shot was  
08 no longer an option under consideration at  
09 that point?  
10 A. As I say, the junk shot was under  
11 consideration. It just wasn't going to happen  
12 in the next 24 hours. And my understanding  
13 was that the Unified Command were going to be  
14 taking one intervention option at a time and  
15 they would seek permission for each  
16 intervention option as it arose.  
17 Q. Okay. So just to be clear, when  
18 you write a junk shot is no longer on the flow  
19 sheet, that's a true statement, correct?  
20 A. That is a statement that I made,  
21 purely wanted because it was not -- it was not  
22 a -- a true reflection of what's going on but  
23 the intent was that for the immediate future,  
24 which is the next intervention, the next  
25 intervention was going to be top kill and top  
00361:01 kill only. And junk shot, if it was to be  
02 used, would be run through Unified Command all  
03 the way up to the top to get final approval.

Page 361:15 to 361:16

00361:15 Was there a process flow  
16 sheet put out?

Page 363:02 to 363:05

00363:02           A.     At the 3:00 meeting, open to all  
03     members of the incident team, a process flow  
04     diagram was put up for the next series of  
05     interventions.

Page 363:11 to 363:24

00363:11     The first part of the process  
12     flow outlined the process for conducting the  
13     top kill attempt. The process flow then went  
14     on to outline that the junk shot, which had  
15     been considered at the same time, was now  
16     considered as a separate option which would  
17     not be initiated until such times as the top  
18     kill was complete. And if not successful,  
19     then would go through a full review process  
20     with Unified Command seeking approvals at all  
21     levels to enter into a junk shot attempt.  
22           Q.     So the junk shot was still an  
23     option under consideration, correct?  
24           A.     That is correct.

Page 364:06 to 364:06

00364:06     (Exhibit Number 9536 marked.)

Page 364:17 to 365:06

00364:17           Q.     Have you ever seen  
18     Mr. Merewether's e-mail before at the top of  
19     this page?  
20           A.     No.  
21           Q.     Did Mr. Merewether ever tell you  
22     that he thought you had lied to him?  
23           A.     No.  
24           Q.     In his e-mail, he writes, Tom Knox  
25     assured me, and then copies your e-mail where  
00365:01     you say, the junk shot is no longer on the  
02     flow sheet. It is not an option under  
03     consideration.  
04                     And then after that he  
05     writes, the rest is history. They lie.  
06                     Is that correct?

Page 365:10 to 365:17

00365:10           A.     That is what it says on that  
11     document.  
12           Q.     But he never said that to you?  
13           A.     I had no conversation about this  
14     with Mr. Merewether.  
15           Q.     But apparently, according to this  
16     e-mail, he wrote it to the Secretary of

17 Energy, didn't he?

Page 365:19 to 365:20

00365:19 A. It appears that that is the  
20 recipient.

Page 365:25 to 365:25

00365:25 (Exhibit Number 9537 marked.)

Page 367:21 to 368:12

00367:21 Q. What did this team do to analyze  
22 the riser and evaluate erosion at the bend?  
23 A. My understanding is that the team  
24 looked at a series of methods to try to  
25 estimate the flow path through the kink in the  
00368:01 riser.  
02 Q. What were this team's conclusions?  
03 A. At the time, with the assumptions  
04 that they could make, I believe they came to  
05 the conclusion that erosion was unlikely.  
06 Q. What were the assumptions that  
07 they could make?  
08 A. Primarily that the kinked riser  
09 was unobstructed, with the exception of the --  
10 the collapsed section.  
11 Q. Are those all the assumptions?  
12 A. To the best of my knowledge, yes.

Page 368:20 to 369:12

00368:20 Q. Did the team conclude that  
21 crimping the riser might work?  
22 A. I believe that the -- the team  
23 felt that if the -- the riser could be crimped  
24 and it was empty, then that was a -- a viable  
25 option for closing the well.  
00369:01 Q. Was that an option that was ever  
02 pursued?  
03 A. It was not.  
04 Q. Why not?  
05 A. Because on the 28th of April,  
06 holes appeared on the outside surface of the  
07 kinked riser. These holes were inconsistent  
08 with the previous assumptions and there was  
09 concern that there would be obstructions in  
10 the riser that could include casing or drill  
11 string. And if that were true, then crimping  
12 was unlikely to work.

Page 369:14 to 369:17

00369:14 Around April 25th, 2010 when  
 15 these -- this e-mail was April 24th, 2010 --  
 16 but around that date, what flow rate was BP  
 17 assuming for purposes of its erosion analysis?

Page 369:19 to 371:04

00369:19 A. My understanding of the analysis  
 20 that was done was that this was conducted at  
 21 two values that had been given to the incident  
 22 team. A lower bound of 1,000 barrels per day  
 23 estimate provided by MMS and 10,000 barrels  
 24 per day which had also been provided but I'm  
 25 not aware of the source of that number.

00370:01 Q. Who at MMS provided the  
 02 1,000-barrel per day lower bound?

03 A. I don't know.

04 Q. How did you find out about it?

05 A. As part of joining the team, I was  
 06 made aware of information. I was also -- as  
 07 a -- as an employee and as, you know, an  
 08 interested party watching the news. And I  
 09 believe the 1,000 number was quoted as being  
 10 provided by MMS.

11 Q. You said as part of joining the  
 12 team, I was made aware of information.

13 Who made you aware of that  
 14 information?

15 A. Primarily Graham Openshaw.

16 Q. Anyone else?

17 A. At the point of joining the team,  
 18 no. Graham Openshaw was my liaison with the  
 19 incident team.

20 Q. If you flip back to the first page  
 21 of this exhibit, do you see the e-mail from a  
 22 Mr. Pierre Beynet?

23 A. I do.

24 Q. In this e-mail Mr. Beynet asks for  
 25 erosion analysis, quote, assuming the flow,  
 00371:01 all liquid to flow, 100 barrels,  
 02 1,000 barrels.

03 Correct?

04 A. He does.

Page 371:20 to 371:20

00371:20 (Exhibit Number 9538 marked.)

Page 372:11 to 373:07

00372:11 Q. And this e-mail chain -- this

12 e-mail -- sorry -- is dated April 25th, 2010,  
 13 correct?  
 14 A. That's correct.  
 15 Q. On the fourth page, part of  
 16 Mr. Ballard's e-mail -- sorry.  
 17 A. There's only three pages.  
 18 Q. Oh, sorry. I made them  
 19 double-sided. Okay.  
 20 On the part that ends with  
 21 002, do you see the Conclusions heading?  
 22 A. I do.  
 23 Q. There's only one conclusion  
 24 listed, correct?  
 25 A. There is.  
 00373:01 Q. It says, orifice size expected to  
 02 flow approximately 1,000 barrels per day  
 03 through two orifice restrictions is 0.15 to  
 04 0.2 inches, correct?  
 05 A. That's correct.  
 06 Q. Why was Mr. Ballard using a  
 07 1,000 barrel per day flow rate?

Page 373:09 to 373:25

00373:09 A. I can't answer as to why he's  
 10 using that number but at that time I think the  
 11 official number from the incident team was  
 12 1,000 barrels per day. And I was aware that  
 13 some modeling was done at 1' and  
 14 10,000 barrels per day as I had mind in my  
 15 previous question -- answer.  
 16 Q. What modeling was done at  
 17 10,000 barrels per day?  
 18 A. I believe the same modeling as --  
 19 as this, that the -- the models were tested at  
 20 1,000 barrels per day and at 10,000 barrels  
 21 per day.  
 22 Q. Do you see anywhere in this e-mail  
 23 where Mr. Ballard uses the flow rate  
 24 10,000 barrels per day?  
 25 A. Not in this e-mail.

Page 374:04 to 375:06

00374:04 (Exhibit Number 9539 marked.)  
 05 Q. The bottom e-mail is written by  
 06 Jay Thorseth. Do you know him?  
 07 A. I do not.  
 08 Q. Do you know either of the  
 09 recipients of this e-mail, Kelly McAughan or  
 10 Walt Bozeman?  
 11 A. I don't believe so.  
 12 Q. In the e-mail from Jay he writes,  
 13 quote, Kelly, we need to have a flow rate

14 which you all have calculated, but also  
 15 production and pressure profiles in case this  
 16 goes on for a while, close quote.

17 Did I read that correctly?

18 A. You did.

19 Q. And Kelly responds in the e-mail  
 20 above, quote, attached are the forecasts plus  
 21 cumulative production and raw numbers for the  
 22 base case, close quote. Correct?

23 A. That's correct.

24 Q. Let's turn to the attachment that  
 25 she references. Do you see the table?

00375:01 A. I do.

02 Q. The first row starts with the date  
 03 April 21, 2010, correct?

04 A. It does.

05 Q. And that row forecasts an oil flow  
 06 rate of 97,585 barrels per day, correct?

Page 375:09 to 375:12

00375:09 A. I can't comment on whether that's  
 10 a forecast or not.

11 Q. In her e-mail, Ms. McAughan  
 12 referred to it as a forecast, correct?

Page 375:14 to 375:22

00375:14 A. She does use the word forecast.

15 Q. Do you see the row for April 25th,  
 16 2010, in her table?

17 A. April 25th?

18 Q. Yes.

19 A. I do.

20 Q. That row forecasts an oil flow  
 21 rate of 96,687 barrels per day, correct?

22 A. That is --

Page 375:25 to 376:09

00375:25 A. That is the number on the table.

00376:01 Q. So on the last document we saw BP  
 02 measuring orifice size on April 25th by  
 03 assuming a 1,000 barrel per day flow rate,  
 04 correct?

05 A. Yes.

06 Q. But here we see a BP employee had  
 07 forecast a flow rate of nearly a hundred  
 08 thousand barrels per day for April 25th; isn't  
 09 that correct?

Page 376:12 to 376:16



00376:12 A. The table has a number of  
13 96,000 barrels per day.  
14 Q. Why wasn't BP measuring erosion  
15 and estimating orifice size assuming a flow  
16 rate of a hundred thousand barrels per day?

Page 376:18 to 377:01

00376:18 A. My understanding at the time was  
19 that the team who were looking at orifice size  
20 were using the numbers provided at Unified  
21 Command for what was believed to be the  
22 bounded flows.  
23 Q. Did the team that was looking at  
24 orifice size receive the information from  
25 Ms. McAughan?  
00377:01 A. I don't know if they did or not.

Page 377:04 to 377:04

00377:04 (Exhibit Number 9540 marked.)

Page 377:09 to 378:06

00377:09 Q. Can you turn to the page that ends  
10 with the Bates Number 261? Do you see the  
11 e-mail from Julian Austin dated April 27th  
12 near the top the page?  
13 A. Yes, I do.  
14 Q. He writes, quote, here is the  
15 orifice versus leakage rate calculation you  
16 requested based on both the local kink model  
17 and the entire riser/downhole system - the  
18 models agree well. I've plotted against both  
19 orifice diameter and orifice area for  
20 convenience, close quote.  
21 Did I read that correctly?  
22 A. You did.  
23 Q. And on the next page, do you see  
24 the e-mail from David Petruska where he lists  
25 action items from meeting?  
00378:01 A. I do.  
02 Q. The first action item says, quote,  
03 Andy had concern if flow rates are wrong and  
04 are really much higher, close quote.  
05 Did I read that correctly?  
06 A. You did.

Page 378:18 to 378:20

00378:18 Q. Did anyone express a concern to  
19 you that flow rates may be much higher than BP  
20 was predicting internally?

Page 378:23 to 379:09

00378:23           A.     No, not that I recollect.  
24           Q.     Did anyone express concern to you  
25     that flow rates might -- might be much higher  
00379:01     than were being used for purposes of erosion  
02     analysis?  
03           A.     I don't recollect anyone saying  
04     that.  
05           Q.     Did anyone express concern to you  
06     that flow rates might be much higher than were  
07     being used for purposes of measuring orifice  
08     size?  
09           A.     No, I don't recollect that.

Page 380:05 to 380:07

00380:05           Q.     And in exhibit 9500 which was used  
06     yesterday, I'm just going to hand you a copy  
07     of it, which is the 30(b)(6) notice.

Page 380:11 to 380:12

00380:11           Q.     On that last page of that, do you  
12     see the topic 24?

Page 380:14 to 380:14

00380:14           A.     Topic 24.

Page 380:22 to 381:07

00380:22           Q.     And this a topic for which you're  
23     designated to testify as -- on behalf of BP,  
24     correct?  
25           A.     That's correct.  
00381:01           Q.     Can you read that topic to me,  
02     please?  
03           A.     All analyses, calculations,  
04     modeling or estimates by BP, BP's contractors  
05     and/or any entity working under the direction  
06     of BP relating to the effect of erosion on the  
07     rate of flow from the Macondo well.

Page 381:12 to 382:03

00381:12     (Exhibit Number 9541 marked.)  
13           Q.     This is an e-mail chain dated  
14     May 4th, 2010, correct?  
15           A.     That's correct.  
16           Q.     You were cc'ed on the top e-mail

17 from Simon Webster to Trevor Hill, correct?

18 A. I was.

19 Q. In the bottom e-mail from Trevor  
20 Hill he writes, quote, we are endeavoring to  
21 narrow down the range of flow rates coming  
22 from main riser site in order to inform key  
23 decisions over the next few days/week, close  
24 quote.

25 Did I read that correctly?

00382:01 A. You did.

02 Q. What range of flow rates was

03 Mr. Hill referring to?

Page 382:06 to 382:11

00382:06 A. I'm not aware of what range he was  
07 talking about.

08 Q. Did you ask him?

09 A. I did not.

10 Q. What key decisions was Mr. Hill  
11 referring to?

Page 382:14 to 382:25

00382:14 A. I'm not sure what decisions  
15 Mr. Hill was involved in at this time.

16 Q. Did you ask him?

17 A. I did not.

18 Q. In the top e-mail from Mr. Webster  
19 he writes, quote, we are looking at some  
20 options to measure flow rates by listening to  
21 the acoustic noise, close quote.

22 Do you see that?

23 A. I do.

24 Q. Were you involved in that effort?

25 A. Yes, I was.

Page 383:04 to 383:11

00383:04 (Exhibit Number 9542 marked.)

05 Q. This is an e-mail chain dated  
06 May 4th -- sorry. Excuse me. This is an  
07 e-mail chain dated May 6th, 2010, correct?

08 A. That's correct.

09 Q. And the e-mail at the bottom of  
10 this page is from you to Trevor Hill, correct?

11 A. It is.

Page 383:16 to 384:09

00383:16 Q. Okay. You write, quote, we are  
17 working with WHOI to try to measure oil flow  
18 using Doppler sonar.

19                               And what was that effort --  
20 how would that effort be different from using  
21 acoustic noise to measure flow rate?  
22       A.       They are different principles of  
23 investigation. Acoustic noise is a term used  
24 for a method called acoustic emission and  
25 acoustic emission uses effectively a  
00384:01 microphone to listen for a noise and identify  
02 its source. Doppler sonar is a means of  
03 sending in a sound pulse into a region of  
04 differing densities and measuring the  
05 reflections of that sound.  
06       Q.       Okay. I think you talked about  
07 four techniques yesterday. Are these two of  
08 those techniques that you were discussing  
09 yesterday?

Page 384:11 to 384:20

00384:11       A.       I believe I covered both these  
12 techniques in conversation yesterday.  
13       Q.       Thank you. And did WHOI refer to  
14 Woods Hole?  
15       A.       It does.  
16       Q.       So when did these measurements  
17 using Doppler sonar take place?  
18       A.       I'm not aware that they did take  
19 place.  
20       Q.       And why not?

Page 384:23 to 384:24

00384:23       Q.       Let me rephrase. Why didn't they  
24 take place?

Page 385:02 to 386:04

00385:02       A.       I was mobilizing a large number of  
03 inspection technologies including the Woods  
04 Hole one. All scheduled for boat time at or  
05 immediately before this, the intervention that  
06 was called the Cofferdam initiated. That took  
07 the majority of the boat time and ROV time in  
08 the area and we were -- we were then allotted  
09 a limited amount of access time to the BOP.  
10 And I worked with Graham Openshaw to  
11 understand what the Unified Command's  
12 priorities were. We could not deploy all  
13 techniques and I asked them to provide me with  
14 the prioritized list.  
15       Q.       Okay. What was the priority --  
16 what was listed as the top priority in the  
17 prioritized list?

18           A.     The top priority was to understand  
19 if there were any obstructions in the riser  
20 kink and also to investigate the locking bar  
21 on one of the rams of the BOP.

22           Q.     So were efforts to measure flow  
23 rate lower down on the priority list?

24           A.     I don't know the relative position  
25 of any of the techniques in the priority list  
00386:01 with the exception that the number one  
02 priority was to understand the condition of  
03 the kink and the current position of the  
04 locking -- locking bar on BOP ram.

Page 387:01 to 387:01

00387:01 (Exhibit Number 9543 marked.)

Page 387:10 to 387:17

00387:10           Q.     Mr. Hill writes, quote: The  
11 subject remains of high interest to BP and  
12 DOE, close quote.

13                         Correct?

14           A.     Yes.

15           Q.     Why was the subject of possible  
16 erosion of the burst disc holders of interest  
17 to BP?

Page 387:20 to 388:03

00387:20           A.     The interest in Unified Command on  
21 bursting disc condition was that there was an  
22 open question around whether the bursting  
23 discs pressed in the wellbore were intact. If  
24 they were not intact, leakage from the  
25 wellbore into formation rocks outside of the  
00388:01 casing could eventually bypass the well casing  
02 and allow leakage from the well into the  
03 seabed at the -- at the seafloor.

Page 389:10 to 389:17

00389:10           Q.     Why was the subject of interest to  
11 the DOE?

12           A.     The ultimate aim was the permanent  
13 closure of this well. Closure of the well via  
14 the wellhead or BOP, should there be a breach  
15 in the casing, would stop the flow from the  
16 BOP but leave open a potential flow path to  
17 the seabed.

Page 391:03 to 391:06

00391:03 MR. ALDEN: This document ends in  
04 Bates number 06957482. I'd like to mark it as  
05 exhibit 9544.  
06 (Exhibit Number 9544 marked.)

Page 391:09 to 391:18

00391:09 And there's an attachment as  
10 well.  
11 Q. You wrote the cover e-mail to this  
12 attachment, correct?  
13 A. I did.  
14 Q. And it is dated July 12th, 2010,  
15 correct?  
16 A. That's correct.  
17 Q. And at the end of the attachment,  
18 your name is listed, correct?

Page 391:20 to 393:02

00391:20 A. It is.  
21 Q. And it is dated July 12th, 2010,  
22 correct?  
23 A. It is.  
24 Q. Do you recall putting together  
25 this flow regime analysis --  
00392:01 A. I --  
02 Q. -- based on the riser inspection?  
03 A. I do.  
04 Q. Turn to the second page of your  
05 analysis. It ends in 484.  
06 Do you see the paragraph that  
07 begins with jet cutting?  
08 A. Yes.  
09 Q. You write, quote: Jet cutting of  
10 the riser requires high flow velocities from  
11 the drill string which in turn requires high  
12 flow rates through the string. And it goes on  
13 from there. Is that correct?  
14 A. That's correct.  
15 Q. Did you observe jet cutting of the  
16 riser?  
17 A. We observed, at the time, holes  
18 which appeared to line up with holes in the  
19 drill string. And the assumption was that jet  
20 cutting was a possibility.  
21 Q. And when did you observe that?  
22 A. Only once we had recovered the  
23 riser and completed all of the internal  
24 inspections.  
25 Q. What flow rate did you mean when  
00393:01 you said that jet cutting of the riser  
02 required, quote, high flow rates, close quote?

Page 393:04 to 393:07

00393:04           A.     I had no flow rate in mind. It  
05     was just a relative term to say that there had  
06     to be flow through there to create a jet.  
07           Q.     Relative to what?

Page 393:09 to 393:21

00393:09           A.     There had to be sufficient  
10     pressure in flow, particularly pressure to  
11     create a jet. It would -- the -- the flow  
12     rate that required would depend on the opening  
13     on the drill string. And at this point we  
14     could not assess the opening on the drill  
15     string because it was still trapped inside the  
16     kink.  
17           Q.     Based on your observation of the  
18     opening, what did you believe to be the  
19     minimum flow rate that could have caused that  
20     opening?  
21           A.     I --

Page 393:23 to 394:04

00393:23           A.     I made no analysis of flow rates.  
24     I had insufficient information to conduct such  
25     analyses.  
00394:01           Q.     So high flow rates doesn't mean  
02     any specific number to you?  
03           A.     It did not mean any specific  
04     number to me.

Page 395:04 to 395:16

00395:04           Q.     Did you send this analysis to the  
05     U.S. Government?  
06           A.     I sent this analysis to the  
07     incident team.  
08           Q.     Who did you send it to  
09     specifically on the incident team?  
10           A.     I believe this will have gone back  
11     to Julian Austin and Trevor Hill.  
12           Q.     You believe or you know?  
13           A.     I can't recollect who it went back  
14     to.  
15           Q.     Is there anyone who you can  
16     recollect it was actually sent to?

Page 395:19 to 395:24

00395:19 A. Certainly to Simon Webster.  
20 Q. Anyone else?  
21 A. I can't recollect.  
22 Q. So you don't know for sure that  
23 this was sent to anyone other than Simon  
24 Webster, correct?

Page 396:02 to 397:08

00396:02 A. I can't recollect who this was  
03 sent to.  
04 Q. Did you have any communications  
05 with the United States about this analysis?  
06 A. I -- my communications at the time  
07 were all -- all through individuals associated  
08 with the incident response.  
09 Q. Which in -- sorry.  
10 A. Which included members of the  
11 science team put forward by the United States  
12 Government.  
13 Q. Which members of the science team?  
14 A. Multiple members of the science  
15 team. I can recollect some names.  
16 Q. Which ones are those?  
17 A. Certainly Mr. Andy Bowen at Woods  
18 Hole.  
19 Q. I'm sorry. Andy?  
20 A. Bowen. Bowen. B-o-w-e-n.  
21 I think it was Scott Watson  
22 at Los Alamos National Laboratory. Mr. Roger  
23 Hartman at Sandia. Marcia McNutt, I think.  
24 I'm not sure if she was Los Alamos or Sandia.  
25 And -- and a number of others that I was on a  
00397:01 -- an e-mail chain with and on telephone  
02 communications with.  
03 Q. Okay. Let's go down this list  
04 quickly. Andy Bowen, you said he was at Woods  
05 Hole, correct?  
06 A. That's correct.  
07 Q. Do you remember talking to  
08 Mr. Bowen about this analysis?

Page 397:10 to 397:23

00397:10 A. I don't remember talking with  
11 anyone specifically around this analysis.  
12 Q. Do you remember speaking with  
13 Scott Watson about this analysis?  
14 A. I don't recollect speaking to  
15 anyone about this analysis.  
16 Q. Do you recall speaking to Roger  
17 Hartman about this analysis?  
18 A. I don't recollect speaking to  
19 anyone about this analysis.



20 Q. Do you recall speaking to Marcia  
21 McNutt about this analysis?  
22 A. I don't recollect speaking to  
23 anyone about this analysis.

Page 398:03 to 398:03

00398:03 (Exhibit Number 9545 marked.)

Page 398:08 to 398:21

00398:08 Q. The subject line of this e-mail  
09 from Cindy Yeilding, dated September 23rd,  
10 2010, reads, quote: Updated: Flow rate team,  
11 close quote.  
12 Correct?  
13 A. That is correct.  
14 Q. You are one of the recipients of  
15 this e-mail, correct?  
16 A. That is correct.  
17 Q. And it appears to be setting up a  
18 conference call, correct?  
19 A. That is correct.  
20 Q. Were you on a flow rate team in  
21 September 2010?

Page 398:25 to 399:09

00398:25 A. This was a teleconference of  
00399:01 individuals who were participating in a  
02 privileged process.  
03 Q. When was this team set up?  
04 A. I cannot recollect the exact date  
05 but I believe it was around either late August  
06 or early September.  
07 Q. Are the other recipients listed  
08 the members of the team?  
09 A. I believe that they are.

Page 400:13 to 400:15

00400:13 Q. Oh, sorry. Erosion -- earlier you  
14 told us that erosion made the top kill doomed  
15 to failure, correct, erosion in the riser?

Page 400:18 to 400:25

00400:18 A. I believe what I said was that  
19 the -- in my view, the then-current condition  
20 of the inside of the kinked riser was such  
21 that I did not believe it would hold the flow  
22 of mud kill.

23 Q. So the then-current condition is  
24 as the riser was at the time of the top kill,  
25 or later?

Page 401:04 to 401:06

00401:04 A. The condition of the riser that I  
05 refer to was the as-recovered riser post a  
06 number of interventions.

Page 402:11 to 403:23

00402:11 Q. Okay. Do you as a corporate  
12 representative for BP or in your personal  
13 capacity have any criticism about anything  
14 Halliburton did, or perhaps failed to do, in  
15 the relief efforts after April 20th of 2010?  
16 A. I am not aware of what efforts or  
17 otherwise Halliburton made and -- and,  
18 therefore, I have no criticism.  
19 Q. Did you ever hear anyone else  
20 offering any kind of criticism of Halliburton  
21 in connection with the relief efforts?  
22 A. During the relief efforts, all  
23 conversations that I recollect were centered  
24 on closing the well.  
25 Q. Okay. And then just to be clear,  
00403:01 when I was asking if you'd ever heard of any  
02 criticisms of Halliburton in connection with  
03 the relief efforts, had you ever heard any  
04 such -- have you ever heard such criticisms at  
05 any time, whether during the relief efforts or  
06 to the present moment?  
07 A. I have -- I have no recollection  
08 of any criticisms of any participants in the  
09 relief effort.  
10 Q. Okay. Were you aware of any  
11 representative of Halliburton that was a  
12 member of the UAC team?  
13 A. I don't know.  
14 Q. Okay. And do you recall anyone  
15 associated with Halliburton offering any  
16 advice in connection with the relief efforts?  
17 A. I don't know.  
18 Q. Okay. I'd like to direct your  
19 attention back to exhibit 9534. This is the  
20 e-mail that you wrote in which you said that  
21 the top kill is, quote, doomed to failure.  
22 A. Can I have a copy?  
23 Q. Yeah, sure.

Page 404:04 to 404:08

00404:04           Q.       And I think a moment ago you  
05 testified you cannot answer whether any  
06 intervention would or would not have  
07 succeeded.  
08                       Do you recall that testimony?

Page 404:10 to 404:17

00404:10           A.       I recollect commenting that on the  
11 condition of the riser, as recovered, I did  
12 not believe that that intervention could have  
13 succeeded.  
14           Q.       And, in fact, you reached the  
15 conclusion that it was doomed to failure,  
16 right?  
17           A.       Based --

Page 404:19 to 404:24

00404:19           A.       My comment relate to the condition  
20 of the riser as recovered.  
21           Q.       And what was it about the  
22 condition of the riser as recovered that led  
23 you to conclude that the relief -- that the  
24 relief effort was doomed to failure?

Page 405:02 to 405:25

00405:02           A.       My analysis of the riser indicated  
03 that there was evidence of significant erosion  
04 and that in its recovered state, that riser,  
05 in my view, would not provide sufficient back  
06 pressure.  
07           Q.       Okay. So when you referred to the  
08 then-current condition of the riser, you're  
09 referring to the significant erosion of the  
10 riser; is that accurate?  
11           A.       I'm referring to the condition of  
12 the riser as recovered, which exhibited  
13 considerable erosion within the body of it.  
14           Q.       Okay. So you recover the riser,  
15 you observe significant erosion, correct?  
16           A.       That is correct.  
17           Q.       Was there anything else other than  
18 the significant erosion that caused you to  
19 conclude that the top kill effort was doomed  
20 to failure?  
21           A.       No.  
22           Q.       Okay. So is it possible that if  
23 the top kill effort had been executed prior to  
24 the erosion of the riser, that it could have  
25 succeeded?

Page 406:03 to 406:10

00406:03           A.     I'm not in a position to answer  
04     that because I did not know, prior to recovery  
05     of the riser, the condition at any point in  
06     time of that riser.  
07           Q.     But knowing what you know now, is  
08     it possible that the top kill effort would  
09     have succeeded had there not been a  
10     significant erosion in the riser?

Page 406:13 to 406:24

00406:13           A.     At the point of writing this, the  
14     only information I had available was the  
15     condition of the riser. I had no information  
16     on any other part of the system so I based my  
17     assumptions, or my comments, on the condition  
18     of the riser only.  
19           Q.     I'm not sure I'm understanding  
20     you. I'm asking you, as you sit here today,  
21     to explain to me whether you believe that if  
22     the top kill had been executed prior to the  
23     significant erosion, included doing that  
24     effort, that it might have succeeded?

Page 407:02 to 407:16

00407:02           A.     If the only obstruction to flow in  
03     this system was the riser, then my belief  
04     that -- in the condition the riser was  
05     recovered, it could not have stopped the flow  
06     of the mud from the system. That there were  
07     other restrictions to flow became apparent on  
08     recovery of the BOP and, therefore, any  
09     analysis that would be done would have to take  
10     into account the condition of the BOP. And I  
11     have not conducted that analysis.  
12           Q.     Sure.  
13                    But it is your current belief  
14     that the significant erosion in the riser was  
15     a significant reason why the top kill was  
16     doomed to failure?

Page 407:19 to 408:04

00407:19           A.     My belief at the time of writing  
20     this memorandum is based on the condition of  
21     the kinked riser, which was the only piece of  
22     equipment in the riser stack that I had  
23     information on.  
24           Q.     And you find the existence of  
25     significant erosion to be significant because

00408:01 that was the basis for your conclusion that  
02 the top kill was, in your words, doomed to  
03 failure, right?  
04 A. I --

Page 408:06 to 408:18

00408:06 A. I found at the time, given the  
07 information that was available to me, that my  
08 view was the damage to the riser, if it alone  
09 was the restriction to flow, its condition was  
10 not conducive to allow any top kill to  
11 succeed.  
12 Q. Well, and not only was it not  
13 conducive, but in your own words, it was  
14 doomed to failure, right?  
15 A. Those are words I used.  
16 Q. Okay. Let me direct your  
17 attention back to a previously marked exhibit,  
18 9505, and I've got a copy of that for you.

Page 416:13 to 417:13

00416:13 During the course of the last  
14 two days you've been asked several questions  
15 about an e-mail exchange you had with Trevor  
16 Hill regarding top kill.  
17 Do you recall that?  
18 A. I do.  
19 Q. And can you explain what, if any,  
20 role that you had with the top kill operation  
21 at the time that it was being performed?  
22 A. I had no direct involvement in the  
23 top kill intervention.  
24 Q. Were you involved in evaluating  
25 the factors to evaluate whether top kill would  
00417:01 be successful?  
02 A. I was not.  
03 Q. Did anyone ask you to provide any  
04 direct input as to the factor that would be  
05 important to assess the success of top kill?  
06 A. They did not.  
07 Q. Now, you were asked questions with  
08 regard to an e-mail that you exchanged with  
09 Trevor Hill relating to top kill, correct?  
10 A. I was.  
11 Q. And this related to an evaluation  
12 that you did of top kill based on new  
13 information; is that correct?

Page 417:15 to 418:05

00417:15 A. It was.

16 Q. How long after the top kill  
17 operation did you prepare this e-mail?

18 A. The -- the e-mail was prepared  
19 after the riser was recovered and we were  
20 given access to do physical inspection, which  
21 was in early July, around about the -- I think  
22 around the -- the -- the 10th, the 11th of  
23 July, was the last piece of information. I  
24 don't recollect the exact dates in which top  
25 kill was actually executed. I believe it was  
00418:01 May, towards the end of May.

02 Q. What information did you have  
03 available to you at the time you prepared this  
04 e-mail in July 2010 that would not have been  
05 available to the response team?

Page 418:07 to 418:15

00418:07 A. The information that I refer to in  
08 my note was the information from the physical  
09 inspections of the recovered riser. And we  
10 were granted access to that riser on behalf of  
11 the incident team three times.

12 Q. Access to the riser once it was  
13 recovered was not something that was available  
14 to the response team at the time they  
15 implemented top kill, correct?

Page 418:18 to 419:01

00418:18 A. The condition of the riser at  
19 in situ was unknown and it was only  
20 post-recovery and inspection that we got  
21 access to the condition of that riser.

22 Q. In your evaluation regarding the  
23 top kill procedure that was performed in  
24 July 2010, did you evaluate the impact that  
25 the BOP could have had on the top kill  
00419:01 procedure?

Page 419:03 to 419:07

00419:03 A. I did not.

04 Q. And you were aware of what, if  
05 any, impact the restrictions across the B --  
06 BOP could have had with respect to the top  
07 kill procedure?

Page 419:09 to 422:02

00419:09 A. I was not.

10 Q. In preparation for your  
11 deposition, Mr. Knox, did you talk with

12 Mr. Julian Austin?  
13 A. I did.  
14 Q. And did you speak to Mr. Austin  
15 regarding the work that he did -- that he did  
16 evaluating the kinked riser?  
17 A. I did.  
18 Q. And did the conversation you have  
19 with Mr. Austin include a discussion about the  
20 work that he did relating to the kinked riser  
21 prior to May 3rd?  
22 A. Yes, it did.  
23 Q. And did you review any documents  
24 that were prepared by Mr. Austin and others  
25 relating to their work regarding the kinked  
00420:01 riser prior to May 3rd?  
02 A. I have.  
03 Q. And I'd like to show you what has  
04 previously been marked as exhibit 9506. If  
05 you can, review that document for me.  
06 Exhibit 9506 was a document that you reviewed  
07 yesterday during the deposition, correct?  
08 A. That's correct.  
09 Q. And you were asked questions about  
10 9506; is that right?  
11 A. I was.  
12 Q. And 95 -- exhibit 9506 has a cover  
13 e-mail between Julian Austin, Gordon Birrell,  
14 and Paul Tooms, correct?  
15 A. That's correct.  
16 Q. And it's dated April 25th, 2010;  
17 is that right?  
18 A. That's correct.  
19 Q. And the attachment -- there's an  
20 attachment to exhibit 9506, correct?  
21 A. That is correct.  
22 Q. And it has a title, Estimate of  
23 Erosion Rates for Kinked Riser?  
24 A. That is correct.  
25 Q. The -- and you were asked  
00421:01 questions about the attachments to  
02 exhibit 9506 yesterday, correct?  
03 A. I was.  
04 Q. I'd like to draw your attention to  
05 the bottom part of the page that has the  
06 heading Conclusion.  
07 Do you see that?  
08 A. I do.  
09 Q. And you were asked some questions  
10 about the conclusion yesterday.  
11 Do you recall that?  
12 A. I recall answering questions about  
13 this. I can't remember the specific  
14 questions.  
15 Q. And this relates to a conclusion  
16 that was drawn based on Julian Austin's

17 analysis; is that right?  
18 A. Yes.  
19 Q. Are you aware of the assumptions  
20 that Julian Austin made in drawing this  
21 conclusion?  
22 A. In discussion with Mr. Austin, I  
23 am.  
24 Q. And was there information obtained  
25 after Julian Austin prepared this document  
00422:01 that indicates -- that indicated his  
02 assumptions were incorrect?

Page 422:04 to 422:24

00422:04 A. Yes. Yes, there was.  
05 Q. And what information was obtained?  
06 A. Initially on the 28th of April,  
07 holes appeared at the outside of the riser  
08 which immediately raised questions in  
09 Mr. Austin's mind, and -- and others, about  
10 the assumption that the riser was, in fact,  
11 empty.  
12 This was then confirmed  
13 sometime in mid-May via radiography of the  
14 kinked riser, which confirmed at least one  
15 piece of drill string present in the kinked  
16 riser. And then eventually, when the riser  
17 was removed from the BOP stack, video footage  
18 of that process indicated there were two  
19 pieces of drill string in the kinked riser.  
20 Q. You discussed the appearance of  
21 erosion holes on April 28th. What impact did  
22 the appearance of those erosion holes have on  
23 the conclusion that Julian Austin reached in  
24 this document?

Page 423:01 to 423:09

00423:01 A. Mr. Austin had asked for  
02 calculations of erosion rates based on a free  
03 unobstructed cross-section area based on a  
04 number of models he had applied to determine  
05 that cross-sectional area.  
06 Q. And what did the appearance of the  
07 erosion holes on April 25th -- 28 indicate as  
08 to whether or not the kinked riser was free  
09 and unobstructed?

Page 423:11 to 423:18

00423:11 A. The view at the time was that the  
12 predicted erosion rates as a function of the  
13 cross-sectional area of an unobstructed kink



14 meant that erosion could not occur. The --  
15 the presence of erosion suggested that there  
16 had to be something wrong with that assumption  
17 and that, you know, part, if not a significant  
18 part, of the riser was occluded.

Page 423:21 to 423:24

00423:21 If you can, turn to the  
22 binder that's opened in front of you and  
23 tab 183 of the government's binder, and this  
24 has been previously marked as exhibit 6201.

Page 424:12 to 425:02

00424:12 Q. And if I can turn your attention  
13 to the page with the last three digits 221.  
14 And you were -- I'd like to draw your  
15 attention to the section of that page that  
16 begins, an absolute worst case flow rate.  
17 Do you see that?  
18 A. I do.  
19 Q. And underneath that is a bullet  
20 point that reads, BOP is in place and may be  
21 partially activated.  
22 Did I read that correctly?  
23 A. You did.  
24 Q. And what, if any, information did  
25 the response team have at this point in time  
00425:01 that indicated that the BOP may be partially  
02 activated?

Page 425:05 to 428:05

00425:05 A. Can I have a date for the  
06 document?  
07 Q. And let me clarify. The date on  
08 the cover e-mail is May 19th.  
09 A. Yep. I was just checking that.  
10 By May 19th, there were a  
11 number of pieces of information available.  
12 The first piece that I recollect was the early  
13 attempts of ROV intervention on the BOP where  
14 I believe attempts were made to activate or  
15 move a number of the rams.  
16 The second piece of  
17 information was part of a workflow that I was  
18 asked to conduct, which was investigation of  
19 the condition or position of one of those  
20 rams, which was done by radiography of the  
21 locking pin on the back of one of the rams.  
22 Q. Why would radiography of the  
23 locking pin indicate whether the BOP may be

24 partially activated?

25 A. The activation of the ram requires  
00426:01 hydraulic fluid which pushes against a plunger  
02 moving the ram into a closed position. Once  
03 that happens, there is a -- a separate  
04 hydraulically-activated pin which can slide  
05 behind the piston and lock the ram in  
06 position. If the locking pin is in the closed  
07 position, then the ram has had to have moved  
08 forward out of its housing and into the bore  
09 of the BOP.

10 Q. Are you aware of the results of  
11 the radiography that was performed relating to  
12 the locking pin of the DEEPWATER HORIZON BOP?

13 A. I am.

14 Q. And what were those results?

15 A. The -- the radiography confirmed  
16 that the locking pin was in its locked  
17 position and that therefore, the ram had moved  
18 forward into the path of the flowing liquid in  
19 the BOP annulus.

20 Q. Is the ram that you're referring  
21 to the blind shear rams?

22 A. I believe it is.

23 Q. Mr. Knox, let me hand you a  
24 document that we'll mark as deposition  
25 exhibit 9546.

00427:01 (Exhibit Number 9546 marked.)

02 Q. If you can, review that document  
03 for me. And for the record, this has  
04 previously been identified as  
05 BP-HZN-2179MDL06120906 through 25.

06 A. Are you familiar with  
07 deposition exhibit 9546?

08 A. I am.

09 Q. And what is deposition  
10 exhibit 9546?

11 A. It's a document discussing BOP ram  
12 position as determined by density and  
13 radiographic inspection.

14 Q. Was this a document that you  
15 received as a member or as an individual who  
16 was involved in the response effort?

17 A. It is.

18 Q. And who prepared deposition  
19 exhibit 9546?

20 A. I believe it was Mrs. Cathy  
21 Hyde-Barber.

22 Q. And who does Ms. Hyde-Barber work  
23 for?

24 A. I'm not sure. I believe it is one  
25 of the National Labs, but I -- I never really  
00428:01 knew.

02 Q. Were the government scientists  
03 that you interacted with during the response

04 effort aware of the radiography that was being  
05 performed on the locking pin?

Page 428:07 to 428:15

00428:07 A. The team that I mobilized into the  
08 field to do this included representatives from  
09 Los Alamos and, I believe, Sandia and Lawrence  
10 Livermore, but I'm not sure if they were on  
11 the boat, but they were exposed to the  
12 information.  
13 Q. Were the government scientists  
14 aware of the results of the radiography?  
15 A. They were, and --

Page 428:17 to 428:20

00428:17 A. They were aware of it. They  
18 participated in the gathering of that data,  
19 and the data was reviewed and reported on by  
20 Los Alamos National Laboratory.

Page 429:01 to 429:11

00429:01 Q. On what basis were you aware that  
02 the government scientists knew of the  
03 radiography that was being performed and the  
04 results of it?  
05 A. I had daily conversations with  
06 said scientists and my team, discussing the  
07 procedures and analysis of the radiography. I  
08 had live conversations with them by  
09 teleconference as they were on the boat,  
10 discussing procedures as -- as they were  
11 executed.

Page 429:18 to 430:21

00429:18 Q. On what date was the report  
19 prepared that's deposition exhibit 9546?  
20 A. May 17th.  
21 Q. And did you receive the report on  
22 or around that day?  
23 A. I don't recollect the date and  
24 time that I received it, but I believe I  
25 received it very soon after the -- what was  
00430:01 completed.  
02 Q. And if you can, turn to the -- the  
03 second page of the report. And it has the  
04 last three digits of 908 in the Bates number.  
05 Do you see that?  
06 A. I do.  
07 Q. And if you can, turn to the fourth

08 paragraph on that page. It reads, the  
09 acquired data sent was reviewed by the data  
10 acquisition team, which included scientists  
11 from Los Alamos, Sandia, and Lawrence  
12 Livermore National Laboratory, BP technical  
13 representatives, Cameron representatives, and  
14 specialized representatives from critical  
15 other companies.

16 Did I read that correctly?

17 A. You did.

18 Q. And is that an indication of the  
19 individuals who received the results of the  
20 radiography at that time?

21 A. I believe it is.

Page 431:04 to 432:21

00431:04 Q. The next statement reads, due to  
05 the importance of the information, independent  
06 processing and validation of the raw  
07 radiographic data was performed by both  
08 Los Alamos and GE.

09 Did I read that correctly?

10 A. You did.

11 Q. And are you aware of independent  
12 processing that was performed by Los Alamos  
13 relating to radiography?

14 A. I am.

15 Q. And can you explain what that was?

16 A. The -- the initial analysis that  
17 was done by the team on the -- on the boat was  
18 a visual examination of the recovered  
19 radiograph. So the radiographs were  
20 generically an x-ray picture, and visual  
21 indication suggested that the ram was in  
22 place.

23 Further electronic processing  
24 of the recovered images was done using  
25 conventional radiographic filtering  
00432:01 techniques, and these were conducted by  
02 Los Alamos and by GE, who had provided us with  
03 some of the radiographic equipment and data  
04 processing equipment that were used onboard.

05 Q. The next section of the report  
06 reads, the following conclusions have been  
07 reached based upon the interpretation supplied  
08 by the data acquisition team and independent  
09 validation.

10 Did I read that correctly?

11 A. You did.

12 Q. And the first bullet point under  
13 that statement reads, the radiographic data  
14 indicates that the wedge lock appears to be  
15 present within the east side bonnet of the  
16 blind shear rams. As such, the ram is

17 believed to be closed.  
18 Did I read that correctly?  
19 A. You did.  
20 Q. And can you explain what was meant  
21 by that statement?

Page 432:23 to 433:09

00432:23 A. As I answered before, the -- the  
24 configuration of the rams in the system  
25 allowed for hydraulic pressure to move rams  
00433:01 into position, and once in position, a  
02 separate hydraulic system activated a locking  
03 bolt to prevent those rams from returning to  
04 an open position.  
05 The presence of the locking  
06 bolt or wedge in the locked position meant  
07 that the ram had now closed and could not open  
08 unless hydraulic pressure was applied to  
09 physically open the rams.

Page 433:24 to 434:06

00433:24 Throughout the response, you  
25 were a BP employee, correct?  
00434:01 A. I was.  
02 Q. Okay. And you were never  
03 personally a member of the incident  
04 commanded -- or -- I'm sorry -- the Unified  
05 Command?  
06 A. No.

Page 434:12 to 435:17

00434:12 Q. Okay. And you don't have any  
13 personal knowledge of the work that Mr. Austin  
14 did relating to the kink in the riser, do you?  
15 A. Only in preparation and  
16 discussion.  
17 Q. And when you say preparation and  
18 discussion --  
19 A. Preparation for the deposition --  
20 Q. Okay.  
21 A. -- and discussions with Mr.  
22 Austin.  
23 Q. Okay. And those discussions all  
24 came within the last two weeks or so, I  
25 believe you said, last -- yesterday?  
00435:01 A. On those specific documents and  
02 workflows, yes.  
03 Q. Okay. And aside from that, you  
04 don't have any personal knowledge about the  
05 work that Mr. Austin did relating to the

06 kinked riser during the response?  
07 A. Throughout the response, I was  
08 aware of some of the work that was being done.  
09 Prior to participating directly, I was aware  
10 that a member of my team was working with  
11 Mr. Austin and his team, but I was not -- I  
12 did not participate in that workflow.  
13 Q. Okay. And so you don't have  
14 any -- at the time, you didn't have any  
15 further knowledge about the details of that  
16 work?  
17 A. I did not.

Page 436:01 to 437:14

00436:01 (Exhibit Number 9547 marked.)  
02 Q. If you could take a look at that  
03 and let me know if you've seen this document  
04 before.  
05 Okay. Mr. Knox, have you  
06 seen this document before?  
07 A. I don't recollect seeing this  
08 document before.  
09 Q. Okay. Let me ask you to turn to  
10 the fourth page, which is a list of names.  
11 And at the top -- at the top of that page it  
12 says, present in the review, 25 June 2010.  
13 Do you see that?  
14 A. I do.  
15 Q. And there's a bunch of folks from  
16 BP, two individuals from USGS -- do you  
17 understand that to be a government agency?  
18 A. I do.  
19 Q. Okay. And then Sheldon Tieszen  
20 from Sandia, which is part of DOE. Do you  
21 know that?  
22 A. I believe Sandia is part of DOE.  
23 Q. Okay. And what -- are you aware  
24 of what the meeting is that this group of  
25 people was kept together for?  
00437:01 A. I'm not.  
02 Q. Okay. If we look at the first  
03 page, there's a series of slides and it's a  
04 presentation from Trevor Hill dated July --  
05 I'm sorry, June 11th, 2010. Do you see that?  
06 A. I do.  
07 Q. Okay. And the title of the  
08 presentation is development of understanding  
09 of pressure flow behavior in the MC252 system.  
10 Do you see that?  
11 A. I do.  
12 Q. Okay. And it looks -- so it looks  
13 like this is a presentation that was made at  
14 the review meeting on -- on June 25th?

Page 437:16 to 438:16

00437:16           A.     It appears so.  
           17           Q.     And if we look at in the middle  
           18 row of slides, there's a -- a heading  
           19 measurement of two phase flow.  
           20                   Do you see that?  
           21           A.     I do.  
           22           Q.     And can you read that slide to  
           23 yourself.  
           24                   And it's talk -- this -- it  
           25 looks like this slide is talking about the  
 00438:01 possibility of getting some kind of meter or  
           02 other device to measure the two phase flow  
           03 coming out of the MC252 well; is that right?  
           04           A.     That's correct.  
           05           Q.     Okay. And that wasn't, in fact,  
           06 done, was it?  
           07           A.     Not to the best of my knowledge.  
           08           Q.     Okay. And it says here: This is  
           09 deemed of lower priority than collection or  
           10 containment efforts, especially when  
           11 collection efforts will also provide a direct  
           12 measurement of flow rate.  
           13                   Do you see that?  
           14           A.     I do.  
           15           Q.     Do you know why that decision was  
           16 made?

Page 438:20 to 438:20

00438:20           A.     I do not.

Page 439:01 to 439:05

00439:01           Q.     Let me ask you to turn -- or look  
           02 down to the last slide on this page under the  
           03 heading proportional change in flow rate.  
           04                   Do you see that?  
           05           A.     I do.

Page 439:17 to 439:20

00439:17           Q.     Okay. And what Mr. Hill is saying  
           18 here is that there's a -- a relationship  
           19 between the flowing -- the wellhead flowing  
           20 pressure and the flow rate; is that right?

Page 439:22 to 440:05

00439:22           A.     I believe that is what he's  
           23 saying.

24 Q. Okay. And so he's saying, based  
25 on that, the company can make decisions on  
00440:01 remediation based on the resulting  
02 proportional change in flow rate given by the  
03 predicted change in wellhead flowing pressure  
04 without being dependent on knowledge of the  
05 absolute flow rate; is that right?

Page 440:07 to 441:12

00440:07 A. That is what is said on here.  
08 Q. Okay. Let -- let me ask you to  
09 turn to the next page. And can I ask you to  
10 look at the slide in the middle line with the  
11 heading percent flow rate increase on riser  
12 removal? Do you see that?  
13 A. Yes, I do.  
14 Q. If you can read that to yourself.  
15 A. I have read that.  
16 Q. Okay. And this is an application  
17 of the principle that we talked about a second  
18 ago, where there's a relationship between  
19 wellhead flowing pressure and flow rate,  
20 correct?  
21 A. This talks about the kink  
22 pressure, as opposed to the wellhead pressure.  
23 Q. Okay. Well, he says: On cutting  
24 the riser downstream of the kink, the wellhead  
25 flowing pressure dropped by about 50 psi.  
00441:01 Correct?  
02 A. Yes. Sorry.  
03 Q. And then he says: On cutting the  
04 riser immediately upstream of the riser kink,  
05 the wellhead flowing pressure dropped by a --  
06 a further 100 psi.  
07 Correct?  
08 A. Yes.  
09 Q. Okay. And so Mr. Hill is looking  
10 at those changes in wellhead flowing pressure  
11 and drawing a conclusion about the flow rate,  
12 correct?

Page 441:14 to 441:21

00441:14 A. It appears he is.  
15 Q. Okay.  
16 A. Yes.  
17 Q. And the conclusion that he drew  
18 based on that change in wellhead flowing  
19 pressure is that cutting off the riser would  
20 result in a proportional flow rate increase of  
21 two to five percent; is that correct?



Page 441:23 to 441:25

00441:23 A. That is what he said on this line.  
24 Q. Do you have any reason to believe  
25 that's not correct?

Page 442:02 to 442:14

00442:02 A. I'm not an expert on flow rates  
03 but that is consistent with the model that  
04 Mr. Hill has laid out.  
05 Q. So that's a no, you -- you don't  
06 have anything else that's contrary to this  
07 information?  
08 A. I have nothing contrary to this  
09 information.  
10 Q. Okay. And that would be  
11 consistent with the idea that you're  
12 removing -- by cutting off the riser, you're  
13 removing a relatively small restriction and so  
14 you get a relatively small increase in flow?

Page 442:17 to 442:23

00442:17 A. I would say that by removing an  
18 obstruction to flow, the flow rate increases.  
19 Q. Okay. And Mr. Hill here has  
20 quantified the proportional increase in flow  
21 as a result of this particular restriction,  
22 being the riser?  
23 A. I believe he --

Page 442:25 to 442:25

00442:25 A. I believe he has.