MONTARA COMMISSION OF INQUIRY

Held at Level 1, 51 Allara Street,
Canberra, ACT

Before The Commissioner, Mr David Borthwick AO

On Tuesday, 23 March 2010 at 9.30am

(Day 7)

<LINDSAY SCOTT WISHART, on former oath: [9.30am]

MR HOWE: Just before I resume questioning Mr Wishart, may I indicate the proposed course of the further hearings of the Inquiry for the assistance of legal representatives and their clients.

As things presently stand, it is unlikely that all of the witnesses will be completed by this week, and we will need to go into next week and perhaps the week following. Noting, of course, that it is Easter at the end of next week, it is proposed that the Inquiry would adjourn on Wednesday afternoon of next week and not resume until the Wednesday of the following week. The reason for that is to enable legal representatives and their clients to use the Thursday before Easter and the Tuesday after Easter for travelling so that they are not required to give up public holidays for the purposes of attending the Inquiry.

We hope that that course commends itself to everyone and doesn't present undue difficulty. There seems to be some warm reception to that proposal, judging by the expressions of those to my left.

In any event, if there is some particular difficulty, that could be raised with Mr Berger in the first instance.

<EXAMINATION BY MR HOWE CONTINUING:

MR HOWE: Q. Mr Wishart, could we resume going through your statutory declaration, please. I want to take you to subparagraph (s) on page 13 of your declaration. There you refer to different regimes of batch drilling and sequential drilling. Do you see that?
A. I do.

Q. You conclude by saying:

... it is generally accepted that the advantages of batch drilling outweigh the disadvantages and batch drilling is preferred to sequential drilling ...

Do you see that?
A. Correct, yes.

Q. As I understand it, the reason is that batch drilling

1 does give rise to some efficiencies in relation to
2 deployment of rig, equipment and personnel and the like; is
3 that right?
4 A. Correct, yes.
5
6 Q. Would you agree, though, that batch drilling can
7 itself give rise to well control issues?
8 A. No, I don't agree with that.
9
10 Q. Do you agree, for instance, that if you are going to
11 take the derrick from one rig to another in order to do
12 batch drilling --
13 A. One well?
14
15 Q. Yes.
16 A. From one well to another?
17
18 Q. Yes. That gives rise to a need to ensure that you
19 have well integrity in the well that you have just left in
20 order to go and do batch drilling on other wells; that's
21 right, isn't it?
22 A. Correct.
23
24 Q. I'm not suggesting that the well control issues are
25 insoluble, but you will agree with me that batch drilling
26 does give rise to the need to ensure that you have well
27 integrity in place at all times?
28 A. Yes, I agree with that.
29
30 Q. In the next subparagraph, you refer to offline work as
31 being part of well control operations:
32
33 *That work is undertaken while the drilling*
34 *rig is positioned over some other well.*
35
36 Do you see that?
37 A. I do.
38
39 Q. Would you agree, sir, that if offline work involves an
40 important matter, such as the installation of a barrier in
41 a well, there should be some system that is in place which
42 ensures the capture of relevant information about that
43 offline activity?
44 A. Yes, I agree with that.
45
46 Q. Going next to paragraphs 67 and 68 of your statutory
47 declaration, you refer there to the slurry design in

1 connection with the cementing of the casing shoe. Do you
2 see that?
3 A. I do.
4
5 Q. In paragraph 67, you say that the slurry was designed
6 to:
7
8 *... inhibit the formation of gas channels*
9 *across the reservoir interval ...*
10
11 Do you see that?
12 A. I do.
13
14 Q. In paragraph 68, you say:
15
16 *The objective was to use the higher density*
17 *tail cement slurry in the reservoir ...*
18
19 Do you see that?
20 A. I do, yes.
21
22 Q. I take it that it was intended, when the cement was
23 introduced, that you would have top of tail cement well
24 above the top of the reservoir; is that right?
25 A. That is what I believe, yes.
26
27 Q. As I understand it, the objective in relation to this
28 particular casing shoe was to achieve a vertical height
29 above top of reservoir of some 69 metres; does that accord
30 with your recollection?
31 A. Yes, but I don't go into the design of the cement
32 slurries.
33
34 Q. Yes. I'm not suggesting otherwise, sir.
35 A. Okay.
36
37 Q. However, if, in fact, contrary to the objective that
38 I have just stated, the top of tail cement reached a height
39 61 metres below top of reservoir, would you agree that that
40 can give rise to the formation of gas channels, as referred
41 to in paragraph 67 of your declaration?
42 A. I can't comment on that.
43
44 Q. You can't comment?
45 A. No.
46
47 Q. Could I take you next, please, sir, to paragraph 102

1 of your statutory declaration. You refer there to a rule
2 of thumb when pumping cement. Do you see that?
3 A. Yes, I do.
4
5 Q. I'm not suggesting, sir, that that rule of thumb is
6 applicable in this scenario, because here the plugs did
7 apparently bump at the exact correct point.
8 A. Correct.
9
10 Q. Is that your understanding?
11 A. Yes.
12
13 Q. But, nonetheless, the rule of thumb recognises, does
14 it not, the importance of not overdisplacing cement from
15 beneath the float collar?
16 A. Correct.
17
18 Q. Because, otherwise, you can have a wet shoe?
19 A. Correct.
20
21 Q. And you don't want that?
22 A. Not at all.
23
24 Q. A wet shoe couldn't count as a tested, verified
25 permanent barrier, could it?
26 A. No, not at all.
27
28 Q. May I then take you to paragraph 105 of your
29 declaration. You refer there to a cemented casing, tested
30 by way of a pressure test, being considered a permanent
31 barrier as per section 5 of the well construction
32 standards; do you see that?
33 A. Yes, I do.
34
35 Q. I take it that you are referring there to a pressure
36 test which is completed and resolved and gives rise to no
37 problem or issue whatsoever?
38 A. Correct.
39
40 Q. Could I take you to paragraph 107 of your declaration,
41 sir, where you quote from the West Atlas Operations
42 Procedures Manual. Do you see that?
43 A. I do, yes.
44
45 Q. Are you aware of any other document that was in place
46 that was part of the well control management framework that
47 expressly dealt with the contingency of float failure?

A. No, I wasn't, no.

Q. This is the only one you were aware of?
A. Yes.

Q. Were you aware of this particular document and its content in relation to float failure back in March last year, or was it something you came to be aware of in the course of preparing your declaration?
A. I can't honestly answer that. Where I read it or what time frame I read it, I don't know.

Q. All right. Well, you will see that you set out paragraph 16 from the procedures manual. I wonder if you could just interpret that and explain that in your own words to the Commissioner?
A. Sorry, could you ask the question again?

Q. Yes. I'm just asking if you could interpret and explain paragraph 16 of the operations procedures manual to the Commissioner?
A. Okay. Commissioner, after the cement is set and positioned and the plugs are bumped, the casing is pressure tested up to the required value. Once the time frame for that test is achieved, the residual pressure is then bled off. Once it is bled down to zero, from the cement unit you monitor how much return volume you get as opposed to how much you have pumped to obtain that pressure. Once you have bled off the cement unit and all is good, I go to the rig floor, close the valve on the cement head, knock the hose off downstream of the valve and then slowly open the valve to check to see that there is no additional backflow coming from the casing.

Q. You will see that paragraph 16 that you have quoted seems to be directed to a situation where the floats have apparently failed.
A. Yes.

Q. It says that the valve must be closed to prevent the cement from flowing back inside the casing. Do you see that?
A. Yes.

Q. That is the point which you took the Commissioner to in your explanation, but I really wanted you to explain the following paragraph.

1 A. Sorry?
2
3 Q. See paragraph 16?
4 A. Yes.
5
6 Q. Can you explain that paragraph, please, to the
7 Commissioner, in terms of what is described as a strategy
8 for dealing with an apparent failure of the floats after
9 the valve is closed?
10 A. Well, we wouldn't be knocking the hose off on the
11 cement pour, for a start. We would know that there is too
12 much flow coming back at the cement unit at that stage.
13
14 Q. Yes.
15 A. Sorry, Mr Howe?
16
17 Q. I'm sorry, sir, can you see paragraph 16 from the
18 procedures manual, which is quoted in your paragraph 107?
19 A. Yes, I can.
20
21 Q. I would like you, please, to explain that in your own
22 words; that is, explain what is described in that
23 paragraph in your own words, as a strategy for dealing with
24 an apparent float failure?
25 A. Well, once you have bled the - what pressure you
26 used - what volume you used to pump the casing up to the
27 test pressure, you bleed that volume off. If any more
28 volume returns, you shut the well in and stop.
29
30 Q. Is what is described there, for instance, directed to
31 a situation where, at the relevant time, a BOP is in place?
32 A. Sorry, Mr Howe?
33
34 Q. Is what is described in that paragraph directed to a
35 situation where, at the relevant time, a blowout preventer
36 is in place?
37 A. Yes.
38
39 Q. You will see that there is a reference to observing
40 flow or pressure for 8 to 12 hours after cementing or until
41 a compression strength of a particular amount is reached.
42 Do you see that?
43 A. Yes, I do.
44
45 Q. So far as you are aware, is it your understanding
46 that, in response to the apparent failure of the floats on
47 7 March, this procedure wasn't adopted?

1 A. Yes.
2
3 Q. Doing the best you can, was that your understanding
4 back in March, or can you simply not say, because you are
5 not sure whether you were aware of this back in March?
6 A. True.
7
8 Q. It is the latter, is it?
9 A. Yes, indeed.
10
11 Q. If I could just take you, please, to paragraphs 110
12 and 114 of your statutory declaration. In paragraph 110,
13 you say:
14
15 *The pore pressure of the H1 Well was listed*
16 *in the [Basis of Well Design] as*
17 *Normal-1.04sg.*
18
19 Do you see that?
20 A. Yes, I do.
21
22 Q. Then in paragraph 111, you say that that was provided
23 by the geologist David Thornton. Do you see that?
24 A. Yes.
25
26 Q. The next sentence seems to make clear that both the
27 description of "normal" and the numeric value of 1.04 sg
28 were given in the BOWD; do you see that?
29 A. Yes, I do.
30
31 Q. But you attached more significance to the description
32 as opposed to the numbers; is that right?
33 A. Yes, I did.
34
35 Q. Then you go on to say, at the start of paragraph 112:
36
37 *"Normal pressure" is equivalent to that of*
38 *seawater which is usually considered to be*
39 *1.03sg.*
40
41 Do you see that?
42 A. Yes.
43
44 Q. But would you agree with me, sir, that if a geologist
45 says, "The pore pressure of the H1 formation is normal -
46 1.04sg", that isn't equivalent to seawater, which has an sg
47 of 1.03; would you agree with that?

A. Yes.

Q. If, in fact, you look at the information actually given by the geologist - namely, normal pressure, 1.04 sg - you could not regard that pore pressure as being overbalanced by seawater with an sg of 1.03, could you?
A. No.

Q. Could I next take you to paragraph 127 of your declaration, where you quote from section 6.6 of the well construction standards; do you see that?
A. Yes, I do.

Q. Just in relation to paragraph 128, sir, where you say, "However, in a cased hole, nothing is exposed", can you tell the Commissioner what you mean by that?
A. Can you bring paragraph 128 up? "However, in a cased hole, nothing is exposed", meaning that the idea of the 9-5/8" casing, or the casing in question - there's no flow path through the formation because of the cement barrier; it's a plug in the shoe track.

Q. So does that particular paragraph relate specifically to anything that you have quoted above that paragraph from section 6.6?
A. Can we scroll back up, please? So we're looking at the primary well control for - this is in regard to leak-off tests and FITs.

Q. Well, I just note that the format of your declaration, sir, is to quote from section 6.6 of the well construction standards, and, having quoted from that section, you then say:

> *However, in a cased hole, nothing is "exposed".*

I am just wondering what paragraph 128 relates to in section 6.6 of the well construction standards?
A. I can't answer that, Mr Howe.

Q. Then in paragraph 131 of your declaration, you refer to displacement fluids not normally coming in contact with open hole and being a mixture of seawater and corrosion inhibitors; do you see that?
A. I do, yes.

1 Q. Then in the very next paragraph, you say:
2
3 *The [well construction standards] does not*
4 *expressly deal with the characteristics of*
5 *any displacement fluids.*
6
7 Do you see that?
8 A. Yes, I do.
9
10 Q. Can I suggest to you, sir, the reason is that normally
11 you wouldn't use a displacement fluid that had been
12 deployed in the course of a cementing operation as a
13 secondary well barrier; would you agree with that?
14 A. We were of the understanding that the column of salt
15 water was enough hydrostatic to contain the formation.
16
17 Q. Yes, I'm not asking what your understanding was back
18 then. I'm asking you about what you said in paragraph 132.
19 Would you agree with me that the reason the standards don't
20 deal with the characteristics of displacement fluids is
21 that you wouldn't normally use a displacement fluid which
22 you had deployed to displace cement as a secondary well
23 control barrier?
24 A. I don't understand the question.
25
26 Q. All right. According to your understanding of what
27 generally happens in the course of putting barriers in
28 wells to achieve security or integrity, do you agree that
29 you would not normally rely upon displacement fluid which
30 had been deployed to cement a casing shoe as a well control
31 barrier?
32 A. We wouldn't normally use?
33
34 Q. Yes, that's right.
35 A. No, we wouldn't normally use.
36
37 Q. You might use other fluids, such as mud and drilling
38 fluids and the like, which have a significant margin for
39 safety built in?
40 A. Yes.
41
42 Q. The well construction standards deal explicitly or
43 expressly, don't they, with the need for drilling fluids to
44 be overbalanced to formation pressure so as to achieve
45 barrier status; that's correct, isn't it?
46 A. Yes.
47

1 Q. That's what you say in paragraph 133, do you see?
2 A. Yes.
3
4 Q. Then in paragraph 135, you quote from section 5 of the
5 well construction standards; do you see that?
6 A. Yes, I do.
7
8 Q. The very first sentence refers to the need for the
9 following barriers to be maintained in the annulus. Do you
10 understand that the annulus being referred to there is the
11 annulus outside the 9-5/8" casing, or is it also the space
12 in the shoe track within the casing?
13 A. Within the internal void of the 9-5/8" casing.
14
15 Q. You will see in relation to one barrier type, there is
16 a description of what can be regarded as proven, do you see
17 that, under a heading "Barrier Type - Proven"?
18 A. Yes.
19
20 Q. And then there is a description and it refers to:
21
22 *Wellbore fluid stable at surface, provided*
23 *it can be monitored.*
24
25 Do you see that?
26 A. Yes, I do.
27
28 Q. How would that monitoring normally occur?
29 A. It would be circulated over a trip tank.
30
31 Q. So it is hooked up to the circulation system, is it?
32 A. Correct, yes.
33
34 Q. So you have, in effect, machines and computers applied
35 in order to monitor the wellbore fluid; is that right?
36 A. Yes.
37
38 Q. They can take readings of density, level and the like?
39 A. No. They just take volumes.
40
41 Q. I see. Level?
42 A. A constant volume, yes.
43
44 Q. Under that table, you will see there is a reference
45 to:
46
47 *Temporary suspension is where the MODU ...*

1
2 That's the mobile offshore drilling unit; correct?
3 A. Correct.
4
5 Q.
6 *... or well intervention vessel remains on*
7 *location.*
8
9 Now, that statement seems clear enough; do you agree?
10 A. Yes.
11
12 Q. In April last year, the MODU left the location, didn't
13 it?
14 A. Indeed, yes.
15
16 Q. That rather suggests that the status of the well after
17 the MODU left was not within the description of the
18 temporary suspension that's given here?
19 A. Correct.
20
21 Q. Then it goes on to say:
22
23 *The following minimum number of tested,*
24 *independent barriers shall be installed ...*
25
26 Now, firstly, you will agree that there is an emphasis on
27 barriers being both tested and independent; do you see
28 that?
29 A. Yes, I do.
30
31 Q. Does that mean that they shouldn't, as it were, depend
32 on one another; that is, each barrier should operate
33 independently of the other?
34 A. Yes, indeed.
35
36 Q. Then there is a reference to the barriers needing to
37 be installed on both the annulus and the tubing or casing.
38 Do you see that?
39 A. Yes.
40
41 Q. There is a description in the table of what the sorts
42 of barriers can be; do you see that?
43 A. I do, yes, sir.
44
45 Q. Then the next table sets out a heading "Barriers
46 During Temporary Suspension". Do you see that?
47 A. I do, yes.

Q. So this is contemplating a situation where there is not active drill or operational activity on a particular well, but you still have the MODU on location?
A. Yes.

Q. The permanent barriers are described, you will see, as cement plug and cemented casing. Do you see that?
A. I do, yes.

Q. Then a temporary barrier is described as:

Fluid with hydrostatic head greater than formation pressure...

Do you see that?
A. Yes.

Q. Then it says.

... provided that the liquid level and density can be monitored and maintained.

Do you see that?
A. Yes, I do.

Q. Again, do you say that that monitoring and maintenance would be by way of being hooked up to the circulation system?
A. Yes, indeed, yes.

Q. Then two paragraphs later, sir, there is a reference to:

For long term suspensions and abandonment requirement refer to Section 14.

Do you see that?
A. Yes, I do, yes.

Q. That, to this point, suggests, doesn't it, that you have a temporary or a short-term suspension if the MODU remains on location, but you might have a long-term suspension or abandonment when the MODU leaves the location; is that right?
A. Yes.

1 Q. Then in relation to the general topic of barriers, the
2 standards go on to say that they must be verified in situ.
3 Do you see that?
4 A. Yes, I do.
5
6 Q. "In situ" means, in this context, in location?
7 A. On location, yes.
8
9 Q. Once installed?
10 A. Yes.
11
12 Q. In connection with annulus cement, you will see that
13 there is a requirement to wait until surface cement tail
14 samples are set. Then it goes on:
15
16 *... provided that the cement job proceeded*
17 *normally.*
18
19 Do you see that?
20 A. Yes, I do.
21
22 Q. It refers to a bumping of the plug, and the next dot
23 point assumes, as it were, that there was a bumping of the
24 plug and that the cement job proceeded normally; that's
25 right, isn't it?
26 A. Yes.
27
28 Q. You will agree that, based on what we now know, there
29 wasn't a verification of the annulus cement in respect of
30 the cementing of the casing shoe on 7 March?
31 A. No.
32
33 Q. In any event, you will see that the next dot point
34 refers to a top of cement being a minimum of 50 metres
35 above any hydrocarbon zone. Now, for present purposes,
36 that means that the top of cement has to be above the top
37 of reservoir, doesn't it?
38 A. Correct.
39
40 Q. Do you have any understanding as to whether that
41 requirement was satisfied on 7 March or not?
42 A. No, I don't.
43
44 Q. Are you aware, though, that there is a concern as to
45 whether or not sufficient tail cement was used?
46 A. Yes, I am aware of that.
47

Q. If insufficient tail cement is used, are you aware that it can give rise to gas migration problems as a result of the leaching of hydrocarbons out of the formation into the annulus cement while it is settling?
A. Yes, I agree, yes.

Q. Then you quote from section 14 of the well construction standards, and a long-term suspension is described in reasonably simple terms, isn't it:

> *A long-term suspension is when the MODU leaves the well site.*

Do you see that?
A. Can we scroll down a little bit? Yes.

Q. And that happened, I think, on 20/21 April last year?
A. Correct.

Q. So we had a long-term suspension within the meaning of these standards?
A. Yes.

Q. Then the standards require that two permanent tested barriers must be installed in the annulus and wellbore, so that is both the space outside the 9-5/8" casing and the internal space within the shoe track of the 9-5/8" casing?
A. Yes.

Q. You can't rely on temporary barriers when you have a long-term suspension; would you agree that that is what the standard is saying?
A. That's what the standards say, yes.

Q. There is no reference there at all, is there, to reliance upon hydrostatic fluid as a barrier in the course of a long-term suspension?
A. In accordance with the construction standards, no, there is not.

Q. It is pretty clear, isn't it, because with a temporary suspension, it says that you can rely on a temporary barrier, which might be the fluid, depending on particular conditions, but if you are talking a long-term suspension, you need permanent barriers in place?
A. As I understand it, yes.

1 Q. Then you will see, sir, that it sets out the permanent
2 barriers and then it deals with the topic of abandonment.
3 Do you see that?
4 A. Yes.
5
6 Q. You will see that the permanent barriers don't include
7 a PCC; that's right, isn't it?
8 A. It doesn't include that, no.
9
10 Q. Then over the page, if we can go, please, operator, to
11 just above paragraph 138 of the declaration, you will see,
12 sir, that the second-last sentence on that screen refers
13 to:
14
15 *A corrosion cap should be installed on the*
16 *MLS.*
17
18 Do you see that?
19 A. Yes, I do.
20
21 Q. If you look at the form of the document, it seems to
22 be saying, well, look, during a long-term suspension or
23 abandonment, you have these permanent barriers in place,
24 and then in respect of abandonment, they are sort of set
25 out, and then this seems to be an additional requirement
26 for abandonment, namely, that a corrosion cap should be
27 installed on the MLS; do you see that?
28 A. Yes, I do.
29
30 Q. So that seems to be drawing a distinction between
31 permanent barriers on the one hand and a corrosion cap on
32 the other hand; do you agree with that?
33 A. Yes.
34
35 Q. The purpose served by such a corrosion cap on the MLS
36 is primarily to protect the threads, isn't it?
37 A. Indeed, yes.
38
39 Q. That is their customary usage or application, isn't
40 it, sir?
41 A. Yes.
42
43 Q. Indeed, PCCs are normally not used at surface; their
44 primarily application is to protect the threads in the
45 subsea situation?
46 A. Below the mud line, correct.
47

1 Q. Then, sir, in your declaration, you set out in
2 paragraphs 139 to 148 various propositions. Are they truly
3 your own words, sir? Could you just re-read those?
4 A. Yes.
5
6 Q. So in paragraph 148, are you describing there what you
7 understand to have been intended by the standards?
8 A. Sorry, can you ask the question again, Mr Howe?
9
10 Q. Well, I took you to the standards, and you agreed that
11 a PCC, for instance, isn't listed as a permanent barrier,
12 but in paragraph 148 you seem to be saying, well, although
13 it isn't listed, it was intended, when these standards were
14 formulated, that you could interchange a PCC with an
15 identified permanent barrier?
16 A. Yes.
17
18 Q. But you will agree that if that was the intention, it
19 isn't clearly expressed in the standards, is it?
20 A. No, it is not.
21
22 Q. Then in paragraph 153, you have used the words,
23 "I considered Section 14 of the WCS was intended to apply
24 to" a situation which you set out; do you see that?
25 A. Yes, I do.
26
27 Q. Are you talking there of what your understanding was
28 back in March, or should it really say, "I consider
29 Section 14 of the WCS"?
30 A. Correct.
31
32 Q. It is the latter?
33 A. "I consider", yes.
34
35 Q. Yes. Would you agree, sir, that if that was the
36 intention, it hasn't been very clearly expressed, because
37 the situation you describe as anticipated gets no word of
38 mention whatsoever in section 14 of the standards, does it?
39 A. No.
40
41 Q. Then in paragraph 154, you refer to the standards
42 being a component part of the well construction management
43 system. Do you see that?
44 A. Yes.
45
46 Q. Then you refer to the fact that there needs to be
47 ongoing risk management that is specific to the particular

1 conditions that are encountered. Do you see that?
2 A. Yes, I do.
3
4 Q. Those particular conditions need to be assessed
5 carefully if they give rise to risks; that's what you are
6 saying, isn't it?
7 A. Yes.
8
9 Q. And appropriate decisions are made in the light of the
10 risks which arise in particular circumstances; that's
11 right, isn't it?
12 A. Yes, I agree.
13
14 Q. In this case, you say, well, look, the standards allow
15 the well construction manager to risk assess and to
16 basically make an informed decision to deviate from the
17 standards if he considered it appropriate to do so; is that
18 what you are saying?
19 A. No, I don't agree with that.
20
21 Q. I am just wondering about the second-last sentence of
22 that paragraph:
23
24 *Part 1.3 of the WCS allows for the well*
25 *construction manager to risk assess any*
26 *deviation in accordance with the Well*
27 *Construction Risk Management Process and*
28 *approve that deviation.*
29
30 Do you see that?
31 A. Yes, I do.
32
33 Q. So the standards themselves, you are suggesting, allow
34 for departures from what is set out in order to adequately
35 deal with a risk that is presented?
36 A. Yes. I can see what you are saying now, Mr Howe, yes.
37
38 Q. And as I understand it, you wouldn't say that's a bad
39 thing?
40 A. No.
41
42 Q. Because it means that you are not beholden to the
43 standards; rather, you are free to do something else if a
44 proper assessment of the risks requires that to be done?
45 A. Correct.
46
47 Q. And you say this is what occurred in the case of the

1 H1 well?
2 A. Yes.
3
4 Q. Your understanding is that, in effect, the
5 installation of the barriers in the H1 well was overseen
6 and monitored and managed by senior PTT people onshore?
7 A. Yes.
8
9 Q. Could I take you, please, sir, to paragraph 168.
10 There, as I understand it, you are quoting from the
11 drilling program which applied in early March 2009. Do you
12 see that?
13 A. Yes, I can.
14
15 Q. That program made provision for cementing of the
16 casing shoe - you will see that - and also for the setting
17 of a cement plug from 160 metres to 115 metres. Do you see
18 that? We will have to go down a bit, operator.
19 A. Yes, I can, yes. No, it is further down.
20
21 Q. Paragraph 214, I think, is the point. There, there is
22 reference to --
23 A. Yes.
24
25 Q. -- setting the cement plug, and you saw, above that,
26 reference to cementing the casing, as per the program.
27 That was at paragraph 205. Could we go up to 205, please.
28 You will see there that there is a reference to monitoring
29 for returns, displacing cement with inhibited seawater,
30 estimating top of cement using differential pressure prior
31 to bumping the plug and reporting same on the DDR, and then
32 pressure testing the casing for 10 minutes if the plugs
33 bump. Then there is a reference to "check that the floats
34 are holding". Do you see that?
35 A. Yes, I do.
36
37 Q. I want to suggest to you, sir, that the program, as
38 expressed there and quoted by you, gets close to assuming
39 that the plugs will bump and doesn't in any sort of way
40 instruct what should happen in the event that the floats
41 don't hold?
42 A. No, it doesn't.
43
44 Q. You will agree, sir, that those on the rig at the time
45 might have been assisted if the drilling program had dealt
46 with the contingency of a plug in fact becoming displaced
47 after apparently bumping and the floats apparently failing?

1 A. Sorry, Mr Howe, could you ask that question again?
2
3 Q. I want to ask you, sir, whether you would agree that
4 those on the rig at the time might have been assisted in
5 responding to the problem which occurred on 7 March if the
6 drilling program had dealt with the contingencies that
7 actually arose, namely, the plugs becoming displaced after
8 apparently bumping and the float valves failing?
9 A. Yes, but, I mean, the failure of a float valve is such
10 a rare event, they just don't add that.
11
12 Q. Well, it might be rare, but it is not an unpredictable
13 event, is it?
14 A. Do you mean unpredictable?
15
16 Q. Well, it is an event that can be predicted; that is,
17 it is generally known that, from time to time, the plugs
18 won't bump and, if they do bump, they might become
19 displaced and there might be a failure of the float valves.
20 That's right, isn't it?
21 A. That's possible, yes.
22
23 Q. What I'm suggesting to you is that this drilling
24 program didn't really deal in any helpful way with that
25 possibility, did it?
26 A. No.
27
28 Q. In paragraph 171, you refer to the monitoring which
29 you did of the cement samples, which took three hours.
30 Then you say that returns were monitored, "of which there
31 were none". I just want to clarify that with you, sir,
32 because there has been some evidence to the effect that
33 after the wait on cement period and the bleeding off of
34 pressure, some 3.5 barrels returned.
35 A. Yes.
36
37 Q. So, in fact, although you have made a reference to
38 there being no returns --
39 A. No, that - no. That 3.5 barrels that was returned was
40 the volume for the 1,350-odd psi pressure that was held on
41 the cement while it set.
42
43 Q. So you say, do you, that in order to hold pressure at
44 around 1,350 after the floats had apparently failed --
45 A. Yes.
46
47 Q. -- 3.5 barrels of seawater were introduced in order to

1 pressure up to 1,350, and it was those --
2 A. No, no. That 1,350 psi was the residual pressure that
3 they used to displace the 16.5 barrels back into the casing
4 after they took the return.
5
6 Q. Yes.
7 A. That pressure was held.
8
9 Q. Yes.
10 A. Yes? After 3 hours, once the cement had set, that
11 pressure was bled off and returned 3.5 barrels.
12
13 Q. Right.
14 A. Yes? And then after that 3.5 barrels was returned,
15 the well stayed static. There was no return flow.
16
17 Q. So you are really talking there about there being no
18 returns after the initial return of 3.5 barrels?
19 A. Correct.
20
21 Q. Thank you, sir. Then in the next paragraph, you say
22 that you then backed out of the 9-5/8" casing and laid down
23 the landing string and installed the 9-5/8" PCC. Do you
24 see that?
25 A. Yes.
26
27 Q. It might be obvious, but the reason you did that was
28 because that's what the revised program required, and
29 no-one onshore told you to do anything else?
30 A. That's correct.
31
32 Q. Then, sir, in paragraph 174, you refer to your
33 preparation of an email dated 8 March that contained a
34 description of events of 7 March 2009.
35 A. Yes.
36
37 Q. We might go to this in due course, but is it your
38 recollection that you compiled that email by reference to
39 the IADC report, and you had in turn translated the
40 information in that report to a draft daily drilling report
41 for Mr Treasure's consideration?
42 A. Yes, indeed.
43
44 Q. And this was a draft email that you drafted but which
45 you intended Mr Treasure would look at?
46 A. Yes.
47

1 Q. And express any disagreement with one way or another?
2 A. Yes.
3
4 Q. As you understood it, the system was that an email
5 would then be sent by Mr Treasure, enclosing the daily
6 drilling report and perhaps other documents?
7 A. No.
8
9 Q. No?
10 A. Mr Treasure or Mr O'Shea would review both the DDR and
11 the cover note. The email you are referring to we refer to
12 as the cover note. It is a brief description of the
13 previous 24 hours. They would both check them. If they
14 were happy with them, they would give me the go-ahead,
15 while I would make any changes or amendments that they
16 wanted, and then, once they were happy with it, I would
17 forward the email.
18
19 Q. I see. So it wasn't Mr Treasure who hit the "send"
20 button; it was you?
21 A. No, it was me.
22
23 Q. And you would enclose with that email the primary
24 documents as enclosures, such as the DDR and persons
25 onboard, and so on?
26 A. That's right, correct.
27
28 Q. You have quoted in paragraph 174 from the email which
29 you drafted, and the third bullet dot point refers to:
30
31 *Checked cement integrity - OK.*
32
33 Do you see that?
34 A. Yes, I do.
35
36 Q. Were you really referring there, sir, to the fact that
37 after pressure was held at about 1,350 until expiry of a
38 wait on cement period --
39 A. Until the samples were hard, yes.
40
41 Q. -- there were no returns of any sort of significance
42 at all?
43 A. After the initial pressure was bled off, correct.
44
45 Q. And you thought that that amounted to a confirmation
46 of cementing integrity?
47 A. Correct.

Q. In the course of preparation for your evidence to the Commissioner today, have you had cause to review what did, in fact, happen and how some problem with the cementing of the casing shoe might have meant that it didn't act as an effective barrier and thereby didn't work to prevent a blowout?
A. Yes.

Q. Is what you are saying to the Commissioner that you just didn't have that understanding back in March, and so you thought that the cemented casing shoe at that point could properly be regarded as a proven and tested permanent barrier?
A. Yes.

Q. Of course, it was the case, though, wasn't it, that in the email that you sent onshore, you enclosed the information which you had available to you in the daily drilling report so that if anyone else had a different understanding, they could have got back in touch with the rig and suggested some different course of action?
A. Yes.

Q. Indeed, sir, that was part of the system that was in place that required the daily drilling reports to be sent onshore, isn't it, so that they could be carefully checked?
A. Yes.

Q. Because, really, Mr Wilson and Mr Duncan had day-to-day responsibility for managing the activities on the rig?
A. Yes, that's what I believe.

Q. Indeed, as you understood it, the onshore PTT people were responsible for keeping the regulator informed by sending off the daily drilling reports; that's right, isn't it?
A. I believe so, yes.

Q. So your understanding was that, if they were going to do that, they would check them and make sure they were happy with them?
A. Correct.

Q. Then you say in paragraph 178:

Based on the above I considered as at 7 March 2009 that despite the in service failure of the valves, the cementing of the 244mm (9-5/8") shoe casing had been correctly completed.

Do you see that?
A. Yes.

Q. There was nothing at all in the drilling program to suggest otherwise to you, was there?
A. No.

Q. There was nothing in the well construction standards to suggest otherwise to you, was there?
A. No.

Q. You received no indication from anyone onshore that your understanding was contrary to proper well control integrity principles, did you?
A. Onshore or offshore, no.

Q. And as far as you were aware, PTT onshore were in the loop in relation to what had happened with the cementing of the casing shoe?
A. Correct.

Q. Sir, in relation to paragraph 179, in the second sentence, you say:

We did not have enough corrosion caps to cover everything we were doing.

What is that information based on?
A. Stocks on the rig at the time, but I believe that there were more being sourced. At that present stage, we didn't have enough to finish the job, but I believe there were more ordered and more being taken - getting to the rig.

Q. I think very early on in March, the various plans, for all of the wells, made provision for cement plugs rather than PCCs?
A. Correct.

Q. Then there was a change, and a decision was made to use PCCs, is that right, instead of cement plugs?

1 A. As I understand it, yes.
2
3 Q. Are you saying at the time that decision was made, so
4 far as you're aware, there weren't actually enough PCCs on
5 the rig at the time to fulfil the installation needs; is
6 that right?
7 A. At that time, yes, but we weren't about to leave the
8 well site that day. There was still time to obtain more
9 pressure-controlling caps and have them brought to the rig
10 and then finish what we needed to do.
11
12 Q. What was your understanding of the turnaround time
13 for --
14 A. I have no idea. I don't know whether they were
15 off-the-shelf items or they had to be manufactured.
16 I don't know.
17
18 Q. In your evidence that there weren't enough corrosion
19 caps, you made reference to stores. Did you have some sort
20 of discussion with the stores manager --
21 A. No.
22
23 Q. -- or the logistics person?
24 A. No, I didn't.
25
26 Q. Do you recall how it was that you actually came to
27 form this understanding in early March that there weren't
28 enough PCCs to go round?
29 A. I think I must have spoken to the day company man, or
30 maybe the logistics guy, but, honestly, I don't know.
31 I can't tell you.
32
33 Q. All right. Then in paragraph 180, you say:
34
35 *However, we managed to buy off another*
36 *operator ...*
37
38 Firstly, who would have been responsible for that on the
39 rig?
40 A. Not on the rig. Onshore.
41
42 Q. So this purchase order would be placed onshore?
43 A. Yes.
44
45 Q. Who would have responsibility for that?
46 A. I'm not sure. Well construction management.
47

1 Q. You make reference to purchasing PCCs off another
2 operator. Do you know which operator?
3 A. No, I don't. I didn't get involved in that.
4
5 Q. Do you understand that that happened because the
6 manufacturer had a turnaround time that was way longer than
7 what PTT was hoping for?
8 A. I don't know.
9
10 Q. You don't have any understanding about that?
11 A. No.
12
13 Q. You say, though, that additional equipment was
14 purchased, including one further PCC. Do you see that?
15 A. Yes.
16
17 Q. So far as you are aware, was there a purchase of any
18 other PCCs --
19 A. I don't know.
20
21 Q. -- or it was just one?
22 A. I don't know.
23
24 Q. So it could have been that more than one PCC was
25 purchased around this time?
26 A. I don't know.
27
28 Q. Then you refer in paragraph 181 to a decision being
29 made on 6 March. Now, that is a decision onshore, isn't
30 it?
31 A. Yes.
32
33 Q. Then in paragraph 188, sir, the second sentence, you
34 refer to receiving:
35
36 *... no instruction either verbally or*
37 *written in a forward plan to pressure test*
38 *the 244mm (9-5/8") PCC at any time.*
39
40 Do you see that?
41 A. Yes, I do.
42
43 Q. Had you been given any such instruction by anyone
44 onshore, would you have complied with it?
45 A. Of course I would have.
46
47 Q. In paragraph 189, you say:

1
2 *The Change Control Form did not include*
3 *instructions on when the 340mm (13-3/8")*
4 *PCC and 244mm (9-5/8") PCC should be*
5 *installed ...*
6
7 Do you see that?
8 A. Yes, I do.
9
10 Q. Had provision been made in the change control form
11 which came from shore as to when the barriers should be
12 installed, do you agree that any such instruction or
13 stipulation would have been complied with on the rig?
14 A. Of course.
15
16 Q. Then in paragraph 191, you say that you believed that
17 the 13-3/8" PCC was going to be installed at a later date
18 and possibly offline. Can you assist the Commissioner at
19 all with what that belief or recollection is based on,
20 casting your mind back?
21 A. Well, at the time, the 13-3/8" casing was still made
22 up to the 13-3/8" MLS, which was then continued up where
23 the BOPs were installed. So to accommodate installing the
24 13-3/8" pressure-control cap, we had to remove the 13-3/8"
25 casing from the MLS, and then the cap would screw into that
26 profile that we just abandoned.
27
28 Q. Yes.
29 A. So I couldn't install it at any time until that casing
30 was removed.
31
32 Q. Do you have any understanding at all as to whether PTT
33 people onshore would have kept the regulator informed about
34 when barriers were going to be installed?
35 A. I believe so.
36
37 Q. Because that would be important information?
38 A. Correct.
39
40 Q. Then in paragraph 197, sir, you set out a series of
41 propositions. Can you see that? You say that you don't
42 have a specific recollection of any of those events. Then
43 you conclude:
44
45 *However, given the extracts from the DDRs*
46 *above, one or more of the scenarios in (a)*
47 *to (c) above must have occurred.*

1
2 Now, I think you agreed yesterday or said yesterday that,
3 in fact, the whiteboard wasn't used to record scheduled
4 activities or proposed activities, and it wasn't used, as
5 it were, by way of ticks being applied to indicate that
6 those activities had been done?
7 A. Yes.
8
9 Q. It was really used simply for people to narrate, in
10 text, steps that they had, in fact, already taken?
11 A. Yes.
12
13 Q. You have no recollection at all of ever seeing on the
14 whiteboard some text to the effect that the 13-3/8" PCC has
15 now been installed?
16 A. No, I can't recollect that.
17
18 Q. If I could go, please, to paragraph 203, you quote
19 there from particular paragraphs of the drilling program.
20 Do you see that?
21 A. Yes, I do.
22
23 Q. Paragraph 5.6 of the program dealt with tie-back of
24 the 20" casing. Do you see that?
25 A. Yes.
26
27 Q. Then you go to 5.16, which deals with tie-back of the
28 13-3/8" casing, and various things are set out, and then
29 5.17 deals with tie-back of the 9-5/8" casing. Do you see
30 that?
31 A. No.
32
33 Q. I am sorry. If the operator could go down to 5.17,
34 that deals with tie-back of the 9-5/8" casing, and you will
35 see there against item number 196 there is removal of the
36 corrosion cap, et cetera?
37 A. Yes.
38
39 Q. What we now know, don't we, is that item 196, removal
40 of the 9-5/8" casing, was actually brought forward quite a
41 long way?
42 A. Removal of the corrosion cap.
43
44 Q. I'm sorry?
45 A. Removal of the corrosion cap.
46
47 Q. Yes. What did I say?

1 A. "Removal of the 9-5/8" casing".
2
3 Q. I am sorry, I apologise. We now know that item 196,
4 removal of the corrosion cap, was actually brought forward
5 considerably, right up to this point around items 15 to 20?
6 A. Yes.
7
8 Q. That's right, isn't it?
9 A. Correct.
10
11 Q. In between 5.6 and 5.16, the drilling program also
12 made provision for the doing of other things as well,
13 didn't it?
14 A. Sorry, Mr Howe, in what regard?
15
16 Q. You will see that you have quoted from section 5.6?
17 A. Can we scroll back up to that?
18
19 Q. Then you go from 5.6 to section 5.16. Do you see
20 that?
21 A. Yes - can we scroll a bit more? Yes, okay, yes.
22
23 Q. So there is 5.6?
24 A. Yes.
25
26 Q. I think the last numbered item in that section is 23.
27 Do you want to just scroll down - do you see that?
28 A. Yes, I do.
29
30 Q. Then the drilling program had other sections which
31 described other activities, but, for present purposes, you
32 have gone to paragraph 5.16. Do you see that?
33 A. Yes.
34
35 Q. And the first item is number 173?
36 A. Yes.
37
38 Q. So all I'm suggesting is that between 5.6 and 5.16,
39 there were lots of other steps that were described in the
40 drilling program?
41 A. Yes.
42
43 Q. That's right, isn't it?
44 A. Yes.
45
46 Q. So item 196, of removing the 9-5/8" corrosion cap, was
47 bringing forward that milestone quite considerably in the

1 scheme of things, wasn't it?
2 A. Yes, to accommodate cleaning of the 13-3/8" MLS.
3
4 Q. That's right.
5 A. Yes.
6
7 Q. As I understand it, a view was taken that the threads
8 on the 13-3/8" casing had corroded, and to clean those, you
9 needed to run down some equipment, which wouldn't fit
10 unless the 9-5/8" cap was removed?
11 A. Yes, we needed it bottomed out on the plugs, on the
12 top of the PCC, yes.
13
14 Q. Then I want to suggest to you, sir, that what I have
15 just described, the bringing forward of the removal of the
16 9-5/8" casing, meant --
17 A. Pressure-control cap.
18
19 Q. I'm sorry, pressure-containment cap - that meant that
20 the cap was removed some three to four days earlier than
21 otherwise?
22 A. Correct.
23
24 Q. Is that your understanding?
25 A. Yes.
26
27 Q. At that point, we know that the 13-3/8" PCC wasn't on
28 the well, was it?
29 A. Correct.
30
31 Q. At the point of removal of the 9-5/8" PCC, that left
32 only the cemented casing shoe as a barrier?
33 A. Yes.
34
35 Q. Plus whatever influence the hydrostatic fluid was able
36 to bring to bear?
37 A. Correct.
38
39 Q. Would you agree that if, at that point, a detailed
40 risk assessment was undertaken just to check on the
41 barriers, to make sure that without the 13-3/8" PCC and
42 with the removal of the 9-5/8" PCC there was sufficient
43 well integrity, those onshore may well have detected the
44 problem with the cementing of the casing shoe?
45 A. When the pressure-containment cap was removed, there
46 was a check to see if there was any pressure trapped below
47 that cap, of which there was none. Once the cap was

1 removed, there was a gas detection test done inside the
2 internal bore, that 9-5/8" casing MLS, and there was no
3 indication of any explosive gas or hydrocarbons of any
4 kind.
5
6 Q. Yes, but you will agree with me, sir, won't you, that
7 it's important at all times to maintain well integrity?
8 A. We were still on the understanding that we had a
9 competent cemented shoe track at that stage.
10
11 Q. That's right.
12 A. Yes.
13
14 Q. What I'm suggesting to you is that if at the point
15 when a step was taken that would mean that there wasn't a
16 13-3/8" PCC in place, as required by the program, and a
17 9-5/8" PCC was going to be taken off, a proper risk
18 assessment at that point might well have shone light on the
19 problems with the cementing of the casing shoe?
20 A. No, I don't agree with that.
21
22 Q. Do you agree, sir, that the effect of what happened on
23 7 March was to overdisplace the cement out of the casing
24 shoe track and out of the rat hole beneath the casing shoe?
25 A. That was established after the fact.
26
27 Q. Yes.
28 A. Yes.
29
30 Q. By reference to the very information that you had
31 recorded in the daily drilling report and sent to PTT
32 onshore; that's right, isn't it?
33 A. Yes.
34
35 Q. It is apparent from that information, when you do the
36 maths, that there was a serious overdisplacement of cement;
37 that's right, isn't it?
38 A. That hadn't been established at that time.
39
40 Q. I'm sorry?
41 A. That hadn't been established at that time - the
42 problem with the overdisplacement.
43
44 Q. Yes. I'm not suggesting, sir, that anyone was aware
45 of the problem and deliberately decided to ignore it as a
46 risk. I'm not suggesting that. I am just asking you
47 whether you would agree that if at the point in time we're

1 talking about - namely, removal of the 9-5/8" PCC, which
2 left the well protected only by a cemented casing shoe and
3 hydrostatic fluid - a risk assessment was undertaken and a
4 review of the cementing of the casing shoe by reference to
5 the information you had recorded, that may well have caused
6 the experts from onshore to realise that there was a
7 problem.
8 A. Quite possibly, yes.
9
10 Q. I want to suggest to you, sir, that really it is
11 sensible, good practice, in terms of achieving well
12 integrity, to review what barriers you have in place if you
13 are going to remove one of them and if you discover that
14 another of them, which should have been installed, wasn't;
15 you will agree that that's a good, sensible precaution?
16 A. In hindsight, yes.
17
18 Q. I want to suggest to you, sir, that it is not really
19 compliant with sensible, reasonable practice, in terms of
20 well integrity, to leave a well for days and days protected
21 only by one primary barrier and unmonitored hydrostatic
22 fluid; would you agree with that?
23 A. Yes.
24
25 Q. That is not, I suggest, a subtle or highly nuanced
26 proposition; basically, well integrity requires, doesn't
27 it, that there be a proper primary barrier and at least one
28 proven, tested secondary barrier at all times?
29 A. Yes.
30
31 Q. In paragraph 211 - I am sorry, in fairness, I should
32 take you to paragraph 210, sir, where you say that when you
33 started work at 1800 hours, the operations you describe
34 above had been completed and the derrick was in the process
35 of moving from H1 to GI. Do you see that? That is in your
36 paragraph 210.
37 A. No.
38
39 Q. I am sorry. We will need to scroll down, operator, to
40 paragraph 210. It's a bit confusing. If we could just
41 scroll up to paragraph 209 so that the witness can refresh
42 his memory. You are really there talking about the
43 discovery of the corrosion on the 13-3/8" and the removal
44 of the 9-5/8" PCC and so on, aren't you?
45 A. Yes.
46
47 Q. Then you say in paragraph 210 --

1 A. This is a discussion I had with Mr O'Shea - yes?
2
3 Q. Yes, that what you have described above were
4 operations that were completed by the time you started
5 work?
6 A. That's correct.
7
8 Q. So your knowledge about those is based upon
9 Mr Treasure, is it?
10 A. No, Mr O'Shea at that stage.
11
12 Q. Mr O'Shea. Then in paragraph 211, you say that you
13 didn't discuss with anybody, and nobody raised with you,
14 the reinstalling of the 9-5/8" PCC. Do you see that?
15 A. Yes.
16
17 Q. At this stage, Mr Duncan, a senior PTT person onshore,
18 was actually on the rig; that's right, isn't it?
19 A. That's correct.
20
21 Q. Now, if Mr Duncan had said, "Look, Lindsay, reinstall
22 that 9-5/8" PCC", you would have done it, wouldn't you?
23 A. In a heartbeat.
24
25 Q. In paragraph 211, sir, you refer to your understanding
26 of the status of the H1 well, and you go on to say:
27
28 *... and the absence of any physical*
29 *evidence of a change in fluid status ...*
30
31 We know that the understanding you had at the time about
32 the cementing of the casing shoe involved an imperfect
33 appreciation of what had occurred and the fact that that
34 meant the barrier was deficient?
35 A. Not at that stage.
36
37 Q. Yes. You didn't have an understanding of that at that
38 time?
39 A. No, no. I still firmly - I believed that we had a
40 competent shoe track barrier --
41
42 Q. Yes, that's my point, sir.
43 A. -- and hydrostatic fluid in the hole and it was
44 stable.
45
46 Q. Yes, and it is only the third point I want to explore
47 with you. I want to emphasise, sir, that no-one is going

1 to suggest to you that you were positively aware of any
2 deficiency in that casing shoe and ignored it.
3 A. Okay, correct, yes.
4
5 Q. No-one is going to get close to that proposition, as
6 I understand it.
7 A. Okay.
8
9 Q. But I just want to explore with you the reliance that
10 you placed on the absence of any physical evidence of a
11 change in fluid status. Now, I think you will agree that
12 in terms of achieving well integrity, you really don't work
13 back from what observations you make about the fluid in the
14 casing, do you?
15 A. Sorry?
16
17 Q. In other words, to achieve well integrity, you put in
18 place proper tested barriers, don't you?
19 A. Yes.
20
21 Q. You don't, as it were, look at the fluid and think,
22 "Oh, there are some bubbles there. I might whack in a
23 barrier to stop a blowout"; that's not how it is done, is
24 it?
25 A. No.
26
27 Q. You install the barriers in advance, in effect, to
28 prevent against a blowout, rather than take things as they
29 come and, if you see some bubbles, try to take some
30 intervention at that point; do you agree with me?
31 A. Sorry, Mr Howe, can you ask that question again?
32
33 Q. Do you agree that in order to achieve well
34 integrity --
35 A. Yes.
36
37 Q. -- sensible practice requires that you have in place
38 proven, tested barriers, rather than rely upon --
39 A. Yes.
40
41 Q. -- the observations you make of what's happening with
42 the fluid?
43 A. Yes.
44
45 Q. Indeed, would you agree that the blowout which
46 occurred here rather demonstrates that you can't put much
47 reliance upon what observations you make from time to time

1 of what's happening with the fluid?
2 A. Correct.
3
4 Q. You would agree, sir, that wells can kick suddenly?
5 A. Indeed.
6
7 Q. It might be some seismic activity that accounts for a
8 sudden kick in a well; that's right, isn't it?
9 A. Possibly, yes.
10
11 Q. You can be staring at that fluid for the three days
12 beforehand and you won't get warning of a blowout?
13 A. No. Well, you might get - well, one would expect to
14 see some degree of flow, and it would slowly increase; not
15 an instantaneous ejection of 40 or 60 barrels of fluid, as
16 it did.
17
18 Q. Is that evidence based on any course of study --
19 A. Yes.
20
21 Q. -- that you have undertaken in relation to well
22 blowouts?
23 A. Also from my experience in drilling wells.
24
25 Q. How much prior experience do you have of actual
26 blowouts?
27 A. None. But I have had wells flow on me before. I have
28 had wells full of oil-based mud, and there is a phenomenon
29 with oil-based mud where gas becomes in solution, where it
30 comes to the surface, chills down as it comes up through
31 the riser, turns back into a gas and ejected, at this
32 particular time, probably 180 barrels of oil-based mud out
33 of the hole.
34
35 Q. Indeed, part of the vice about gas is that as it
36 leaches from a formation into the fluid, it can actually
37 lower the density of the fluid, can't it?
38 A. Yes, it can.
39
40 Q. In any event, I want to suggest to you that, really,
41 it is not sensible practice to rely upon observations of
42 what the fluid is doing in terms of making decisions about
43 what barriers to have in place; would you agree with that?
44 A. Yes.
45
46 Q. Then in the last sentence of paragraph 211, you say:
47

1 *In order to re-install the 244mm (9-5/8")*
2 *PCCC it would have been necessary to skid*
3 *the West Atlas over the H1 Well again.*
4
5 Do you see that?
6 A. Yes.
7
8 Q. That might have involved the expenditure of some time
9 and effort; that's right, isn't it?
10 A. Yes.
11
12 Q. And it might have involved PTT in some additional
13 expense, because what the rig might otherwise be doing
14 would be postponed whilst the 9-5/8" PCC was being put on;
15 that's right, isn't it?
16 A. Yes.
17
18 Q. But, in the scheme of things, it wouldn't have
19 involved a significant expenditure of time, effort or
20 money, would it?
21 A. No.
22
23 Q. In paragraph 233 of your declaration, there are just a
24 couple of anomalies I want to clarify. In
25 subparagraph (b), you refer to about 8 barrels being pumped
26 to perform the casing pressure test. As I understand it,
27 the records indicate that 9.25 barrels were pumped. Does
28 that accord with your recollection, or would you dispute
29 that?
30 A. No, I wouldn't dispute that.
31
32 Q. In paragraph (d), you say:
33
34 *When the pressure was bled off,*
35 *I understand about 16.5 barrels were*
36 *returned, which is twice the shoe track*
37 *volume.*
38
39 I want to suggest, sir, that the 16.5 barrels was closer to
40 three times the shoe track volume, rather than twice; would
41 you --
42 A. Well, not really, because part of that 16.5 barrels
43 that was bled off was the volume they used to pressure the
44 casing to 4,000 psi.
45
46 Q. So when you talk about twice the shoe track volume,
47 you are talking about the net return, are you --

1 A. Yes.
2
3 Q. -- after allowing for the 9.25 barrels?
4 A. No, it is inclusive.
5
6 Q. I'm sorry?
7 A. That 16.5 barrels includes the test pressure volume.
8
9 Q. That's right.
10 A. Yes.
11
12 Q. But when you say "which is twice the shoe track
13 volume", are you talking about the 16.5 barrels?
14 A. Yes.
15
16 Q. I want to suggest that the 16.5 barrels is closer to
17 three times the shoe track volume rather than two times;
18 would you dispute that?
19 A. I would have to do the figures.
20
21 Q. In paragraph (k), sir, you refer to the fact that, in
22 your 22 years' experience, this was the second shoe valve
23 that you have seen fail?
24 A. Yes.
25
26 Q. Can you tell the Commissioner the circumstances
27 surrounding the first occasion of shoe valve failure?
28 A. I can't remember the size casing we had cemented in,
29 but we had pumped cement, we had tested the casing, we had
30 bled that pressure off, and we observed that we were
31 getting more volume than the test pressure volume that was
32 introduced, and the well was shut in, and we waited on
33 cement.
34
35 At that stage, we weren't abandoning the well; we were
36 continuing to drill ahead. So we waited on cement until
37 the cement set up, and we took exactly the same steps as we
38 did this time. We bled the residual pressure off that we
39 held on the cement while it set. We then checked for
40 backflow. There was no backflow. So we then nippled down
41 the BOP. We installed an adaptor spool below the BOP,
42 nippled the BOP back up again and continued to drill ahead.
43
44 Q. Do you mean drill ahead in that very well?
45 A. Yes.
46
47 Q. With the BOP in place?

1 A. Correct.
2
3 Q. In paragraph (n), you refer to the fact that bypassing
4 the cement wiper plugs and moving into the shoe track is
5 likely to have caused --
6 A. Paragraph 10?
7
8 Q. I am sorry, paragraph (n).
9 A. Okay.
10
11 Q. -- a contaminated channel within the shoe track. Are
12 you aware, sir, that, in fact, in the events which
13 occurred, it is likely that there was a complete
14 displacement of cement from the hole of the casing shoe
15 track as a result of the pumping back of an additional
16 9.25 barrels of inhibited seawater?
17 A. Yes, coming to what I understand now, yes.
18
19 Q. In paragraph (q), you refer to a post-cementing
20 pressure test not normally being performed. That's in a
21 circumstance where everything goes to plan; that's what you
22 are talking about, isn't it?
23 A. Yes.
24
25 Q. Then in paragraph (r), you talk about your experience
26 of pressure tests. You set out what the results of a
27 post-procedure pressure test might be. The first one is if
28 the plugs had rebumped. Do you see that?
29 A. Yes.
30
31 Q. The second one is if the plugs had not rebumped. Do
32 you see that?
33 A. Yes.
34
35 Q. What you are saying is, in relation to paragraphs (i)
36 and (ii), even a post-procedure pressure test might not
37 truly be a test of the integrity of the cement; that's
38 right, isn't it?
39 A. That's my belief, yes.
40
41 Q. But, of course, a third result might be that if the
42 plugs hadn't rebumped and the shoe track was not full of
43 non-contaminated cement, the test would possibly have
44 identified any problems with the integrity of the cement
45 within the shoe track. Now, just in relation to that
46 option, should the word "not" appear in the first line?
47

1 MR ABBOTT: There are two "nots" in the first line,
2 Mr Howe.
3
4 MR HOWE: Yes, I see.
5
6 Q. Are you really talking, in that third scenario, sir,
7 about a situation in which things have gone badly because
8 the plugs haven't rebumped and the shoe track might be full
9 of contaminated cement, or even worse --
10 A. Yes.
11
12 Q. -- full of fluid; in that situation, a post-procedure
13 pressure test might identify problems with the integrity of
14 the cement?
15 A. Possibly, yes.
16
17 Q. Because you would get a failure?
18 A. Possibly, yes.
19
20 Q. That is a good reason to do the test - because it
21 might actually demonstrate that you don't have integrity?
22 A. Correct.
23
24 Q. Then, sir, in paragraph 235, you say that the absence
25 of pressure testing for the PCCs on installation was not
26 causative of the uncontrolled release. Do you see that?
27 A. Yes.
28
29 Q. I want to explore that briefly with you, sir. If the
30 PCC wasn't tested after installation, firstly, it can't be
31 considered a properly proven or tested barrier, can it?
32 A. No.
33
34 Q. Secondly, some problem might have arisen in the course
35 of installation such that it is not working properly, and
36 if you don't test it, you won't find out; that's right,
37 isn't it?
38 A. Yes, but I installed that PCC, and I firmly believed
39 that it was installed and the integrity of that plug was
40 good.
41
42 Q. Well, you might have that belief, but unless you
43 actually conduct a test, you can't be sufficiently sure,
44 can you?
45 A. No. It was rated at 10,000 psi, as per manufacturer's
46 specifications.
47

Q. Yes.
A. And, no, there was no call from the manufacturer's specifications to test it.

Q. What do you mean by that?
A. Well, it was rated at 10,000 psi. I wasn't instructed to test it.

Q. Are you aware, sir, that there will be evidence from PTT people onshore to the effect that when you were instructed to install the PCC, they expected that you would test it after installation?
A. That wasn't on the forward plan.

Q. You, no doubt, say, "Well, if that was their expectation, they should have included it in the program"; is that right?
A. I believe so, yes.

Q. But you have told the Commissioner that you understand that a barrier is meant to be tested or proven in situ, that is, in location?
A. Yes, but also that the compressive strength of that cement at that stage was insufficient to put a pressure test on top of it. We already knew the cement was in place. We had confidence that we had a cemented shoe track. The cement hadn't set sufficiently enough to apply another pressure test, in my belief.

Q. I think we're talking at cross-purposes. I'm now talking about the non-testing of the PCC.
A. Correct.

Q. You can test it from above, can't you?
A. No.

Q. Are you sure about that?
A. Yes.

Q. You are absolutely positive?
A. Yes.

MR HOWE: Might that be a convenient time, Commissioner?

THE COMMISSIONER: Thank you, Mr Howe. We will resume at 11.20.

1 **SHORT ADJOURNMENT**
2
3 THE WITNESS: Mr Howe, I would like to revisit the last
4 question, when you asked me if we could pressure test the
5 cap from above. My answer to that was no. After thinking
6 about it, we could have, but that would only pressure test
7 the seals from above. The pressure control cap is designed
8 to take pressure from below, so I'm not sure whether a
9 pressure test on the top would qualify as an accepted test.
10
11 MR HOWE: Q. As I understand it, you suggested that
12 there might be a problem with doing a pressure test from
13 below the PCC, because that might compromise the integrity
14 of the cementing of the casing shoe; is that right?
15 A. Correct, the cement outside the casing.
16
17 Q. But if you were going to test to, say, a pressure of
18 4,000 psi, if that did have the effect of demonstrating a
19 lack of integrity in the cementing of the casing shoe, that
20 would be a good result in the sense that it would tell you
21 something you needed to know, wouldn't it?
22 A. Correct, yes, I agree with that.
23
24 Q. Just in relation to PCCs, sir, in paragraph 234, you
25 say that you would consider the use of PCCs was good
26 practice and appropriate in the circumstances; do you see
27 that?
28 A. Yes, I do.
29
30 Q. I just want to raise with you one possible
31 shortcoming --
32 A. Excuse me, could we scroll back up to that? I only
33 have part of it. Thank you.
34
35 Q. I want to explore one possible shortcoming of a PCC
36 when it is used as a form of barrier in a well; namely, if
37 you are attaching it on the MLS as occurred here, then in
38 the course of tying back, you normally have to take the PCC
39 off?
40 A. Yes.
41
42 Q. If you do that before a BOP is installed, then you
43 don't have the barriers in place that you need to ensure
44 well integrity?
45 A. Correct.
46
47 Q. I just want to explore with you, sir, what you say at

1 the start of paragraph 236, where you say:
2
3 *The absence of the 340mm (13-3/8") PCCC*
4 *didn't cause the uncontrolled release.*
5
6 I don't want to spend a lot of time on this, sir. I just
7 want to run this scenario past you. The non-installation
8 of the 13-3/8" PCC was significant because it led to the
9 corrosion of the threads of the 13-3/8" casing, which, in
10 order to be cleaned, required the removal of the 9-5/8"
11 PCC, which left the well without a secondary barrier. Now,
12 expressed in that way, would you agree that the
13 non-installation of the 13-3/8" PCC can be regarded as
14 having significance in terms of the subsequent blowout?
15 A. No. If the MLS of the 9-5/8" had been set another
16 half a metre deeper, there wouldn't have been a problem.
17 The brush wouldn't have bottomed out on it.
18
19 Q. I accept that, sir, but I am just talking about the
20 events which actually occurred in this case.
21 A. Yes.
22
23 Q. I absolutely take that point, and I don't disagree
24 with it. In offering that, I assume you are saying that in
25 different circumstances, we might not have had to remove
26 the 9-5/8" PCC to clean the threads?
27 A. Correct.
28
29 Q. Therefore, it could have remained in place as a
30 secondary barrier to prevent a blowout within the casing;
31 that's what you seem to be saying?
32 A. Yes.
33
34 Q. But here, we know that because of the relative heights
35 of the two casing sizes, in order to clean the threads of
36 the 13-3/8" casing at the MLS point, you did have to remove
37 the 9-5/8"s PCC; that's right, isn't it?
38 A. Correct.
39
40 Q. If the 13-3/8" PCC had been in place, that would have
41 stopped the corrosion?
42 A. So should the inhibited seawater that we used. That's
43 the whole reason for putting the inhibiter in there - to
44 stop corrosion.
45
46 Q. Yes, although it is still exposed to the atmosphere
47 and the like, isn't it?

1 A. Yes.
2
3 Q. And the inhibited seawater doesn't come up to the
4 actual height of the threads?
5 A. Well, it should have been. They should have stayed
6 full. I don't know.
7
8 Q. I just want to explore this proposition, and you can
9 disagree with it, if you like, sir. Just in terms of the
10 events which actually occurred, here the non-installation
11 of the 13-3/8" PCC led to the corrosion of the threads; do
12 you agree with that?
13 A. Yes.
14
15 Q. To clean those threads, you had to remove the 9-5/8"
16 PCC; do you agree with that?
17 A. Yes.
18
19 Q. That meant, at the point of removal of the 9-5/8" PCC,
20 you didn't have a secondary mechanised barrier in place; do
21 you agree with that?
22 A. Yes.
23
24 Q. So in the scheme of things, in terms of what happened
25 here, I want to suggest that the non-installation of the
26 13-3/8" PCC can be regarded as having significance?
27 A. In a roundabout way, yes.
28
29 Q. I am wondering, sir, whether you would agree that in
30 relation to a topic as important as the installation of
31 primary and secondary barriers, it would be good to have in
32 place a system that required the rig people and the onshore
33 people to actually sign off to the effect that they are
34 satisfied that that is a properly tested barrier? Do you
35 think there is a place for that?
36 A. For sure, yes.
37
38 Q. In paragraph (c) of paragraph 239, you commence that
39 paragraph by saying:
40
41 *As there were no indications or reasons*
42 *after 21 April 2009 to think that the wells*
43 *were not suspended per the [drilling*
44 *program] ...*
45
46 I take it what you mean there is that there were no
47 indications of which you were aware of any departure from

1 the program; that's right, isn't it?
2 A. Yes.
3
4 Q. Then you go on to say:
5
6 *... there was no reason to conduct any form*
7 *of audit ...*
8
9 Do you see that?
10 A. Yes.
11
12 Q. I'm not trying to trip you up, sir, but I just wonder,
13 do you have any expertise in quality assurance through
14 processes of random and systematic audits?
15 A. No.
16
17 Q. Would you agree, as a matter of commonsense, that if
18 you did have in place some process for systematic audit of
19 well barriers during a period of suspension, then one
20 virtue of such an audit is that it might detect a problem
21 that otherwise went unnoticed?
22 A. I agree.
23
24 Q. In subparagraph 239(e), in about the third sentence,
25 you refer to any pressure below the PCC being recorded.
26 You say:
27
28 *Any pressure below the PCC can be recorded.*
29
30 Do you see that?
31 A. Yes.
32
33 Q. The Commission has heard some evidence to the effect
34 that, in fact, there could be a low level or minimal level
35 of pressure build-up that might be below the sensitivity of
36 the gauges to detect. Do you agree that that is at least a
37 possibility?
38 A. Not the gauges. Sensors, yes, I believe that. That's
39 quite possible.
40
41 Q. When you say the "sensors", do you mean just the
42 hand-held --
43 A. The pressure sensors.
44
45 Q. The hand-held ones or the machine sensors?
46 A. The ones on the choke manifold or in the drillers
47 console.

1
2 Q. In paragraph (g), you describe there what you
3 understand to be a common scenario. That's not a scenario
4 which actually obtained or prevailed at the point of the
5 removal of the 9-5/8" PCC, is it?
6 A. No.
7
8 Q. Then - I don't want to spend long on it, sir - in
9 paragraph 242, you express particular views to the effect
10 that, really, there couldn't have been any hydrocarbon
11 leakage from the formation during the period of suspension.
12 Sir, I am just wondering, do you consider that you have
13 sufficient expertise to express those sorts of views?
14 A. In my experience, yes. But I don't have the
15 expertise, no.
16
17 Q. Then in subparagraph 242(b), you refer to the change
18 control process which led to the earlier removal of the
19 9-5/8" PCC, and you say that you think that was appropriate
20 in the circumstances. Do you see that?
21 A. Yes.
22
23 Q. Can I suggest to you, sir, that in the circumstances
24 which applied here where you didn't have the 13-3/8" PCC in
25 place, as required by the approved drilling program, and
26 you were bringing forward the removal of the 9-5/8" PCC by
27 three to four days, that does have some significance and
28 can't be described as just a common garden variety timing
29 issue, can it?
30 A. No.
31
32 Q. Then in subparagraph (c), you will see that you
33 express a view that the removal of the 9-5/8" PCC earlier
34 in the drilling sequence reduced the H1 well to one
35 permanent barrier. This is in circumstances where it might
36 be days and days before the installation of the BOP,
37 mightn't it?
38 A. Yes.
39
40 Q. I want to suggest to you, sir, that in the
41 circumstances which prevailed, if it was appropriate to
42 remove the PCC, it should have been done through the BOP
43 and it should have been reinstalled, in order to maintain
44 the necessary well integrity; do you agree?
45 A. I agree.
46
47 Q. I am nearly finished, sir, to give you some optimism

1 about the process. Can you do your level best to explain
2 to the Commissioner why you think the 13-3/8" PCC might not
3 have been installed as required?
4 A. I don't know whether it was an oversight or whether
5 the instructions were given and just weren't followed. The
6 assistant company man, who was responsible for the offline
7 work - I was in control of what was happening on the drill
8 floor at that stage. I just took it for granted, after
9 seeing the 20" trash cap on top of the H1 well, that
10 everything below that was taken care of.
11
12 Q. In light of that, would you agree that it would have
13 been of real assistance if PTT onshore had set up a system
14 whereby there needed to be some certification or sign-off
15 by someone to the effect that a barrier has, in fact, been
16 installed and is tested and can be relied upon? That would
17 be a good thing, because then people would realise that if
18 they don't receive the certification, there might be
19 something wrong?
20 A. Yes.
21
22 Q. PTT, in their submissions, sir, have suggested that,
23 really, in the ordinary course, having regard to what
24 happens on the rig, there would have been quite a number of
25 people on the rig who would have been in a position to
26 observe the fact that there wasn't a 13-3/8" PCC installed.
27 I am just wondering what you think of that proposition?
28 A. Well, PTT people, yes. Atlas Drilling people,
29 possibly not.
30
31 Q. Why do you make that distinction, sir?
32 A. Because they act on instructions. They don't have the
33 drilling program for them to read. They act on what is on
34 the drilling - their forward plan, or what they are
35 instructed to do.
36
37 Q. At some stage, did you become aware that some bubbles
38 were observed by someone in the course of the removal of
39 the 9-5/8" PCC?
40 A. No.
41
42 Q. Again, I'm not sure that anything of great
43 significance turns on it, but could we bring up document
44 identity number PTT.9002.0008.0327. Sir, this is just a
45 covering email that I wanted to show you from Mathieu
46 Higgins, a PTT drilling engineer, to Paul O'Shea and Bruce
47 McElhinney. He says:

1
2 *Please find attached.*
3
4 Do you see that?
5 A. Yes.
6
7 Q. Then the subject is described as "Paul and Lindsay's
8 notes"?
9 A. Yes.
10
11 Q. Then if we go to the next document, the next page,
12 that's the first page of a whole series of handwritten
13 notes. Do you recognise these notes?
14 A. No.
15
16 Q. They seem to be notes that had been brought into
17 existence by the time of the email I showed you, which was
18 sent on 24 August 2009 at 5.07; do you see that?
19 A. Yes.
20
21 Q. I wonder if the operator could just scroll slowly down
22 the notes so that Mr Wishart can check the contents?
23 A. Yes.
24
25 Q. Sir, could you direct the operator to scroll through
26 at the pace that you want?
27 A. Yes. You can scroll down. Yes. What am I looking
28 for actually here, Mr Howe?
29
30 Q. At this stage, at least, do you recognise the notes at
31 all?
32 A. Yes.
33
34 Q. What do they appear to relate to?
35 A. This is when we were standing by on the Java
36 Constructor just after the rig had blown out and we had
37 abandoned the rig, and we made our way to a supply vessel
38 and then over to the Java Constructor, as an infield
39 observer.
40
41 Q. Are the notes in your and Mr O'Shea's handwriting --
42 A. Yes.
43
44 Q. -- or in someone else's handwriting?
45 A. No. They are in mine and Paul's.
46
47 Q. Could the operator please go to page 0335 of the

1 notes. You will see there is an asterisk there and then
2 the words, "Well was bubbling". Do you see that?
3 A. Yes.
4
5 Q. Whose handwriting is that?
6 A. That's Paul's.
7
8 Q. Then it has:
9
10 *- released cap no pressure*
11 *- hand held gas.*
12
13 Do you see that?
14 A. Yes.
15
16 Q. Then it has "Wishy". Is that a reference to you?
17 A. Yes.
18
19 Q.
20 *- no-one informed him that the well was*
21 *bubbling prior to the first kick [as at]*
22 *05:35am.*
23
24 It is not a memory test, but I am simply putting this
25 information before you because it does suggest that, soon
26 after the blowout, you became aware that there was some
27 bubbling at the time the 9-5/8" cap was released, and you
28 seem to have made the point around this time that the notes
29 were being created, well, if that's right, no-one told you
30 about it?
31 A. Correct.
32
33 Q. Do you think that was significant information that
34 should have been the subject of some considered risk
35 assessment?
36 A. Well, there was a gas detection test done, and there
37 was no flammable gas present. So the bubbles could have
38 been CO2 just breaking down or just a bit of air coming up.
39
40 Q. Could I go back to the transcript, please, to a
41 question I asked, and there is no answer recorded. I asked
42 you this question, sir:
43
44 *I want to suggest to you, sir, that in the*
45 *circumstances which prevailed, if it was*
46 *appropriate to remove the PCC, it should*
47 *have been done through the BOP and it*

1 *should have been reinstalled, in order to*
2 *maintain the necessary well integrity; do*
3 *you agree?*
4
5 My recollection is that you answered "yes"; is that right?
6 A. Yes. I agree.
7
8 Q. In any event, having refreshed your memory with those
9 notes, you say, look, in the scheme of those things, so far
10 as you are aware, the particular bubbling that was observed
11 has no significance for present purposes; is that right?
12 A. Yes.
13
14 Q. I just want to raise another issue with you that has
15 been raised with the Commissioner by Atlas in a report
16 which they submitted or produced to the Inquiry. In that
17 report, they raised the possibility that the very process
18 of taking off the 9-5/8" PCC might have actually
19 accelerated the process which was under way and which led
20 to the blowout. Do you feel as though you have any
21 sufficient expertise to express an opinion one way or
22 another about that proposition?
23 A. No.
24
25 Q. This is the final topic that I want to canvass with
26 you, sir. Just in relation to this question of hydrostatic
27 overbalance or equal balance and underbalance, could the
28 operator please bring up document identity number
29 HAL.9000.0001.0118. You will see, sir, that this is an
30 email from Chris Wilson --
31 A. Yes.
32
33 Q. -- to Peter Geste, attaching time depth curves for H2
34 and H3 and also the pore pressure charts. Do you see that?
35 A. Yes.
36
37 Q. You will see in the list of attachments, there is
38 reference to pressure PDFs for H2 and H3. Do you see where
39 it says "Attachments"?
40 A. Yes.
41
42 Q. Accepting, of course, that we're not talking
43 specifically about the H1 well, we are, nonetheless,
44 talking about pore pressure charts relating to the
45 reservoir in question, aren't we?
46 A. Yes.
47

Q. Then if the operator could go to document HAL.9000.0001.0125, this is, I suggest, the pressure summary in true vertical depth for the H2 well. If the operator could scroll down to the foot of the document, you will see in the legend at the very bottom left of the page there is a reference to pore pressure, and that corresponds to a broken vertical line. Do you see that?
A. Yes.

Q. Then if you go to that line where it appears in the document, I want to suggest to you that it is located at a point which suggests that the specific gravity of the reservoir was 1.04. Can you see that?
A. Yes.

Q. Likewise, if the next page is brought up, in relation to the Montara H3, I want to suggest to you that it depicts the pore pressure also as 1.04. Do you agree with that?
A. It looks like that, yes.

Q. Can you think of any plausible reason why there would be a different pore pressure at different well points?
A. No.

Q. If we could go, please, to document identity number PTT.9001.0007.0340, you will see that this is a daily drilling report, which identifies you and Mr Treasure as the drilling supervisors up the top left-hand corner. Do you see that?
A. Yes, I do.

Q. It is for the Montara H1 well, dated 5 March 2009.
A. Yes.

Q. It is report number 5. In relation to well control, which is dealt with at the bottom of the page, there is an entry "Pore pressure (SG)" and then it says "1.06". Do you see that?
A. Yes.

Q. That is indicating, isn't it, that the pore pressure of the reservoir was assessed to be 1.06 specific gravity?
A. That is the figure that was supplied to me by the mud loggers.

Q. Yes.
A. Yes.

Q. That's an indication of the pore pressure of the reservoir?
A. If their tools are calibrated correctly, yes.

Q. If we could go to PTT.9001.0007.0343, this is the next daily drilling report, of 6 March, report number 6, and again it indicates pore pressure of the reservoir at 1.06. Do you see that?
A. Can we scroll down? Yes, I can.

Q. Again, that indicates what you understood, based upon the information supplied to you, the pore pressure of the reservoir, to be?
A. If the tools registering that pressure are calibrated correctly, yes.

Q. I take it that if you had information to the effect that the tools were calibrated incorrectly and therefore the pore pressure recording of 1.06 was deficient, you would have included that information in your daily drilling report to town, wouldn't you?
A. Yes.

Q. If the operator could bring up document PTT.9003.0003.0258, you will see this is a daily geological report dated 7 March 2009. It is report number 6. Is that right?
A. Yes.

Q. Do I take it that these reports would be produced from time to time and would number from 1 up to the number of this report, number 6; is that right?
A. Yes.

Q. These are supplied by the geologists; is that right?
A. Onboard the rig, yes.

Q. Up the top of the document, on the right-hand side, there is a reference to:

Est. Pore Pressure: Normal.

Do you see that?
A. Yes.

Q. Does the "Est." signify "Estimated"?

1 A. I believe so, yes.
2
3 Q. It is shown there as "Normal", which, as I understand
4 it, you agreed was 1.04?
5 A. 1.03.
6
7 Q. Why do you think the pore pressure of a reservoir,
8 which is shown on a geological report as normal, means that
9 it is 1.03 and not 1.04?
10 A. Well, I was under the understanding that the specific
11 gravity of seawater at that stage was 1.03, and that's the
12 column of fluid in the annulus that we believed is
13 contained in the formation.
14
15 Q. We might continue on. If the operator could bring up
16 PTT.9004.0001.0121, do you recognise this document?
17 A. Yes.
18
19 Q. If the operator could scroll down, I think there must
20 be another page.
21 A. There is a front page.
22
23 Q. Yes, I'm looking for the front page. There we go. If
24 we could scroll down that - I had the wrong identity
25 number. Mr Treasure gave evidence to the Commissioner that
26 under the heading "Pit", there is a reference to "Pit 1", a
27 reference to "Volume" and a reference to "Weight", and he
28 said that is a reference to the displacement fluid that was
29 utilised the next day for the displacement of the cement
30 for the purposes of cementing the casing shoe, and he
31 wasn't challenged on that evidence by anyone from PTT. You
32 will see, sir, that the specific gravity of that
33 displacement fluid is recorded as 1.02. Do you see that?
34 A. Yes, I do.
35
36 Q. Would you agree that that specific gravity indicates
37 that there wasn't an overbalance to formation pressure?
38 A. Yes.
39
40 Q. Could we go, please, to page 106. This is
41 PTT.9001.0007.0346. This is daily drilling report number 7
42 of 7 March 2009. I want to quickly show you, sir, that in
43 respect of well control, there is an entry against "Pore
44 pressure (SG)" of 1.06. Do you see that?
45 A. No. Can we scroll down to that? Yes, I can see that.
46
47 Q. So you and/or Mr Treasure seem to be consistently

1 recording - with the awareness of Mr Trueman; is that
2 right? - that the pore pressure of the reservoir was
3 considered to be 1.06 in specific gravity?
4 A. Yes.
5
6 Q. I think you actually prepared this very report; is
7 that right?
8 A. Yes. But, Mr Howe, it would be fair to say that if
9 that was a typo on the first day, if the pore pressure
10 wasn't expected to change, it wouldn't be checked every
11 day. It may have been a typo on a particular day, and it
12 proceeded through on subsequent reports, unchecked.
13
14 Q. So it may be that it accurately reflects the
15 information you were given by the mud loggers?
16 A. Maybe.
17
18 Q. And, indeed, the system of work is designed such that
19 that is meant to be an accurate reflection; that's right,
20 isn't it?
21 A. Correct. Correct.
22
23 Q. I want to confirm with you that at least to the extent
24 disclosed in relevant contemporaneous documents, it seems
25 as though there was not a hydrostatic overbalance in the
26 displacement fluid as against the pore pressure of the
27 formation; would you agree with that?
28 A. In relation to the figures that I have seen, yes.
29
30 MR HOWE: I have no further questions.
31
32 THE COMMISSIONER: Thank you, Mr Howe. Mr Colvin?
33
34 **<EXAMINATION BY MR COLVIN:**
35
36 MR COLVIN: Q. If Mr Wishart's statement is still
37 available on the screen, could we go to paragraph 64 of
38 that statement. From this point on, for about the next
39 80-odd paragraphs in your statement, there is a description
40 of various types of terminology used in the industry. Do
41 you recall that?
42 A. Yes.
43
44 Q. Did you sit down and explain all that to someone for
45 the purpose of preparing your statement, or was that
46 presented to you for your consideration?
47 A. Sorry, mate?

Q. Did you sit down with somebody and explain to them all of that terminology for the purposes of preparing your statement, or was that presented to you by somebody, already prepared, for your consideration?
A. A bit of both.

Q. How much of the information was presented to you for your consideration?
A. I couldn't honestly tell you unless I read it again.

Q. The first time you saw this section on drilling terminology, had you had any discussions with anyone about that terminology?
A. No.

Q. So this section of your report was substantially prepared by someone else for you to consider as to whether it was correct?
A. Yes.

Q. Could we go to paragraph 107. These paragraphs here that you were taken to by my learned friend assisting the Commission - are those paragraphs part of what was presented to you for your consideration?
A. Yes.

Q. So you didn't raise any issue about the procedures manual; the first time that that arose in this document, which was to become your statement, was because somebody had put this in there for you to look at?
A. Correct.

Q. In fact, the procedures manual didn't form any part of the material to which you had regard in carrying out your work on the rig in relation to the cementing job for the H1 well?
A. Sorry, can you repeat that?

Q. Yes. The procedures manual referred to here wasn't referred to by you when you were doing your work on the rig in relation to the cementing of the H1 well?
A. I didn't cement the H1 well.

Q. But you were on the well when that cementing operation was carried out?
A. Yes.

Q. Indeed, after the wait on cement period, you came on shift, and that cementing operation was almost complete?
A. It was complete.

Q. Complete in the sense that all of the cement had been pumped?
A. And displaced.

Q. At that time, in relation to what might be done or considered to be appropriate as to the next step after that cement had been pumped, you didn't have regard to this procedures manual at all?
A. No.

Q. Indeed, the procedures manual is a Seadrill document, isn't it, for use by Seadrill personnel?
A. In relation to the cementing of the well?

Q. No, just generally. Can I ask you, have you seen the whole document, or have you just seen these paragraphs that are quoted in your statement?
A. What is "the whole document"? What is it called?

Q. It is listed, described there, the "West Atlas SD1 Operations Procedures Manual".
A. Oh, okay. I had seen it and I had read it, but it was such a long time ago, I have only seen - I can only recall seeing this bit here.

Q. So when you prepared your statement, you didn't have regard to the manual itself; you just looked at this part that is quoted here?
A. Yes.

Q. When you say it was a long time ago, you didn't have regard to the manual when you were doing your work on the West Atlas rig for the drilling of the Montara wells?
A. No. I relied on the PTT documents and manuals.

Q. So this paragraph is entirely irrelevant to anything you did on the rig?
A. No.

THE COMMISSIONER: Mr Colvin, what does "no" mean in the context of your question?

1 MR COLVIN: Q. The manual wasn't used by you to carry
2 out your work on the rig?
3 A. No.
4
5 Q. In that sense, it was irrelevant to the work that you
6 did?
7 A. It was part of it, but not - not totally irrelevant.
8 As the night drilling supervisor, I acted on the PTT
9 drilling program.
10
11 Q. Just to make it abundantly clear, you didn't refer to
12 the manual?
13 A. This West Atlas manual?
14
15 Q. Yes.
16 A. No.
17
18 Q. So why is it referred to in paragraph 107 of your
19 statement?
20 A. It was just the basic outline of what happened with
21 the cementing of that, the casing, in that state - in that
22 set-up.
23
24 Q. If it hadn't been in the material that was provided to
25 you for your consideration, would you have made no
26 reference to it in explaining to somebody the relevant
27 events concerning the drilling of the H1 well?
28 A. Sorry? I don't understand the question.
29
30 Q. Well, if it hadn't been in the document that was
31 provided to you for your consideration about drilling
32 terminology, you wouldn't have referred to it in explaining
33 to somebody what happened in relation to the H1 well?
34 A. No.
35
36 MR HOWE: Again, I think that answer might be infected by
37 the vice raised by the Commissioner.
38
39 Q. Could you just clarify, sir, did you agree with what
40 Mr Colvin just said to you?
41 A. Yes, I agree.
42
43 MR COLVIN: I am grateful to my learned friend.
44
45 Q. That's true of significant parts of your statement,
46 isn't it? There is lots of stuff in here that was
47 presented to you for your consideration that is not

1 material that you would have --
2
3 MR ABBOTT: With respect, it is unfair to the witness to
4 refer to his statement at large. If my friend wishes to
5 identify a passage that he says is irrelevant, then that
6 would be fair to the witness.
7
8 MR COLVIN: It is perfectly fair, with respect. I am
9 asking him whether other paragraphs in his statement have
10 that same character. It is a perfectly fair question, in
11 my view.
12
13 MR HOWE: Could I rise, Commissioner, just to lend support
14 to the submission of Mr Colvin. I don't think the question
15 is unfair.
16
17 THE COMMISSIONER: Please answer the question.
18
19 THE WITNESS: Could you re-ask the question?
20
21 MR COLVIN: Q. Yes, I am happy to. There are other
22 parts of your statement that have been included only
23 because they were provided to you in material for your
24 consideration, and they wouldn't have been included by you
25 if you were just explaining what you knew about what
26 happened in relation to the H1 well?
27 A. Yes, I agree.
28
29 Q. In relation to the cementing job that was undertaken
30 on the H1 well on 7 March, you came on duty at 6pm that
31 day?
32 A. Correct.
33
34 Q. I think you took over from Mr Treasure in terms of
35 supervising the drilling operations?
36 A. Yes.
37
38 Q. After that work was done, you, in the course of the
39 night, prepared the PTT daily drilling report for that day?
40 A. Correct.
41
42 Q. I think your evidence has been that you did that by
43 reference to the IADC report that had been prepared during
44 the course of the day?
45 A. Correct.
46
47 Q. So that is delivered up to you, is it, what, late at

1 night?
2 A. After midnight, once the driller who had knocked off
3 at midnight has finished it, yes.
4
5 Q. That's a regular practice?
6 A. Yes.
7
8 Q. If you could be shown PTT.0002.0001.0001. If the
9 middle part of that document could be blown up, please, and
10 the bottom half of that middle page. Do you recognise this
11 document?
12 A. Yes, I do.
13
14 Q. Do you recognise it in general terms as an IADC
15 report, or do you recognise it as the one that relates to
16 7 March?
17 A. I recognise it as the IADC report.
18
19 Q. Have you seen it recently?
20 A. No - oh, yes, I just saw it yesterday.
21
22 Q. But before you came to give your oral evidence here,
23 had you seen it recently?
24 A. No.
25
26 Q. But this is the part of that report that you would
27 have been looking at when you prepared your daily drilling
28 report?
29 A. Yes.
30
31 Q. If you could be shown PTT.9001.0007.0346, this is the
32 daily drilling report that you prepared?
33 A. Yes.
34
35 Q. You do that on screen, do you, on a computer screen
36 and type in fields?
37 A. Yes.
38
39 Q. If you could just scroll down on that document to the
40 next page, stopping there, the entries under the statement
41 "Sequential operation" - you type those in?
42 A. Correct.
43
44 Q. Just to assist you in comparing what is in the IADC
45 report and what is in the PTT drilling report, I want you
46 to be shown EXH.0001.0001.0005. This is a document which
47 I want you to read on the basis that in the left-hand

1 column, under the "IADC Handwritten Report", that's a
2 transcription of what's in the handwriting on the IADC
3 report for 7 March, and on the right-hand side is what you
4 typed into the PTT daily drilling report. Do you
5 understand that?
6 A. Yes.
7
8 Q. Of course, in the handwritten version, the information
9 is not presented broken up with these underlinings in it.
10 Each entry for each period of time is in a single box, but,
11 for comparison purposes, it has been written with those
12 lines to break up the material. Do you understand that?
13 A. Yes.
14
15 Q. I just wanted to know that you understand that
16 clearly. I want to look at a couple of differences between
17 the material to see whether you can recall why the changes
18 were made between one wording and the other. Before I do
19 that, do I understand your evidence that you have given to
20 be that part of what you are doing when you are writing up
21 the daily drilling report is interpreting and clarifying
22 what is in the handwritten document?
23 A. Yes.
24
25 Q. In doing that, do you draw on your experience or do
26 you draw on other conversations that you have had with
27 people during the day, or both?
28 A. Both.
29
30 Q. Are those conversations principally that you had with
31 Mr Treasure when you handed over?
32 A. It could have been with Mr Treasure; it could have
33 been with the cementer; it could have been with the
34 toolpusher.
35
36 Q. In the left-hand column, you will see that the way the
37 information is presented, there is a swap to Halliburton
38 pressure, and that means that a manifold has been switched
39 over and the cementer's pump is taking control of what is
40 happening in the cementing job; is that right?
41 A. Yes.
42
43 Q. Then there is a reference to the testing of the casing
44 to 4,000 psi "okay", and you have written pretty much the
45 same, except that you changed it to a megapascal reference
46 instead of a psi reference?
47 A. Correct.

Q. Did you have to make those calculations because PTT required information to be presented in metric?
A. Northern Territory Government did.

Q. So part of what you are doing when you are preparing this report is getting out a calculator to do the translation from one to the other?
A. Yes.

Q. And then in the next box, you will see:

9.25 bbls to pressure and decrease pressure to 200 psi.

A. Yes.

Q. At the time, can you recall what you understood "9.25 barrels to pressure" meant, that is, at the time that you were writing the entries in the daily drilling report?
A. No. I can't recall.

Q. Reading it now, what do you understand that to mean?
A. I read it now that it bled off the test pressure, and we recovered 9.25 barrels.

Q. Then going to the next entry:

Then pressure shot up to 1300 psi.

A. Yes.

Q. At the time, you understood what was written in the IADC report to be a chronological description of what happened during the course of the day?
A. Yes.

Q. So that's the next thing that is written there, and you have written:

Then observed pressure rapidly increase ...

A. Yes.

Q. That pretty much follows what is written in the IADC report. Then there is:

1 *Given 16.5 bbls back.*
2
3 Can you recall what you understood that to mean at the
4 time - that's on 7 March - when you were reading that
5 information?
6 A. That when they bled off the test pressure, they
7 recovered 16.5 barrels from the well.
8
9 Q. What I want to put to you is that it is not clear from
10 the IADC report whether that 16.5 barrels back is an amount
11 that takes into account the 9.25 barrels to pressure up?
12 Do you see the point that I'm making?
13 A. Yes, yes.
14
15 Q. Do you accept that that is an ambiguity in the
16 handwritten report?
17 A. Yes.
18
19 Q. So I note that you have then put in a note in your
20 daily drilling report that expresses the position
21 differently by saying that there has been pumped 1.47 cubic
22 metres - and that's a reference to the 9.25 barrels?
23 A. No - oh, they pumped 1.47, yes, that's gone back, and
24 then bled off 2.62, yes.
25
26 Q. Then the 2.62 cubic metres is the 16.5?
27 A. Correct.
28
29 Q. And then "suspected float valve failure". By
30 expressing it in that way, you are making it clear, aren't
31 you - and you were intending to make it clear - that the
32 2.62 included the 1.47?
33 A. Correct.
34
35 Q. And you were removing the ambiguity in the IADC
36 report?
37 A. Correct.
38
39 Q. Was that something that you did yourself, or did you
40 speak to others about it in order to know that that was the
41 position?
42 A. Sorry?
43
44 Q. When you were writing your note in the daily drilling
45 report --
46 A. Yes.
47

1 Q. -- were you drawing on information that you had
2 received from others that meant that you knew that that was
3 the position?
4 A. I was drawing on information that I got from others.
5
6 Q. Who was that?
7 A. Mr Treasure.
8
9 Q. Is that something he had told you at the time of the
10 handover?
11 A. Yes.
12
13 Q. Did he tell you anything else about what had happened
14 with the pumping and what had been received back?
15 A. No. I don't recall.
16
17 Q. Then you have continued to describe:
18
19 *Pumped 2.54m3 back into casing at 9.3MPa.*
20
21 That's a reference to the 16.5 barrels going back; is that
22 right?
23 A. Yes.
24
25 Q. Being pumped back?
26 A. Yes.
27
28 Q. There is a slight difference between the two numbers.
29 Did you have access to some other information about what
30 the 16.5 barrels was?
31 A. The 16.5 barrels --
32
33 Q. Can you explain the difference between the 2.62 and
34 the 2.54?
35 A. That's half a barrel.
36
37 Q. So were you told by Mr Treasure that there was half a
38 barrel less pumped back?
39 A. Yes.
40
41 Q. So the 16.5 in the IADC handwritten report you knew
42 wasn't right, because that's exactly the same as what was
43 stated previously?
44 A. Yes.
45
46 Q. You knew they had pumped back but to half a barrel
47 less?

A. Yes. I may have read that in the IADC report in the early hours of the morning, and it could have been a correction made by Mr Treasure when he QC'd the document before it was sent to town.

Q. You just can't remember which?
A. No.

Q. But the difference between the two documents is a result of information from Mr Treasure?
A. Yes.

Q. Then if you go down that document further to the 1800 period, the handwritten document presented to you said, "Retest float good", and then you have written something very different when you have written up the daily drilling report. Can you explain why you have used different words there?
A. Because what I wrote is actually what we did. What the driller had put in was not correct. We did not retest the float at that stage. We opened the casing annulus to atmosphere and checked for no backflow.

Q. You understood that that wasn't properly captured by the words, "Retest float good"; you understood that the words, "Retest float good" didn't --
A. Didn't capture the actual event, no.

Q. And you know that the handwritten record is written up by the driller?
A. Yes.

Q. Where is the driller relative to where the cementing operation is happening?
A. On the drill floor.

Q. How far away is that from where the cement pumps are that are being operated by Halliburton?
A. Possibly - in the vicinity of 12 metres above and probably 20 metres behind. The driller is on the drill floor, and the cement pump is on the main deck.

Q. The main deck of the rig?
A. Correct.

Q. The rig floor has been cantilevered out over the top of the Montara platform?

1 A. Correct.
2
3 Q. So it is quite a distance between them?
4 A. Yes.
5
6 Q. And the driller can't actually see physically what's
7 happening in relation to the operation of the cement pumps?
8 A. No.
9
10 Q. And can't see physically what is happening down at the
11 wellhead?
12 A. No.
13
14 Q. So the driller depends on receiving information from
15 others?
16 A. Yes.
17
18 Q. Do you accept that when you wrote your note in your
19 daily drilling report, you recorded the information which,
20 if it had been understood at the time, would have showed
21 that there was a problem with displacement of the casing
22 shoe?
23 A. In hindsight, yes, but not at the time.
24
25 Q. When you wrote your note, you didn't come to that view
26 at the time?
27 A. No.
28
29 Q. Even though your note records that more is being
30 pumped back than came out?
31 A. Less. Less is being pumped back. 16.5 came back, and
32 they pumped 16 in.
33
34 Q. More net. If you look at your - you have pumped
35 1.47 - sorry, I see where we are at cross-purposes. Your
36 note says that you pumped 1.47 to pressure up?
37 A. To 4,000 psi, yes.
38
39 Q. And then you have bled off 2.62?
40 A. Which is 16.5, yes.
41
42 Q. But you have pumped back nearly all of the 2.62?
43 A. Yes.
44
45 Q. So your note shows that too much has been pumped back,
46 in hindsight?
47 A. Yes.

Q. But that didn't occur to you at the time?
A. I didn't do the job.

Q. What do you mean by that?
A. I didn't do the cement job.

Q. So do you say that you didn't consciously reflect on any significance associated with these figures?
A. No, not at the time.

Q. Can I ask you, then, some questions about the whiteboard that you have referred to in your statement. Did you smile at that point?
A. The dreaded whiteboard.

Q. Why do you say it is "dreaded"?
A. Well, it's a misconception of what it was used for - the ticking off of things and the adding of things that needed to be done. That was never the case for that whiteboard. It was a case to capture the events that happened while I was asleep so I could put them on the DDR. That's the bottom line.

Q. Who put to you the idea that there had been a ticking off on the whiteboard?
A. Mr Howe.

Q. Well, could we go to your statement at paragraph 35. It is the second paragraph 35, I am sorry. There is another one that follows. Do you see there it says:

> *If I knew offline work had been completed I would tick that work off on the whiteboard.*

A. Well, I would add it to the DDR and I would rub it off the whiteboard.

Q. Is this part of the information that came in your witness statement for you to consider, and you just haven't picked up that problem?
A. No.

Q. So this is something that you just missed in reading the witness statement?
A. Yes.

Q. So when you were referring to a misconception, you were referring to the earlier examination by Mr Howe?
A. Yes.

Q. Not a misconception that has arisen prior to you coming today to give your evidence, that you knew about?
A. No.

Q. So you are quite clear in your recollection that the way the whiteboard worked was that people wrote things up there during the course of the day knowing that the purpose of that was to enable you to come along in the evening or the night and prepare the daily drilling report?
A. Yes, indeed.

Q. Could I ask for the operator to put up document PTT.9001.0016.0254. Do you recognise this is the drilling report for 15 April on the rig?
A. Yes.

Q. If you could go down to the second page, please, or it might be further on in the document - the "Comments & Lessons Learned" section. When you were preparing these daily drilling reports, what kinds of comments would you put in that box?
A. Jobs that had been performed offline, or equipment failure, or activities, like cleaning the 244mm casing string, just to give town some insight of what's been going on in the background.

Q. If it was on the whiteboard, it went in here?
A. Yes.

Q. So this information about the "H1 and H3-ST1 340mm casing removed above the MLS" would have been written up on the whiteboard?
A. Or possibly told to me verbally.

Q. So it wasn't just the whiteboard that was the source of information to go in this "Comments" section?
A. Correct.

Q. That description, "H1 and H3-ST1 340mm casing removed above the MLS" - is that removing casing between the wellhead and the rig floor?
A. Between the MLS and the rig floor, yes.

Q. Is that the first step necessary to undertake works to suspend those wells?
A. No.

Q. What's the first step?
A. 9-5/8".

Q. So that would have been done, presumably, on an earlier report?
A. Yes.

Q. So you have to remove these in order from the smallest to the largest?
A. Correct, starting from the inside, working out.

Q. So this report is saying that the 340mm and the 508mm casings have been removed?
A. Yes.

Q. Prior to their removal, a person moving about the rig wouldn't be able to see whether there was a PCC in place on any of the casings for the H1 well, would they?
A. Unless they physically went down to that level and looked inside, no.

Q. But while these casings were in place between the wellhead and the floor --
A. Oh, no, no.

Q. -- there is just no way you could see. So this day was the first time somebody might have been able to go down on to where the wellhead is and be able to look down and see that there is no PCC on any of the casings?
A. Yes.

Q. Can I ask the operator to show you document PTT.9002.0081.0046. This is the email to which, amongst other things, the daily drilling report that we have just been looking at was attached and sent the following morning; is that right?
A. Yes.

Q. If we go to the end of that document, there is, at the foot, a number of names there, including your name?
A. Yes.

1 Q. And "Paul" is Mr O'Shea?
2 A. Correct.
3
4 Q. "Brian" is Mr Robinson?
5 A. Yes.
6
7 Q. And "Steven" is Mr Loveless?
8 A. Correct.
9
10 Q. So this is a document which you were all jointly
11 preparing to send back to town?
12 A. No.
13
14 Q. Why are all your names on there?
15 A. Because we work as a team, and I put the names down
16 from a team point of view.
17
18 Q. So that was your practice --
19 A. Yes.
20
21 Q. -- to record in that way? But I think your evidence
22 was this morning that after some discussion with at least,
23 if it was Mr O'Shea who was on duty, Mr O'Shea, if it was
24 Mr Treasure who was on duty, Mr Treasure --
25 A. Yes.
26
27 Q. -- then you were the one who sent the email?
28 A. Correct.
29
30 Q. Did that mean that this was done after you had
31 finished your shift? You were 6 to 6; is that right?
32 A. That's correct, yes.
33
34 Q. This email was sent around 7 o'clock, so this is
35 another hour after the end of your shift?
36 A. Indeed, yes.
37
38 Q. By that stage, are you really just waiting to see what
39 they are going to tell you so that you can make the changes
40 and send it off?
41 A. I'm waiting for the day company man, whoever that may
42 be, to QC the document, make sure that he is happy with it,
43 and then I would send it.
44
45 Q. So it is not so much a discussion between you; it is
46 the day drilling supervisor who is checking it and then
47 telling you of any corrections to be made?

1 A. Correct.
2
3 Q. Is that because the day person is the senior person?
4 A. Correct.
5
6 Q. Do you recall whether any changes were made to this
7 document through that process in relation to the report
8 that went out?
9 A. I don't recall.
10
11 Q. You don't? Do you recall typing the summary - well,
12 I take it that you typed the first draft of the document?
13 A. Yes.
14
15 Q. Do you recall typing the summary based upon your daily
16 drilling report?
17 A. Yes.
18
19 Q. The statement in this document that the corrosion caps
20 and trash caps should be installed by the late afternoon -
21 do you recall the source of that information?
22 A. No, I don't.
23
24 Q. Is that something that you would have known about at
25 the night-time, or is that something that those coming on
26 shift would know and expect to happen?
27 A. Yes, the person coming on shift.
28
29 Q. So would you expect that that would be information
30 that is provided to you by the day drilling supervisor?
31 A. No.
32
33 Q. Who would you expect it to be coming from?
34 A. Mr Robinson.
35
36 Q. Because he was responsible for the offline activities?
37 A. Yes.
38
39 Q. But Mr Robinson finished his shift at midday each day?
40 A. That day?
41
42 Q. Yes, on that day.
43 A. Yes.
44
45 Q. He was working from midnight to midday?
46 A. Mr Robinson worked extended hours.
47

1 Q. But you have a recollection that, on that day, he
2 finished at midday?
3 A. I don't recall.
4
5 Q. So you can't --
6 A. I was asleep. I don't know what time he knocked off.
7
8 Q. But you are aware of his shift times?
9 A. Mr Robinson was working 12 to 12. He was working 6
10 to 6. He was working any time he woke up.
11
12 Q. Can I then ask you to look at paragraph 197(c) of your
13 statement. This part of your statement, if we just go up
14 to paragraph 197, is referring to what the position was in
15 relation to the failure to fit the 13-3/8" PCC to the H1
16 well; right?
17 A. Yes.
18
19 Q. Subsequently, on 17 April, at the end of 16 April, you
20 prepared a daily drilling report for the events that had
21 happened on that day?
22 A. Yes.
23
24 Q. I should have taken you to that document as well.
25 That's GEO.0003.0001.1098. If we could go to page 3 of
26 that document, the "Comments" box, that is the daily
27 drilling report that you prepared at the end of 16 April,
28 or after midnight on 16 April?
29 A. Yes.
30
31 Q. There is the comment in there in relation to the
32 corrosion caps being fitted. Do you see that?
33 A. Yes.
34
35 Q. Is it your evidence that the source of that
36 information would have been something written on the
37 whiteboard?
38 A. Or it could have been given to me verbally. I could
39 have been sitting there doing the report at that stage, and
40 he could have walked in and just said, "Wish, we did this",
41 and I could have added it straightaway.
42
43 Q. When you say "he", who are you referring to?
44 A. Mr Robinson.
45
46 Q. Or it could have been Mr Treasure the following
47 morning?

1 A. It could have been, yes.
2
3 Q. Or it could have been that Mr Treasure wrote it on the
4 whiteboard during the course of the day?
5 A. Could have been.
6
7 Q. In any event, it wasn't based upon any knowledge on
8 your part of the actual event?
9 A. No.
10
11 Q. I don't know whether we need to take you to the
12 document, but you included that event in the covering email
13 that was to go the next day?
14 A. Yes.
15
16 Q. Going back to paragraph 197 of your statement, it
17 wouldn't have been the case that you would have seen
18 Mr Robinson install the 13-3/8" PCC?
19 A. No.
20
21 Q. The statement recorded in the daily drilling report
22 is, on your evidence, based upon something that somebody
23 has told you or information in the whiteboard?
24 A. Correct.
25
26 Q. If we could go up to paragraph 195, where you quote
27 what was included in the email that you prepared and then
28 was reviewed and then you sent the following morning, you
29 see the bullet point as recorded there is:
30
31 *Corrosion caps and trash caps installed by*
32 *on wells H1 and H3-ST1.*
33
34 Do you see that? Could it have been the case that you
35 prepared the email in draft on the basis that somebody
36 would insert who had done that work?
37 A. No, I think that's a typo.
38
39 Q. It is not a phrase that was prepared with a blank in
40 there --
41 A. No.
42
43 Q. Just to make it clear, that is a correct quotation
44 from the email itself?
45 A. That was a typo.
46
47 Q. I just want to ask you some questions about the

1 suspension of the H1 well.
2 A. Yes.
3
4 Q. There was a change on 6 March to the instructions as
5 to how the well would be suspended?
6 A. I believe so, yes.
7
8 Q. Do you recall that happening at about the same time as
9 the cementing job was being undertaken on the casing shoe?
10 A. No, I don't recall.
11
12 Q. But you recall that there was a change to the way in
13 which the well would be suspended to remove the cement plug
14 and put on a PCC?
15 A. Yes, sorry, I knew that.
16
17 Q. It is the case, isn't it, that the drilling program
18 was never updated to express any time when the 13-3/8" PCC
19 would be installed?
20 A. No.
21
22 Q. You are agreeing with what I said?
23 A. That the program wasn't changed?
24
25 Q. Yes.
26 A. Yes.
27
28 Q. Could we go to paragraph 168 of your statement.
29 Sorry, could we go to paragraph 169, which is at the end of
30 paragraph 168. There, you are quoting from the way that
31 the drilling program was expressed in relation to the
32 suspension of the well before the change to have the
33 13-3/8" PCC?
34 A. Could we scroll down to that - 169?
35
36 Q. If we can go up, probably, is best. If we go to the
37 beginning of paragraph 168.
38 A. Okay.
39
40 Q. It says that in about early March, the drilling
41 program reflected these stages?
42 A. Yes.
43
44 Q. When you prepared your statement, did you go back to
45 the drilling program, or did you just have presented to you
46 these quotations?
47 A. I just had these presented to me.

1
2 Q. Then if you go down to paragraph 169 - just above
3 paragraph 169, it's the very last part of the work to be
4 done in relation to the H1 well, and it finishes with
5 simply applying lubricant and applying a corrosion cap. Do
6 you see that?
7 A. Yes.
8
9 Q. That's not a pressure-containing corrosion cap, is it;
10 it is just --
11 A. No, it is not.
12
13 Q. It's what gets referred to as a trash cap?
14 A. Correct.
15
16 Q. Then at paragraph 276, there is a reference to a
17 corrosion cap, but that is, again, a trash cap, going on
18 the 508mm casing; is that right?
19 A. Yes.
20
21 Q. All of that work was to be done, under the original
22 drilling program, immediately after the cement plug going
23 into the 9-5/8" casing; do you recall that?
24 A. Sorry, can you ask the question again?
25
26 Q. Yes. Under the original drilling program, which is
27 quoted here, the offline work in relation to trash caps was
28 to be done after there had been a cement plug inserted into
29 the 9-5/8" casing?
30 A. Yes.
31
32 Q. There was then a change on 6 March to go to the PCCs
33 for the 13-3/8"?
34 A. Yes.
35
36 Q. Nobody provided to you an updated program concerning
37 when that work would be done?
38 A. No.
39
40 Q. Would you go to paragraph 239 of the statement,
41 please, at page 45. At this point, perhaps if we could go
42 up two paragraphs to where this section starts, you are
43 talking here about the 13-3/8" PCC and you don't know why
44 it was not installed; that's the position, isn't it?
45 A. Yes.
46
47 Q. You simply don't have any information about that?

1 A. No.
2
3 Q. You then say in paragraph 239(a)(ii) that you consider
4 that on the West Atlas, the following personnel should have
5 been aware that the PCC was not installed - do you see
6 that?
7 A. Yes.
8
9 Q. Is this part of the statement that was presented to
10 you --
11 A. No.
12
13 Q. -- for your consideration?
14 A. No.
15
16 Q. Can you explain why this paragraph was expressed in
17 terms which use, word for word, the identical language in
18 other statements from PTT people?
19 A. No, I can't explain that.
20
21 Q. You have not compared this part of your statement with
22 that of anyone else from PTT?
23 A. No.
24
25 Q. So you can't explain why the language is expressed in
26 the same terms in other witness statements?
27 A. No.
28
29 Q. What is in paragraph 239 is supposition on your part;
30 you don't have any actual knowledge about whether the Atlas
31 Drilling toolpusher was aware of anything in relation to
32 the 13-3/8" PCC?
33 A. Sorry, could you rephrase that, re-ask the question?
34
35 Q. You don't have any knowledge about whether the Atlas
36 Drilling toolpusher was aware that the 13-3/8" PCC had not
37 been installed?
38 A. No.
39
40 Q. When you say "should have been aware", do you mean
41 that if proper practices had been followed, then PTT would
42 have informed the Atlas Drilling toolpusher to do the work?
43 A. Yes.
44
45 Q. In relation to the reference to the OIM, that's the
46 same position: if proper procedures had been followed,
47 then there would have been an instruction that would have

1 been typed out for the work to be done, and the OIM would
2 have received that instruction?
3 A. I don't know about for offline activities. Online
4 activities, yes.
5
6 Q. In any event, because of the practice that was
7 followed, with Mr Robinson supervising the offline
8 activities, there wasn't a procedure by which the OIM would
9 necessarily know about those procedures?
10 A. No.
11
12 Q. Going to paragraph 239(b), if we could scroll down to
13 see that, in relation to your statement there that the
14 following personnel should have been made aware, and that
15 includes Mr Millar - again, you are expressing what should
16 have happened if proper procedures had been followed?
17 A. Yes.
18
19 Q. Could I ask the operator to go to paragraph 242,
20 please. This is a statement of your explanation, with
21 hindsight, about what occurred in relation to causing the
22 blowout; is that right?
23 A. Yes.
24
25 Q. Is this material that is presented here part of the
26 material that came to you in a form for you to consider,
27 and that is the first time that you saw that material?
28 A. No.
29
30 Q. This material at paragraph 242, in paragraphs (a) and
31 (b), is expressed word for word in at least one other
32 statement of a PTT witness. Do you have any explanation as
33 to how that happened?
34 A. No, I don't.
35
36 Q. Could we go to paragraph (b), where you say:
37
38 *However, there was an auditable documentary*
39 *chain in place because the forward plan had*
40 *been revised in consultation with the OIM.*
41
42 Do you see that?
43 A. Yes.
44
45 Q. You don't know whether that's the case in fact; you
46 are just looking back at information with hindsight?
47 A. Yes.

Q. That is to say, you don't know what consultation, if any, there was with the OIM about this matter, about the change in the sequence?
A. No.

MR COLVIN: Thank you, Mr Wishart. We have nothing further for this witness, Mr Commissioner.

THE COMMISSIONER: Thank you, Mr Colvin. We might adjourn for lunch and resume at 2pm.

MR HOWE: Before we do that, Commissioner, there is one matter that I did raise, and that is that I did support Mr Colvin's question to the witness, as to whether there were parts of the statement that were already in a particular form rather than being based upon information specifically provided by him, as being a fair question.

The witness answered "yes", but there was no development of that as to which parts answer the description of being in the particular form that they are as set out in his declaration when he first saw it, and I would ask that Mr Wishart, over lunch, mark up on this statutory declaration those parts of it which he thinks were substantially in that form rather than being based on specific information which he gave.

So if Mr Wishart could be given a copy of this, which is a clean copy of his declaration, and if he could attend to that exercise over lunch. He can be given a highlighter pen and he can mark up either in the margins or on the text of the document.

Subsequently, when Mr Colvin put particular passages to him, he denied that they were based, and I think that the Commissioner needs to have some understanding of exactly what Mr Wishart's acceptance of the original proposition put to him by Mr Colvin entailed by reference to the actual document.

Q. Can you do that, please, Mr Wishart?
A. Sure.

MR HOWE: Will you be continuing after lunch?

MR COLVIN: There may be an issue that might arise from

that exercise. But, subject to that, we are complete.

MR HOWE: Mr Abbott, do you anticipate having any questions?

MR ABBOTT: Just a couple.

MR HOWE: All right. We will resume after lunch, if that is convenient.

LUNCHEON ADJOURNMENT

1 **UPON RESUMPTION:**
2
3 **<EXAMINATION BY MR HOWE:**
4
5 MR HOWE: Q. Have you had a chance to highlight on the
6 document relevant passages?
7 A. Yes.
8
9 Q. Could I have that returned to me, please? (Handed).
10 Do I take it that the paragraphs that you highlighted
11 contain information which was presented to you --
12 A. No.
13
14 Q. -- substantially in that form?
15 A. That I had put in.
16
17 Q. So the paragraphs that you haven't highlighted contain
18 information substantially in that form and which was
19 presented to you for the purposes of constructing this
20 statutory declaration?
21 A. Yes.
22
23 Q. May I just put a highlight up the top, and could
24 I describe that information as being, in effect, your own
25 unassisted work?
26 A. Yes, yes.
27
28 MR HOWE: Unfortunately, Commissioner, the easiest thing
29 is going to be to ask you to retire for some 5 to
30 10 minutes so that counsel can sequentially quickly examine
31 this document to see if they have any further questions of
32 the witness.
33
34 THE COMMISSIONER: I'm happy to do that, Mr Howe.
35
36 **SHORT ADJOURNMENT**
37
38 **<EXAMINATION BY MR COLVIN:**
39
40 MR COLVIN: Thank you, Mr Commissioner. I have ended up
41 with Mr Wishart's marked statement. If I could hand that
42 back to him, there's just one matter that I want to clarify
43 in relation to the markings on the document.
44
45 Q. If you could go to paragraph 242, do you remember,
46 before lunch, I asked you some questions about this,
47 particularly the reference in paragraph (b) to the OIM?

A. Yes.

Q. I asked you then whether this was part of the material that was presented to you in a format for you to consider?
A. Yes.

Q. And you answered, "No". Do I take it that, on reflection over lunch, you have reviewed paragraph 242 and you are now satisfied that it was part of the material that was presented to you in that format for you to consider?
A. Yes.

MR COLVIN: Thank you. Nothing further, Mr Commissioner.

THE COMMISSIONER: Thank you, Mr Colvin. Mr Howe, is it you or Mr Abbott?

MR HOWE: I think Mr Abbott has some brief questions for the witness.

<EXAMINATION BY MR ABBOTT:

MR ABBOTT: Q. Mr Wishart, you have marked up your copy of the statement that shows the parts of the statement that you included, unassisted, in your statement.
A. Yes.

Q. At time that you got the statement, it obviously included material that was included there for your consideration?
A. Yes.

Q. Did you consider the entirety of your statement?
A. Yes, I did.

Q. And were you able to change any aspect of the statement that you regarded necessary to change?
A. Yes.

Q. Did you in fact make changes to the statement?
A. Yes, I did.

Q. So by doing that, did you adopt the entirety of the statement?
A. Yes, I did.

Q. Did you understand that, by signing the statement, you

1 were declaring that it was true?
2 A. Yes, I did.
3
4 Q. Did you understand that the statement was to be used
5 for the purpose of this Inquiry?
6 A. Yes, I did.
7
8 Q. And that if you had included material that was
9 intentionally false, then you would be subject to penalty?
10 A. Yes, I understand that.
11
12 Q. You were asked some questions previously, I think by
13 my learned friend Mr Howe, about whether or not the
14 drilling program contained instructions as to what to do in
15 the event that there was a failure of the float, the float
16 valve?
17 A. Yes.
18
19 Q. What is it that the drilling program is intended to
20 do?
21 A. Outline the construction of the well, basically.
22
23 Q. In sequential order?
24 A. Yes.
25
26 Q. And they are the instructions that you, I think on
27 your evidence, say you would habitually follow?
28 A. Yes. I would follow the forward plan, which was
29 drafted from the drilling program.
30
31 Q. Does the forward plan include any indications about
32 what to do in the event of a float failure?
33 A. Not that I recall, no.
34
35 Q. Obviously, the failure of a float valve is something
36 that would not be a matter contained within the sequential
37 order of things that you would do to construct the well?
38 A. Not that I'm - no.
39
40 Q. Are there any other things apart from the failure of
41 a float valve that may go wrong in the course of
42 constructing a well?
43 A. Are you talking about to run the casing or to drill
44 the well?
45
46 Q. In any respect.
47 A. There's a lot of things that could happen.

Q. Does the drilling program contain any direction for any of those other matters?
A. No.

Q. So what do you habitually do in the event of something not going according to plan?
A. Well, we stop and assess it and derive a way forward.

Q. And you do that without there being any reference in the drilling program to what you should do?
A. Yes.

Q. How big would the drilling program have to be if it included a direction to take into account every contingency for something going wrong?
A. Infinite.

Q. How would you describe the status of the well if the pore pressure were in fact to be 1.0143 sg - how would you describe the status of the well if the pore pressure were 1.0143 sg?
A. It would be normally balanced, normal pressure.

Q. The pore pressure would be normally pressured?
A. Yes.

Q. And in relation to fluids in the casing, how would they be relative to the pore pressure?
A. They would be overbalanced.

Q. If the pore pressure were in fact 1.06 sg and you removed the 9-5/8" pressure-containing corrosion cap --
A. Yes.

Q. -- what physically would you expect to see or detect in that event?
A. You'd expect to see the well start to flow.

Q. In your experience, when the 9-5/8" pressure-containing corrosion cap was not removed, is there any possibility that the pore pressure could have been 1.06 sg?
A. No.

Q. I understood your evidence to be that if something occurs even during the night-shift that is unexpected, you

1 would speak to the day drilling supervisor?
2 A. Yes.
3
4 Q. And that you would do that even if it required waking
5 him?
6 A. Yes, indeed.
7
8 Q. What's the process after that in order to resolve
9 whatever issue has arisen?
10 A. Well, depending on the situation, if I found a problem
11 during the night that I couldn't deal with, I would wake
12 the day company man up, or the senior drilling supervisor,
13 and between us we would discuss it, and if we couldn't come
14 up with a solution, we would call town.
15
16 Q. What are you expecting town to do in the event of
17 calling them?
18 A. Well, with their expertise, hopefully help us resolve
19 it, or help us plan a way forward.
20
21 Q. Is there anyone else on the rig that you might consult
22 in that process?
23 A. Yes, we would consult with the toolpushers. I mean,
24 we have an open-door policy. If we have a problem, we let
25 everybody put their two cents worth in, you know? Somebody
26 might have a piece of relevant information that they've
27 learned on another well, on another rig, that we could put
28 into practice and hopefully resolve our situation.
29
30 MR ABBOTT: Thank you, Mr Commissioner. Thank you,
31 Mr Wishart.
32
33 THE COMMISSIONER: Thank you, Mr Abbott. Mr Howe?
34
35 **<EXAMINATION BY MR HOWE:**
36
37 MR HOWE: Q. Now, in relation to the events which
38 occurred on 7 March last year concerning the cementing of
39 the casing shoe and the apparent failure of the floats, did
40 you understand that Mr Treasure had spoken about those
41 events with someone from PTT onshore?
42 A. Yes, I did understand that, yes.
43
44 Q. Who was the person you understood he had spoken to?
45 A. I believe he spoke with Mr Wilson.
46
47 Q. When did you become aware of that?

1 A. When I came on shift at 6pm that night, I had a brief
2 discussion with Mr Treasure about the day's events and what
3 had happened, and it was at that stage that he informed me
4 that he had called town.
5
6 Q. Do you understand that Mr Treasure acted in conformity
7 with advice or instructions that he'd received about how to
8 deal with the problem from Mr Wilson?
9 A. No. I don't know.
10
11 Q. If he had a conversation with Mr Wilson, it's unlikely
12 that he acted contrary to any advice and instructions,
13 isn't it?
14 A. Yes.
15
16 Q. Do you recall any telephone call from town to the rig
17 after you came on duty on 7 March at which this topic was
18 discussed?
19 A. No, I don't.
20
21 Q. What about the next day - the morning call or --
22 A. No, I don't recall.
23
24 Q. What about the next afternoon?
25 A. No, Mr Howe, I don't recall.
26
27 Q. But I take it that what you are clear about is that at
28 no stage did anyone advise you that PTT personnel onshore
29 considered that any further or different action should be
30 taken in relation to the cementing of the casing shoe?
31 A. Sorry, can you ask that again?
32
33 Q. Can you be sure, sir, that if you had received any
34 advice or instruction after the cementing of the casing
35 shoe from PTT personnel onshore as to the taking of any
36 step, you would have taken that step?
37 A. Indeed I would have, yes.
38
39 Q. So you can be sure that in the events following the
40 cementing of the casing shoe, so far as you're aware,
41 no-one from PTT onshore advised or instructed that any
42 particular step should be taken in relation to the
43 cementing of the casing shoe?
44 A. No.
45
46 MR ABBOTT: I object to that question. My friend put to
47 the witness that if there had been an instruction to him,

1 he would follow the instruction, and now it has gone to
2 some other matter and it couldn't connect logically to the
3 first question, with respect.
4
5 MR HOWE: Yes, I'm happy to put it differently.
6
7 Q. Is it your understanding that if Mr Treasure had
8 received instructions from anyone at PTT to do anything
9 further or different in relation to the cementing of the
10 casing shoe, he would have acted in conformity with those
11 instructions?
12 A. Yes.
13
14 Q. You didn't take any further or additional step in
15 relation to the cementing of the casing shoe later on the
16 evening of 7 March or at any time thereafter, did you?
17 A. No.
18
19 Q. And you received absolutely no instruction from anyone
20 onshore to do so, did you?
21 A. No.
22
23 Q. You mean you agree with me?
24 A. Yes, I agree with you, yes.
25
26 Q. You referred, on a couple of occasions, to documents
27 being given by you to Mr Treasure for him to QC.
28 A. Yes.
29
30 Q. What does that expression mean?
31 A. The DDR?
32
33 Q. The DDR or the email.
34 A. Yes. For him to view to make sure that he was happy
35 with what the content was and that I could send it.
36
37 Q. Does that expression "QC" stand for "quality control"?
38 A. Yes.
39
40 Q. You would accept, would you not, that one flaw in
41 relation to the use of the whiteboard for recording
42 activity is that someone could have narrated on the
43 whiteboard that the 13-3/8" PCC had been installed, when
44 they might not know that first hand; they might be just
45 assuming that, for instance, because they saw the trash cap
46 placed on the top of the casing?
47 A. That's possible, yes.

Q. Could I have a look, please, at the statutory declaration that you have marked up? (Handed). Is it the case, sir, that when you were presented with the information substantially in the form that ultimately appears in your statutory declaration, you looked at it and checked it to make sure that you didn't disagree with it; is that right?
A. Yes.

Q. But is it the case that being presented with large slabs of material already prepared meant that you, on some occasions, were seeing material about which you had no prior knowledge; is that right?
A. Yes.

Q. Do I understand that you took on face value the content of that material unless you conscientiously believed it to be false?
A. Correct.

Q. For instance, paragraph 112 in your declaration states that:

> *When the field discovery wells were evaluated, the reservoir pressures were resolved to be slightly less than sea water.*

A. Yes.

Q. I take it that you didn't have any prior personal knowledge about that?
A. No.

Q. But you were presented with that information, and you didn't know it to be false, and so you were prepared to have it remain in your declaration; is that right?
A. Yes, yes.

Q. You told the Commissioner that if the drilling program contained within its four corners every little thing that might go wrong, it would be of infinite size; do you recall giving that evidence?
A. Yes, I do.

Q. Well, sir, I want to suggest to you that whilst that

might be true if you included every single little thing that might go wrong in relation to every tiny increment in the program, there's a lot to be said for including in the program what should happen in the event that things go wrong while you're doing something as basic and fundamental as installing barriers; do you agree with that?
A. Yes.

Q. Finally, sir, you gave evidence to the Commissioner that, in your view, there was no possibility that when the PCC was removed, the pore pressure of the formation could have been 1.06. Do you recall giving that evidence?
A. Yes.

Q. In giving that evidence, did you factor in to your answer any particular understanding of the nature and extent of the channels or worm holes that might have been created in the cement?
A. No.

Q. That would be relevant to do that, wouldn't it?
A. It would.

Q. Did you factor in to your answer an assessment by you as to the length of casing and therefore the distance that any percolation of formation fluid would have to travel in order to escape from the wellhead?
A. No.

Q. That would be relevant, too, wouldn't it?
A. Yes, it would.

MR HOWE: May it please, I have nothing further.

THE COMMISSIONER: Thank you, Mr Howe.

MR HOWE: Might the witness be excused?

THE COMMISSIONER: Thank you, Mr Wishart.

<THE WITNESS WITHDREW

MR HOWE: May it please, could David Horne be called?

MR COLVIN: Commissioner, he has been waiting downstairs and isn't here outside.

THE COMMISSIONER: Thank you, Mr Colvin.

MR HOWE: Commissioner, could I also rise to say that if Mr O'Shea is waiting, then I think we can send him away on the basis that we have him here tomorrow, because even if we finish early, that's a virtue, and we probably wouldn't want to start too late in the afternoon with Mr O'Shea.

Also while Mr Horne is coming, could I hand up to you, Commissioner, a copy of the statutory declaration that was marked up by Mr Wishart, and could we make arrangements for a version of it to be copied and similarly marked up and distributed to the parties' legal representatives, save for Mr Abbott, who I think has had that already attended to.

You don't need another copy of the statutory declaration marked up?

MR ABBOTT: Thank you. We've already marked our copy.

<DAVID HORNE, affirmed: [2.44pm]

<EXAMINATION BY MR HOWE:

MR HOWE: Q. Sir, could you state again, please, your full name and your address, and if you would prefer to give a work address, by all means do so?
A. David Horne, 22 Withnell Road, Liverpool, England.

Q. You're employed as a driller; is that right?
A. Correct.

Q. In connection with these proceedings, did you make a statutory declaration on - I'm not sure whether it is 22 March 2010 or 22 February?
A. Yes, I did.

Q. Do you have a copy of that with you?
A. Yes.

Q. Can you tell us, please, what date it is? On the last page, I think, sir.
A. 23 February.

Q. The 22nd or 23rd?
A. 23rd.

1 Q. 23 February, all right. Sir, are the contents of that
2 statutory declaration true and correct to the best of your
3 knowledge, information and belief?
4 A. Yes.
5
6 Q. I'd like to ask you a few brief questions about the
7 declaration and then ask you some questions more generally.
8 In relation to your background and qualifications, is it
9 correct that you don't have any formal qualifications in
10 respect of drilling for oil offshore?
11 A. I don't understand what your question is.
12
13 Q. Do you have any formal qualifications that you have
14 obtained as a result of a course of study in connection
15 with drilling for petroleum offshore?
16 A. I'm still not understanding the --
17
18 Q. Have you undertaken any courses of study in respect of
19 offshore petroleum drilling?
20 A. Yes. I have an IWCF drilling certificate.
21
22 Q. You have a drilling certificate?
23 A. Yes.
24
25 Q. When did you obtain that?
26 A. Last year, on 5 December.
27
28 Q. Was that the first occasion you had ever obtained such
29 a certificate?
30 A. No. I've had a certificate on a few occasions over
31 the years.
32
33 Q. So from time to time you got certified, and then the
34 certificate would lapse or something, would it?
35 A. No, it's every two years, you renew your certificate.
36
37 Q. And you do that by doing a course of study, do you?
38 A. That's correct, yes.
39
40 Q. How long does that study last for?
41 A. Five days.
42
43 Q. Apart from that, have you undertaken any other course
44 of study in connection with offshore petroleum drilling?
45 A. No.
46
47 Q. If you could go, please, to paragraph 14 of your

1 statutory declaration, which is WIT.1501.0004.0001. In
2 paragraph 14, you refer to the fact that the procedure for
3 suspending the well involved the cementing of the 9-5/8"
4 casing. Do you see that?
5 A. Yes.
6
7 Q. But you say that you don't recall the specifics of
8 this cementing program at all.
9 A. No, I don't, no.
10
11 Q. Do you even know whether you were on the rig at the
12 time?
13 A. I think I was on the rig at the time, yes.
14
15 Q. Because in paragraph 5, you say that you were onboard
16 the rig in or around March 2009 and when the uncontrolled
17 release occurred on 21 August 2009. Do you see that?
18 A. Yes.
19
20 Q. Have you gone back and checked exactly when it was
21 that you were on the rig at those times?
22 A. No.
23
24 Q. You refer, in the next sentence, to the cementing job
25 being carried out by Halliburton personnel, who were
26 directly supervised by PTT representatives. Do you see
27 that?
28 A. Yes.
29
30 Q. Sir, whenever I refer to PTT, I'm referring to the
31 organisation you've described as PTTEPAA. Do you
32 understand that?
33 A. Yes.
34
35 Q. Now, I take it that the cementing job being carried
36 out under the direct supervision of PTT representatives was
37 the standard operating procedure --
38 A. Yes.
39
40 Q. -- on the rig at the time; is that right?
41 A. That's correct.
42
43 Q. In paragraph 15, you say that you recall that
44 a corrosion cap was installed. Do you see that?
45 A. Yes.
46
47 Q. Can you remember when or around when that happened?

1 A. No, I don't.
2
3 Q. You go on to say that you can't recall, in fact, which
4 of the two sizes of corrosion cap were installed. Do you
5 see that?
6 A. I do.
7
8 Q. Have you been back and reviewed any records to try to
9 improve your recollection?
10 A. No, I haven't.
11
12 Q. You say that the other corrosion cap which could have
13 been fitted was not installed, but you can't remember the
14 reason why. Do you see that?
15 A. Yes.
16
17 Q. You go on to say that you don't recall any discussions
18 about why the other cap was not installed?
19 A. No, I don't.
20
21 THE COMMISSIONER: Can we scroll up, please.
22
23 MR HOWE: This is paragraph 15.
24
25 Q. But you say that you were present when the cap, of
26 whatever size, was installed. Do you see that?
27 A. Yes.
28
29 Q. Do you mean present on the rig, or do you mean present
30 during the actual installation process?
31 A. On the rig.
32
33 Q. Indeed, you don't even have a recollection as to
34 whether you had any personal involvement or not in the
35 installation of that cap; is that right?
36 A. That's correct.
37
38 Q. Then in paragraph 23, you discuss what occurred
39 shortly prior to the blowout in August last year, do you
40 see that, namely, the removal of the 9-5/8"
41 pressure-containing cap?
42 A. Yes.
43
44 Q. You say that you recall discussing with Bart Kok what
45 kind of pressure might be under the cap. Do you see that?
46 A. Yes.
47

1 Q. Was there something about that conversation that
2 caused it to imprint in your recollection?
3 A. Can you say that again, please?
4
5 Q. All right. How is it that you are able to recall that
6 discussion with Mr Kok? Is it because it occurred shortly
7 prior to the blowout? Why are you able to recall that
8 conversation?
9 A. Because we discussed it and I remember it.
10
11 Q. Can you tell the Commissioner what your best
12 recollection is of the terms of that conversation?
13 A. We discussed how we were going to read pressure once
14 we inserted the runner tool into the pressure cap and how
15 we were going to read it through the choke, through the top
16 drive, going down through to the choke, and if there was
17 any pressure there, how to control it.
18
19 Q. Do you recall that there was actually a change of
20 control process that led to the removal of this 9-5/8" PCC?
21 A. I don't understand the question there.
22
23 Q. Do you recall whether or not there were any written
24 instructions that were in place in relation to the removal
25 of this 9-5/8" cap?
26 A. There was a forward plan on removal of the cap.
27
28 Q. It contained a series of instructions about measuring
29 the pressure from underneath it before removal, and so on,
30 didn't it?
31 A. Yes.
32
33 Q. You recall that?
34 A. Yes.
35
36 Q. You refer in that paragraph to there being different
37 ways of reading pressure under the cap. Can you tell the
38 Commissioner what those different ways might be?
39 A. It's just the same ways that we did regarding reading
40 the pressure on the choke - bring it through your top
41 drive, going through into your choke, where we've got
42 a gauge there, and if there is any pressure, it will read
43 on the gauge.
44
45 Q. I wonder, sir, do you know what the sensitivity of
46 that gauge is?
47 A. How do you mean?

Q. Well, do you know, for instance, whether it can read pressure down as low as 5 psi?
A. Yes, it reads zero, and if there was any pressure there, it would have read it.

Q. Sir, the Commissioner has received some evidence to the effect that there could have been a minimal amount of pressure stored under that corrosion cap, which might not have triggered a reading on the manifold choke gauge. Are you able to positively dispute that or not?
A. Well, our gauge was reading zero, and if there would have been any pressure, regardless, it would have read it.

Q. Yes, but do you have any knowledge at all as to the calibrations of the gauge and what sensitivity the gauge had in terms of reading very low pressures?
A. Yes, the gauge could read very, very low pressures.

Q. Do you know a Mr Brian Robinson?
A. I do, yes.

Q. Was he an experienced operator?
A. Yes, so I believe he was.

Q. Because he, for instance, has suggested in a document that, given the length from the PCC to the choke manifold, it probably couldn't have read pressures as low as 20 psi. Does that surprise you, does it?
A. No, not really, because the gauges that we have on the choke manifolds are regularly calibrated.

Q. So it does surprise you that Mr Robinson would say he doesn't think the gauge could pick up a pressure between zero and 20 psi?
A. It does pick up zero to 20 psi.

Q. In paragraph 31, you say that you don't recall any discussions about replacing the 9-5/8" cap. Do you see that?
A. I do, yes.

Q. You say:

However, the cap could have been replaced after the brush had been run.

1 Do you see that?
2 A. Yes.
3
4 Q. And it wouldn't have involved any great expenditure of
5 time, effort or money to reinstall the cap, would it?
6 A. No.
7
8 Q. Then in paragraph 34, you make reference to there
9 being only one 18-3/4" BOP on the West Atlas at the time?
10 A. Yes.
11
12 Q. Now, I just want to clarify that statement, because
13 it's potentially ambiguous. Do you mean that there were
14 other BOPs of different sizes, or do you mean there was one
15 BOP and it was an 18-3/4" size?
16 A. That was the only BOP that was there.
17
18 Q. Then in paragraph 35, you refer to the fact that on
19 the rig at the time, there was no adaptor to allow the BOP
20 to be fitted directly to the well casings. Do you see
21 that?
22 A. Yes.
23
24 Q. Does that mean, for instance, that you couldn't put
25 the BOP on the 20" casing and then take off PCCs through
26 the BOP?
27 A. You'd have to have an adaptor for the flange from the
28 bottom of the BOP.
29
30 Q. Yes, and there was no such adaptor?
31 A. No.
32
33 Q. And then in the last sentence of that paragraph, you
34 say:
35
36 *The absence of a BOP did not concern me*
37 *because in my experience they are not*
38 *always used on well casings.*
39
40 Do you see that?
41 A. Yes.
42
43 Q. But do you agree that it would be a good idea to have
44 on the rig appropriate adaptors to enable the BOP to be
45 fitted on to the different sized casings?
46 A. Yes.
47

1 Q. That would give you more flexibility, wouldn't it?
2 A. Yes, it would, yes.
3
4 Q. And it would mean that if you wanted to, you could
5 hook up the BOP and put on or take off corrosion caps
6 through the BOP; that's right, isn't it?
7 A. Yes.
8
9 Q. Thereby maintaining well integrity - that is, the BOP
10 would act as a barrier?
11 A. Yes.
12
13 Q. Sir, just some general questions. Do you know
14 anything at all about a suggestion that the wrong volumes
15 of tail cement were used when calculating the cement
16 slurries in connection with the cementing of the casing
17 shoe on 7 March?
18 A. I didn't know that there was wrong slurry, no.
19
20 Q. You're hearing that, as it were, for the first time
21 here and now?
22 A. Yes, yes.
23
24 Q. Do you know what the system in place was on the rig
25 for the calculation of the cement volumes or not?
26 A. I don't, no.
27
28 Q. And do you have any understanding at all as to what
29 the effect might be of the use of wrong volumes of tail
30 cement?
31 A. Yes.
32
33 Q. What might the effect be?
34 A. Well, the cement job wouldn't go - do a good deal,
35 wouldn't go right.
36
37 Q. Do you have any knowledge of the process that is
38 utilised when cementing a casing shoe? You're involved in
39 that sort of thing from time to time, are you?
40 A. I am, yes.
41
42 Q. And do you know that in the casing shoe there's
43 a float collar, and, beneath that, there's a casing shoe
44 float?
45 A. Yes.
46
47 Q. The purpose of introducing the cement, followed by

1 seawater, is to get the cement underneath the float collar
2 in the internal cavity of the casing shoe and then to
3 spread out beneath the casing shoe and to rise up in the
4 annulus; that's right, isn't it?
5 A. That's correct, yes.
6
7 Q. The objective is to get the cement just beneath the
8 float collar so that you have as much cement as possible in
9 the internal cavity of the casing shoe; that's right, isn't
10 it?
11 A. Yes.
12
13 Q. So you calculate your volumes of displacement fluid so
14 that, when the plugs bump, you have your cement right up
15 near the float collar; that's the objective, isn't it?
16 A. Yes.
17
18 Q. Were you aware, at the time, that after a pressure
19 test of casing, you might sometimes get a return of cement
20 from beneath the float collar? Were you aware of that as
21 something that could happen or might happen in the course
22 of cementing a casing shoe?
23 A. Yes, when you displace.
24
25 Q. I'm sorry?
26 A. When you displace.
27
28 Q. I'm suggesting after you've displaced the cement
29 beneath the float collar, you then pressure up for 10 to
30 20 minutes to test the casing joints by, for instance,
31 introducing some extra volume of seawater in order to bring
32 the pressure up to about 4,000 psi. Are you aware of that
33 or not?
34 A. Yes.
35
36 Q. And are you aware that sometimes after that test, when
37 you bleed off pressure, you can get a return of cement from
38 beneath the float collar?
39 A. Yes.
40
41 Q. Had you ever had prior experience of that sort of an
42 event?
43 A. No.
44
45 Q. How long have you been involved in the cementing of
46 casing shoes?
47 A. I've been drilling nine years.

1
2 Q. Nine years?
3 A. Yes.
4
5 Q. Did you have much knowledge, back in March last year,
6 as to what steps could or should be taken when you had
7 a return of cement from beneath the float collar, as I've
8 described?
9 A. I don't recall at that time.
10
11 Q. Back in March, did you have any knowledge about what
12 steps could or should be taken in the event that you had
13 a return of cement from beneath the float collar at the
14 time I've described to you?
15 A. No.
16
17 Q. Because you hadn't encountered the situation before;
18 is that right?
19 A. That's correct.
20
21 Q. And I take it that you hadn't, therefore, read any
22 literature or seen any instructions that suggested what
23 should happen?
24 A. No.
25
26 Q. Do you have any understanding now, in particular, as
27 to what steps could or should be taken in response to the
28 event I've just described?
29 A. Yes.
30
31 Q. Do you understand that, whatever you do, you shouldn't
32 pump back the cement and continue to pump so that you
33 displace the cement from beneath the float collar and,
34 instead, introduce seawater into the cavity within the
35 casing shoe and in the rat hole; do you understand that's
36 a bad thing to happen?
37 A. Yes.
38
39 Q. How did you acquire that understanding? Was it just
40 in the course of preparing for these proceedings?
41 A. Yes.
42
43 Q. Did you have any understanding, back in March, as to
44 what steps you might need to verify the integrity of
45 a casing shoe that gave rise to an apparent failure of the
46 floats and so on? Did you know back then?
47 A. Yes.

1
2 Q. What was your understanding of what tests should be
3 done?
4 A. I can't remember at the moment.
5
6 Q. Do you have any recollection or understanding as to
7 what steps, if any, were taken in relation to the cementing
8 of this casing shoe on 7 March? --
9 A. No.
10
11 Q. -- after the apparent failure of the floats?
12 A. No.
13
14 Q. I take it that you don't have any understanding of any
15 particular risk assessment that was undertaken by anyone
16 involved in that operation either on the rig or offshore?
17 A. No.
18
19 Q. I'm sorry, onshore.
20 A. No.
21
22 Q. And you don't have any recollection or understanding
23 as to what communication took place between whom about that
24 event?
25 A. No.
26
27 Q. What about in relation to the use of PCCs as barriers?
28 In your nine years, have you come across PCCs being
29 installed in wellbores as a form of secondary well control,
30 that is, as a secondary barrier against a blowout?
31 A. Yes, you have two barriers.
32
33 Q. Yes.
34 A. Cement plugs and sometimes a mechanical.
35
36 Q. So often the cemented casing shoe is what's called the
37 primary barrier; is that your understanding?
38 A. Yes.
39
40 Q. And then you would ordinarily have a secondary
41 mechanical barrier in the event that the primary barrier
42 failed; is that right?
43 A. Yes, that's right.
44
45 Q. The secondary barrier might be a cemented plug; is
46 that right?
47 A. That's correct, yes.

Q. And there are other forms of secondary barriers; that's right, isn't it?
A. That's right.

Q. What I'm asking is, prior to the events in March last year, in your nine years of previous experience, had you come across the use of these corrosion caps as a form of secondary barrier that were placed or installed within a wellbore as a secondary mechanical barrier? Had you come across that or not?
A. No.

MR ABBOTT: Sorry to interrupt my friend. The question there is relating to corrosion caps.

MR HOWE: Yes.

Q. Do you understand by "corrosion cap" I mean a pressure-containing corrosion cap?
A. Yes.

Q. Had you actually come across those pressure-containing corrosion caps being used at all for any purpose?
A. No, I hadn't, no.

Q. I take it, sir, without intending any disrespect, that since the blowout you haven't really conducted your own researches to satisfy yourself as to what might have caused or contributed to the blowout; is that right?
A. That's correct.

Q. Do you have any understanding of what's commonly meant by a "temporary suspension" and a "long-term suspension" or not?
A. Yes.

Q. Is a temporary suspension ordinarily understood to occur when the rig leaves the location; is that your understanding?
A. Yes, temporary, yes.

Q. Whereas a longer-term - I'm sorry, did I put that wrongly? I'm sorry, I misled you, sir. What do you understand to be the difference between a temporary and a long-term suspension?
A. A temporary is where you can set a couple of plugs and

1 maybe in a mechanical way you can remove it and drill out
2 the plugs - that's a temporary. But if it's a permanent,
3 they run a different mechanical - set a couple more cement
4 plugs but run another mechanical packer to seal off the -
5 and then put cement on top of it as well.
6
7 Q. Did you understand that the distinction between the
8 two might depend at all on whether the rig stayed on the
9 location or left, or not?
10 A. Sorry, can you say that again?
11
12 Q. So far as distinguishing between a temporary
13 suspension and a long-term suspension, in your mind did
14 that depend at all on whether the rig stayed on the site or
15 left the site?
16 A. Well, we knew we were going to come back to the
17 location.
18
19 Q. Yes.
20 A. So it was going to be a temporary.
21
22 Q. Right. That was your understanding, was it?
23 A. Yes, yes.
24
25 Q. What was that understanding based on?
26 A. With the plugs that we had in the well.
27
28 Q. What was your understanding of what barriers were in
29 place when the H1 well was suspended?
30 A. You had two cement plugs and a corrosion cap, and we
31 had inhibited seawater as well in the well.
32
33 Q. That's as best you can recall?
34 A. Yes.
35
36 Q. I want to assume that you're wrong about that, sir,
37 and at the point of suspension the barriers being relied
38 upon were a cemented casing shoe, inhibited seawater in the
39 9-5/8" casing column, a 13-3/8" PCC and a 9-5/8" PCC. Do
40 you follow?
41 A. Yes.
42
43 Q. All right. Now, making that assumption, if you got to
44 a point where you discovered the 13-3/8" PCC wasn't in fact
45 installed and you were going to take off the 9-5/8" PCC, do
46 you think it would be a good idea to assess the other
47 barriers at that time to make sure that they were going to

1 give you well integrity?
2 A. Yes.
3
4 MR COLVIN: I object. I rise to raise the point as to
5 whether my learned friend has established the foundation of
6 experience or expertise for this witness to express
7 an opinion in response to that question?
8
9 MR HOWE: With respect, I accept that the level of
10 expertise is something that will certainly go to the weight
11 that you would attach to the answer, but, for what it's
12 worth, he is a driller who has had nine years' experience
13 and, with respect, it's a permissible question for me to
14 ask, and the weight to be attached to it is a matter for
15 submissions, in my submission.
16
17 MR COLVIN: I accept that.
18
19 MR HOWE: Q. In any event, you gave an answer "yes",
20 I think; is that right, sir?
21 A. Yes.
22
23 Q. Did you have any knowledge or understanding at all
24 that, at any time last year, there were any bubbles that
25 were seen or observed in connection with this H1 well?
26 A. No.
27
28 Q. Sir, did you have any understanding at all last year
29 as to what the specific gravity was of the fluid inside the
30 9-5/8" casing as compared to the pore pressure of the
31 formation? Was that anything that you had an understanding
32 of or not?
33 A. No, I don't recall it.
34
35 Q. Do you recall at all providing some information to
36 Atlas in the course of an investigation by it into the
37 circumstances that led to the blowout? - or Seadrill,
38 sorry?
39 A. Sorry, say that again?
40
41 Q. Do you recall providing any information or being
42 interviewed in the course of an investigation undertaken by
43 Atlas or Seadrill into the events leading to the blowout?
44 A. Regarding NOPSA?
45
46 Q. No. This is an Atlas or a Seadrill --
47 A. Oh, no.

1
2 Q. -- internal investigation.
3 A. No.
4
5 Q. All right. There has been a report that was
6 undertaken by Atlas or Seadrill into the circumstances of
7 the blowout produced to the Commission. That indicates
8 that you did supply some information. Perhaps if document
9 number SEA.010.001.0001, at page 61, could be brought up?
10 If you could just look down that information, that seems to
11 be attributed to you; in other words, the indication is
12 that this is information that you supplied, and if you
13 could ask the operator to scroll down when you get to the
14 bottom of that screen.
15 A. Okay.
16
17 Q. It's really just the last entry that I want to ask you
18 about, which seems to indicate that you made a comment to
19 the effect that there were regular changes to the program
20 during the first phase of drilling, most of which were just
21 to save two to three minutes and cut corners. Do you see
22 that?
23 A. Yes.
24
25 Q. Do you recall providing that information to anyone?
26 A. Yes.
27
28 Q. Does that information that is attributed to you
29 accurately record your views?
30 A. Yes.
31
32 Q. Could you tell the Commissioner whether you have any
33 recollection at all of the sorts of changes that you're
34 talking about that involved a saving of small periods of
35 time and cutting corners?
36 A. We'd get set up on doing a job, and we have all the
37 safety paperwork in place, and then we'd get a phone call
38 or they'd come up and they'd changed the program again,
39 which would cut out a few other things, and the program
40 gets changed, sometimes three or four times through that
41 period.
42
43 Q. What period are we talking about? Is this March/April
44 last year?
45 A. Yes.
46
47 Q. Before the wells were suspended?

1 A. Yes.
2
3 Q. Can you think of any other examples or instances that
4 gave you this impression that there was a cutting of
5 corners that was happening?
6 A. No, I can't, can't recall.
7
8 Q. Over the page, operator, there's also a reference to
9 another comment about changes being made on the fly and no
10 official approvals or paperwork. Now, do you have any
11 recollection of what's described there as having occurred
12 on the rig around the time we've been discussing?
13 A. Yes, we had changes made without official paperwork
14 given to us as a forward plan, type of thing.
15
16 Q. Can you remember any specific examples of --
17 A. No, I can't.
18
19 Q. What about the storage of equipment on the rig - can
20 you recall what provision there was for storing all of the
21 equipment and whether it was adequate?
22 A. As - I don't follow what you mean.
23
24 Q. Well, there was lots of casing and equipment like PCCs
25 and all sorts of other equipment that was needed on the
26 rig. Was there adequate storage facility on the rig?
27 A. The rig on a regular basis was always full.
28
29 Q. What was full, sorry?
30 A. The rig was always full of equipment, all over the
31 rig. There wasn't much space on the rig.
32
33 Q. Was there any dedicated storage space on the rig, such
34 as a hangar or a specific storage shed where you could go
35 in and see where particular items of equipment were stored,
36 and so on? Was it systematic like that, or not?
37 A. No, no.
38
39 Q. Were pieces of equipment sort of left out from under
40 cover, or were they always stored under cover?
41 A. Some were covered up. Some were and some weren't.
42
43 Q. Do you have any knowledge or understanding at all as
44 to how the PCCs were stored at the time?
45 A. No, I don't recall.
46
47 Q. What about things like casing shoes with the float

collars inside them - do you know how they were stored?
A. Yes, they were stored on the cantilever or on the main deck.

Q. Was that under cover or not?
A. No.

MR HOWE: Just to clarify one point, I have finished my questioning, Commissioner, but I cited a document identity number, which I'm told is incorrect. Apparently, Mr Horne's properly executed statutory declaration is identity number WIT.1501.0002.0001. I had brought up a version that is identical but which was not correctly executed, so the ID that I had earlier given was incorrect.

THE COMMISSIONER: But it is identical?

MR HOWE: It is identical, so I don't think anything of substance arises. May it please, that completes my questioning of the witness. I understand that there might be some changes to his declaration that counsel for Atlas wishes to facilitate.

<EXAMINATION BY MR COLVIN:

MR COLVIN: Q. Mr Horne, before coming to give your evidence today, did you review your statement and identify a matter that should be corrected?
A. I did.

Q. Do you have a copy of your statement there?
A. Yes.

Q. What is the correction?
A. On paragraph 33:

> *At that time the welder was cutting the excess casing. When he blew a hole in the casing, the inhibited seawater came out through the hole, which is [not unusual].*

The word "not" I have changed.

Q. Do you have your signed statement in front of you there?
A. Yes.

1 Q. Can I ask you to look at the screen. Do you see
2 paragraph 33 there?
3 A. Yes.
4
5 Q. Is there a change to what's in paragraph 33 of your
6 signed statement that you wish to make?
7 A. Yes. "Not", where it says "which is usual", it should
8 be "which is not unusual" - the word "not".
9
10 Q. Do you mean to make a distinction between something
11 being usual and something being not unusual?
12 A. It's not unusual for the water to come up the hole.
13
14 Q. So that's that matter. Can I draw your attention to
15 paragraph 25. Is there any correction in relation to the
16 matters in paragraph 25 that you wish to make?
17 A. Yes. Where it says, "I read the pressure gauge and it
18 indicated that there was no pressure under the 9-5/8"
19 cap" - I wasn't there at the time. You couldn't read the
20 pressure, because the tool hadn't been run in to read the
21 pressure at the time. So I handed it over to Bart Kok.
22 I left the floor then to go and eat, and by the time I came
23 back from eating, he had run the tool and retrieved the
24 pressure cap, corrosion cap, and he told me that he read no
25 pressure below it.
26
27 Q. So the statement should say, "Bart Kok told me he had
28 read the pressure gauge and it indicated that there was no
29 pressure under the 9-5/8" cap"?
30 A. That's correct.
31
32 Q. Are there any other changes?
33 A. No.
34
35 Q. Can I draw your attention to paragraph 26. Given what
36 you have just said, is it right to say, in paragraph 26,
37 after your statement that Bart Kok told you that he had
38 read the pressure gauge, that you then left the rig floor?
39 A. No. I left the rig floor, and then they had to run
40 the tool down to the cap, go into the cap, and then they
41 had to read the pressure gauge after that.
42
43 Q. So the sentence that follows, then, after the first
44 sentence in paragraph 26, "I told Bart" - who does "Bart"
45 refer to there?
46 A. Yes.
47

1 Q. Do you see that, paragraph 26?
2 A. Yes.
3
4 Q.
5
6 *I told Bart that there was no pressure*
7 *under the 9-5/8" cap.*
8
9 A. Yes, I never read it. Bart had to. I left the rig
10 floor at the time.
11
12 Q. So that sentence should be deleted?
13 A. Yes.
14
15 MR COLVIN: That's all the questions we have by way of
16 correction of the statement. There might be some questions
17 after my learned friends ask some questions.
18
19 THE COMMISSIONER: Thank you, Mr Colvin.
20
21 MR ABBOTT: Thank you, Mr Commissioner, we have no
22 questions for Mr Horne.
23
24 THE COMMISSIONER: Thank you, Mr Abbott. Mr Colvin?
25
26 MR COLVIN: Q. Mr Horne, you gave some evidence in
27 relation to the comment "cutting of corners". Do you
28 recall that?
29 A. Yes.
30
31 Q. You said, in your answer, "They'd come up and they'd
32 changed the program"?
33 A. Yes.
34
35 Q. Who is "they"?
36 A. PTT.
37
38 Q. Anyone in particular?
39 A. The company man.
40
41 Q. Is "the company man" a reference to the day or night
42 drilling supervisor, the senior PTT person on the rig?
43 A. Yes.
44
45 Q. Can I ask for Mr Horne to be shown document
46 PTT.0002.0001.0001. Do you recognise this as an IADC
47 report?

A. Yes, yes.

Q. And as a driller, part of your responsibility was to fill in reports of this kind on the Atlas rig in March 2009?
A. That's correct.

Q. Could we have the middle of that document blown up, please? At the top part of that document, whose handwriting is that in the "Details of Operation" section?
A. That's my handwriting.

Q. Going down to the bottom part of the document, is that your handwriting?
A. No.

Q. If we could go back to the top of the whole document, and if we could have the first page enlarged, do you see that's the report for 7 March 2009?
A. Yes.

Q. If we could go halfway down that page, is that your signature?
A. It is.

Q. What information on the page does that signature relate to?
A. That's the 12-hour day events.

Q. So that's the part of the day that you were present --
A. Yes.

Q. -- on shift, as it were?
A. Yes.

Q. You were asked some questions about your knowledge of matters relevant to cementing operations; do you recall those questions?
A. Yes.

Q. I just want to identify precisely where you are and what you know in relation to cementing operations on the Atlas rig. Could the operator display SEA.9003.0001.0002 and if that could be rotated - twice more. Do you recognise that as a schematic drawing of the Atlas rig next to the Montara platform?
A. Yes.

Q. The section on the left-hand side of the diagram with the two large struts - is that the rig?
A. The legs?

Q. Yes, the legs.
A. Yes, yes.

Q. Thank you. So that's the Atlas rig?
A. Yes.

Q. And whereabouts are the accommodation arrangements placed on the rig?
A. It's just before the heli-deck on the bow.

Q. So the heli-deck is on the far left-hand side, the part projecting out?
A. Yes.

Q. Then next to that, on the right-hand side, is the accommodation area?
A. Yes.

Q. Are there any offices in there?
A. There is.

Q. Whose offices are there?
A. There's the OIM's, the company man's office, toolpusher's office, service personnel offices, and logistics, their office.

Q. Sorry, the logistics?
A. That's the one.

Q. Then as you go to the right-hand side, the third item projecting upwards - is that the part of the rig cantilevered out over the Montara platform?
A. It is, yes.

Q. The top part of that is referred to as the derrick?
A. It is.

Q. Can you identify on there where the break is between the Montara platform and the part of the rig that's cantilevered out over the platform?
A. Just where it skids out just below - where it's level with the rig hull.

Q. So level with the rig hull?
A. Yes.

Q. So do you see there's a crane sitting on there - is that the point that you're identifying?
A. Yes - yes.

Q. And that part of the rig will move back towards the rig or further away from the rig, that cantilever?
A. Yes, it skids in and out.

Q. And it also moves in a plane, as you're looking at this diagram, closer to you and further away?
A. Yes.

Q. Now, when cementing operations are being undertaken, if you're the driller who's working, where are you situated?
A. I'm on the rig floor.

Q. Whereabouts is the rig floor on this diagram?
A. Just where the derrick is, just below where the windwall is.

Q. Can I ask you to look at document SEA.9003.0001.0001, and if we could scroll down a bit on that document, please. There is an annotation on this document referring to "rig floor"?
A. Yes.

Q. Is that what you're referring to?
A. Yes.

Q. I'm going to hand you a blank copy of the earlier document that we have been looking at and a red pen and I'm just going to ask you to mark some points on this document. (Handed). So I'm asking you now where you were situated. Could you put an arrow with the letter "A" pointing to where you would be, as the driller, when cementing operations are being undertaken?
A. Yes.

Q. Could you show us what you have marked?
A. (Witness held document up).

Q. In relation to the Halliburton cementing people, where

1 would they be located during the cementing operations?
2 A. Do you want another arrow?
3
4 Q. Yes, and could you mark that with a "B"?
5 A. Okay.
6
7 Q. Can you show us where that is?
8 A. That's underneath the cantilever, where the rig
9 skidded out so far. It's on the main deck.
10
11 Q. About in line with where the right-hand leg is?
12 A. Yes.
13
14 Q. On that part of the rig, and where would the company
15 man be?
16 A. He'd be there with the --
17
18 Q. At the point "B" as well?
19 A. Yes.
20
21 Q. And in relation to what's happening at the wellhead,
22 would there be someone there while the cementing operations
23 are happening?
24 A. No.
25
26 Q. That's the point where the cement is flowing in; is
27 that right?
28 A. Yes.
29
30 Q. Where is it that you observe returns?
31 A. It'll be at the shell shakers.
32
33 Q. At the what?
34 A. Shell shakers.
35
36 Q. Where is that?
37 A. It's over on the starboard side of the rig.
38
39 Q. When you say "the starboard side", before you mark
40 anything on the document can you describe where that is?
41 A. That's, as we're looking here, on the boat - it's the
42 opposite side to where that is.
43
44 Q. So the observer, in this schematic, is observing from
45 the port side looking across to the starboard side in the
46 distance?
47 A. Yes.

Q. Is that right?
A. Yes.

Q. So on the starboard side of the main rig is where the returns are observed; is that right?
A. Yes, yes.

Q. And is there anyone there to observe them?
A. Yes.

Q. Who is there?
A. The shaker hand and the mud engineer, at times.

Q. So are you able to mark with a point "C" where they are, bearing in mind they're further back in the distance?
A. Yes.

Q. As a driller, can you see any of that from where you will be?
A. No.

Q. How do you receive information about the cementing job?
A. Through telephone.

Q. I'll just ask this question without reference to your statement. In your statement, you deal with the occasion when, in August, the 9-5/8" PCC was removed from the H1 well. Do you recall that?
A. Yes.

Q. And there was a change of instructions provided?
A. That's correct, yes.

Q. Do you recall receiving the change of instructions?
A. I do, yes.

Q. Where were you?
A. I was on the rig floor.

Q. Who else was there?
A. Bart Kok came up. He was there when we had them.

Q. And who gave you the change of instructions?
A. The company man, Paul O'Shea.

1 Q. Was anyone else there?
2 A. No.
3
4 Q. Did you know where Mr Trueman was at that time?
5 A. Yes. He was in his office.
6
7 Q. How do you know that?
8 A. Because I phoned him up there.
9
10 Q. When did you phone him up?
11 A. As soon as I got handed the change of instructions,
12 I phoned him up to explain that there's been a change of
13 plan.
14
15 Q. Do you have to phone the office in particular, so that
16 is why you know where he was?
17 A. Well, that's where - he more or less is there all the
18 time unless he's out on deck; I'll page him.
19
20 Q. By that I meant do you have a dial a particular number
21 on the system to get him?
22 A. Yes, yes.
23
24 Q. Who was present with you on the rig floor when you
25 made that call?
26 A. Paul O'Shea and Bart Kok.
27
28 MR COLVIN: Thank you, Mr Horne. I have nothing further.
29 Thank you, Mr Commissioner.
30
31 THE COMMISSIONER: Thank you, Mr Colvin.
32
33 MR COLVIN: Perhaps we could arrange to have the marked
34 document identified in due course, and if that could be
35 returned.
36
37 Q. Having said that I had finished, it might be
38 convenient if, on this document, the office that you
39 referred to also is marked.
40
41 THE COMMISSIONER: That's Mr Treasure's office?
42
43 MR COLVIN: That's the office of the OIM, Mr Trueman's
44 office.
45
46 Q. Could you mark that with a "D" and an arrow?
47 A. Yes.

MR COLVIN: Thank you. Now I really have finished.

THE COMMISSIONER: The gist of what you're proposing is that they're a long way away.

MR COLVIN: Yes, with no visual means of seeing what's happening; only by telephone communication.

<EXAMINATION BY MR HOWE:

MR HOWE: Q. You've marked on this particular diagram with the letter "D" where Mr Trueman's office was. Do you recall that?
A. Yes.

Q. Would that also generally identify where Mr Treasure's office was?
A. Well, it was right next door.

Q. If we could go, please, to document number PTT.0002.0001.0001, and if you could go to the middle of the document, you'll see depicted on screen your handwriting, which you've already identified; is that correct?
A. That's correct.

Q. And then, operator, could you scroll down immediately beneath that. Now, do you recognise the handwriting underneath your own? I don't mean immediately underneath, I mean occupying a large space under your own handwriting.
A. Yes, that's my relief's handwriting.

Q. So this is against an entry commencing at 1200 hours, and then there's a detail inserted, and it goes right down to 2400 hours; is that what you're talking about?
A. Yes, yes.

Q. What's the name of the person, then, who --
A. Joe Mangels.

Q. Joe Mangels, and you described him as a relief driller?
A. Yes, I work 12 hours, he works 12 hours. We relieve each other after 12 hours.

Q. And how long had he been on the rig by this time, by

7 March?
A. He'd come on crew change day. That's Thursday, I think it was.

Q. So he'd briefly come back on shift. Do you know how long he had been employed on the rig prior to 7 March - had he been there for 12 months or 18 months?
A. Oh, probably 12 months, I think; maybe longer.

MR HOWE: If it pleases, I have no further questions, and, on that basis, could I ask that Mr Horne be excused from further attendance?

THE COMMISSIONER: You may be excused, Mr Horne. I gather that you have come a very long way to assist us in our inquiries, and we're very appreciative that you have done so.

THE WITNESS: Thank you.

<THE WITNESS WITHDREW

THE COMMISSIONER: Mr Howe, you were earlier proposing that we call a halt to today's proceedings after Mr Horne?

MR HOWE: That's right. We are finishing about half an hour earlier, but if we could adjourn until tomorrow morning at 9.30, when we will resume with the evidence of Mr O'Shea.

THE COMMISSIONER: Okay, if everyone is agreeable to that, we will adjourn till tomorrow at 9.30.

AT 3.50PM THE COMMISSION WAS ADJOURNED TO WEDNESDAY, 24 MARCH 2010 AT 9.30AM

0

0335 [1] - 684:47
05:35am [1] - 685:22

1

1 [3] - 638:26, 688:32, 689:26
1,350 [4] - 657:44, 658:1, 658:2, 659:37
1,350-odd [1] - 657:40
1.0143 [2] - 718:20, 718:22
1.02 [1] - 689:33
1.03 [5] - 645:47, 646:6, 689:5, 689:9, 689:11
1.03sg [1] - 645:39
1.04 [6] - 645:27, 646:4, 687:13, 687:18, 689:4, 689:9
1.04sg [1] - 645:46
1.06 [8] - 687:42, 688:8, 688:20, 689:44, 690:3, 718:32, 718:43, 723:12
1.06" [1] - 687:37
1.3 [1] - 655:24
1.47 [5] - 698:21, 698:23, 698:32, 701:35, 701:36
10 [4] - 656:32, 675:6, 715:30, 732:29
10,000 [2] - 676:45, 677:6
102 [1] - 641:47
105 [1] - 642:28
106 [1] - 689:40
107 [4] - 642:40, 644:18, 691:22, 693:18
11.20 [1] - 677:46
110 [2] - 645:11, 645:12
111 [1] - 645:22
112 [2] - 645:35, 722:22
114 [1] - 645:12
115 [1] - 656:17
12 [9] - 644:40, 700:39, 707:9, 749:44, 749:45, 750:7, 750:8
12-hour [1] - 743:28
1200 [1] - 749:34
127 [1] - 646:9
128 [3] - 646:14, 646:17, 646:38
13 [1] - 639:32
13-3/8 [36] - 664:3, 664:17, 664:21, 664:22, 664:24, 665:14, 665:28, 667:2, 667:8, 667:27, 667:41, 668:16, 669:43, 679:3, 679:8, 679:9, 679:13, 679:36, 679:40, 680:11, 680:26, 682:24, 683:2, 683:26, 707:15, 708:18, 709:18, 709:33, 710:33, 710:43, 711:32, 711:36, 721:43, 736:39, 736:44
1300 [1] - 697:29
131 [1] - 646:42
132 [1] - 647:18
133 [1] - 648:1
135 [1] - 648:4
138 [1] - 653:11
139 [1] - 654:2
14 [7] - 650:36, 652:7, 654:23, 654:29, 654:38, 725:47, 726:2
148 [3] - 654:2, 654:6, 654:12
15 [4] - 666:5, 703:19, 726:43, 727:23
153 [1] - 654:22
154 [1] - 654:41
16 [9] - 643:14, 643:20, 643:35, 644:3, 644:17, 701:32, 707:19, 707:27, 707:28
16.5 [17] - 658:3, 673:35, 673:39, 673:42, 674:7, 674:13, 674:16, 698:1, 698:7, 698:10, 698:26, 699:21, 699:30, 699:31, 699:41, 701:31, 701:40
160 [1] - 656:17
168 [4] - 656:9, 709:28, 709:30, 709:37
169 [4] - 709:29, 709:34, 710:2, 710:3
17 [1] - 707:19
171 [1] - 657:28
173 [1] - 666:35
174 [2] - 658:32, 659:28
178 [1] - 660:46
179 [1] - 661:28
18 [1] - 750:7
18-3/4 [2] - 730:9, 730:15
180 [2] - 662:33, 672:32
1800 [2] - 669:33, 700:13
181 [1] - 663:28
188 [1] - 663:33
189 [1] - 663:47
191 [1] - 664:16
195 [1] - 708:26
196 [4] - 665:35, 665:39, 666:3, 666:46
197 [3] - 664:40, 707:14, 708:16
197(c [1] - 707:12

2

2.44pm [1] - 724:21
2.54 [1] - 699:34
2.54m3 [1] - 699:19
2.62 [6] - 698:24, 698:26, 698:32, 699:33, 701:39, 701:42
20 [9] - 665:24, 666:5, 683:9, 700:40, 729:28, 729:35, 729:36, 730:25, 732:30
20/21 [1] - 652:17
200 [1] - 697:14
2009 [12] - 656:11, 658:34, 661:2, 680:42, 684:18, 687:32, 688:27, 689:42, 726:16, 726:17, 743:5, 743:19
2010 [3] - 638:37, 724:35, 750:35
203 [1] - 665:18
205 [2] - 656:27
209 [1] - 669:41
21 [2] - 680:42, 726:17
210 [4] - 669:32, 669:36, 669:40, 669:47
211 [4] - 669:31, 670:12, 670:25, 672:46
214 [1] - 656:21
22 [4] - 674:22, 724:28, 724:35
22nd [1] - 724:45
23 [5] - 638:37, 666:26, 724:43, 725:1, 727:38
233 [1] - 673:23
234 [1] - 678:24
235 [1] - 676:24
236 [1] - 679:1
239 [3] - 680:38, 710:40, 711:29
239(a)(ii [1] - 711:3
239(b [1] - 712:12
239(e [1] - 681:24
23rd [2] - 724:45, 724:46
24 [3] - 659:13, 684:18, 750:35
2400 [1] - 749:36
242 [5] - 682:9, 712:19, 712:30, 715:45, 716:8
242(b [1] - 682:17
244mm [5] - 661:4, 663:38, 664:4, 673:1, 703:28
25 [2] - 741:15, 741:16
26 [4] - 741:35, 741:36, 741:44, 742:1
276 [1] - 710:16
2pm [1] - 713:11

3

3 [2] - 658:10, 707:25
3.5 [6] - 657:34, 657:39, 657:47, 658:11, 658:14, 658:18
3.50PM [1] - 750:34
31 [1] - 729:38
33 [3] - 740:35, 741:2, 741:5
34 [1] - 730:8
340mm [5] - 664:3, 679:3, 703:35, 703:44, 704:17
35 [3] - 702:29, 702:30, 730:18

4

4,000 [5] - 673:44, 678:18, 696:44, 701:37, 732:32
40 [1] - 672:15
45 [1] - 710:41

5

5 [8] - 642:31, 648:4, 687:32, 687:35, 715:29, 725:26, 726:15, 729:3
5.07 [1] - 684:18
5.16 [5] - 665:27, 666:11, 666:19, 666:32, 666:38
5.17 [2] - 665:29, 665:33
5.6 [6] - 665:23, 666:11, 666:16, 666:19, 666:23, 666:38
50 [1] - 651:34
508mm [2] - 704:17, 710:18
51 [1] - 638:26

6

6 [11] - 663:29, 688:7, 688:27, 688:33, 705:31, 707:9, 707:10, 709:4, 710:32
6.6 [4] - 646:10, 646:25, 646:31, 646:39
60 [1] - 672:15
61 [2] - 641:39, 738:9
64 [1] - 690:37
67 [3] - 640:46, 641:5, 641:41
68 [2] - 640:46, 641:14
69 [1] - 641:29
6pm [2] - 694:30, 720:1

7

7 [24] - 638:39, 644:47, 651:30, 651:41, 657:5, 658:34, 661:2, 668:23, 688:27, 689:41, 689:42, 694:30, 695:16, 696:3, 698:4, 705:34, 719:38, 720:17, 721:16, 731:17, 734:8, 743:19, 750:1,

750:6

8

8 [3] - 644:40, 658:33, 673:25
80-odd [1] - 690:39

9

9-5/8 [56] - 646:19, 648:11, 648:13, 652:26, 652:27, 658:22, 658:23, 661:4, 663:38, 664:4, 665:29, 665:34, 665:40, 666:1, 666:46, 667:10, 667:16, 667:31, 667:42, 668:2, 668:17, 669:1, 669:44, 670:14, 670:22, 673:1, 673:14, 679:10, 679:15, 679:26, 680:15, 680:19, 682:5, 682:19, 682:26, 682:33, 683:39, 685:27, 686:18, 710:23, 710:29, 718:33, 718:40, 726:3, 727:40, 728:20, 728:25, 729:39, 736:39, 736:45, 737:30, 741:18, 741:29, 742:7, 747:29
9-5/8" [1] - 704:7
9-5/8"s [1] - 679:37
9.25 [8] - 673:27, 674:3, 675:16, 697:13, 697:19, 697:25, 698:11, 698:22
9.30 [2] - 750:28, 750:32
9.30am [2] - 638:37, 639:1
9.30AM [1] - 750:35
9.3MPa [1] - 699:19

A

abandoned [2] - 664:26, 684:37
abandoning [1] - 674:35
abandonment [6] - 650:35, 650:44, 653:2, 653:23, 653:24, 653:26
ABBOTT [10] - 676:1, 694:3, 714:6, 716:21, 716:23, 719:30, 720:46, 724:19, 735:14, 742:21
Abbott [6] - 714:3, 716:16, 716:18, 719:33, 724:14, 742:24
able [9] - 667:35, 704:22, 704:32, 704:33, 716:36, 728:5, 728:7, 729:11, 747:15
absence [5] - 670:28, 671:10, 676:24, 679:3, 730:36
absolutely [3] - 677:40, 679:23, 721:19
abundantly [1] - 693:11
accelerated [1] - 686:19
accept [6] - 679:19, 698:15, 701:18, 721:40, 737:9, 737:17
acceptance [1] - 713:38
accepted [2] - 639:39, 678:9
accepting [1] - 686:42
access [1] - 699:29
accommodate [2] - 664:23, 667:2
accommodation [2] - 744:12, 744:21
accord [2] - 641:29, 673:28
accordance [2] - 652:38, 655:26
according [2] - 647:26, 718:7
account [2] - 698:11, 718:15
accounts [1] - 672:7
accurate [1] - 690:19
accurately [2] - 690:14, 738:29
achieve [5] - 641:28, 647:28, 647:44, 671:17, 671:33
achieved [1] - 643:25
achieving [2] - 669:11, 671:12
acquire [1] - 733:39
ACT [1] - 638:27
act [4] - 660:5, 683:32, 683:33, 731:10
acted [4] - 693:8, 720:6, 720:12, 721:10
action [2] - 660:22, 720:29
active [1] - 650:3
activities [10] - 660:31, 665:4, 665:6, 666:31, 703:28, 706:36, 712:3, 712:4, 712:8
activity [4] - 640:43, 650:3, 672:7, 721:42
actual [7] - 672:25, 680:4, 700:27, 708:8, 711:30, 713:40, 727:30
adaptor [4] - 674:41, 730:19, 730:27, 730:30
adaptors [1] - 730:44
add [2] - 657:10, 702:37
added [1] - 707:41
adding [1] - 702:19
additional [6] - 643:32, 653:25, 663:13, 673:12, 675:15, 721:14
address [2] - 724:26, 724:27
adequate [2] - 739:21, 739:26
adequately [1] - 655:34
adjourn [4] - 639:12, 713:10, 750:27, 750:32
ADJOURNED [1] - 750:34
ADJOURNMENT [3] - 678:1, 714:11, 715:36
adopt [1] - 716:43
adopted [1] - 644:47
advance [1] - 671:27
advantages [1] - 639:40
advice [3] - 720:7, 720:12, 720:34
advise [1] - 720:28
advised [1] - 720:41
affirmed [1] - 724:21
afternoon [4] - 639:13, 706:20, 720:24, 724:7
ago [2] - 692:28, 692:36
agree [63] - 640:6, 640:8, 640:10, 640:25, 640:28, 640:39, 640:44, 641:39, 645:44, 645:47, 647:13, 647:19, 647:28, 649:9, 649:26, 651:28, 652:5, 652:31, 653:32, 654:18, 654:35, 655:12, 655:19, 656:44, 657:3, 664:12, 667:39, 668:6, 668:20, 668:22, 668:47, 669:15, 669:22, 671:11, 671:30, 671:33, 671:45, 672:4, 672:43, 678:22, 679:12, 680:12, 680:16, 680:21, 680:29, 681:17, 681:22, 681:36, 682:44, 682:45, 683:12, 686:3, 686:6, 687:18, 689:36, 690:27, 693:39, 693:41, 694:27, 721:23, 721:24, 723:6, 730:43
agreeable [1] - 750:31
agreed [3] - 654:10, 665:2, 689:4
agreeing [1] - 709:22
ahead [4] - 659:14, 674:36, 674:42, 674:44
air [1] - 685:38
Allara [1] - 638:26
allow [3] - 655:14, 655:33, 730:19
allowing [1] - 674:3
allows [1] - 655:24
almost [1] - 692:3
ambiguity [2] - 698:15, 698:35
ambiguous [1] - 730:13
amendments [1] - 659:15
amount [3] - 644:41, 698:10, 729:8
amounted [1] - 659:45
annotation [1] - 745:28
annulus [11] - 648:9, 648:10, 648:11, 649:37, 651:12, 651:29, 652:4, 652:25, 689:12, 700:21, 732:4
anomalies [1] - 673:24
answer [12] - 643:10, 646:40, 678:5, 685:41, 693:36, 694:17, 713:21, 723:16, 723:24, 737:11, 737:19, 742:31
answered [3] - 686:5, 713:20, 716:7
anticipate [1] - 714:3
anticipated [1] - 654:37
AO [1] - 638:32
apart [2] - 717:40, 725:43
apologise [1] - 666:3
apparent [7] - 644:8, 644:24, 644:46, 668:35, 719:39, 733:45, 734:11
appear [2] - 675:46, 684:34
applicable [1] - 642:6
application [2] - 653:39, 653:44
applied [4] - 648:34, 656:11, 665:5, 682:24
apply [2] - 654:23, 677:27
applying [2] - 710:5
appreciation [1] - 670:33
appreciative [1] - 750:16
appropriate [8] - 655:9, 655:17, 678:26, 682:19, 682:41, 685:46, 692:11, 730:44
approvals [1] - 739:10
approve [1] - 655:28
approved [1] - 682:25
April [8] - 649:12, 652:17, 680:42, 703:19, 707:19, 707:27, 707:28
area [1] - 744:21
arise [2] - 655:10,

713:47
arisen [3] - 676:34, 703:6, 719:9
arises [1] - 740:19
arose [2] - 657:7, 691:29
arrange [1] - 748:33
arrangements [2] - 724:11, 744:12
arrow [3] - 745:39, 746:2, 748:46
asleep [2] - 702:22, 707:6
aspect [1] - 716:36
assess [4] - 655:15, 655:25, 718:8, 736:46
assessed [2] - 655:4, 687:42
assessment [7] - 655:44, 667:40, 668:18, 669:3, 685:35, 723:24, 734:15
assist [3] - 664:18, 695:44, 750:15
assistance [2] - 639:5, 683:13
assistant [1] - 683:6
assisted [2] - 656:45, 657:4
assisting [1] - 691:23
associated [1] - 702:9
assume [2] - 679:24, 736:36
assumes [1] - 651:23
assuming [2] - 656:38, 721:45
assumption [1] - 736:43
assurance [1] - 681:13
asterisk [1] - 685:1
AT [2] - 750:34, 750:35
Atlas [21] - 642:41, 673:3, 683:28, 686:15, 692:25, 692:38, 693:13, 711:4, 711:30, 711:35, 711:42, 730:9, 737:36, 737:43, 737:46, 738:6, 740:21, 743:4, 743:43, 743:45, 744:9
atmosphere [2] - 679:46, 700:22
attach [1] - 737:11
attached [4] - 645:31, 684:2, 704:40, 737:14
attaching [2] - 678:37, 686:33
attachments [2] - 686:37, 686:39
attend [1] - 713:30
attendance [1] - 750:12
attended [1] - 724:14
attending [1] - 639:18
attention [2] - 741:14, 741:35
attributed [2] - 738:11, 738:28
audit [3] - 681:7, 681:18, 681:20
auditable [1] - 712:38
audits [1] - 681:14
August [4] - 684:18, 726:17, 727:39, 747:29
available [2] - 660:19, 690:37
aware [32] - 642:45, 643:3, 643:6, 643:8, 644:45, 645:5, 651:44, 651:46, 652:1, 661:23, 662:4, 663:17, 668:44, 671:1, 675:12, 677:9, 680:47, 683:37, 685:26, 686:10, 707:8, 711:5, 711:31, 711:36, 711:40, 712:14, 719:47, 720:40, 732:18, 732:20, 732:32, 732:36
awareness [1] - 690:1

B

backed [1] - 658:22
backflow [4] - 643:32, 674:40, 700:22
background [2] - 703:30, 725:8
bad [2] - 655:38, 733:36
badly [1] - 676:7
balance [1] - 686:27
balanced [1] - 718:23
barrel [3] - 699:35, 699:38, 699:46
barrels [28] - 657:34, 657:39, 657:47, 658:3, 658:11, 658:14, 658:18, 672:15, 672:32, 673:25, 673:27, 673:35, 673:39, 673:42, 674:3, 674:7, 674:13, 674:16, 675:16, 697:19, 697:25, 698:7, 698:10, 698:11, 698:22, 699:21, 699:30, 699:31
barrier [42] - 640:40, 642:25, 642:31, 646:20, 647:13, 647:23, 647:31, 647:45, 648:15, 648:17, 649:32, 650:11, 652:36, 652:43, 654:11, 654:15, 660:6, 660:14, 667:32, 669:21, 669:27, 669:28, 670:34, 670:40, 671:23, 676:31, 677:21, 678:36, 679:11, 679:30, 680:20, 680:34, 682:35, 683:15, 731:10, 734:30, 734:37, 734:41, 734:45, 735:9, 735:10
barriers [35] - 647:27, 648:9, 649:24, 649:27, 649:36, 649:42, 649:45, 650:7, 651:1, 652:25, 652:30, 652:45, 653:2, 653:6, 653:23, 653:31, 656:5, 664:11, 664:34, 667:41, 669:12, 671:18, 671:27, 671:38, 672:43, 678:43, 680:31, 681:19, 723:6, 734:27, 734:31, 735:2, 736:28, 736:37, 736:47
bart [9] - 727:44, 741:21, 741:27, 741:37, 741:44, 742:6, 742:9, 747:43, 748:26
Bart [1] - 741:44
based [17] - 651:28, 661:1, 661:34, 664:19, 670:8, 672:18, 672:28, 672:29, 672:32, 688:12, 706:15, 708:7, 708:22, 713:17, 713:26, 713:36, 736:25
basic [2] - 693:20, 723:5
basis [5] - 695:47, 708:35, 724:5, 739:27, 750:11
Basis [1] - 645:16
batch [8] - 639:33, 639:40, 639:41, 639:47, 640:6, 640:12, 640:20, 640:25
bbls [2] - 697:13, 698:1
bear [1] - 667:36
bearing [1] - 747:16
became [1] - 685:26
become [4] - 657:18, 683:37, 691:30, 719:47
becomes [1] - 672:29
becoming [2] - 656:46, 657:7
beforehand [1] - 672:12
beginning [1] - 709:37
behind [1] - 700:40
beholden [1] - 655:42
belief [5] - 664:19, 675:39, 676:42, 677:28, 725:3
below [13] - 641:39, 653:46, 667:46, 674:41, 678:8, 678:13, 681:25, 681:28, 681:35, 683:10, 741:25, 744:46, 745:23
beneath [12] - 642:15, 668:24, 731:43, 732:3, 732:7, 732:20, 732:29, 732:38, 733:7, 733:13, 733:33, 749:29
berger [1] - 639:26
best [6] - 645:3, 683:1, 709:36, 725:2, 728:11, 736:33
between [21] - 653:30, 666:11, 666:38, 696:16, 696:18, 699:28, 699:33, 700:9, 701:3, 703:45, 703:47, 704:27, 705:45, 719:13, 729:34, 734:23, 735:45, 736:7, 736:12, 741:10, 744:43
big [1] - 718:14
bit [8] - 652:15, 656:18, 666:21, 669:40, 685:38, 691:6, 692:29, 745:27
blank [2] - 708:39, 745:35
bled [14] - 643:25, 643:26, 643:29, 644:25, 658:11, 659:43, 673:34, 673:43, 674:30, 674:38, 697:24, 698:6, 698:24, 701:39
bleed [2] - 644:27, 732:37
bleeding [1] - 657:33
blew [1] - 740:38
blown [3] - 684:36, 695:9, 743:8
blowout [19] - 644:35, 660:7, 671:23, 671:28, 671:45, 672:12, 679:14, 679:30, 685:26, 686:20, 712:22, 727:39, 728:7, 734:30, 735:28, 735:30, 737:37, 737:43, 738:7
blowouts [2] - 672:22, 672:26
boat [1] - 746:41
BOP [21] - 644:31, 674:41, 674:42, 674:47, 678:42, 682:36, 682:42, 685:47, 730:9, 730:15, 730:16, 730:19, 730:25, 730:26, 730:28, 730:36, 730:44, 731:5, 731:6, 731:9
BOPs [2] - 664:23, 730:14
bore [1] - 668:2
Borthwick [1] - 638:32

bottom [7] - 687:5, 687:36, 695:10, 702:23, 730:28, 738:14, 743:13
bottomed [2] - 667:11, 679:17
bow [1] - 744:14
BOWD [1] - 645:28
box [4] - 696:10, 697:11, 703:26, 707:26
break [2] - 696:12, 744:43
breaking [1] - 685:38
Brian [2] - 705:4, 729:20
brief [4] - 659:12, 716:18, 720:1, 725:6
briefly [2] - 676:29, 750:5
bring [8] - 646:17, 667:36, 683:43, 686:28, 688:25, 689:15, 728:40, 732:31
bringing [3] - 666:47, 667:15, 682:26
broken [2] - 687:7, 696:9
brought [7] - 662:9, 665:40, 666:4, 684:16, 687:16, 738:9, 740:12
Bruce [1] - 683:46
brush [2] - 679:17, 729:46
bubbles [5] - 671:22, 671:29, 683:37, 685:37, 737:24
bubbling [3] - 685:21, 685:27, 686:10
bubbling" [1] - 685:2
build [1] - 681:35
build-up [1] - 681:35
built [1] - 647:39
bullet [2] - 659:29, 708:29
bump [6] - 642:7, 656:33, 656:39, 657:18, 732:14
bumped [1] - 643:23
bumping [5] - 651:22, 651:23, 656:31, 656:47, 657:8
button [1] - 659:20
buy [1] - 662:35
BY [9] - 639:28, 690:34, 715:3, 715:38, 716:21, 719:35, 724:23, 740:24, 749:10
bypassing [1] - 675:3

C

calculate [1] - 732:13
calculating [1] - 731:15
calculation [1] - 731:25
calculations [1] - 697:2
calculator [1] - 697:7
calibrated [4] - 688:4, 688:15, 688:19, 729:31
calibrations [1] - 729:16
Canberra [1] - 638:27
cantilever [3] - 740:2, 745:10, 746:8
cantilevered [3] - 700:46, 744:37, 744:45
canvass [1] - 686:25
cap [57] - 653:15, 653:26, 653:31, 653:35, 664:24, 664:25, 665:36, 665:42, 665:45, 666:4, 666:46, 667:10, 667:17, 667:19, 667:20, 667:45, 667:47, 678:5, 678:7, 683:9, 685:10, 685:27, 710:5, 710:9, 710:13, 710:17, 718:33, 718:41, 721:45, 726:44, 727:4, 727:12, 727:18, 727:25, 727:35, 727:41, 727:45, 728:14, 728:25, 728:26, 728:37, 729:9, 729:39, 729:45, 730:5, 735:19, 735:20, 736:30, 741:19, 741:24, 741:29, 741:40, 742:7
caps [13] - 661:31, 662:9, 662:19, 706:19, 706:20, 707:32, 708:31, 710:27, 731:5, 735:8, 735:15, 735:24
capture [3] - 640:42, 700:27, 702:21
captured [1] - 700:24
care [1] - 683:10
carefully [2] - 655:5, 660:27
carried [3] - 691:46, 726:25, 726:35
carry [1] - 693:1
carrying [1] - 691:35
case [12] - 655:14, 655:47, 660:17, 679:20, 702:20, 702:21, 708:17, 708:34, 709:17, 712:45, 722:4, 722:11
cased [3] - 646:15, 646:17, 646:35
casing [109] - 641:1, 641:28, 642:29, 643:23, 643:33, 643:41, 644:26, 646:19, 647:30, 648:11, 648:12, 648:13, 649:37, 650:8, 651:30, 652:26, 652:27, 656:16, 656:26, 656:32, 658:3, 658:22, 660:5, 660:12, 661:4, 661:25, 664:21, 664:25, 664:29, 665:24, 665:28, 665:29, 665:34, 665:40, 667:8, 667:16, 667:32, 667:44, 668:2, 668:19, 668:23, 668:24, 669:2, 669:4, 670:32, 671:2, 671:14, 673:26, 673:44, 674:28, 674:29, 675:14, 678:14, 678:15, 678:19, 679:9, 679:30, 679:35, 679:36, 689:30, 693:21, 696:43, 699:19, 700:21, 701:21, 703:28, 703:36, 703:44, 703:45, 709:9, 710:18, 710:23, 710:29, 717:43, 718:28, 719:39, 720:30, 720:34, 720:40, 720:43, 721:10, 721:15, 721:46, 723:25, 726:4, 730:25, 731:16, 731:38, 731:42, 731:43, 732:2, 732:3, 732:9, 732:19, 732:22, 732:30, 732:46, 733:35, 733:45, 734:8, 734:36, 736:38, 736:39, 737:30, 739:24, 739:47, 740:38, 740:39
casing" [1] - 666:1
casings [7] - 704:18, 704:23, 704:27, 704:34, 730:20, 730:38, 730:45
casting [1] - 664:20
causative [1] - 676:26
caused [4] - 669:5, 675:5, 728:2, 735:29
causing [1] - 712:21
cavity [3] - 732:2, 732:9, 733:34
cement [93] - 641:17, 641:22, 641:23, 641:31, 641:38, 642:2, 642:14, 643:22, 643:26, 643:29, 643:30, 643:41, 644:11, 644:12, 646:20, 647:22, 647:30, 650:8, 651:12, 651:13, 651:16, 651:24, 651:29, 651:34, 651:36, 651:45, 652:1, 652:4, 656:17, 656:25, 656:29, 656:30, 657:29, 657:33, 657:41, 658:10, 659:31, 659:38, 661:42, 661:47, 668:23, 668:36, 674:29, 674:33, 674:36, 674:37, 674:39, 675:4, 675:14, 675:37, 675:43, 675:44, 676:9, 676:14, 677:24, 677:25, 677:27, 678:15, 689:29, 691:43, 692:2, 692:6, 692:12, 700:37, 700:41, 701:7, 702:6, 709:13, 710:22, 710:28, 723:18, 731:15, 731:25, 731:30, 731:34, 731:47, 732:1, 732:7, 732:8, 732:14, 732:19, 732:28, 732:37, 733:7, 733:13, 733:32, 733:33, 734:34, 736:3, 736:5, 736:30, 746:26
cemented [11] - 642:29, 650:8, 660:12, 667:32, 668:9, 669:2, 674:28, 677:26, 734:36, 734:45, 736:38
cementer [1] - 696:33
cementer's [1] - 696:39
cementing [52] - 641:1, 644:40, 647:12, 651:30, 656:15, 656:26, 659:46, 660:4, 661:3, 661:24, 667:44, 668:19, 669:4, 670:32, 675:19, 678:14, 678:19, 689:30, 691:36, 691:42, 691:45, 692:3, 692:18, 693:21, 694:29, 696:40, 700:33, 709:9, 719:38, 720:30, 720:34, 720:40, 720:43, 721:9, 721:15, 726:3, 726:8, 726:24, 726:35, 731:16, 731:38, 732:22, 732:45, 734:7, 743:37, 743:42, 745:17, 745:40, 745:47, 746:1, 746:22, 747:23
cents [1] - 719:25
certainly [1] - 737:10
certificate [6] - 725:20, 725:22, 725:29, 725:30, 725:34, 725:35
certification [2] - 683:14, 683:18
certified [1] - 725:33
cetera [1] - 665:36
chain [1] - 712:39
challenged [1] - 689:31

chance [1] - 715:5
change [22] - 661:46, 664:2, 664:10, 670:29, 671:11, 682:17, 690:10, 709:4, 709:12, 709:32, 710:32, 713:4, 716:36, 716:37, 728:19, 741:5, 747:33, 747:36, 747:45, 748:11, 748:12, 750:2
changed [6] - 696:45, 709:23, 738:38, 738:40, 740:42, 742:32
changes [11] - 659:15, 696:17, 705:39, 706:6, 716:40, 738:19, 738:33, 739:9, 739:13, 740:21, 741:32
channel [1] - 675:11
channels [3] - 641:8, 641:40, 723:17
character [1] - 694:10
characteristics [2] - 647:4, 647:20
charts [2] - 686:34, 686:44
check [7] - 643:32, 656:33, 659:13, 660:42, 667:40, 667:46, 684:22
checked [7] - 659:31, 660:27, 674:39, 690:10, 700:22, 722:7, 726:20
checking [1] - 705:46
chills [1] - 672:30
choke [8] - 681:46, 728:15, 728:16, 728:40, 728:41, 729:10, 729:27, 729:31
Chris [1] - 686:30
chronological [1] - 697:34
circulated [1] - 648:29
circulation [2] - 648:31, 650:28
circumstance [1] - 675:21
circumstances [11] - 655:10, 674:26, 678:26, 679:25, 682:20, 682:23, 682:35, 682:41, 685:45, 737:37, 738:6
cited [1] - 740:9
clarify [6] - 657:31, 673:24, 693:39, 715:42, 730:12, 740:8
clarifying [1] - 696:21
clean [5] - 667:8, 679:26, 679:35, 680:15, 713:30
cleaned [1] - 679:10
cleaning [2] - 667:2, 703:28
clear [10] - 645:26, 649:9, 652:41, 693:11, 698:9, 698:30, 698:31, 703:10, 708:43, 720:27
clearly [3] - 654:19, 654:36, 696:16
clients [2] - 639:6, 639:15
close [3] - 643:30, 656:38, 671:5
closed [2] - 643:40, 644:9
closer [3] - 673:39, 674:16, 745:14
CO2 [1] - 685:38
collar [11] - 642:15, 731:43, 732:1, 732:8, 732:15, 732:20, 732:29, 732:38, 733:7, 733:13, 733:33
collars [1] - 740:1
column [5] - 647:14, 689:12, 696:1, 696:36, 736:39
Colvin [12] - 690:32, 692:45, 693:40, 694:14, 713:10, 713:35, 713:39, 716:15, 724:1, 742:19, 742:24, 748:31
COLVIN [23] - 690:34, 690:36, 693:1, 693:43, 694:8, 694:21, 713:7, 713:47, 715:38, 715:40, 716:13, 723:45, 737:4, 737:17, 740:24, 740:26, 742:15, 742:26, 748:28, 748:33, 748:43, 749:2, 749:7
Colvin's [1] - 713:15
coming [11] - 643:33, 644:12, 646:43, 675:17, 685:38, 703:7, 706:25, 706:27, 706:33, 724:9, 740:26
commence [1] - 680:38
commencing [1] - 749:34
commends [1] - 639:20
comment [6] - 641:42, 641:44, 707:31, 738:18, 739:9, 742:27
Comments [2] - 703:23, 703:41
comments [2] - 703:25, 707:26
COMMISSION [2] - 638:20, 750:34
Commission [3] - 681:33, 691:24, 738:7
COMMISSIONER [21] - 677:45, 690:32, 692:45, 694:17, 713:10, 715:34, 716:15, 719:33, 723:35, 723:39, 724:1, 727:21, 740:16, 742:19, 742:24, 748:31, 748:41, 749:4, 750:14, 750:23, 750:31
Commissioner [37] - 638:32, 643:16, 643:21, 643:22, 643:45, 644:7, 646:16, 660:3, 660:10, 664:18, 674:26, 677:20, 677:43, 683:2, 686:15, 689:25, 693:37, 694:13, 713:8, 713:13, 713:37, 715:28, 715:40, 716:13, 719:30, 722:41, 723:9, 723:45, 724:3, 724:10, 728:11, 728:38, 729:7, 738:32, 740:9, 742:21, 748:29
common [2] - 682:3, 682:28
commonly [1] - 735:33
commonsense [1] - 681:17
communication [2] - 734:23, 749:8
company [9] - 662:29, 683:6, 705:41, 719:12, 742:39, 742:41, 744:28, 746:14, 747:46
compared [2] - 711:21, 737:30
comparing [1] - 695:44
comparison [1] - 696:11
competent [2] - 668:9, 670:40
compiled [1] - 658:38
complete [5] - 675:13, 692:3, 692:4, 692:6, 714:1
completed [6] - 639:9, 642:36, 661:5, 669:34, 670:4, 702:33
completes [1] - 740:19
compliant [1] - 669:19
complied [2] - 663:44, 664:13
component [1] - 654:42
compression [1] - 644:41
compressive [1] - 677:23
compromise [1] - 678:13
computer [1] - 695:35
computers [1] - 648:34
concern [2] - 651:44, 730:36
concerning [3] - 693:27, 710:36, 719:38
conclude [2] - 639:37, 664:43
conditions [3] - 652:44, 655:1, 655:4
conduct [2] - 676:43, 681:6
conducted [1] - 735:28
confidence [1] - 677:26
confirm [1] - 690:23
confirmation [1] - 659:45
conformity [2] - 720:6, 721:10
confusing [1] - 669:40
connect [1] - 721:2
connection [7] - 641:1, 651:12, 724:33, 725:14, 725:44, 731:16, 737:25
conscientiously [1] - 722:18
consciously [1] - 702:8
consider [11] - 654:28, 654:33, 678:25, 682:12, 691:18, 702:41, 711:3, 712:26, 716:4, 716:10, 716:33
considerably [2] - 666:5, 666:47
consideration [11] - 658:41, 690:46, 691:5, 691:9, 691:25, 693:25, 693:31, 693:47, 694:24, 711:13, 716:30
considered [10] - 642:30, 645:38, 654:23, 655:17, 661:1, 676:31, 685:34, 690:3, 692:11, 720:29
consistently [1] - 689:47
console [1] - 681:47
constant [1] - 648:42
construct [1] - 717:37
constructing [2] - 715:19, 717:42
construction [16] - 642:31, 646:11, 646:31, 646:39, 647:3, 647:42, 648:5, 652:8, 652:38, 654:42, 655:15, 655:25, 655:27, 661:14, 662:46, 717:21
Constructor [2] - 684:36, 684:38
consult [2] - 719:21, 719:23
consultation [2] - 712:40, 713:2
contact [1] - 646:43

contain [4] - 647:15, 715:11, 715:17, 718:2
contained [6] - 658:33, 689:13, 717:14, 717:36, 722:42, 728:28
containing [6] - 710:9, 718:33, 718:41, 727:41, 735:20, 735:23
containment [2] - 667:19, 667:45
contaminated [3] - 675:11, 675:43, 676:9
contemplating [1] - 650:2
contemporaneous [1] - 690:24
content [3] - 643:7, 721:35, 722:18
contents [2] - 684:22, 725:1
context [2] - 651:6, 692:46
contingencies [1] - 657:6
contingency [3] - 642:47, 656:46, 718:15
continue [2] - 689:15, 733:32
continued [3] - 664:22, 674:42, 699:17
continuing [2] - 674:36, 713:45
CONTINUING [1] - 639:28
contrary [3] - 641:37, 661:19, 720:12
contributed [1] - 735:30
control [22] - 640:7, 640:24, 640:31, 642:46, 646:27, 647:23, 647:30, 661:19, 664:2, 664:10, 664:24, 667:17, 678:7, 682:18, 683:7, 687:35, 689:43, 696:39, 721:37, 728:17, 728:20, 734:29
controlling [1] - 662:9
convenient [3] - 677:43, 714:9, 748:38
conversation [4] - 720:11, 728:1, 728:8, 728:12
conversations [2] - 696:26, 696:30
copied [1] - 724:12
copy [9] - 713:29, 713:30, 716:23, 724:10, 724:16, 724:19, 724:38, 740:31, 745:35
corner [1] - 687:28
corners [4] - 722:42, 738:21, 738:35, 739:5
corners" [1] - 742:27
correct [86] - 639:45, 640:4, 640:22, 642:7, 642:8, 642:16, 642:19, 642:38, 647:45, 648:32, 649:2, 649:3, 649:19, 651:38, 652:18, 653:46, 654:30, 655:45, 658:19, 658:30, 659:26, 659:43, 659:47, 660:44, 661:26, 661:44, 664:38, 666:9, 667:22, 667:29, 667:37, 670:6, 670:19, 671:3, 672:2, 675:1, 676:22, 677:32, 678:15, 678:22, 678:45, 679:27, 679:38, 685:31, 690:21, 691:19, 691:32, 694:32, 694:40, 694:45, 695:42, 696:47, 698:27, 698:33, 698:37, 700:20, 700:44, 701:1, 703:42, 704:15, 705:2, 705:8, 705:28, 705:32, 706:1, 706:4, 708:24, 708:43, 710:14, 722:20, 724:31, 725:2, 725:9, 725:38, 726:41, 727:36, 732:5, 733:19, 734:47, 735:31, 741:30, 743:6, 747:34, 749:25, 749:26
corrected [1] - 740:28
correction [4] - 700:3, 740:34, 741:15, 742:16
corrections [1] - 705:47
correctly [4] - 661:5, 688:4, 688:16, 740:13
corresponds [1] - 687:7
corroded [1] - 667:8
corrosion [37] - 646:44, 653:15, 653:26, 653:31, 653:35, 661:31, 662:18, 665:36, 665:42, 665:45, 666:4, 666:46, 669:43, 679:9, 679:41, 679:44, 680:11, 706:19, 707:32, 708:31, 710:5, 710:9, 710:17, 718:33, 718:41, 726:44, 727:4, 727:12, 729:9, 731:5, 735:8, 735:15, 735:19, 735:20, 735:24, 736:30, 741:24
counsel [2] - 715:30, 740:21
count [1] - 642:24
couple [6] - 673:24, 696:16, 714:6, 721:26, 735:47, 736:3
course [35] - 639:4, 639:11, 639:20, 643:9, 647:12, 647:27, 652:36, 658:37, 660:2, 660:17, 660:22, 663:45, 664:14, 672:18, 675:41, 676:34, 678:38, 683:23, 683:38, 686:42, 694:38, 694:44, 696:8, 697:35, 703:12, 708:4, 717:41, 725:14, 725:37, 725:43, 732:21, 733:40, 737:36, 737:42, 748:34
courses [1] - 725:18
cover [6] - 659:11, 659:12, 661:32, 739:40, 740:5
covered [1] - 739:41
covering [2] - 683:45, 708:12
crane [1] - 745:5
created [2] - 685:29, 723:18
crew [1] - 750:2
cross [2] - 677:30, 701:35
cross-purposes [2] - 677:30, 701:35
cubic [2] - 698:21, 698:26
curves [1] - 686:33
customary [1] - 653:39
cut [2] - 738:21, 738:39
cutting [4] - 738:35, 739:4, 740:37, 742:27

D

daily [28] - 658:40, 659:5, 660:19, 660:26, 660:37, 668:31, 687:26, 688:7, 688:21, 688:26, 689:41, 694:39, 695:27, 695:32, 696:4, 696:21, 697:20, 698:20, 698:44, 700:16, 701:19, 703:14, 703:25, 704:39, 706:15, 707:20, 707:26, 708:21
date [2] - 664:17, 724:41
dated [3] - 658:33, 687:32, 688:27
David [4] - 638:32, 645:23, 723:43, 724:28
DAVID [1] - 724:21
day's [1] - 720:2
day-to-day [1] - 660:31
days [8] - 667:20, 669:20, 672:11, 682:27, 682:36, 725:41
DDR [7] - 656:31, 659:10, 659:24, 702:22, 702:37, 721:31, 721:33
DDRs [1] - 664:45
deal [9] - 647:4, 647:20, 647:42, 655:35, 657:24, 719:11, 720:8, 731:34, 747:28
dealing [2] - 644:8, 644:23
deals [4] - 653:2, 665:27, 665:29, 665:34
dealt [5] - 642:47, 656:45, 657:6, 665:23, 687:36
December [1] - 725:26
decided [1] - 668:45
decision [5] - 655:16, 661:46, 662:3, 663:28, 663:29
decisions [2] - 655:9, 672:42
deck [7] - 700:41, 700:43, 740:3, 744:14, 744:16, 746:9, 748:18
declaration [31] - 639:31, 639:32, 640:47, 641:41, 642:1, 642:29, 642:40, 643:9, 645:12, 646:10, 646:30, 646:42, 653:11, 654:1, 673:23, 713:23, 713:25, 713:30, 715:20, 722:3, 722:6, 722:22, 722:38, 724:10, 724:17, 724:34, 725:2, 725:7, 726:1, 740:11, 740:21
declaring [1] - 717:1
decrease [1] - 697:13
dedicated [1] - 739:33
deeper [1] - 679:16
deficiency [1] - 671:2
deficient [2] - 670:34, 688:20
degree [1] - 672:14
deleted [1] - 742:12
deliberately [1] - 668:45
delivered [1] - 694:47
demonstrate [1] - 676:21
demonstrates [1] - 671:46
demonstrating [1] - 678:18
denied [1] - 713:36
density [4] - 641:16, 648:38, 650:22, 672:37
departure [1] - 680:47

departures [1] - 655:34
depicted [1] - 749:23
depicts [1] - 687:17
deployed [3] - 647:12, 647:22, 647:30
deployment [1] - 640:2
depth [2] - 686:33, 687:3
derive [1] - 718:8
derrick [4] - 640:11, 669:34, 744:40, 745:23
describe [8] - 654:37, 669:33, 682:2, 699:17, 715:24, 718:19, 718:21, 746:40
described [20] - 644:7, 644:22, 644:30, 644:34, 650:7, 650:11, 652:9, 666:31, 666:39, 667:15, 670:3, 682:28, 684:7, 692:25, 726:31, 733:8, 733:14, 733:28, 739:11, 749:42
describing [1] - 654:6
description [12] - 645:27, 645:31, 648:16, 648:20, 649:17, 649:41, 658:34, 659:12, 690:39, 697:34, 703:44, 713:22
design [2] - 640:47, 641:31
Design [1] - 645:16
designed [3] - 641:5, 678:7, 690:18
despite [1] - 661:2
detail [1] - 749:35
detailed [1] - 667:39
Details [1] - 743:10
detect [3] - 681:20, 681:36, 718:36
detected [1] - 667:43
detection [2] - 668:1, 685:36
development [1] - 713:21
deviate [1] - 655:16
deviation [2] - 655:26, 655:28
diagram [4] - 744:2, 745:14, 745:22, 749:12
dial [1] - 748:20
difference [4] - 699:28, 699:33, 700:9, 735:45
differences [1] - 696:16
different [15] - 639:33, 660:20, 660:22, 679:25, 687:22, 700:16, 700:17, 720:29, 721:9, 728:36, 728:38, 730:14, 730:45, 736:3
differential [1] - 656:30
differently [2] - 698:21, 721:5
difficulty [2] - 639:21, 639:25
direct [2] - 684:25, 726:36
directed [3] - 643:36, 644:30, 644:34
direction [2] - 718:2, 718:15
directly [2] - 726:26, 730:20
disadvantages [1] - 639:41
disagree [3] - 679:23, 680:9, 722:7
disagreement [1] - 659:1
disclosed [1] - 690:24
discover [1] - 669:13
discovered [1] - 736:44
discovery [2] - 669:43, 722:25
discuss [3] - 670:13, 719:13, 727:38
discussed [3] - 720:18, 728:9, 728:13
discussing [2] - 727:44, 739:12
discussion [6] - 662:20, 670:1, 705:22, 705:45, 720:2, 728:6
discussions [3] - 691:13, 727:17, 729:39
displace [5] - 647:22, 658:3, 732:23, 732:26, 733:33
displaced [5] - 656:46, 657:7, 657:19, 692:8, 732:28
displacement [13] - 646:43, 647:5, 647:11, 647:20, 647:21, 647:29, 675:14, 689:28, 689:29, 689:33, 690:26, 701:21, 732:13
displacing [1] - 656:29
display [1] - 743:43
dispute [4] - 673:28, 673:30, 674:18, 729:11
disrespect [1] - 735:27
distance [4] - 701:3, 723:25, 746:46, 747:16
distinction [4] - 653:30, 683:31, 736:7, 741:10
distinguishing [1] - 736:12
distributed [1] - 724:13
document [62] - 642:45, 643:6, 653:21, 683:43, 684:11, 686:28, 687:1, 687:4, 687:11, 687:25, 688:25, 688:39, 689:16, 691:29, 692:16, 692:21, 692:23, 693:30, 695:9, 695:11, 695:39, 695:46, 696:22, 700:3, 700:13, 700:14, 703:17, 703:23, 704:37, 704:44, 705:10, 705:42, 706:7, 706:12, 706:19, 707:24, 707:26, 708:12, 713:33, 713:40, 715:6, 715:31, 715:43, 729:26, 738:8, 740:9, 742:45, 743:8, 743:9, 743:13, 743:17, 745:26, 745:27, 745:28, 745:36, 745:37, 745:45, 746:40, 748:34, 748:38, 749:21, 749:23
documentary [1] - 712:38
documents [6] - 659:6, 659:24, 690:24, 692:39, 700:9, 721:26
done [21] - 655:44, 665:6, 668:1, 670:22, 671:23, 682:42, 685:36, 685:47, 692:10, 694:38, 702:20, 704:9, 705:30, 708:36, 710:4, 710:21, 710:28, 710:37, 712:1, 734:3, 750:16
door [2] - 719:24, 749:19
dot [3] - 651:22, 651:33, 659:29
doubt [1] - 677:15
down [42] - 643:26, 652:15, 656:18, 656:19, 658:22, 665:33, 666:27, 667:9, 669:39, 672:30, 674:40, 684:21, 684:27, 685:38, 687:4, 688:10, 689:19, 689:24, 689:45, 690:44, 691:2, 695:39, 700:13, 701:10, 703:22, 704:24, 704:32, 704:33, 705:15, 709:34, 710:2, 712:12, 728:16, 729:3, 738:10, 738:13, 741:40, 743:13, 743:22, 745:27, 749:28, 749:35
downstairs [1] - 723:45
downstream [1] - 643:31
draft [4] - 658:40, 658:44, 706:12, 708:35
drafted [3] - 658:44, 659:29, 717:29
draw [4] - 696:25, 696:26, 741:14, 741:35
drawing [4] - 653:30, 699:1, 699:4, 743:45
dreaded [2] - 702:15, 702:17
drill [9] - 650:3, 674:36, 674:42, 674:44, 683:7, 700:35, 700:40, 717:43, 736:1
driller [14] - 695:2, 700:20, 700:30, 700:33, 700:40, 701:6, 701:14, 724:30, 737:12, 743:3, 745:18, 745:40, 747:19, 749:43
drillers [1] - 681:46
Drilling [4] - 683:28, 711:31, 711:36, 711:42
drilling [93] - 639:33, 639:34, 639:40, 639:41, 639:42, 639:47, 640:6, 640:12, 640:20, 640:25, 640:33, 647:37, 647:43, 649:2, 656:11, 656:45, 657:6, 657:23, 658:40, 659:6, 660:20, 660:26, 660:37, 661:10, 665:19, 666:11, 666:30, 666:40, 668:31, 672:23, 680:43, 682:25, 682:34, 683:33, 683:34, 683:46, 687:27, 687:28, 688:7, 688:21, 689:41, 691:12, 692:38, 693:8, 693:9, 693:27, 693:31, 694:35, 694:39, 695:27, 695:32, 695:45, 696:4, 696:21, 697:20, 698:20, 698:44, 700:16, 701:19, 703:14, 703:18, 703:25, 704:39, 705:46, 706:16, 706:30, 707:20, 707:27, 708:21, 709:17, 709:31, 709:40, 709:45, 710:22, 710:26, 717:14, 717:19, 717:29, 718:2, 718:11, 718:14, 719:1, 719:12, 722:41, 725:10, 725:15, 725:19, 725:20, 725:22, 725:44,

732:47, 738:20, 742:42
drive [2] - 728:16, 728:41
due [2] - 658:37, 748:34
Duncan [3] - 660:30, 670:17, 670:21
During [1] - 649:46
during [13] - 653:22, 681:19, 682:11, 694:43, 696:27, 697:35, 703:12, 708:4, 718:47, 719:11, 727:30, 738:20, 746:1
duty [4] - 694:30, 705:23, 705:24, 720:17

E

early [6] - 656:11, 661:41, 662:27, 700:2, 709:40, 724:6
easiest [1] - 715:28
Easter [3] - 639:11, 639:16
eat [1] - 741:22
eating [1] - 741:23
effect [18] - 648:34, 656:4, 657:32, 665:14, 668:22, 671:27, 677:10, 678:18, 680:33, 681:33, 682:9, 683:15, 688:18, 715:24, 729:8, 731:29, 731:33, 738:19
effective [1] - 660:6
efficiencies [1] - 640:1
effort [3] - 673:9, 673:19, 730:5
either [3] - 663:36, 713:32, 734:16
ejected [1] - 672:31
ejection [1] - 672:15
email [20] - 658:33, 658:38, 658:44, 659:4, 659:11, 659:17, 659:23, 659:28, 660:18, 683:45, 684:17, 686:30, 704:38, 705:27, 705:34, 708:12, 708:27, 708:35, 708:44, 721:33
emphasis [1] - 649:26
emphasise [1] - 670:47
employed [2] - 724:30, 750:6
enable [3] - 639:15, 703:13, 730:44
enclose [1] - 659:23
enclosed [1] - 660:18
enclosing [1] - 659:5
enclosures [1] - 659:24
encountered [2] - 655:1, 733:17
end [6] - 639:11, 704:44, 705:35, 707:19, 707:27, 709:29
ended [1] - 715:40
engineer [2] - 683:46, 747:13
England [1] - 724:28
enlarged [1] - 743:18
ensure [3] - 640:18, 640:26, 678:43
ensures [1] - 640:42
entailed [1] - 713:39
entirely [1] - 692:41
entirety [2] - 716:33, 716:43
entries [2] - 695:40, 697:20
entry [6] - 687:37, 689:43, 696:10, 697:27, 738:17, 749:34
equal [1] - 686:27
equipment [11] - 640:2, 663:13, 667:9, 703:27, 739:19, 739:21, 739:24, 739:25, 739:30, 739:35, 739:39
equivalent [2] - 645:37, 645:46
escape [1] - 723:27
Est [2] - 688:42, 688:47
established [4] - 668:25, 668:38, 668:41, 737:5
Estimated [1] - 688:47
estimating [1] - 656:30
et [1] - 665:36
evaluated [1] - 722:26
evening [2] - 703:13, 721:16
event [25] - 639:25, 651:33, 656:40, 657:10, 657:13, 657:16, 672:40, 686:8, 700:27, 708:7, 708:8, 708:12, 712:6, 717:15, 717:32, 718:6, 718:37, 719:16, 723:4, 732:42, 733:12, 733:28, 734:24, 734:41, 737:19
events [15] - 658:34, 664:42, 675:12, 679:20, 680:10, 693:27, 702:21, 707:20, 719:37, 719:41, 720:2, 720:39, 735:6, 737:43, 743:28
evidence [27] - 657:32, 660:2, 662:18, 670:29, 671:10, 672:18, 677:9, 681:33, 689:25, 689:31, 694:42, 695:22, 696:19, 703:7, 705:21, 707:35, 708:22, 717:27, 718:46, 722:44, 723:9, 723:12, 723:15, 729:7, 740:27, 742:26, 750:28
exact [1] - 642:7
exactly [4] - 674:37, 699:42, 713:38, 726:20
examination [1] - 703:3
EXAMINATION [9] - 639:28, 690:34, 715:3, 715:38, 716:21, 719:35, 724:23, 740:24, 749:10
examine [1] - 715:30
examples [2] - 739:3, 739:16
except [1] - 696:45
excess [1] - 740:38
excuse [1] - 678:32
excused [3] - 723:37, 750:11, 750:14
executed [2] - 740:11, 740:14
exercise [2] - 713:31, 714:1
EXH.0001.0001.0005 [1] - 695:46
existence [1] - 684:17
expect [6] - 672:13, 706:26, 706:29, 706:33, 718:36, 718:38
expectation [1] - 677:16
expected [2] - 677:11, 690:10
expecting [1] - 719:16
expenditure [3] - 673:8, 673:19, 730:4
expense [1] - 673:13
experience [12] - 672:23, 672:25, 674:22, 675:25, 682:14, 696:25, 718:40, 730:37, 732:41, 735:7, 737:6, 737:12
experienced [1] - 729:23
expertise [7] - 681:13, 682:13, 682:15, 686:21, 719:18, 737:6, 737:10
experts [1] - 669:6
expiry [1] - 659:37
explain [15] - 643:15, 643:20, 643:46, 644:6, 644:21, 644:22, 683:1, 690:44, 691:2, 699:33, 700:17, 711:16, 711:19, 711:25, 748:12
explaining [3] - 693:26, 693:32, 694:25
explanation [3] - 643:46, 712:20, 712:32
explicitly [1] - 647:42
explore [6] - 670:46, 671:9, 676:29, 678:35, 678:47, 680:8
explosive [1] - 668:3
exposed [3] - 646:15, 646:18, 679:46
exposed" [1] - 646:36
express [7] - 659:1, 682:9, 682:13, 682:33, 686:21, 709:18, 737:6
expressed [8] - 654:19, 654:36, 656:38, 679:12, 709:31, 711:16, 711:25, 712:31
expresses [1] - 698:20
expressing [2] - 698:30, 712:15
expression [2] - 721:30, 721:37
expressions [1] - 639:23
expressly [3] - 642:47, 647:4, 647:43
extended [1] - 706:46
extent [2] - 690:23, 723:17
extra [1] - 732:31
extracts [1] - 664:45

F

face [1] - 722:17
facilitate [1] - 740:22
facility [1] - 739:26
fact [26] - 641:37, 646:3, 654:46, 656:46, 657:37, 659:36, 660:4, 665:3, 665:10, 668:25, 670:33, 674:21, 675:3, 675:12, 681:34, 683:15, 683:26, 691:34, 712:45, 716:40, 718:20, 718:32, 726:2, 727:3, 730:18, 736:44
factor [2] - 723:15, 723:24
fail [1] - 674:23
failed [3] - 643:37, 657:44, 734:42
failing [2] - 656:47, 657:8
failure [19] - 642:47, 643:7, 644:8, 644:24, 644:46, 657:9, 657:19, 661:3, 674:27, 676:17, 703:28, 707:15, 717:15, 717:32, 717:35, 717:40,

719:39, 733:45, 734:11
failure" [1] - 698:29
fair [5] - 690:8, 694:6, 694:8, 694:10, 713:18
fairness [1] - 669:31
false [3] - 717:9, 722:19, 722:37
far [10] - 644:45, 661:23, 662:4, 663:17, 686:9, 700:37, 720:40, 736:12, 744:16, 746:9
February [3] - 724:35, 724:43, 725:1
few [3] - 725:6, 725:30, 738:39
field [1] - 722:25
fields [1] - 695:36
figure [1] - 687:43
figures [3] - 674:19, 690:28, 702:9
fill [1] - 743:4
final [1] - 686:25
finally [1] - 723:9
finish [3] - 661:37, 662:10, 724:6
finished [8] - 682:47, 695:3, 705:31, 706:39, 707:2, 740:8, 748:37, 749:2
finishes [1] - 710:4
finishing [1] - 750:26
firmly [2] - 670:39, 676:38
first [25] - 639:26, 648:8, 666:35, 674:27, 675:27, 675:46, 676:1, 684:12, 685:21, 690:9, 691:12, 691:29, 704:2, 704:6, 704:32, 706:12, 712:27, 713:23, 721:3, 721:44, 725:28, 731:20, 738:20, 741:43, 743:18
firstly [3] - 649:26, 662:38, 676:30
fit [2] - 667:9, 707:15
FITs [1] - 646:28
fitted [4] - 707:32, 727:13, 730:20, 730:45
five [1] - 725:41
flammable [1] - 685:37
flange [1] - 730:27
flaw [1] - 721:40
flexibility [1] - 731:1
float [29] - 642:15, 642:47, 643:7, 644:24, 657:8, 657:9, 657:19, 698:29, 700:15, 700:21, 700:25, 700:26, 717:15, 717:32, 717:35, 717:41, 731:43, 731:44, 732:1, 732:8, 732:15, 732:20, 732:29, 732:38, 733:7, 733:13, 733:33, 739:47
floats [10] - 643:36, 644:8, 644:46, 656:33, 656:40, 656:47, 657:44, 719:39, 733:46, 734:11
floor [17] - 643:30, 683:8, 700:35, 700:41, 700:46, 703:46, 703:47, 704:28, 741:22, 741:38, 741:39, 742:10, 745:20, 745:22, 745:29, 747:40, 748:24
flow [7] - 644:12, 644:40, 646:19, 658:15, 672:14, 672:27, 718:38
flowing [2] - 643:41, 746:26
fluid [31] - 647:11, 647:21, 647:29, 648:22, 648:35, 650:13, 652:36, 652:43, 667:35, 669:3, 669:22, 670:29, 670:43, 671:11, 671:13, 671:21, 671:42, 672:1, 672:11, 672:15, 672:36, 672:37, 672:42, 676:12, 689:12, 689:28, 689:33, 690:26, 723:26, 732:13, 737:29
fluids [7] - 646:43, 647:5, 647:20, 647:37, 647:38, 647:43, 718:28
fly [1] - 739:9
follow [5] - 717:27, 717:28, 721:1, 736:40, 739:22
followed [6] - 683:5, 711:41, 711:46, 712:7, 712:16, 731:47
following [11] - 639:10, 639:14, 643:47, 648:9, 649:23, 704:40, 707:46, 708:28, 711:4, 712:14, 720:39
follows [3] - 697:45, 702:31, 741:43
foot [2] - 687:4, 704:45
form [16] - 653:21, 662:27, 664:2, 664:10, 678:36, 681:6, 691:34, 712:26, 713:17, 713:22, 713:26, 715:14, 715:18, 722:5, 734:29, 735:8
formal [2] - 725:9, 725:13
format [3] - 646:30, 716:4, 716:10
formation [16] - 641:8, 641:40, 645:45, 646:20, 647:15, 647:44, 650:14, 652:3, 672:36, 682:11, 689:13, 689:37, 690:27, 723:11, 723:26, 737:31
former [1] - 639:1
forms [1] - 735:2
formulated [1] - 654:14
forward [16] - 659:17, 663:37, 665:40, 666:4, 666:47, 667:15, 677:13, 682:26, 683:34, 712:39, 717:28, 717:31, 718:8, 719:19, 728:26, 739:14
foundation [1] - 737:5
four [4] - 667:20, 682:27, 722:42, 738:40
frame [2] - 643:11, 643:24
framework [1] - 642:46
free [1] - 655:43
friend [7] - 691:23, 693:43, 694:4, 717:13, 720:46, 735:14, 737:5
friends [1] - 742:17
front [3] - 689:21, 689:23, 740:44
fulfil [1] - 662:5
full [9] - 672:28, 675:42, 676:8, 676:12, 680:6, 724:26, 739:27, 739:29, 739:30
fundamental [1] - 723:5

G

garden [1] - 682:28
gas [11] - 641:8, 641:40, 652:2, 668:1, 668:3, 672:29, 672:31, 672:35, 685:11, 685:36, 685:37
gather [1] - 750:14
gauge [13] - 728:42, 728:43, 728:46, 729:10, 729:12, 729:16, 729:18, 729:34, 741:17, 741:28, 741:38, 741:41
gauges [3] - 681:36, 681:38, 729:30
general [3] - 651:1, 695:14, 731:13
generally [6] - 639:39, 647:27, 657:17, 692:20, 725:7, 749:17
GEO.0003.0001.1098 [1] - 707:25
geological [2] - 688:26, 689:8
geologist [3] - 645:23, 645:44, 646:4
geologists [1] - 688:36
Geste [1] - 686:33
GI [1] - 669:35
gist [1] - 749:4
given [17] - 645:28, 646:4, 649:18, 663:43, 664:45, 683:5, 690:15, 696:19, 698:1, 707:38, 713:29, 713:31, 721:27, 729:27, 739:14, 740:14, 741:35
go-ahead [1] - 659:14
Government [1] - 697:4
granted [1] - 683:8
grateful [1] - 693:43
gravity [7] - 687:12, 687:42, 689:11, 689:32, 689:36, 690:3, 737:29
great [2] - 683:42, 730:4
greater [1] - 650:13
guy [1] - 662:30

H

H1 [28] - 645:15, 645:45, 656:1, 656:5, 669:35, 670:26, 673:3, 682:34, 683:9, 686:43, 687:32, 691:37, 691:42, 691:43, 693:27, 693:33, 694:26, 694:30, 703:35, 703:44, 704:23, 707:15, 708:32, 709:1, 710:4, 736:29, 737:25, 747:29
H2 [3] - 686:33, 686:38, 687:3
H3 [3] - 686:34, 686:38, 687:17
H3-ST1 [3] - 703:35, 703:44, 708:32
habitually [2] - 717:27, 718:6
HAL.9000.0001.0118 [1] - 686:29
HAL.9000.0001.0125 [1] - 687:2
half [6] - 679:16, 695:10, 699:35, 699:37, 699:46, 750:26
halfway [1] - 743:22
Halliburton [4] - 696:37, 700:38, 726:25, 745:47
halt [1] - 750:24
hand [20] - 653:31, 653:32, 681:42, 681:45, 685:11, 687:28, 688:39, 695:47, 696:3, 696:36, 715:41, 721:44, 724:9, 744:2, 744:16, 744:20,

744:35, 745:35, 746:11, 747:13
hand-held [2] - 681:42, 681:45
handed [3] - 696:31, 741:21, 748:11
Handed) [3] - 715:9, 722:3, 745:38
handover [1] - 699:10
handwriting [11] - 684:41, 684:44, 685:5, 696:2, 743:10, 743:11, 743:14, 749:24, 749:29, 749:31, 749:32
handwritten [7] - 684:12, 696:8, 696:22, 698:16, 699:41, 700:14, 700:29
Handwritten [1] - 696:1
hangar [1] - 739:34
happy [8] - 659:14, 659:16, 660:43, 694:21, 705:42, 715:34, 721:5, 721:34
hard [1] - 659:39
head [2] - 643:30, 650:13
heading [3] - 648:17, 649:45, 689:26
heard [1] - 681:33
hearing [1] - 731:20
hearings [1] - 639:4
heartbeat [1] - 670:23
height [3] - 641:28, 641:38, 680:4
heights [1] - 679:34
held [8] - 657:40, 658:7, 659:37, 674:39, 681:42, 681:45, 685:11, 745:45
Held [1] - 638:26
heli [2] - 744:14, 744:16
heli-deck [2] - 744:14, 744:16
help [2] - 719:18, 719:19
helpful [1] - 657:24
Higgins [1] - 683:46
higher [1] - 641:16
highlight [2] - 715:5, 715:23
highlighted [2] - 715:10, 715:17
highlighter [1] - 713:31
highly [1] - 669:25
hindsight [5] - 669:16, 701:23, 701:46, 712:21, 712:46
hit [1] - 659:19
hold [2] - 656:41, 657:43
holding" [1] - 656:34
hole [12] - 646:15, 646:18, 646:35, 646:44, 668:24, 670:43, 672:33, 675:14, 733:35, 740:38, 740:40, 741:12
holes [1] - 723:17
holidays [1] - 639:18
honestly [3] - 643:10, 662:30, 691:10
hook [1] - 731:5
hooked [2] - 648:31, 650:28
hope [1] - 639:20
hopefully [2] - 719:18, 719:28
hoping [1] - 663:7
Horne [11] - 723:43, 724:9, 724:28, 740:26, 742:22, 742:26, 742:45, 748:28, 750:11, 750:14, 750:24
HORNE [1] - 724:21
Horne's [1] - 740:11
hose [2] - 643:31, 644:10
hour [2] - 705:35, 750:27
hours [12] - 644:40, 657:29, 658:10, 659:13, 669:33, 700:2, 706:46, 749:34, 749:36, 749:44, 749:45
HOWE [36] - 639:3, 639:28, 639:30, 676:4, 677:43, 678:11, 690:30, 693:36, 694:13, 713:13, 713:45, 714:3, 714:8, 715:3, 715:5, 715:28, 716:18, 719:35, 719:37, 721:5, 723:33, 723:37, 723:43, 724:3, 724:23, 724:25, 727:23, 735:17, 737:9, 737:19, 740:8, 740:18, 749:10, 749:12, 750:10, 750:26
Howe [23] - 644:15, 644:32, 646:40, 654:8, 655:36, 657:1, 666:14, 671:31, 676:2, 677:45, 678:3, 684:28, 690:8, 690:32, 702:27, 703:3, 715:34, 716:15, 717:13, 719:33, 720:25, 723:35, 750:23
hull [2] - 744:47, 745:2
hydrocarbon [2] - 651:35, 682:10
hydrocarbons [2] - 652:3, 668:3
hydrostatic [9] - 647:15, 650:13, 652:36, 667:35, 669:3, 669:21, 670:43, 686:26, 690:25

I

IADC [14] - 658:39, 694:43, 695:14, 695:17, 695:44, 696:1, 696:2, 697:34, 697:45, 698:10, 698:35, 699:41, 700:1, 742:46
ID [1] - 740:14
idea [5] - 646:18, 662:14, 702:25, 730:43, 736:46
identical [4] - 711:17, 740:13, 740:16, 740:18
identified [4] - 654:15, 675:44, 748:34, 749:24
identifies [1] - 687:27
identify [6] - 676:13, 694:5, 740:27, 743:41, 744:43, 749:17
identifying [1] - 745:6
identity [6] - 683:44, 686:28, 687:25, 689:24, 740:9, 740:12
ignore [1] - 668:45
ignored [1] - 671:2
ii [1] - 675:36
immediately [3] - 710:22, 749:28, 749:30
imperfect [1] - 670:32
importance [1] - 642:14
important [4] - 640:40, 664:37, 668:7, 680:30
impression [1] - 739:4
imprint [1] - 728:2
improve [1] - 727:9
include [4] - 653:6, 653:8, 664:2, 717:31
included [13] - 677:16, 688:21, 694:22, 694:24, 698:32, 708:12, 708:27, 716:25, 716:29, 717:8, 718:15, 723:1
includes [2] - 674:7, 712:15
including [3] - 663:14, 704:45, 723:3
inclusive [1] - 674:4
incorrect [2] - 740:10, 740:14
incorrectly [1] - 688:19
increase [2] - 672:14, 697:41
increment [1] - 723:2
indeed [20] - 645:9, 649:14, 649:34, 650:30, 653:37, 653:43, 658:42, 660:25, 660:35, 671:45, 672:5, 672:35, 690:18, 692:2, 692:16, 703:15, 705:36, 719:6, 720:37, 727:33
independent [2] - 649:24, 649:27
independently [1] - 649:33
indicate [4] - 639:4, 665:5, 673:27, 738:18
indicated [2] - 741:18, 741:28
indicates [4] - 688:8, 688:12, 689:36, 738:7
indicating [1] - 687:41
indication [4] - 661:18, 668:3, 688:2, 738:11
indications [3] - 680:41, 680:47, 717:31
industry [1] - 690:40
infected [1] - 693:36
infield [1] - 684:38
infinite [2] - 718:17, 722:43
influence [1] - 667:35
information [53] - 640:42, 646:3, 658:40, 660:19, 661:34, 664:37, 668:30, 668:35, 669:5, 685:25, 685:33, 688:13, 688:18, 688:21, 690:15, 691:8, 696:8, 696:37, 697:3, 698:5, 699:1, 699:4, 699:29, 700:10, 701:14, 701:19, 702:40, 703:35, 703:41, 706:21, 706:29, 707:36, 708:23, 710:47, 712:46, 713:17, 713:27, 715:11, 715:18, 715:24, 719:26, 722:5, 722:36, 725:3, 737:35, 737:41, 738:8, 738:10, 738:12, 738:25, 738:28, 743:26, 747:23
informed [6] - 655:16, 660:36, 664:33, 685:20, 711:42, 720:3
inhibit [1] - 641:8
inhibited [7] - 656:29, 675:16, 679:42, 680:3, 736:31, 736:38, 740:39
inhibiter [1] - 679:43
inhibitors [1] - 646:45
initial [2] - 658:18, 659:43
inquiries [1] - 750:16
INQUIRY [1] - 638:20
Inquiry [5] - 639:5, 639:12, 639:18, 686:16, 717:5
insert [1] - 708:36

inserted [3] - 710:28, 728:14, 749:35
inside [6] - 643:41, 668:1, 704:15, 704:25, 737:29, 740:1
insight [1] - 703:29
insoluble [1] - 640:25
install [5] - 664:29, 671:27, 673:1, 677:11, 708:18
installation [15] - 640:40, 656:5, 662:5, 676:25, 676:30, 676:35, 677:12, 679:7, 679:13, 680:10, 680:25, 680:30, 682:36, 727:30, 727:35
installed [36] - 649:24, 649:37, 651:9, 652:25, 653:15, 653:27, 658:23, 664:5, 664:12, 664:17, 664:23, 664:34, 665:15, 669:14, 674:41, 676:38, 676:39, 678:42, 683:3, 683:16, 683:26, 706:20, 708:31, 709:19, 710:44, 711:5, 711:37, 721:43, 726:44, 727:4, 727:13, 727:18, 727:26, 734:29, 735:9, 736:45
installing [2] - 664:23, 723:6
instance [10] - 639:26, 640:10, 644:30, 654:11, 721:45, 722:22, 729:2, 729:26, 730:24, 732:30
instances [1] - 739:3
instantaneous [1] - 672:15
instead [3] - 661:47, 696:46, 733:34
instruct [1] - 656:40
instructed [4] - 677:6, 677:11, 683:35, 720:41
instruction [9] - 663:36, 663:43, 664:12, 711:47, 712:2, 720:34, 720:47, 721:1, 721:19
instructions [17] - 664:3, 683:5, 683:32, 709:4, 717:14, 717:26, 720:7, 720:12, 721:8, 721:11, 728:24, 728:28, 733:22, 747:33, 747:36, 747:45, 748:11
insufficient [2] - 652:1, 677:24
integrity [27] - 640:19, 640:27, 647:28, 659:31, 659:46, 661:20, 667:43, 668:7, 669:12, 669:20, 669:26, 671:12, 671:17, 671:34, 675:37, 675:44, 676:13, 676:21, 676:39, 678:13, 678:19, 678:44, 682:44, 686:2, 731:9, 733:44, 737:1
intended [6] - 641:22, 654:7, 654:13, 654:23, 658:45, 717:19
intending [2] - 698:31, 735:27
intention [2] - 654:18, 654:36
intentionally [1] - 717:9
interchange [1] - 654:14
internal [6] - 648:13, 652:27, 668:2, 732:2, 732:9, 738:2
interpret [2] - 643:15, 643:19
interpreting [1] - 696:21
interrupt [1] - 735:14
interval [1] - 641:9
intervention [2] - 649:6, 671:30
interviewed [1] - 737:42
introduce [1] - 733:34
introduced [3] - 641:23, 657:47, 674:32
introducing [2] - 731:47, 732:31
investigation [3] - 737:36, 737:42, 738:2
involved [11] - 663:3, 670:32, 673:8, 673:12, 673:19, 726:3, 730:4, 731:38, 732:45, 734:16, 738:34
involvement [1] - 727:34
involves [1] - 640:39
irrelevant [4] - 692:41, 693:5, 693:7, 694:5
issue [6] - 642:37, 682:29, 686:14, 691:28, 713:47, 719:9
issues [2] - 640:7, 640:24
it'll [1] - 746:31
item [7] - 665:35, 665:39, 666:3, 666:26, 666:35, 666:46, 744:35
items [3] - 662:15, 666:5, 739:35
itself [4] - 639:20, 640:7, 692:32, 708:44
IWCF [1] - 725:20

J

Java [2] - 684:35, 684:38
job [14] - 651:16, 651:24, 661:37, 691:36, 694:29, 696:40, 702:3, 702:6, 709:9, 726:24, 726:35, 731:34, 738:36, 747:24
jobs [1] - 703:27
Joe [2] - 749:40, 749:42
jointly [1] - 705:10
joints [1] - 732:30
judging [1] - 639:22

K

keeping [1] - 660:36
kept [1] - 664:33
kick [3] - 672:4, 672:8, 685:21
kind [3] - 668:4, 727:45, 743:4
kinds [1] - 703:25
knock [1] - 643:30
knocked [2] - 695:2, 707:6
knocking [1] - 644:10
knowing [1] - 703:12
knowledge [14] - 670:8, 708:7, 711:30, 711:35, 722:14, 722:33, 725:3, 729:15, 731:37, 733:5, 733:11, 737:23, 739:43, 743:36
known [2] - 657:17, 706:24
Kok [7] - 727:44, 728:6, 741:21, 741:27, 741:37, 747:43, 748:26

L

lack [1] - 678:19
laid [1] - 658:22
landing [1] - 658:23
language [2] - 711:17, 711:25
lapse [1] - 725:34
large [4] - 694:4, 722:11, 744:3, 749:31
largest [1] - 704:14
last [21] - 643:7, 649:12, 652:17, 653:12, 655:21, 666:26, 672:46, 678:3, 710:3, 719:38, 724:41, 725:26, 725:40, 727:39, 730:33, 733:5, 735:6, 737:24, 737:28, 738:17, 738:44
late [3] - 694:47, 706:20, 724:7
latter [2] - 645:8, 654:32
leaches [1] - 672:36
leaching [1] - 652:3
leading [1] - 737:43
leak [1] - 646:28
leak-off [1] - 646:28
leakage [1] - 682:11
Learned [1] - 703:24
learned [6] - 691:23, 693:43, 717:13, 719:27, 737:5, 742:17
least [6] - 669:27, 681:36, 684:30, 690:23, 705:22, 712:31
leave [2] - 662:7, 669:20
leaves [3] - 650:44, 652:12, 735:39
led [6] - 679:8, 680:11, 682:18, 686:19, 728:20, 737:37
left [20] - 639:23, 640:19, 649:12, 649:17, 667:31, 669:2, 679:11, 687:5, 687:28, 695:47, 696:36, 736:9, 736:15, 739:39, 741:22, 741:38, 741:39, 742:9, 744:2, 744:16
left-hand [5] - 687:28, 695:47, 696:36, 744:2, 744:16
leg [1] - 746:11
legal [3] - 639:5, 639:15, 724:13
legend [1] - 687:5
legs [2] - 744:4, 744:6
lend [1] - 694:13
length [2] - 723:25, 729:27
less [6] - 699:38, 699:47, 701:31, 722:27, 748:17
Lessons [1] - 703:24
letter [2] - 745:39, 749:13
Level [1] - 638:26
level [10] - 648:38, 648:41, 650:21, 681:34, 683:1, 704:24, 737:9, 744:46, 745:2
light [3] - 655:9, 668:18, 683:12
likely [2] - 675:5, 675:13
likewise [1] - 687:16
Lindsay [1] - 670:21
LINDSAY [1] - 639:1
Lindsay's [1] - 684:7
line [7] - 653:46, 675:46, 676:1, 687:7, 687:10, 702:23, 746:11
lines [1] - 696:12
liquid [1] - 650:21
list [1] - 686:37
listed [4] - 645:15, 654:11, 654:13, 692:25
literature [1] - 733:22
Liverpool [1] - 724:28

located [2] - 687:11, 746:1
location [11] - 649:7, 649:12, 650:4, 650:43, 650:45, 651:6, 651:7, 677:22, 735:39, 736:9, 736:17
loggers [2] - 687:44, 690:15
logically [1] - 721:2
logistics [4] - 662:23, 662:30, 744:30, 744:32
long-term [11] - 650:43, 652:8, 652:11, 652:20, 652:31, 652:37, 652:44, 653:22, 735:34, 735:46, 736:13
longer-term [1] - 735:43
look [17] - 646:3, 653:21, 653:22, 655:14, 658:45, 670:21, 671:21, 686:9, 691:31, 696:16, 701:34, 704:33, 707:12, 722:2, 738:10, 741:1, 745:26
looked [3] - 692:32, 704:25, 722:6
looking [10] - 646:26, 684:27, 689:23, 695:27, 704:40, 712:46, 745:13, 745:36, 746:41, 746:45
looks [1] - 687:19
loop [1] - 661:24
loveless [1] - 705:7
low [5] - 681:34, 729:3, 729:17, 729:18, 729:28
lower [1] - 672:37
lubricant [1] - 710:5
lunch [7] - 713:11, 713:24, 713:31, 713:45, 714:8, 715:46, 716:8
LUNCHEON [1] - 714:11

M

machine [1] - 681:45
machines [1] - 648:34
main [5] - 700:41, 700:43, 740:2, 746:9, 747:5
maintain [3] - 668:7, 682:43, 686:2
maintained [2] - 648:9, 650:22
maintaining [1] - 731:9
maintenance [1] - 650:27
man [8] - 662:29, 683:6, 705:41, 719:12, 742:39, 742:41, 746:15, 747:46
man's [1] - 744:28
managed [2] - 656:6, 662:35
management [5] - 642:46, 654:42, 654:47, 655:27, 662:46
manager [3] - 655:15, 655:25, 662:20
managing [1] - 660:31
Mangels [2] - 749:40, 749:42
manifold [4] - 681:46, 696:38, 729:10, 729:27
manifolds [1] - 729:31
Manual [1] - 642:42
manual [13] - 643:14, 643:20, 644:18, 691:29, 691:34, 691:40, 692:13, 692:16, 692:32, 692:37, 693:1, 693:12, 693:13
manual" [1] - 692:26
manuals [1] - 692:39
manufactured [1] - 662:15
manufacturer [1] - 663:6
manufacturer's [2] - 676:45, 677:2
March [44] - 638:37, 643:7, 644:47, 645:4, 645:5, 651:30, 651:41, 654:28, 656:11, 657:5, 658:33, 658:34, 660:11, 661:2, 661:41, 662:27, 663:29, 668:23, 687:32, 688:7, 688:27, 689:42, 694:30, 695:16, 696:3, 698:4, 709:4, 709:40, 710:32, 719:38, 720:17, 721:16, 724:35, 726:16, 731:17, 733:5, 733:11, 733:43, 734:8, 735:6, 743:4, 743:19, 750:1, 750:6
MARCH [1] - 750:35
March/April [1] - 738:43
margin [1] - 647:38
margins [1] - 713:32
mark [7] - 713:24, 713:32, 745:37, 746:4, 746:39, 747:15, 748:46
marked [11] - 715:41, 716:23, 722:3, 724:11, 724:12, 724:17, 724:19, 745:44, 748:33, 748:39, 749:12
markings [1] - 715:43
mate [1] - 690:47
material [17] - 691:35, 693:24, 694:1, 694:23, 696:12, 696:17, 712:25, 712:26, 712:27, 712:30, 716:3, 716:9, 716:29, 717:8, 722:12, 722:13, 722:18
Mathieu [1] - 683:45
maths [1] - 668:36
matter [10] - 640:40, 681:17, 713:3, 713:14, 715:42, 717:36, 721:2, 737:14, 740:28, 741:14
matters [3] - 718:3, 741:16, 743:37
McElhinney [1] - 683:47
mean [30] - 646:16, 649:31, 657:9, 657:14, 668:15, 674:44, 677:5, 680:46, 681:41, 692:45, 697:23, 698:3, 702:5, 705:30, 711:40, 719:23, 721:23, 721:30, 727:29, 728:47, 730:13, 730:14, 730:24, 731:4, 735:19, 739:22, 741:10, 749:30, 749:31
meaning [2] - 646:18, 652:20
means [7] - 651:6, 651:36, 655:42, 689:8, 696:38, 724:27, 749:7
meant [12] - 660:5, 667:16, 667:19, 670:34, 677:21, 680:19, 690:19, 697:19, 699:2, 722:12, 735:33, 748:20
measuring [1] - 728:28
mechanical [6] - 734:34, 734:41, 735:10, 736:1, 736:3, 736:4
mechanised [1] - 680:20
megapascal [1] - 696:45
memory [3] - 669:42, 685:24, 686:8
mention [1] - 654:38
metre [1] - 679:16
metres [9] - 641:29, 641:39, 651:34, 656:17, 698:22, 698:26, 700:39, 700:40
metric [1] - 697:3
midday [3] - 706:39, 706:45, 707:2
middle [4] - 695:9, 695:10, 743:8, 749:22
midnight [4] - 695:2, 695:3, 706:45, 707:28
might [66] - 647:37, 650:43, 652:43, 656:45, 657:4, 657:12, 657:18, 657:19, 658:27, 658:37, 660:5, 668:18, 671:22, 672:7, 672:13, 673:8, 673:12, 673:13, 675:27, 675:36, 675:41, 676:8, 676:13, 676:21, 676:34, 676:42, 677:43, 678:12, 678:13, 679:25, 681:20, 681:35, 682:35, 683:2, 683:18, 686:18, 689:15, 692:10, 693:36, 703:23, 704:32, 713:10, 713:47, 719:21, 719:26, 721:44, 722:43, 723:1, 723:2, 723:17, 723:37, 727:45, 728:38, 729:9, 731:29, 731:33, 732:19, 732:21, 733:44, 734:45, 735:29, 736:8, 740:20, 742:16, 748:37
mightn't [1] - 682:37
migration [1] - 652:2
milestone [1] - 666:47
Millar [1] - 712:15
mind [3] - 664:20, 736:13, 747:16
mine [1] - 684:45
minimal [2] - 681:34, 729:8
minimum [2] - 649:23, 651:34
minutes [4] - 656:32, 715:30, 732:30, 738:21
misconception [3] - 702:18, 703:2, 703:6
misled [1] - 735:44
missed [1] - 702:45
mixture [1] - 646:44
MLS [13] - 653:16, 653:27, 653:35, 664:22, 664:25, 667:2, 668:2, 678:37, 679:15, 679:36, 703:36, 703:45, 703:47
mobile [1] - 649:2
MODU [7] - 648:47, 649:12, 649:17, 650:4, 650:42, 650:44, 652:11
moment [1] - 734:4
money [2] - 673:20, 730:5
monitor [2] - 643:27, 648:35
monitored [4] - 648:23, 650:22, 656:6, 657:30
monitoring [4] - 648:28, 650:27,

656:28, 657:28
Montara [7] - 687:17, 687:32, 692:38, 700:47, 743:46, 744:37, 744:44
MONTARA [1] - 638:20
months [3] - 750:7, 750:8
morning [7] - 700:2, 704:41, 705:22, 707:47, 708:28, 720:21, 750:28
most [1] - 738:20
move [1] - 745:9
moves [1] - 745:13
moving [3] - 669:35, 675:4, 704:21
MR [69] - 639:3, 639:28, 639:30, 676:1, 676:4, 677:43, 678:11, 690:30, 690:34, 690:36, 693:1, 693:36, 693:43, 694:3, 694:8, 694:13, 694:21, 713:7, 713:13, 713:45, 713:47, 714:3, 714:6, 714:8, 715:3, 715:5, 715:28, 715:38, 715:40, 716:13, 716:18, 716:21, 716:23, 719:30, 719:35, 719:37, 720:46, 721:5, 723:33, 723:37, 723:43, 723:45, 724:3, 724:19, 724:23, 724:25, 727:23, 735:14, 735:17, 737:4, 737:9, 737:17, 737:19, 740:8, 740:18, 740:24, 740:26, 742:15, 742:21, 742:26, 748:28, 748:33, 748:43, 749:2, 749:7, 749:10, 749:12, 750:10, 750:26
mud [8] - 647:37, 653:46, 672:28, 672:29, 672:32, 687:43, 690:15, 747:13
must [6] - 643:40, 651:2, 652:25, 662:29, 664:47, 689:19

N

n) [1] - 675:8
name [3] - 704:45, 724:26, 749:39
namely [6] - 646:4, 653:26, 657:7, 669:1, 678:36, 727:40
names [3] - 704:45, 705:14, 705:15
narrate [1] - 665:9
narrated [1] - 721:42
nature [1] - 723:16
near [1] - 732:15
nearly [2] - 682:47, 701:42
necessarily [1] - 712:9
necessary [5] - 673:2, 682:44, 686:2, 704:2, 716:37
need [12] - 639:10, 640:18, 640:26, 647:43, 648:8, 652:45, 655:4, 669:39, 678:43, 708:11, 724:16, 733:44
needed [7] - 662:10, 667:9, 667:11, 678:21, 683:14, 702:20, 739:25
needing [1] - 649:36
needs [3] - 654:46, 662:5, 713:37
net [2] - 673:47, 701:34
never [3] - 702:20, 709:18, 742:9
next [31] - 639:10, 639:11, 639:13, 640:30, 640:46, 641:47, 645:26, 646:9, 647:1, 649:45, 651:22, 651:33, 658:21, 684:11, 687:16, 688:6, 689:29, 690:38, 692:11, 695:40, 697:11, 697:27, 697:38, 708:13, 720:21, 720:24, 726:24, 743:45, 744:20, 749:19
night [9] - 693:8, 694:39, 695:1, 703:14, 706:25, 718:47, 719:11, 720:1, 742:41
night-shift [1] - 718:47
night-time [1] - 706:25
nine [5] - 732:47, 733:2, 734:28, 735:7, 737:12
nippled [2] - 674:40, 674:42
no" [1] - 716:7
no-one [6] - 658:29, 670:47, 671:5, 685:20, 685:29, 720:41
nobody [2] - 670:13, 710:36
non [6] - 675:43, 677:31, 679:7, 679:13, 680:10, 680:25
non-contaminated [1] - 675:43
non-installation [4] - 679:7, 679:13, 680:10, 680:25
non-testing [1] - 677:31
none [2] - 667:47, 672:27
none" [1] - 657:31
nonetheless [2] - 642:13, 686:43
NOPSA [1] - 737:44
Normal [1] - 689:3
normal [7] - 645:27, 645:37, 645:45, 646:4, 688:42, 689:8, 718:23
normal-1.04sg [1] - 645:17
normally [14] - 646:43, 647:10, 647:21, 647:29, 647:32, 647:35, 648:28, 651:17, 651:24, 653:43, 675:20, 678:38, 718:23, 718:25
Northern [1] - 697:4
not" [1] - 741:8
note [11] - 646:30, 659:11, 659:12, 698:19, 698:44, 701:18, 701:25, 701:29, 701:36, 701:45
notes [10] - 684:8, 684:13, 684:16, 684:22, 684:30, 684:41, 685:1, 685:28, 686:9
nothing [9] - 646:15, 646:18, 646:35, 661:10, 661:14, 713:7, 716:13, 723:33, 748:28
noting [1] - 639:11
nots [1] - 676:1
nuanced [1] - 669:25
number [21] - 649:23, 665:35, 666:35, 683:24, 683:44, 686:28, 687:25, 687:35, 688:7, 688:27, 688:32, 688:33, 689:25, 689:41, 704:45, 738:9, 740:10, 740:12, 748:20, 749:21
numbered [1] - 666:26
numbers [2] - 645:32, 699:28
numeric [1] - 645:27

O

o'clock [1] - 705:34
O'Shea [13] - 659:10, 670:1, 670:10, 670:12, 683:46, 705:1, 705:23, 724:4, 724:7, 747:46, 748:26, 750:29
O'Shea's [1] - 684:41
oath [1] - 639:1
object [2] - 720:46, 737:4
objective [5] - 641:16, 641:27, 641:37, 732:7, 732:15
observations [4] - 671:13, 671:41, 671:47, 672:41
observe [3] - 683:26, 746:30, 747:9
observed [6] - 674:30, 683:38, 686:10, 697:41, 737:25, 747:6
observer [2] - 684:39, 746:44
observing [2] - 644:39, 746:44
obtain [3] - 643:28, 662:8, 725:25
obtained [3] - 682:4, 725:14, 725:28
obvious [1] - 658:27
obviously [2] - 716:28, 717:35
occasion [3] - 674:27, 725:28, 747:28
occasions [3] - 721:26, 722:13, 725:30
occupying [1] - 749:31
occur [3] - 648:28, 702:2, 735:39
occurred [15] - 655:47, 657:5, 664:47, 670:33, 671:46, 675:13, 678:37, 679:20, 680:10, 712:21, 719:38, 726:17, 727:38, 728:6, 739:11
occurs [1] - 718:47
OF [1] - 638:20
off-the-shelf [1] - 662:15
offering [1] - 679:24
office [11] - 744:28, 744:29, 744:30, 748:5, 748:15, 748:38, 748:41, 748:43, 748:44, 749:13, 749:18
offices [3] - 744:24, 744:27, 744:29
official [2] - 739:10, 739:13
offline [11] - 640:30, 640:39, 640:43, 664:18, 683:6, 702:33, 703:27, 706:36, 710:27, 712:3, 712:7
offshore [7] - 649:2, 661:21, 725:10, 725:15, 725:19, 725:44, 734:16
often [1] - 734:36
oil [4] - 672:28, 672:29, 672:32, 725:10
oil-based [3] - 672:28, 672:29, 672:32
OIM [7] - 711:45, 712:1, 712:8, 712:40, 713:3, 715:47, 748:43
OIM's [1] - 744:28
OK [1] - 659:31
onboard [3] - 659:25, 688:37,

726:15
once [10] - 643:24, 643:26, 643:28, 644:25, 651:9, 658:10, 659:16, 667:47, 695:2, 728:13
one [42] - 640:11, 640:13, 640:16, 643:3, 648:15, 649:32, 653:31, 658:29, 659:1, 663:14, 663:21, 663:24, 664:46, 669:13, 669:21, 669:27, 670:47, 671:5, 672:13, 675:27, 675:31, 678:30, 678:35, 681:19, 682:34, 685:20, 685:29, 686:21, 695:15, 696:18, 697:8, 702:31, 705:27, 712:31, 713:13, 715:42, 720:41, 721:40, 730:9, 730:14, 740:8, 744:33
ones [2] - 681:45, 681:46
ongoing [1] - 654:47
online [1] - 712:3
onshore [26] - 656:6, 658:29, 660:18, 660:27, 660:35, 661:18, 661:21, 661:23, 662:40, 662:42, 663:29, 663:44, 664:33, 667:43, 668:32, 669:6, 670:17, 677:10, 680:32, 683:13, 719:41, 720:28, 720:35, 720:41, 721:20, 734:19
open [3] - 643:31, 646:44, 719:24
open-door [1] - 719:24
opened [1] - 700:21
operate [1] - 649:32
operated [1] - 700:38
operating [1] - 726:37
operation [7] - 647:12, 691:45, 692:3, 695:41, 700:34, 701:7, 734:16
Operation [1] - 743:10
operational [1] - 650:3
Operations [1] - 642:41
operations [12] - 640:31, 643:20, 669:33, 670:4, 692:26, 694:35, 743:37, 743:42, 745:17, 745:41, 746:1, 746:22
operator [24] - 653:10, 656:18, 662:36, 663:2, 665:33, 669:39, 684:21, 684:25, 684:47, 686:28, 687:1, 687:4, 688:25, 689:15, 689:19, 703:17, 704:37, 712:19, 729:23, 738:13, 739:8, 743:43, 749:28
opinion [2] - 686:21, 737:7
opposed [2] - 643:27, 645:32
opposite [1] - 746:42
optimism [1] - 682:47
option [1] - 675:46
oral [1] - 695:22
order [20] - 640:11, 640:20, 648:35, 655:34, 657:43, 657:47, 662:42, 671:33, 673:1, 679:10, 679:35, 682:43, 686:1, 698:40, 704:13, 717:23, 717:37, 719:8, 723:27, 732:31
ordered [1] - 661:38
ordinarily [2] - 734:40, 735:38
ordinary [1] - 683:23
organisation [1] - 726:31
original [3] - 710:21, 710:26, 713:38
otherwise [7] - 641:34, 642:18, 661:11, 661:15, 667:21, 673:13, 681:21
outline [2] - 693:20, 717:21
outside [4] - 648:11, 652:26, 678:15, 723:46
outweigh [1] - 639:40
overbalance [3] - 686:27, 689:37, 690:25
overbalanced [3] - 646:6, 647:44, 718:30
overdisplace [1] - 668:23
overdisplacement [2] - 668:36, 668:42
overdisplacing [1] - 642:14
overseen [1] - 656:5
oversight [1] - 683:4
own [8] - 643:15, 644:21, 644:23, 654:3, 715:24, 735:28, 749:30, 749:31

P

pace [1] - 684:26
packer [1] - 736:4
page [24] - 639:32, 653:10, 684:11, 684:12, 684:47, 687:6, 687:16, 687:36, 689:20, 689:21, 689:23, 689:40, 695:10, 695:40, 703:22, 707:25, 710:41, 724:42, 738:9, 739:8, 743:18, 743:22, 743:26, 748:18
paperwork [3] - 738:37, 739:10, 739:13
paragraph [128] - 641:5, 641:14, 641:41, 641:47, 642:28, 642:40, 643:14, 643:20, 643:35, 643:47, 644:3, 644:6, 644:17, 644:18, 644:23, 644:34, 645:12, 645:22, 645:35, 646:9, 646:14, 646:17, 646:23, 646:24, 646:38, 646:42, 647:1, 647:18, 648:1, 648:4, 653:11, 654:6, 654:12, 654:22, 654:41, 655:22, 656:9, 656:21, 656:27, 657:28, 658:21, 658:32, 659:28, 660:46, 661:28, 662:33, 663:28, 663:33, 663:47, 664:16, 664:40, 665:18, 665:23, 666:32, 669:31, 669:32, 669:36, 669:40, 669:41, 669:47, 670:12, 670:25, 672:46, 673:23, 673:32, 674:21, 675:3, 675:6, 675:8, 675:19, 675:25, 676:24, 678:24, 679:1, 680:38, 680:39, 682:2, 682:9, 690:37, 691:22, 692:41, 693:18, 702:29, 702:30, 707:12, 707:14, 708:16, 708:26, 709:28, 709:29, 709:30, 709:37, 710:2, 710:3, 710:16, 710:40, 711:3, 711:16, 711:29, 712:12, 712:19, 712:30, 712:36, 715:45, 715:47, 716:8, 722:22, 725:47, 726:2, 726:15, 726:43, 727:23, 727:38, 728:36, 729:38, 730:8, 730:18, 730:33, 740:35, 741:2, 741:5, 741:15, 741:16, 741:35, 741:36, 741:44, 742:1
paragraphs [15] - 640:46, 645:11, 650:32, 654:2, 665:19, 675:35, 690:39, 691:22, 691:24, 692:21, 694:9, 710:42, 712:30, 715:10, 715:17
part [36] - 640:31, 642:46, 654:42, 655:24, 660:25, 672:35, 673:42, 678:33, 691:24, 691:34, 692:32, 693:7, 695:9, 695:26, 696:20, 697:6, 702:40, 707:13, 708:8, 710:3, 711:9, 711:21, 711:29, 712:25, 716:3, 716:9, 743:3, 743:9, 743:13, 743:30, 744:17, 744:36, 744:40, 744:44, 745:9, 746:14
particular [27] - 639:25, 641:28, 643:6, 644:41, 646:23, 650:3, 652:43, 654:47, 655:4, 655:10, 665:19, 672:32, 682:9, 686:10, 690:11, 713:17, 713:22, 713:35, 720:42, 723:16, 733:26, 734:15, 739:35, 742:38, 748:15, 748:20, 749:12
particularly [1] - 715:47
parties' [1] - 724:13
parts [6] - 693:45, 694:22, 713:16, 713:21, 713:25, 716:24
passage [1] - 694:5
passages [2] - 713:35, 715:6
past [1] - 679:7
path [1] - 646:20
Paul [5] - 683:46, 684:7, 705:1, 747:46, 748:26
Paul's [2] - 684:45, 685:6
PCC [73] - 653:7, 654:11, 654:14, 658:23, 663:14, 663:24, 663:38, 664:4, 664:17, 665:14, 667:12, 667:27, 667:31, 667:41, 667:42, 668:16, 668:17, 669:1, 669:44, 670:14, 670:22, 673:14, 676:30, 676:38, 677:11, 677:31, 678:13, 678:35, 678:38, 679:8, 679:11, 679:13, 679:26, 679:37, 679:40, 680:11, 680:16, 680:19, 680:26, 681:25, 681:28, 682:5, 682:19, 682:24, 682:26,

682:33, 682:42, 683:2, 683:26, 683:39, 685:46, 686:18, 704:22, 704:34, 707:15, 708:18, 709:14, 709:18, 709:33, 710:43, 711:5, 711:32, 711:36, 721:43, 723:11, 728:20, 729:27, 736:39, 736:44, 736:45, 747:29
PCCC [2] - 673:2, 679:3
PCCs [16] - 653:43, 661:43, 661:47, 662:4, 662:28, 663:1, 663:18, 676:25, 678:24, 678:25, 710:32, 730:25, 734:27, 734:28, 739:24, 739:44
PDFs [1] - 686:38
pen [2] - 713:32, 745:36
penalty [1] - 717:9
people [15] - 656:6, 660:35, 664:33, 665:9, 677:10, 680:32, 680:33, 683:17, 683:25, 683:28, 696:27, 703:11, 711:18, 745:47
per [4] - 642:31, 656:26, 676:45, 680:43
percolation [1] - 723:26
perfectly [2] - 694:8, 694:10
perform [1] - 673:26
performed [2] - 675:20, 703:27
perhaps [5] - 639:10, 659:6, 710:41, 738:8, 748:33
period [9] - 657:33, 659:38, 681:19, 682:11, 692:2, 696:10, 700:14, 738:41, 738:43
periods [1] - 738:34
permanent [14] - 642:25, 642:30, 650:7, 652:24, 652:45, 653:1, 653:6, 653:23, 653:31, 654:11, 654:15, 660:13, 682:35, 736:2
permissible [1] - 737:13
person [9] - 662:23, 670:17, 704:21, 706:3, 706:27, 719:44, 742:42, 749:39
personal [2] - 722:32, 727:34
personnel [8] - 640:2, 692:17, 711:4, 712:14, 720:28, 720:35, 726:25, 744:29
persons [1] - 659:24
Peter [1] - 686:33
petroleum [3] - 725:15, 725:19, 725:44
phase [1] - 738:20
phenomenon [1] - 672:28
phone [3] - 738:37, 748:10, 748:15
phoned [2] - 748:8, 748:12
phrase [1] - 708:39
physical [2] - 670:28, 671:10
physically [4] - 701:6, 701:10, 704:24, 718:36
pick [2] - 729:34, 729:36
picked [1] - 702:42
piece [1] - 719:26
pieces [1] - 739:39
pit [2] - 689:26
place [31] - 640:27, 640:41, 642:45, 644:31, 644:36, 652:45, 653:23, 660:26, 668:16, 669:12, 671:18, 671:37, 672:43, 674:47, 677:26, 678:43, 679:29, 679:40, 680:20, 680:32, 680:35, 681:18, 682:25, 704:22, 704:27, 712:39, 728:24, 731:24, 734:23, 736:29, 738:37
placed [5] - 662:42, 671:10, 721:46, 735:9, 744:13
plan [12] - 663:37, 675:21, 677:13, 683:34, 712:39, 717:28, 717:31, 718:7, 719:19, 728:26, 739:14, 748:13
plane [1] - 745:13
plans [1] - 661:41
platform [5] - 700:47, 743:46, 744:37, 744:44, 744:45
plausible [1] - 687:21
pleases [1] - 750:10
plug [13] - 646:21, 650:8, 651:22, 651:24, 656:17, 656:25, 656:31, 656:46, 676:39, 709:13, 710:22, 710:28, 734:45
plugs [21] - 642:6, 643:23, 656:32, 656:39, 657:7, 657:17, 661:42, 661:47, 667:11, 675:4, 675:28, 675:31, 675:42, 676:8, 732:14, 734:34, 735:47, 736:2, 736:4, 736:26, 736:30
plus [1] - 667:35
point [38] - 642:7, 643:45, 650:41, 651:23, 651:33, 656:21, 659:29, 660:12, 666:5, 667:27, 667:31, 667:39, 668:14, 668:18, 668:47, 670:42, 670:46, 671:30, 679:23, 679:36, 680:19, 682:4, 685:28, 687:12, 690:38, 698:12, 702:14, 705:16, 708:29, 710:41, 736:37, 736:44, 737:4, 740:8, 745:6, 746:18, 746:26, 747:15
pointing [1] - 745:39
points [2] - 687:22, 745:37
policy [1] - 719:24
Pore [1] - 688:42
pore [27] - 645:15, 645:45, 646:5, 686:34, 686:44, 687:6, 687:18, 687:22, 687:37, 687:41, 688:2, 688:8, 688:13, 688:20, 689:7, 689:43, 690:2, 690:9, 690:26, 718:20, 718:21, 718:25, 718:29, 718:32, 718:42, 723:11, 737:30
port [1] - 746:45
position [7] - 683:25, 698:20, 698:41, 699:3, 707:14, 710:44, 711:46
positioned [2] - 640:34, 643:23
positive [1] - 677:40
positively [2] - 671:1, 729:11
possibility [5] - 657:25, 681:37, 686:17, 718:42, 723:10
possible [6] - 657:21, 678:30, 678:35, 681:39, 721:47, 732:8
possibly [9] - 664:18, 669:8, 672:9, 675:43, 676:15, 676:18, 683:29, 700:39, 703:38
post [4] - 675:19, 675:27, 675:36, 676:12
post-cementing [1] - 675:19
post-procedure [3] - 675:27, 675:36, 676:12
postponed [1] - 673:14
potentially [1] - 730:13
pour [1] - 644:11
practice [9] - 669:11, 669:19, 671:37, 672:41, 678:26, 695:5, 705:18, 712:6, 719:28
practices [1] - 711:41
precaution [1] - 669:15
precisely [1] - 743:41
predicted [1] - 657:16
prefer [1] - 724:26
preferred [1] - 639:42
preparation [2] - 658:33, 660:2
prepare [1] - 703:14
prepared [16] - 690:6, 691:5, 691:18, 692:31, 694:39, 694:43, 695:27, 695:32, 707:20, 707:27, 708:27, 708:35, 708:39, 709:44, 722:12, 722:37
preparing [7] - 643:9, 690:45, 691:3, 697:6, 703:24, 705:11, 733:40
present [11] - 639:21, 651:35, 661:36, 666:31, 685:37, 686:11, 727:25, 727:29, 743:30, 748:24
presented [21] - 655:35, 690:46, 691:4, 691:8, 691:25, 693:47, 696:9, 696:37, 697:3, 700:14, 709:45, 709:47, 711:9, 712:25, 715:11, 715:19, 716:4, 716:10, 722:4, 722:11, 722:36
presently [1] - 639:8
pressure [132] - 642:30, 642:35, 643:23, 643:25, 643:28, 644:25, 644:27, 644:40, 645:15, 645:37, 645:45, 646:4, 646:5, 647:44, 656:30, 656:32, 657:34, 657:40, 657:43, 658:1, 658:2, 658:7, 658:11, 659:37, 659:43, 662:9, 663:37, 664:24, 667:17, 667:19, 667:45, 667:46, 673:26, 673:34, 673:43, 674:7, 674:30, 674:31, 674:38, 675:20, 675:26, 675:27, 675:36, 676:13, 676:25, 677:24, 677:28, 678:4, 678:6,

678:7, 678:8, 678:9, 678:12, 678:17, 681:25, 681:28, 681:35, 681:43, 685:10, 686:34, 686:38, 686:44, 687:2, 687:6, 687:18, 687:22, 687:37, 687:41, 688:2, 688:8, 688:13, 688:15, 688:20, 689:7, 689:37, 689:44, 690:2, 690:9, 690:26, 696:38, 697:13, 697:19, 697:24, 697:29, 697:41, 698:6, 698:11, 701:36, 710:9, 718:20, 718:21, 718:23, 718:25, 718:29, 718:32, 718:33, 718:41, 718:42, 723:11, 727:41, 727:45, 728:13, 728:14, 728:17, 728:29, 728:37, 728:40, 728:42, 729:3, 729:4, 729:9, 729:13, 729:34, 732:18, 732:29, 732:32, 732:37, 735:20, 735:23, 737:30, 741:17, 741:18, 741:20, 741:21, 741:24, 741:25, 741:28, 741:29, 741:38, 741:41, 742:6
Pressure [1] - 688:42
pressure-containing [6] - 710:9, 718:33, 718:41, 727:41, 735:20, 735:23
pressure-containment [2] - 667:19, 667:45
pressure-control [2] - 664:24, 667:17
pressure-controlling [1] - 662:9
pressure.. [1] - 650:14
pressured [1] - 718:25
pressures [4] - 722:26, 729:17, 729:18, 729:28
presumably [1] - 704:9
pretty [3] - 652:41, 696:44, 697:45
prevailed [3] - 682:4, 682:41, 685:45
prevent [4] - 643:40, 660:6, 671:28, 679:30
preventer [1] - 644:35
previous [2] - 659:13, 735:7
previously [2] - 699:43, 717:12
primarily [2] - 653:36, 653:44
primary [7] - 646:27, 659:23, 669:21, 669:27, 680:31, 734:37, 734:41
principally [1] - 696:30
principles [1] - 661:20
problem [16] - 642:37, 657:5, 660:4, 667:44, 668:42, 668:45, 669:7, 676:34, 678:12, 679:16, 681:20, 701:21, 702:42, 719:10, 719:24, 720:8
problems [4] - 652:2, 668:19, 675:44, 676:13
procedure [7] - 644:47, 675:27, 675:36, 676:12, 712:8, 726:2, 726:37
Procedures [1] - 642:42
procedures [12] - 643:14, 643:20, 644:18, 691:28, 691:34, 691:40, 692:13, 692:16, 692:26, 711:46, 712:9, 712:16
proceeded [3] - 651:16, 651:24, 690:12
proceedings [3] - 724:33, 733:40, 750:24
process [13] - 655:27, 669:34, 681:18, 682:18, 683:1, 686:17, 686:19, 706:7, 719:8, 719:22, 727:30, 728:20, 731:37
processes [1] - 681:14
produced [3] - 686:16, 688:31, 738:7
profile [1] - 664:26
program [43] - 656:11, 656:15, 656:26, 656:37, 656:45, 657:6, 657:24, 658:28, 661:10, 665:19, 665:23, 666:11, 666:30, 666:40, 668:16, 677:16, 680:44, 681:1, 682:25, 683:33, 693:9, 709:17, 709:23, 709:31, 709:41, 709:45, 710:22, 710:26, 710:36, 717:14, 717:19, 717:29, 718:2, 718:11, 718:14, 722:41, 723:3, 723:4, 726:8, 738:19, 738:38, 738:39, 742:32
projecting [2] - 744:17, 744:36
proper [8] - 655:44, 661:19, 668:17, 669:27, 671:18, 711:41, 711:46, 712:16
properly [6] - 660:13, 676:31, 676:35, 680:34, 700:24, 740:11
proposal [1] - 639:22
proposed [3] - 639:4, 639:12, 665:4
proposing [2] - 749:4, 750:23
proposition [6] - 669:26, 671:5, 680:8, 683:27, 686:22, 713:39
propositions [2] - 654:2, 664:41
protect [2] - 653:36, 653:44
protected [2] - 669:2, 669:20
proven [6] - 648:16, 660:13, 669:28, 671:38, 676:31, 677:21
Proven [1] - 648:17
provided [11] - 645:22, 648:22, 650:21, 651:16, 693:24, 693:31, 694:23, 706:30, 710:36, 713:18, 747:33
providing [3] - 737:35, 737:41, 738:25
provision [5] - 656:15, 661:42, 664:10, 666:12, 739:20
psi [16] - 657:40, 658:2, 673:44, 676:45, 677:6, 678:18, 696:44, 696:46, 697:14, 697:29, 701:37, 729:3, 729:28, 729:35, 729:36, 732:32
PTT [34] - 656:6, 660:35, 661:23, 663:7, 664:32, 668:31, 670:17, 673:12, 677:10, 683:13, 683:22, 683:28, 683:46, 689:31, 692:39, 693:8, 694:39, 695:45, 696:4, 697:2, 711:18, 711:22, 711:41, 712:32, 719:41, 720:28, 720:35, 720:41, 721:8, 726:26, 726:30, 726:36, 742:36, 742:42
PTT.0002.0001.0001 [3] - 695:8, 742:46, 749:22
PTT.9001.0007.0340 [1] - 687:26
PTT.9001.0007.0343 [1] - 688:6
PTT.9001.0007.0346 [2] - 689:41, 695:31
PTT.9001.0016.0254 [1] - 703:18
PTT.9002.0008.0327 [1] - 683:44
PTT.9002.0081.0046 [1] - 704:38
PTT.9003.0003.0258 [1] - 688:26
PTT.9004.0001.0121 [1] - 689:16
PTTEPAA [1] - 726:31
public [1] - 639:17
pump [5] - 644:26, 696:39, 700:41, 733:32
pumped [19] - 643:28, 673:25, 673:27, 674:29, 692:7, 692:12, 698:21, 698:23, 699:19, 699:25, 699:38, 699:46, 701:30, 701:31, 701:32, 701:34, 701:36, 701:42, 701:45
pumping [3] - 642:2, 675:15, 699:14
pumps [2] - 700:37, 701:7
purchase [2] - 662:42, 663:17
purchased [2] - 663:14, 663:25
purchasing [1] - 663:1
purpose [6] - 653:35, 690:45, 703:12, 717:5, 731:47, 735:24
purposes [10] - 639:18, 651:35, 666:31, 677:30, 686:11, 689:30, 691:3, 696:11, 701:35, 715:19
put [27] - 671:17, 671:46, 673:14, 677:24, 691:31, 698:9, 698:19, 700:20, 702:22, 702:25, 703:17, 703:26, 705:15, 709:14, 713:35, 713:39, 715:15, 715:23, 719:25, 719:27, 720:46, 721:5, 730:24, 731:5, 735:43, 736:5, 745:39
putting [3] - 647:27, 679:43, 685:24

Q

QC [3] - 705:42, 721:27, 721:37
QC'd [1] - 700:3
qualifications [3] - 725:8, 725:9, 725:13
qualify [1] - 678:9
quality [2] - 681:13,

721:37
questioning [3] - 639:3, 740:9, 740:20
questions [18] - 690:30, 702:12, 708:47, 714:4, 715:31, 715:46, 716:18, 717:12, 725:6, 725:7, 731:13, 742:15, 742:16, 742:17, 742:22, 743:36, 743:38, 750:10
quickly [2] - 689:42, 715:30
quite [7] - 665:40, 666:47, 669:8, 681:39, 683:24, 701:3, 703:10
quotation [1] - 708:43
quotations [1] - 709:46
quote [7] - 642:41, 646:10, 646:31, 648:4, 652:7, 665:18, 708:26
quoted [10] - 643:35, 644:18, 646:24, 646:32, 656:38, 659:28, 666:16, 692:22, 692:33, 710:27
quoting [2] - 656:10, 709:30

R

raise [5] - 678:30, 686:14, 691:28, 713:14, 737:4
raised [5] - 639:26, 670:13, 686:15, 686:17, 693:37
random [1] - 681:14
rapidly [1] - 697:41
rare [2] - 657:10, 657:12
rat [2] - 668:24, 733:35
rated [2] - 676:45, 677:6
rather [10] - 649:16, 655:43, 661:42, 671:28, 671:38, 671:46, 673:40, 674:17, 713:17, 713:26
re [4] - 654:3, 673:1, 694:19, 711:33
re-ask [2] - 694:19, 711:33
re-install [1] - 673:1
re-read [1] - 654:3
reached [2] - 641:38, 644:41
read [26] - 643:10, 643:11, 654:3, 683:33, 691:10, 692:27, 695:47, 697:24, 700:1, 728:13, 728:15, 728:42, 729:2, 729:5, 729:13, 729:18, 729:28, 733:21, 741:17, 741:19, 741:20, 741:24, 741:28, 741:38, 741:41, 742:9
reading [8] - 697:23, 698:4, 702:45, 728:37, 728:39, 729:10, 729:12, 729:17
readings [1] - 648:38
reads [1] - 729:4
real [1] - 683:13
realise [2] - 669:6, 683:17
really [21] - 643:46, 654:28, 657:24, 658:17, 659:36, 660:30, 665:9, 669:10, 669:18, 669:42, 671:12, 672:40, 673:42, 676:6, 682:10, 683:23, 705:38, 729:30, 735:28, 738:17, 749:2
reason [10] - 639:14, 639:47, 647:10, 647:19, 658:27, 676:20, 679:43, 681:6, 687:21, 727:14
reasonable [1] - 669:19
reasonably [1] - 652:9
reasons [1] - 680:41
rebumped [4] - 675:28, 675:31, 675:42, 676:8
receive [2] - 683:18, 747:23
received [9] - 661:18, 699:2, 699:14, 712:2, 720:7, 720:33, 721:8, 721:19, 729:7
receiving [3] - 663:34, 701:14, 747:36
recently [2] - 695:19, 695:23
reception [1] - 639:22
recognise [11] - 684:13, 684:30, 689:16, 695:10, 695:14, 695:15, 695:17, 703:18, 742:46, 743:45, 749:29
recognises [1] - 642:13
recollect [1] - 665:16
recollection [17] - 641:30, 658:38, 664:19, 664:42, 665:13, 673:28, 686:5, 703:10, 707:1, 727:9, 727:33, 728:2, 728:12, 734:6, 734:22, 738:33, 739:11
record [4] - 665:3, 700:29, 705:21, 738:29
recorded [9] - 668:31, 669:5, 681:25, 681:28, 685:41, 689:33, 701:19, 708:21, 708:29
recording [3] - 688:20, 690:1, 721:41
records [3] - 673:27, 701:29, 727:8
recovered [2] - 697:25, 698:7
red [1] - 745:36
reduced [1] - 682:34
refer [29] - 639:33, 640:30, 640:47, 642:1, 642:29, 646:42, 650:36, 654:41, 654:46, 657:28, 658:32, 659:11, 663:28, 663:34, 670:25, 673:25, 674:21, 675:3, 675:19, 681:25, 682:17, 693:11, 694:4, 726:2, 726:24, 726:30, 728:36, 730:18, 741:45
reference [39] - 644:39, 648:44, 649:36, 650:32, 652:35, 656:22, 656:26, 656:28, 656:33, 657:37, 658:38, 662:19, 663:1, 668:30, 669:4, 685:16, 686:38, 687:6, 688:40, 689:26, 689:27, 689:28, 693:26, 694:43, 696:43, 696:45, 696:46, 698:22, 699:21, 710:16, 711:45, 713:39, 715:47, 718:10, 730:8, 739:8, 742:41, 747:27
referred [11] - 641:40, 648:10, 691:40, 691:41, 693:18, 693:32, 702:13, 710:13, 721:26, 744:40, 748:39
referring [10] - 642:35, 659:11, 659:36, 703:2, 703:3, 707:14, 707:43, 726:30, 745:28, 745:32
refers [6] - 648:8, 648:20, 651:22, 651:34, 653:12, 659:29
reflect [1] - 702:8
reflected [1] - 709:41
reflection [2] - 690:19, 716:8
reflects [1] - 690:14
refresh [1] - 669:41
refreshed [1] - 686:8
regard [8] - 646:5, 646:27, 666:14, 683:23, 691:35, 692:12, 692:32, 692:37
regarded [5] - 648:16, 660:13, 679:13, 680:26, 716:37
regarding [2] - 728:39, 737:44
regardless [1] - 729:13
regimes [1] - 639:33
registering [1] - 688:15
regular [3] - 695:5, 738:19, 739:27
regularly [1] - 729:31
regulator [2] - 660:36, 664:33
reinstall [2] - 670:21, 730:5
reinstalled [2] - 682:43, 686:1
reinstalling [1] - 670:14
relate [3] - 646:23, 684:34, 743:27
relates [2] - 646:38, 695:15
relating [2] - 686:44, 735:15
relation [53] - 640:1, 641:27, 643:7, 646:14, 648:15, 651:1, 661:24, 661:28, 672:21, 675:35, 675:45, 678:24, 680:30, 686:26, 687:16, 687:35, 690:28, 691:36, 691:42, 692:10, 692:18, 693:33, 694:26, 694:29, 701:7, 706:7, 707:15, 707:31, 709:31, 710:4, 710:27, 711:31, 711:45, 712:13, 712:21, 715:43, 718:28, 719:37, 720:30, 720:42, 721:9, 721:15, 721:41, 723:2, 725:8, 728:24, 734:7, 734:27, 741:15, 742:27, 743:42, 745:47, 746:21
relative [3] - 679:34, 700:33, 718:29
release [3] - 676:26, 679:4, 726:17
released [2] - 685:10, 685:27
relevant [10] - 640:42, 644:31, 644:35, 690:24, 693:26, 715:6, 719:26, 723:21, 723:30, 743:37
reliance [3] - 652:36, 671:9, 671:47
relied [3] - 683:16, 692:39, 736:37
relief [1] - 749:42
relief's [1] - 749:32
relieve [1] - 749:44

rely [5] - 647:29, 652:30, 652:42, 671:38, 672:41
remain [1] - 722:38
remained [1] - 679:29
remains [2] - 649:6, 650:43
remember [8] - 674:28, 700:6, 715:45, 726:47, 727:13, 728:9, 734:4, 739:16
removal [24] - 665:35, 665:39, 665:42, 665:45, 666:1, 666:4, 667:15, 667:31, 667:42, 669:1, 669:43, 679:10, 680:19, 682:5, 682:18, 682:26, 682:33, 683:38, 704:21, 727:40, 728:20, 728:24, 728:26, 728:29
remove [10] - 664:24, 669:13, 679:25, 679:36, 680:15, 682:42, 685:46, 704:13, 709:13, 736:1
removed [12] - 664:30, 667:10, 667:20, 667:45, 668:1, 703:36, 703:44, 704:18, 718:33, 718:41, 723:11, 747:29
removing [3] - 666:46, 698:35, 703:45
renew [1] - 725:35
repeat [1] - 691:38
rephrase [1] - 711:33
replaced [1] - 729:45
replacing [1] - 729:39
Report [1] - 696:1
report [59] - 658:39, 658:40, 659:6, 660:20, 668:31, 686:15, 686:17, 687:27, 687:35, 688:7, 688:22, 688:27, 688:33, 689:8, 689:41, 690:6, 691:17, 694:39, 694:43, 695:15, 695:17, 695:26, 695:28, 695:32, 695:45, 696:3, 696:4, 696:21, 697:7, 697:20, 697:34, 697:46, 698:10, 698:16, 698:20, 698:36, 698:45, 699:41, 700:1, 700:17, 701:19, 703:14, 703:19, 704:10, 704:17, 704:39, 706:7, 706:16, 707:20, 707:27, 707:39, 708:21, 738:5, 742:47, 743:19
reporting [1] - 656:31
reports [6] - 660:26, 660:37, 688:31, 690:12, 703:25, 743:4
representatives [5] - 639:5, 639:15, 724:13, 726:26, 726:36
require [1] - 652:24
required [11] - 639:17, 643:24, 658:28, 660:26, 668:16, 679:10, 680:32, 682:25, 683:3, 697:3, 719:4
requirement [4] - 650:36, 651:13, 651:41, 653:25
requires [3] - 655:44, 669:26, 671:37
researches [1] - 735:29
reservoir [15] - 641:9, 641:17, 641:24, 641:29, 641:39, 651:37, 686:45, 687:13, 687:42, 688:3, 688:8, 688:14, 689:7, 690:2, 722:26
residual [3] - 643:25, 658:2, 674:38
resolve [3] - 719:8, 719:18, 719:28
resolved [2] - 642:36, 722:27
respect [11] - 651:29, 653:24, 689:43, 694:3, 694:8, 717:46, 721:3, 725:10, 725:18, 737:9, 737:13
responding [1] - 657:5
response [3] - 644:46, 733:27, 737:7
responsibility [3] - 660:31, 662:45, 743:3
responsible [4] - 660:36, 662:38, 683:6, 706:36
result [6] - 652:2, 675:15, 675:41, 678:20, 700:10, 725:14
results [1] - 675:26
resume [7] - 639:3, 639:13, 639:30, 677:45, 713:11, 714:8, 750:28
RESUMPTION [1] - 715:1
retest [2] - 700:15, 700:20
Retest [2] - 700:25, 700:26
retire [1] - 715:29
retrieved [1] - 741:23
return [9] - 643:27, 658:4, 658:15, 658:18, 673:47, 732:19, 732:37, 733:7, 733:13
returned [7] - 657:34, 657:39, 658:11, 658:14, 673:36, 715:9, 748:35
returns [8] - 644:28, 656:29, 657:30, 657:38, 658:18, 659:41, 746:30, 747:6
review [5] - 659:10, 660:3, 669:4, 669:12, 740:27
reviewed [3] - 708:28, 716:8, 727:8
revised [2] - 658:28, 712:40
revisit [1] - 678:3
rig [88] - 640:2, 640:11, 640:34, 643:30, 656:44, 657:4, 660:22, 660:32, 661:35, 661:39, 662:5, 662:9, 662:39, 662:40, 664:13, 670:18, 673:13, 680:32, 683:24, 683:25, 684:36, 684:37, 688:37, 691:36, 691:41, 692:38, 692:42, 693:2, 700:43, 700:46, 703:19, 703:46, 703:47, 704:21, 719:21, 719:27, 720:16, 726:11, 726:13, 726:16, 726:21, 726:40, 727:29, 727:31, 730:19, 730:44, 731:24, 734:16, 735:39, 736:8, 736:14, 739:12, 739:19, 739:26, 739:27, 739:30, 739:31, 739:33, 741:38, 741:39, 742:9, 742:42, 743:4, 743:43, 743:45, 744:3, 744:9, 744:13, 744:36, 744:44, 744:47, 745:2, 745:9, 745:10, 745:20, 745:22, 745:28, 746:8, 746:14, 746:37, 747:5, 747:40, 748:24, 749:47, 750:6
right-hand [5] - 688:39, 696:3, 744:20, 744:35, 746:11
rise [13] - 640:1, 640:7, 640:18, 640:26, 641:40, 642:36, 652:2, 655:5, 694:13, 724:3, 732:3, 733:45, 737:4
riser [1] - 672:31
risk [11] - 654:47, 655:15, 655:25, 655:27, 655:35, 667:40, 668:17, 668:46, 669:3, 685:34, 734:15
risks [3] - 655:5, 655:10, 655:44
Road [1] - 724:28
Robinson [10] - 705:4, 706:34, 706:39, 706:46, 707:9, 707:44, 708:18, 712:7, 729:20, 729:33
rotated [1] - 743:44
round [1] - 662:28
roundabout [1] - 680:27
rub [1] - 702:37
rule [3] - 642:1, 642:5, 642:13
run [9] - 667:9, 679:7, 717:43, 729:46, 736:3, 736:4, 741:20, 741:23, 741:39
runner [1] - 728:14

S

safety [2] - 647:39, 738:37
salt [1] - 647:14
samples [3] - 651:14, 657:29, 659:39
satisfied [3] - 651:41, 680:34, 716:9
satisfy [1] - 735:29
save [2] - 724:13, 738:21
saving [1] - 738:34
saw [6] - 656:25, 691:12, 695:20, 712:27, 713:23, 721:45
scenario [5] - 642:6, 676:6, 679:7, 682:3
scenarios [1] - 664:46
scheduled [1] - 665:3
schematic [2] - 743:45, 746:44
scheme [4] - 667:1, 673:18, 680:24, 686:9
SCOTT [1] - 639:1
screen [7] - 653:12, 690:37, 695:35, 738:14, 741:1, 749:23
screw [1] - 664:25
scroll [23] - 646:26, 652:15, 666:17, 666:21, 666:27, 669:39, 669:41, 678:32, 684:21, 684:25, 684:27, 687:4, 688:10, 689:19, 689:24, 689:45, 695:39, 709:34, 712:12, 727:21, 738:13, 745:27, 749:28
SD1 [1] - 692:25
sea [1] - 722:27
SEA.010.001.0001 [1] - 738:9
SEA.9003.0001.0001 [1] - 745:26
SEA.9003.0001.0002 [1] - 743:43

Seadrill [6] - 692:16, 692:17, 737:37, 737:43, 737:46, 738:6
seal [1] - 736:4
seals [1] - 678:7
seawater [16] - 645:38, 645:46, 646:6, 646:44, 656:29, 657:47, 675:16, 679:42, 680:3, 689:11, 732:1, 732:31, 733:34, 736:31, 736:38, 740:39
second [8] - 653:12, 655:21, 661:28, 663:33, 674:22, 675:31, 702:30, 703:22
second-last [2] - 653:12, 655:21
secondary [14] - 647:13, 647:22, 669:28, 679:11, 679:30, 680:20, 680:31, 734:29, 734:30, 734:40, 734:45, 735:2, 735:9, 735:10
secondly [1] - 676:34
section [22] - 642:31, 646:10, 646:25, 646:31, 646:32, 646:39, 648:4, 650:36, 652:7, 654:23, 654:29, 654:38, 666:16, 666:19, 666:26, 691:12, 691:17, 703:24, 703:41, 710:42, 743:10, 744:2
sections [1] - 666:30
security [1] - 647:28
see [157] - 639:34, 639:44, 640:36, 641:2, 641:11, 641:19, 642:2, 642:32, 642:42, 643:13, 643:32, 643:35, 643:41, 644:3, 644:17, 644:39, 644:42, 645:19, 645:23, 645:28, 645:41, 646:11, 646:45, 647:7, 648:1, 648:5, 648:15, 648:16, 648:25, 648:41, 648:44, 649:27, 649:38, 649:42, 649:46, 650:7, 650:8, 650:16, 650:24, 650:38, 651:3, 651:12, 651:19, 651:33, 652:14, 653:1, 653:3, 653:6, 653:11, 653:18, 653:27, 654:24, 654:43, 655:1, 655:30, 655:36, 656:12, 656:16, 656:17, 656:28, 656:34, 658:24, 659:19, 659:33, 661:7, 663:14, 663:40, 664:7, 664:41, 665:20, 665:24, 665:29, 665:35, 666:16, 666:19, 666:27, 666:32, 667:46, 669:35, 670:14, 671:29, 672:14, 673:5, 675:28, 675:32, 676:4, 676:26, 678:26, 681:9, 681:30, 682:20, 682:32, 684:4, 684:18, 685:1, 685:2, 685:13, 686:29, 686:34, 686:37, 686:38, 687:5, 687:7, 687:13, 687:26, 687:29, 687:38, 688:9, 688:26, 688:44, 689:32, 689:33, 689:44, 689:45, 696:17, 696:36, 697:11, 698:12, 701:6, 701:10, 701:35, 702:31, 704:22, 704:31, 704:34, 705:38, 707:32, 708:29, 708:34, 710:6, 711:5, 712:13, 712:42, 715:31, 718:36, 718:38, 726:4, 726:17, 726:26, 726:44, 727:5, 727:14, 727:26, 727:40, 727:45, 729:39, 730:1, 730:20, 730:40, 738:21, 739:35, 741:1, 742:1, 743:18, 745:5, 747:19, 749:23
seeing [5] - 665:13, 683:9, 692:29, 722:13, 749:7
seem [5] - 654:12, 679:31, 684:16, 685:28, 689:47
seismic [1] - 672:7
send [6] - 659:19, 705:11, 705:40, 705:43, 721:35, 724:4
sending [1] - 660:37
senior [5] - 656:6, 670:17, 706:3, 719:12, 742:42
sense [3] - 678:20, 692:6, 693:5
sensible [5] - 669:11, 669:15, 669:19, 671:37, 672:41
sensitivity [3] - 681:35, 728:45, 729:16
sensors [4] - 681:38, 681:41, 681:43, 681:45
sent [10] - 659:5, 660:18, 660:26, 668:31, 684:18, 700:4, 704:40, 705:27, 705:34, 708:28
sentence [13] - 645:26, 648:8, 653:12, 655:21, 661:29, 663:33, 672:46, 681:24, 726:24, 730:33, 741:43, 741:44, 742:12
sequence [2] - 682:34, 713:4
sequential [5] - 639:33, 639:42, 695:41, 717:23, 717:36
sequentially [1] - 715:30
series [3] - 664:40, 684:12, 728:28
serious [1] - 668:36
served [1] - 653:35
service [2] - 661:2, 744:29
set [22] - 643:13, 643:22, 651:14, 653:24, 654:1, 654:24, 655:34, 657:41, 658:10, 664:40, 665:28, 674:37, 674:39, 675:26, 677:27, 679:15, 683:13, 693:22, 713:23, 735:47, 736:3, 738:36
set-up [1] - 693:22
sets [2] - 649:45, 653:1
setting [2] - 656:16, 656:25
settling [1] - 652:4
sg [8] - 645:27, 645:46, 646:4, 646:6, 718:20, 718:22, 718:32, 718:43
SG [2] - 687:37, 689:44
shaker [1] - 747:13
shakers [2] - 746:31, 746:34
shall [1] - 649:24
shed [1] - 739:34
shelf [1] - 662:15
shell [2] - 746:31, 746:34
shift [11] - 692:3, 705:31, 705:35, 706:26, 706:27, 706:39, 707:8, 718:47, 720:1, 743:33, 750:5
shoe [64] - 641:1, 641:28, 642:18, 642:24, 646:21, 647:30, 648:12, 651:30, 652:27, 656:16, 660:5, 660:12, 661:4, 661:25, 667:32, 667:44, 668:9, 668:19, 668:24, 669:2, 669:4, 670:32, 670:40, 671:2, 673:36, 673:40, 673:46, 674:12, 674:17, 674:22, 674:27, 675:4, 675:11, 675:14, 675:42, 675:45, 676:8, 677:26, 678:14, 678:19, 689:30, 701:22, 709:9, 719:39, 720:30, 720:35, 720:40, 720:43, 721:10, 721:15, 731:17, 731:38, 731:42, 731:43, 732:2, 732:3, 732:9, 732:22, 733:35, 733:45, 734:8, 734:36, 736:38
shoes [2] - 732:46, 739:47
shone [1] - 668:18
shore [1] - 664:11
SHORT [2] - 678:1, 715:36
short [1] - 650:42
short-term [1] - 650:42
shortcoming [2] - 678:31, 678:35
shortly [2] - 727:39, 728:6
shot [1] - 697:29
show [5] - 683:45, 689:42, 704:37, 745:44, 746:7
showed [2] - 684:17, 701:20
shown [6] - 689:3, 689:8, 695:8, 695:31, 695:46, 742:45
shows [2] - 701:45, 716:24
shut [2] - 644:28, 674:32
side [12] - 688:39, 696:3, 744:2, 744:16, 744:20, 744:35, 746:37, 746:39, 746:42, 746:45, 747:5
sign [2] - 680:33, 683:14
sign-off [1] - 683:14
signature [2] - 743:23, 743:26
signed [2] - 740:44, 741:6
significance [8] - 645:31, 659:41, 679:14, 680:26, 682:27, 683:43, 686:11, 702:9
significant [5] - 647:38, 673:19, 679:8, 685:33, 693:45
signify [1] - 688:47
signing [1] - 716:47
similarly [1] - 724:12
simple [1] - 652:9
simply [5] - 645:4, 665:9, 685:24, 710:5, 710:47
single [2] - 696:10, 723:1
sit [2] - 690:44, 691:2
site [4] - 652:12, 662:8, 736:14, 736:15
sitting [2] - 707:39, 745:5

situ [3] - 651:2, 651:6, 677:21
situated [2] - 745:19, 745:38
situation [12] - 643:36, 644:31, 644:35, 650:2, 653:45, 654:24, 654:37, 676:7, 676:12, 719:10, 719:28, 733:17
size [4] - 674:28, 722:43, 727:26, 730:15
sized [1] - 730:45
sizes [3] - 679:35, 727:4, 730:14
skid [1] - 673:2
skidded [1] - 746:9
skids [2] - 744:46, 745:11
slabs [1] - 722:12
slight [1] - 699:28
slightly [1] - 722:27
slowly [3] - 643:31, 672:14, 684:21
slurries [2] - 641:32, 731:16
slurry [4] - 640:47, 641:5, 641:17, 731:18
small [1] - 738:34
smallest [1] - 704:13
smile [1] - 702:14
solution [2] - 672:29, 719:14
someone [8] - 683:15, 683:38, 684:44, 690:44, 691:18, 719:41, 721:42, 746:22
sometimes [4] - 732:19, 732:36, 734:34, 738:40
soon [2] - 685:25, 748:11
sorry [40] - 643:17, 644:1, 644:15, 644:17, 644:32, 654:8, 657:1, 665:33, 665:44, 666:3, 666:14, 667:19, 668:40, 669:31, 669:39, 671:15, 671:31, 674:6, 675:8, 690:47, 691:38, 693:28, 698:42, 701:35, 702:30, 709:15, 709:29, 710:24, 711:33, 720:31, 732:25, 734:19, 735:14, 735:43, 735:44, 736:10, 737:38, 737:39, 739:29, 744:32
sort [7] - 653:24, 656:39, 659:41, 662:19, 731:39, 732:41, 739:39
sorts [4] - 649:41, 682:13, 738:33, 739:25
source [3] - 703:40, 706:21, 707:35
sourced [1] - 661:36
space [6] - 648:11, 652:26, 652:27, 739:31, 739:33, 749:31
specific [12] - 654:47, 664:42, 687:12, 687:42, 689:10, 689:32, 689:36, 690:3, 713:27, 737:29, 739:16, 739:34
specifically [3] - 646:23, 686:43, 713:18
specifications [2] - 676:46, 677:3
specifics [1] - 726:7
spend [2] - 679:6, 682:8
spoken [3] - 662:29, 719:40, 719:44
spool [1] - 674:41
spread [1] - 732:3
stable [2] - 648:22, 670:44
stage [17] - 644:12, 661:36, 668:9, 670:10, 670:17, 670:35, 674:35, 677:24, 683:8, 683:37, 684:30, 689:11, 700:21, 705:38, 707:39, 720:3, 720:28
stages [1] - 709:41
stand [2] - 639:8, 721:37
standard [2] - 652:32, 726:37
standards [25] - 642:32, 646:11, 646:32, 646:39, 647:3, 647:19, 647:42, 648:5, 651:2, 652:8, 652:21, 652:24, 652:33, 652:38, 654:7, 654:10, 654:13, 654:19, 654:38, 654:41, 655:14, 655:17, 655:33, 655:43, 661:14
standing [1] - 684:35
starboard [4] - 746:37, 746:39, 746:45, 747:5
staring [1] - 672:11
start [5] - 644:11, 645:35, 679:1, 718:38, 724:7
started [2] - 669:33, 670:4
starting [1] - 704:15
starts [1] - 710:42
state [2] - 693:21, 724:25
statement [54] - 649:9, 690:36, 690:38, 690:39, 690:45, 691:4, 691:30, 692:22, 692:31, 693:19, 693:45, 694:4, 694:9, 694:22, 695:40, 702:13, 702:29, 702:41, 702:46, 706:19, 707:13, 708:16, 708:21, 709:28, 709:44, 710:40, 711:9, 711:21, 712:13, 712:20, 712:32, 713:16, 715:41, 716:24, 716:25, 716:28, 716:33, 716:37, 716:40, 716:44, 716:47, 717:4, 730:12, 740:27, 740:31, 740:44, 741:6, 741:27, 741:37, 742:16, 747:28
statements [2] - 711:18, 711:26
states [1] - 722:22
static [1] - 658:15
status [7] - 647:45, 649:16, 670:26, 670:29, 671:11, 718:19, 718:21
statutory [14] - 639:31, 640:46, 642:1, 645:12, 713:25, 715:20, 722:2, 722:6, 724:10, 724:16, 724:34, 725:2, 726:1, 740:11
stayed [4] - 658:15, 680:5, 736:8, 736:14
step [8] - 668:15, 692:11, 704:2, 704:6, 720:36, 720:42, 721:14
steps [8] - 665:10, 666:39, 674:37, 733:6, 733:12, 733:27, 733:44, 734:7
Steven [1] - 705:7
still [8] - 650:4, 662:8, 664:21, 668:8, 670:39, 679:46, 690:36, 725:16
stipulation [1] - 664:13
stocks [1] - 661:35
stop [4] - 644:28, 671:23, 679:44, 718:8
stopped [1] - 679:41
stopping [1] - 695:40
storage [4] - 739:19, 739:26, 739:33, 739:34
stored [6] - 729:9, 739:35, 739:40, 739:44, 740:1, 740:2
stores [2] - 662:19, 662:20
storing [1] - 739:20
straightaway [1] - 707:41
strategy [2] - 644:7, 644:23
Street [1] - 638:26
strength [2] - 644:41, 677:23
string [2] - 658:23, 703:29
struts [1] - 744:3
study [6] - 672:18, 725:14, 725:18, 725:37, 725:40, 725:44
stuff [1] - 693:46
subject [4] - 684:7, 685:34, 714:1, 717:9
submission [2] - 694:14, 737:15
submissions [2] - 683:22, 737:15
submitted [1] - 686:16
subparagraph [6] - 639:32, 640:30, 673:25, 681:24, 682:17, 682:32
subsea [1] - 653:45
subsequent [2] - 679:14, 690:12
subsequently [2] - 707:19, 713:35
substance [1] - 740:19
substantially [5] - 691:17, 713:26, 715:14, 715:18, 722:5
subtle [1] - 669:25
sudden [1] - 672:8
suddenly [1] - 672:4
sufficient [4] - 651:45, 667:42, 682:13, 686:21
sufficiently [2] - 676:43, 677:27
suggest [21] - 647:10, 656:37, 661:11, 661:15, 667:14, 669:10, 669:18, 669:25, 671:1, 672:40, 673:39, 674:16, 680:25, 682:23, 682:40, 685:25, 685:44, 687:2, 687:11, 687:17, 722:47
suggested [5] - 660:22, 678:11, 683:22, 729:26, 733:22
suggesting [10] - 640:24, 641:34, 642:5, 655:33, 657:23, 666:38, 668:14, 668:44, 668:46, 732:28
suggestion [1] - 731:14
suggests [3] - 649:16, 650:41, 687:12
summary [3] - 687:3, 706:11, 706:15
supervised [1] - 726:26
supervising [2] - 694:35, 712:7
supervision [1] - 726:36
supervisor [6] - 693:8, 705:46, 706:30, 719:1, 719:12, 742:42
supervisors [1] - 687:28
supplied [4] -

687:43, 688:13, 688:36, 738:12
supply [2] - 684:37, 738:8
support [2] - 694:13, 713:14
supposition [1] - 711:29
surface [4] - 648:22, 651:13, 653:43, 672:30
surprise [2] - 729:29, 729:33
surrounding [1] - 674:27
suspected [1] - 698:29
suspend [1] - 704:3
suspended [5] - 680:43, 709:5, 709:13, 736:29, 738:47
suspending [1] - 726:3
suspension [23] - 648:47, 649:18, 650:42, 650:44, 652:8, 652:11, 652:20, 652:31, 652:37, 652:42, 652:44, 653:22, 681:19, 682:11, 709:1, 709:32, 735:34, 735:38, 735:46, 736:13, 736:37
Suspension" [1] - 649:46
suspensions [1] - 650:35
swap [1] - 696:37
switched [1] - 696:38
system [11] - 640:41, 648:31, 650:29, 654:43, 659:4, 660:25, 680:32, 683:13, 690:18, 731:24, 748:21
systematic [3] - 681:14, 681:18, 739:36

T

table [3] - 648:44, 649:41, 649:45
tail [8] - 641:17, 641:23, 641:38, 651:13, 651:45, 652:1, 731:15, 731:29
tank [1] - 648:29
team [2] - 705:15, 705:16
telephone [3] - 720:16, 747:25, 749:8
temporary [15] - 648:47, 649:18, 650:11, 650:42, 652:30, 652:41, 652:42, 735:34, 735:38, 735:41, 735:45, 735:47, 736:2, 736:12, 736:20
Temporary [1] - 649:46
term [14] - 650:35, 650:42, 650:43, 652:8, 652:11, 652:20, 652:31, 652:37, 652:44, 653:22, 735:34, 735:43, 735:46, 736:13
terminology [5] - 690:40, 691:3, 691:13, 691:14, 693:32
terms [15] - 644:7, 652:9, 669:11, 669:19, 671:12, 672:42, 679:14, 680:9, 680:24, 694:34, 695:14, 711:17, 711:26, 728:12, 729:17
Territory [1] - 697:4
test [37] - 642:30, 642:36, 643:25, 644:27, 663:37, 668:1, 673:26, 674:7, 674:31, 675:20, 675:27, 675:36, 675:37, 675:43, 676:13, 676:20, 676:36, 676:43, 677:3, 677:7, 677:12, 677:25, 677:28, 677:34, 678:4, 678:6, 678:9, 678:12, 678:17, 685:24, 685:36, 697:24, 698:6, 732:19, 732:30, 732:36
tested [16] - 642:24, 642:29, 643:24, 649:23, 649:27, 652:24, 660:13, 669:28, 671:18, 671:38, 674:29, 676:30, 676:31, 677:21, 680:34, 683:16
testing [4] - 656:32, 676:25, 677:31, 696:43
tests [3] - 646:28, 675:26, 734:2
text [3] - 665:10, 665:14, 713:32
THE [27] - 677:45, 678:3, 690:32, 692:45, 694:17, 694:19, 713:10, 715:34, 716:15, 719:33, 723:35, 723:39, 723:41, 724:1, 727:21, 740:16, 742:19, 742:24, 748:31, 748:41, 749:4, 750:14, 750:19, 750:21, 750:23, 750:31, 750:34
themselves [1] - 655:33
thereafter [1] - 721:16
thereby [2] - 660:6, 731:9
therefore [4] - 679:29, 688:19, 723:25, 733:21
they've [1] - 719:26
thinking [1] - 678:5
thinks [1] - 713:25
third [6] - 659:29, 670:46, 675:41, 676:6, 681:24, 744:35
Thornton [1] - 645:23
threads [9] - 653:36, 653:44, 667:7, 679:9, 679:26, 679:35, 680:4, 680:11, 680:15
three [8] - 657:29, 667:20, 672:11, 673:40, 674:17, 682:27, 738:21, 738:40
thumb [3] - 642:2, 642:5, 642:13
Thursday [2] - 639:16, 750:2
tick [1] - 702:34
ticking [2] - 702:19, 702:25
ticks [1] - 665:5
tie [4] - 665:23, 665:27, 665:29, 665:34
tie-back [4] - 665:23, 665:27, 665:29, 665:34
timing [1] - 682:28
tiny [1] - 723:2
TO [1] - 750:35
today [3] - 660:3, 703:7, 740:27
today's [1] - 750:24
tomorrow [3] - 724:5, 750:27, 750:32
took [9] - 643:45, 654:10, 657:29, 658:4, 674:37, 683:8, 694:34, 722:17, 734:23
tool [4] - 728:14, 741:20, 741:23, 741:40
toolpusher [4] - 696:34, 711:31, 711:36, 711:42
toolpusher's [1] - 744:29
toolpushers [1] - 719:23
tools [3] - 688:4, 688:15, 688:19
top [24] - 641:23, 641:24, 641:29, 641:38, 641:39, 651:34, 651:36, 656:30, 667:12, 677:25, 678:9, 683:9, 687:28, 688:39, 700:46, 715:23, 721:46, 728:15, 728:40, 736:5, 743:9, 743:17, 744:40
topic [5] - 651:1, 653:2, 680:30, 686:25, 720:17
totally [1] - 693:7
touch [1] - 660:21
towards [1] - 745:9
town [8] - 688:22, 700:4, 703:29, 705:11, 719:14, 719:16, 720:4, 720:16
track [18] - 646:21, 648:12, 652:27, 668:9, 668:24, 670:40, 673:36, 673:40, 673:46, 674:12, 674:17, 675:4, 675:11, 675:15, 675:42, 675:45, 676:8, 677:27
transcript [1] - 685:40
transcription [1] - 696:2
translated [1] - 658:39
translation [1] - 697:8
trapped [1] - 667:46
trash [7] - 683:9, 706:20, 708:31, 710:13, 710:17, 710:27, 721:45
travel [1] - 723:26
travelling [1] - 639:17
Treasure [24] - 658:45, 659:5, 659:10, 659:19, 670:9, 687:27, 689:25, 689:47, 694:34, 696:31, 696:32, 699:7, 699:37, 700:3, 700:10, 705:24, 707:46, 708:3, 719:40, 720:2, 720:6, 721:7, 721:27
Treasure's [3] - 658:41, 748:41, 749:17
triggered [1] - 729:10
trip [2] - 648:29, 681:12
true [6] - 645:6, 687:3, 693:45, 717:1, 723:1, 725:2
Trueman [2] - 690:1, 748:4
Trueman's [2] - 748:43, 749:13
truly [2] - 654:2, 675:37
try [2] - 671:29, 727:8
trying [1] - 681:12
tubing [1] - 649:37
Tuesday [2] - 638:37, 639:16
turn [1] - 658:39
turnaround [2] - 662:12, 663:6
turns [2] - 672:31, 683:43
twice [5] - 673:36, 673:40, 673:46, 674:12, 743:44
two [16] - 650:32, 652:24, 674:17,

676:1, 679:35, 699:28, 700:9, 710:42, 719:25, 725:35, 727:4, 734:31, 736:8, 736:30, 738:21, 744:3
tying [1] - 678:38
type [4] - 648:15, 695:36, 695:41, 739:14
Type [1] - 648:17
typed [3] - 696:4, 706:12, 712:1
types [1] - 690:40
typing [2] - 706:11, 706:15
typo [4] - 690:9, 690:11, 708:37, 708:45

U

ultimately [1] - 722:5
unassisted [2] - 715:25, 716:25
unchecked [1] - 690:12
uncontrolled [3] - 676:26, 679:4, 726:16
under [20] - 648:17, 648:44, 686:19, 689:10, 689:26, 695:40, 696:1, 710:21, 710:26, 726:36, 727:45, 728:37, 729:9, 739:39, 739:40, 740:5, 741:18, 741:29, 742:7, 749:31
underbalance [1] - 686:27
underlinings [1] - 696:9
underneath [5] - 728:29, 732:1, 746:8, 749:30
understood [12] - 659:4, 660:35, 688:12, 697:18, 697:33, 698:3, 700:24, 700:25, 701:20, 718:46, 719:44, 735:38
undertake [1] - 704:2
undertaken [13] - 640:33, 667:40, 669:3, 672:21, 694:29, 709:9, 725:18, 725:43, 734:15, 737:42, 738:6, 745:17, 745:41
undue [1] - 639:21
unexpected [1] - 718:47
unfair [2] - 694:3, 694:15
unfortunately [1] - 715:28
unit [4] - 643:26, 643:29, 644:12, 649:2
unless [6] - 667:10, 676:42, 691:10, 704:24, 722:18, 748:18
unlikely [2] - 639:8, 720:11
unmonitored [1] - 669:21
unnoticed [1] - 681:21
unpredictable [2] - 657:12, 657:14
unusual [3] - 741:8, 741:11, 741:12
unusual] [1] - 740:40
up [83] - 639:17, 643:24, 644:26, 646:17, 646:26, 648:31, 650:28, 656:27, 658:1, 664:22, 666:5, 666:17, 669:41, 672:30, 674:37, 674:42, 678:32, 680:3, 681:12, 681:35, 683:13, 683:43, 685:38, 686:28, 687:16, 687:28, 688:25, 688:32, 688:39, 689:15, 693:22, 694:47, 695:9, 696:9, 696:12, 696:20, 697:29, 698:11, 700:16, 700:29, 701:36, 702:42, 703:11, 703:17, 703:36, 707:10, 707:13, 708:26, 709:36, 710:42, 713:24, 713:32, 715:23, 715:40, 716:23, 719:12, 719:14, 722:3, 724:9, 724:11, 724:12, 724:17, 727:21, 729:34, 729:36, 731:5, 732:3, 732:14, 732:29, 732:32, 738:9, 738:36, 738:38, 739:41, 740:12, 741:12, 742:31, 743:8, 747:43, 748:8, 748:10, 748:12
up) [1] - 745:45
updated [2] - 709:18, 710:36
UPON [1] - 715:1
upwards [1] - 744:36
usage [1] - 653:39
usual [2] - 741:7, 741:11
utilised [2] - 689:29, 731:38

V

value [3] - 643:24, 645:27, 722:17
valve [12] - 643:30, 643:31, 643:32, 643:40, 644:9, 657:9, 674:22, 674:27, 698:29, 717:16, 717:35, 717:41
valves [3] - 657:8, 657:19, 661:3
variety [1] - 682:28
various [4] - 654:2, 661:41, 665:28, 690:40
verbally [3] - 663:36, 703:38, 707:38
verification [1] - 651:29
verified [2] - 642:24, 651:2
verify [1] - 733:44
version [3] - 696:8, 724:12, 740:13
vertical [3] - 641:28, 687:3, 687:7
vessel [2] - 649:6, 684:37
vice [2] - 672:35, 693:37
vicinity [1] - 700:39
view [7] - 667:7, 682:33, 694:11, 701:25, 705:16, 721:34, 723:10
views [3] - 682:9, 682:13, 738:29
virtue [2] - 681:20, 724:6
visual [1] - 749:7
void [1] - 648:13
volume [17] - 643:27, 644:26, 644:27, 644:28, 648:42, 657:40, 673:37, 673:40, 673:43, 673:46, 674:7, 674:13, 674:17, 674:31, 689:27, 732:31
volumes [5] - 648:39, 731:14, 731:25, 731:29, 732:13

W

wait [4] - 651:13, 657:33, 659:38, 692:2
waited [2] - 674:32, 674:36
waiting [4] - 705:38, 705:41, 723:45, 724:4
wake [1] - 719:11
waking [1] - 719:4
walked [1] - 707:40
warm [1] - 639:22
warning [1] - 672:12
WAS [1] - 750:34
water [3] - 647:15, 722:28, 741:12
ways [3] - 728:37, 728:38, 728:39
WCS [3] - 654:23, 654:29, 655:24
WEDNESDAY [1] - 750:35
Wednesday [2] - 639:13, 639:14
week [6] - 639:9, 639:10, 639:12, 639:13, 639:14
weight [3] - 689:27, 737:10, 737:14
welder [1] - 740:37
wellbore [4] - 648:22, 648:35, 652:25, 735:10
wellbores [1] - 734:29
wellhead [6] - 701:11, 703:46, 704:28, 704:33, 723:27, 746:21
wells [13] - 640:20, 647:28, 661:42, 672:4, 672:23, 672:27, 672:28, 680:42, 692:38, 704:3, 708:32, 722:25, 738:47
West [7] - 642:41, 673:3, 692:25, 692:38, 693:13, 711:4, 730:9
wet [2] - 642:18, 642:24
whack [1] - 671:22
whatsoever [2] - 642:37, 654:38
whereabouts [2] - 744:12, 745:22
whereas [1] - 735:43
whereby [1] - 683:14
whilst [2] - 673:14, 722:47
whiteboard [17] - 665:3, 665:14, 702:13, 702:15, 702:21, 702:26, 702:35, 702:38, 703:11, 703:32, 703:37, 703:40, 707:37, 708:4, 708:23, 721:41, 721:43
whole [5] - 679:43, 684:12, 692:21, 692:23, 743:17
Wilson [5] - 660:30, 686:30, 719:45, 720:8, 720:11
windwall [1] - 745:24
wiper [1] - 675:4
wish [3] - 707:40, 741:6, 741:16
WISHART [1] - 639:1
Wishart [11] - 639:3, 639:30, 684:22, 713:7, 713:24, 713:29, 713:42, 716:23, 719:31, 723:39, 724:11
Wishart's [3] - 690:36, 713:38, 715:41
wishes [2] - 694:4, 740:22
Wishy" [1] - 685:16
WIT.1501.0002.0001 [1] - 740:12
WIT.1501.0004.0001 [1] - 726:1
WITHDREW [2] - 723:41, 750:21
Withnell [1] - 724:28
WITNESS [5] - 678:3, 694:19, 723:41, 750:19, 750:21

witness [17] - 669:41, 694:3, 694:6, 702:41, 702:46, 711:26, 712:32, 713:8, 713:15, 713:20, 715:32, 716:19, 720:47, 723:37, 737:6, 740:20, 745:45
witnesses [1] - 639:9
woke [1] - 707:10
wonder [4] - 643:14, 681:12, 684:21, 728:45
wondering [5] - 646:38, 655:21, 680:29, 682:12, 683:27
word [8] - 654:37, 675:46, 711:17, 712:31, 740:42, 741:8
wording [1] - 696:18
words [11] - 643:16, 644:22, 644:23, 654:3, 654:22, 671:17, 685:2, 700:17, 700:25, 700:26, 738:11
works [2] - 704:2, 749:44
worm [1] - 723:17
worse [1] - 676:9
worth [2] - 719:25, 737:12
writing [3] - 696:20, 697:20, 698:44
written [13] - 663:37, 696:11, 696:44, 697:33, 697:38, 697:39, 697:45, 700:15, 700:16, 700:29, 703:36, 707:36, 728:23
wrongly [1] - 735:44
wrote [5] - 700:19, 701:18, 701:25, 703:11, 708:3

Y

year [11] - 643:8, 649:12, 652:17, 719:38, 725:26, 727:39, 733:5, 735:7, 737:24, 737:28, 738:44
years [6] - 725:31, 725:35, 732:47, 733:2, 734:28, 735:7
years' [2] - 674:22, 737:12
yesterday [3] - 665:2, 695:20
yourself [2] - 698:39, 735:29

Z

zero [5] - 643:26, 729:4, 729:12, 729:35, 729:36
zone [1] - 651:35