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# ONTARIO ENERGY BOARD

FILE NO.: EB-2013-0321

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VOLUME: Technical Conference REDACTED – PUBLIC

DATE: July 9, 2014

**THE ONTARIO ENERGY BOARD**

**IN THE MATTER OF** the *Ontario Energy Board Act*,  
1998, S.O. 1998, c. 15, Sched. B;

**AND IN THE MATTER OF** an application by Ontario  
Power Generation Inc. pursuant to section 78.1  
of the Ontario Energy Board Act, 1998 for an  
order or orders determining payment amounts for  
the output of certain of its generating  
facilities.

Hearing held at 2300 Yonge Street,  
25<sup>th</sup> Floor, Toronto, Ontario,  
on Wednesday, July 9th, 2014,  
commencing at 9:30 a.m.

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TECHNICAL CONFERENCE  
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A P P E A R A N C E S

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PETER THOMPSON E. BLANCHARD	Canadian Manufacturers & Exporters (CME)
JULIE GIRVAN	Consumers' Council of Canada (CCC)
LARRY SCHWARTZ DAVID MacINTOSH	Energy Probe Research Foundation
TAM WAGNER	Independent Energy System Operator (IESO)
PIPPA FEINSTEIN	Lake Ontario Waterkeeper
RICHARD STEPHENSON	Power Workers' Union (PWU)
JAY SHEPHERD MARK RUBENSTEIN	School Energy Coalition (SEC)
RUSS HOULDIN	Society of Engineering Professionals (SEP)
MICHAEL JANIGAN	Vulnerable Energy Consumers' Coalition (VECC)

I N D E X     O F     P R O C E E D I N G S

<u>Description</u>	<u>Page No.</u>
--- On commencing at 9:30 a.m.	1
<b>ONTARIO POWER GENERATION - PANEL 8</b>	1
<b>E. Gould, D. Reiner, G. Rose</b>	
Preliminary Matters:	1
Questions by Mr. Shepherd:	2
Questions by Mr. Crocker:	5
Questions by Ms. Blanchard:	32
--- Recess taken at 11:03 a.m.	53
--- On resuming at 11:23 a.m.	53
Questions by Mr. Battista:	55
Questions by Mr. Shepherd:	59
Questions by Mr. Battista:	60
--- On commencing in camera at 11:52 a.m.	68
Questions by Mr. Poch:	68
--- Luncheon recess taken at 12:34 p.m.	92
--- On resuming at 1:38 p.m.	92
Questions by Ms. Blanchard:	93
Questions by Mr. Shepherd:	97
--- Recess taken at 3:04 p.m.	149
--- On resuming at 3:22 p.m.	149
--- Whereupon the conference concluded at 3:52 p.m.	169

E X H I B I T S

<u>Description</u>	<u>Page No.</u>
--------------------	-----------------

NO EXHIBITS WERE FILED IN THIS PROCEEDING.

## U N D E R T A K I N G S

<u>Description</u>	<u>Page No.</u>
UNDERTAKING NO. JT4.1: WITH REFERENCE TO REPORTS ENTITLED "SCOPE STRATEGY AND PLAN, 12/15/11," "OTHER ENGINEERING, 24 MAY, 2013, VBO OUTAGE STATUS, MDR WORK STREAMS ENGINEERING STUDIES", "DR ENGINEERING WEEKLY TACTICAL UPDATE" DATED APRIL 19, 2013; "DR ENGINEERING WEEKLY TACTICAL UPDATE"; "ENGINEERING WEEKLY TACTICAL UPDATE," DATED MARCH 15TH, 2013; "OPG PROPOSAL, ORG AND LABOUR RESOURCES REVIEW, A, ORGANIZATIONAL LABOUR STRATEGY," DATED MAY 11, 2010: A, TO INDICATE WHERE THEY ARE IN THE EVIDENCE; B, TO PRODUCE THEM; OR C, EXPLAIN WHY THEY CANNOT BE PRODUCED.	21
UNDERTAKING NO. JTX4.2 (IN CONFIDENCE): TO PROVIDE THE TERMINATION PROVISIONS.	97
UNDERTAKING NO. JTX4.3 (IN CONFIDENCE): TO PROVIDE MORE DETAIL ON HOW OPG ARRIVED AT THE 35 TO 45 PERCENT RANGE, AND HOW REASONABLE THE NUMBERS ARE.	115
UNDERTAKING NO. JTX4.4: TO PROVIDE MORE BACKGROUND ON THE EXPERIENCE FACTOR AND HOW IT WAS DERIVED AND HOW IT WAS BENCHMARKED	121
UNDERTAKING NO. JTX4.5: TO CONFIRM THAT NONE OF THAT \$871 MILLION IS CURRENTLY INCLUDED IN THE REVENUE REQUIREMENT PROPOSED FOR THE TEST PERIOD.	143

1 Wednesday, July 9, 2014

2 --- On commencing at 9:30 a.m.

3 **ONTARIO POWER GENERATION - PANEL 8**

4 **Eric Gould**

5 **Dietmar Reiner**

6 **Gary Rose**

7 MR. MILLAR: Good morning, everyone. This is day two  
8 of the technical conference in EB-2013-0321, continuing  
9 with Mr. Crocker today.

10 Mr. Keizer, are there any preliminary matters?

11 **PRELIMINARY MATTERS:**

12 MR. KEIZER: There are just a couple. I believe Mr.  
13 Reiner has one correction to the transcript from yesterday.

14 MR. REINER: Yes, there was a question asked by Mr.  
15 Poch yesterday regarding whether or not we had informed the  
16 government of the Modus reports and when that was, and I  
17 had answered that it was in early June. It was -- we  
18 briefed the shareholder on the 25th of June and at that  
19 time left copies of all of the Modus reports with the  
20 shareholder. In addition to that -- I think we pointed  
21 that out yesterday -- our shareholder does have their own  
22 adviser that has direct access to all information on the  
23 project and would have seen the reports that were issued  
24 prior to the June 26th reports and would have provided  
25 updates based on their view of those reports.

26 MR. MILLAR: Is there anything else, Mr. Keizer?

27 MR. KEIZER: And I believe Mr. Gould has a minor  
28 correction.

1           MR. GOULD: I do have one minor correction. Mr.  
2 Shepherd asked yesterday about an attachment. It's  
3 attachment B to the fourth-quarter 2013 report. It's a  
4 spreadsheet that shows the variances between release 4C and  
5 4B. That document, I believe that I said yesterday that  
6 that was something that we created. That was a document  
7 that OPG created essentially at our request based on their  
8 information. So when that document is released to you,  
9 then you understand where -- the genesis of that document.

10          MR. SHEPHERD: Can I just follow up on that?

11          **QUESTIONS BY MR. SHEPHERD:**

12          MR. KEIZER: Sure.

13          MR. SHEPHERD: So you said it was your document and  
14 Mr. Reiner said it was your document.

15          MR. GOULD: We were mistaken. It was -- it's in the  
16 format of both -- that OPG uses for its cost-estimating  
17 platform, and we had asked that OPG do this comparison.  
18 That's all there is to it.

19          MR. SHEPHERD: Okay. So there is a spreadsheet just  
20 like this that has the 4B numbers in it and there is  
21 another one that has the 4C numbers in it, and they are  
22 both essentially identical to this, and this is just the  
23 difference between the two, right?

24          MR. GOULD: Exactly.

25          MR. SHEPHERD: So we can still get those 4B and 4C  
26 spreadsheets. It's just that you are saying that when we  
27 get them you we shouldn't think they are yours. They're --

28          MR. GOULD: I just wanted to make sure that we were



1 correct on the record.

2 MR. SHEPHERD: I understand, thank you.

3 MR. MILLAR: Anything else, Mr. Keizer?

4 MR. KEIZER: Well, and I think there is, just in terms  
5 of one undertaking response, and I think it relates to the  
6 question of what work in -- it was related to what work was  
7 in the Modus report which was -- is OPG's work, and I think  
8 there was two charts, and I think that was in Undertaking  
9 3.9, and so I think Mr. Gould is able to answer that  
10 question on the record this morning.

11 MR. GOULD: So, yes, in response to Undertaking JT3.9  
12 I went back -- I wanted to make sure that I was being fully  
13 accurate, so I went back through the report, and Mr.  
14 Shepherd identified two graphics that were created by OPG.  
15 Those are correctly identified as OPG's work product.

16 There is also a chart that we have looked at multiple  
17 times in this hearing that's on page 16, and you will see  
18 in that table that refers to the campus plan budget -- it's  
19 under paragraph B, "overall cost impact" -- you will see  
20 that the footnote refers to the fact that these numbers are  
21 current forecast amounts provided by the DR team.

22 So that, like every other number that would be within  
23 this document, would be sourced from the project, but in  
24 terms of your question, Mr. Shepherd, I can state for the  
25 record that that is the only thing -- those are the only  
26 elements within this report or any of our reports  
27 consistently through that would have been provided by OPG.

28 MR. SHEPHERD: So this chart on page 16 of the June

1 26th report, the chart is yours, but the numbers are OPG's,  
2 or did they just simply supply you with the chart?

3 MR. GOULD: No, the chart is ours.

4 MR. SHEPHERD: Okay.

5 MR. GOULD: And the numbers would have to come from  
6 OPG, because we don't have numbers for this project  
7 independent of OPG.

8 MR. SHEPHERD: Okay. But we heard several times Mr.  
9 Rose being asked about this 552 million and saying it's  
10 close but it's not exact because it's not his number, it's  
11 your number, but this is actually his number then.

12 MR. GOULD: The numbers that are in this chart reflect  
13 the documents that are represented here. So if you went  
14 back to the 4C estimate you would see that set of numbers.  
15 If you went to the current forecast as of that time you  
16 would see that set of numbers.

17 MR. SHEPHERD: So then let me ask Mr. Rose: Several  
18 times you said these weren't your numbers, so are these  
19 your numbers?

20 MR. ROSE: Based on the clarification that these are  
21 numbers from the release 4C estimate they are our numbers.  
22 I haven't validated personally that these are in alignment  
23 with 4C, but obviously I respect the advice and direction  
24 from Mr. Gould that they are our numbers. What I did say  
25 is that they are certainly within the range that I would  
26 have expected to see for the FNIP projects.

27 MR. SHEPHERD: Fine, thank you.

28 MR. KEIZER: That's it, thanks.

1 MR. MILLAR: Thank you. Mr. Crocker?

2 **QUESTIONS BY MR. CROCKER:**

3 MR. CROCKER: Thank you. I would like to continue  
4 with questions on the third-quarter 2013 report, Exhibit 1  
5 to the June 26th, 2014 report. And I would like to start  
6 this morning on page 23, please, under the heading  
7 "engineering".

8 In that first paragraph you describe the stresses on  
9 the engineering reporting, and you say, sort of a couple  
10 lines into that paragraph talking about the engineering:

11 "Its metrics and tracking methods of engineering  
12 product were in the embryonic stage. It appeared  
13 the engineering was significantly stressed,  
14 behind schedule. However, the engineering team's  
15 performance indicators did not reflect this  
16 stress."

17 And my question is exactly what you mean by that, and  
18 why were they not -- are you saying that they were not  
19 fully or accurately reporting?

20 MR. GOULD: What I'd say is that this was very early  
21 on in the project. We are talking here about essentially  
22 the beginning of the engineering effort for the  
23 refurbishment project, and that's what's referred to in  
24 this paragraph.

25 So they are very early on. It's certainly common in  
26 the industry that it would take time for metrics like this  
27 to develop. You don't typically see metrics on something  
28 this -- something of this nature right off the bat that are

1 entirely accurate. Every project has its own reasons for  
2 developing different metrics that show you what you need to  
3 know about that effort.

4 So I think we say here that this is in the embryonic  
5 stage, and I think that is what we are referring to.

6 MR. CROCKER: Have they improved their reporting  
7 techniques and the way they are reporting, et cetera?

8 MR. GOULD: Yes, they have.

9 MR. CROCKER: How so? How have they done that?

10 MR. GOULD: So in the past year since we made this  
11 observation, we have seen a sizeable increase in the amount  
12 of reporting that's coming out of the engineering team.  
13 There is a weekly engineering meeting -- there was a weekly  
14 engineering meeting prior to this report, but in that  
15 meeting there is now much greater and much more intense  
16 focus on performance metrics.

17 There are performance metrics being developed -- or  
18 that have been developed that are being tracked on a weekly  
19 basis in the context of those meetings and elsewhere within  
20 the project for each of the major project bundles and for  
21 each of the subset pieces of engineering within those  
22 project bundles.

23 So whereas a year ago when we were putting this report  
24 together you would not have had clear line of site  
25 visibility to that level of detail, now I believe you do,  
26 sir.

27 MR. CROCKER: And why is it important?

28 MR. GOULD: It's important so that -- because

1 engineering gets the project off to the essential start.  
2 You need to get engineering done and have it be accurate on  
3 time so that you are off to a good start, and you also want  
4 to make sure that your engineering product is of sufficient  
5 quality so that you don't have significant issues once you  
6 get into the construction phase.

7 MR. CROCKER: Who reviews the -- to whom is this  
8 engineering reporting done, and how is it responded to?

9 MR. GOULD: So the meetings that I discussed that are  
10 held on a weekly basis every Friday are chaired by the  
11 vice-president of engineering, Mr. Neil Mitchell. Mr.  
12 Mitchell, I believe, reports to Mr. Reiner.

13 So there is -- within the project team there is  
14 project executive attention on the flow of engineering and  
15 -- or the pace of engineering. And in those sessions,  
16 there is absolute accountability that we have seen from the  
17 top down within the project, to ensure that they are  
18 meeting schedule.

19 MR. CROCKER: The bottom of the next page, you say in  
20 the second last line on the page:

21 "OPG planned to prepare the modification design  
22 requirements packages with in-house internal  
23 resources, but OPG could not complete the volume  
24 of work and the number of MDRs required without  
25 additional engineering help. The engineering  
26 team therefore contracted with OSS vendors..."

27 "OSS" stands for outside something, I assume, outside  
28 -- what is the SS of OSS?

1 MR. REINER: "OSS" stands for owners support services.

2 MR. CROCKER: Okay. "...to complete the development",  
3 et cetera. Why wasn't OPG able to do this internally?

4 MR. GOULD: Well, let me answer in part, and I think I  
5 can give the some of that question to Mr. Reiner.

6 So our observation was that OPG in planning this  
7 project and looking out over the risks of this project,  
8 decided to go to the EPC model for engineering, where the  
9 engineering would be procured from outside vendors.

10 At one time -- and we comment about this in subsequent  
11 reports -- at one time OPG had a very, very large in-house  
12 staff and had a lot of engineers that had been part of the  
13 Pickering restart, among other projects. I certainly saw  
14 them for the Pickering restart.

15 The decision was made to scale back that staff, for a  
16 number of reasons that I was not here to validate. I can  
17 only say that the staff that they have right now is  
18 managing the outside vendors so that this work can get  
19 done.

20 But I think there is another important point here.  
21 Yesterday when we were discussing issues related to the  
22 campus plan, Mr. Shepherd asked a series of questions about  
23 the performance specification that was given for the early  
24 pilot projects. And this, what is referred to here as the  
25 MDR packages, that was the major lesson learned for the  
26 overall project, that increasing the amount of definition  
27 within those early engineering packages that were given to  
28 the vendors was essential to achieve the appropriate result

1 in the project.

2 MR. CROCKER: That's not exactly an answer to my  
3 question, but I will take the answer.

4 Is the -- so instead of -- what you are saying is  
5 instead of doing this work internally, it was decided to do  
6 it externally but to supervise it with internal engineers?  
7 I guess that is what you are saying here; correct?

8 MR. REINER: That's -- maybe I will jump in here.  
9 That's correct. So under the quality programs that we have  
10 to adhere to, the design authority, which is a critical  
11 role -- that's ultimately the approval of the final the  
12 design that gets implemented -- that rests with OPG, so  
13 that approval is provided under our quality program.

14 Our strategy for the project is -- you know, we are  
15 not a construction company, we are not resourced with the  
16 engineering capability in-house to manage these large  
17 projects, and that is part of what led us to the EPC  
18 contracting model. So we provide oversight and we use EPC  
19 contractors to do the work.

20 In the case of modification design requirements, which  
21 is essentially an input to the EPC contractor, we have  
22 augmented our capability with these owner support services  
23 contracts. They are essentially engineering services. We  
24 can access technical expertise; that technical expertise  
25 works under our direction, our supervision, our quality  
26 program, and they produce those requirements.

27 And, you know, there is a statement in here that that  
28 has led to increased costs of the development of MDRs. I

1 think if you look at it on a dollar-per-hour basis, that  
2 would be correct. But what I would add to that is when I  
3 look at the costs for managing the overall project, I have  
4 to look at the long-term liability associated with  
5 permanent hires. It's not just an hourly cost; it's a  
6 pension cost and a benefit cost as well. When you roll all  
7 of that in and add to it the flexibility that a contracted  
8 service provides, where I can turn it on and off as  
9 required, it is a far more cost-effective way of executing  
10 the project the way that we have implemented this.

11 MR. CROCKER: So was it a mistake, then, to try to do  
12 it internally at the start?

13 MR. REINER: It -- I don't know -- what I would say  
14 here, again, is, you know, Modus has a view of the  
15 strategy. The strategy from the outset was always to  
16 augment our engineering capability as needed. We will --  
17 we always fully mobilize the resources that are available  
18 to us and make most effective use of them, and then we  
19 augment that as needed, based on the volume of work.

20 I think the learning as we went through this is that  
21 the amount of effort needed to produce design requirements  
22 ended up being larger than was initially anticipated. And  
23 that was a learning that, you know, we had -- we  
24 incorporated as we progressed, but that's what I would say  
25 there.

26 I don't know think there was any mistake made here.  
27 It's a learning, and we adjusted according to the strategy  
28 that we had implemented.



1           MR. CROCKER: Okay. Have you attempted to quantify  
2 the increased costs on an hourly basis? You volunteered  
3 earlier in your answer that on an hourly basis, there would  
4 be an increase of costs. Have you made any effort to  
5 quantify what the increase costs would be?

6           And, secondly, did you let engineers go who had begun  
7 to work on this internally?

8           MR. REINER: We have not let any internal staff go.  
9 So our engineering group is still intact and are still  
10 working actively on the project. So no internal staff have  
11 been let go.

12           However, we do adjust the augmented staff up and down  
13 as needed, and have done that. And so when the specific  
14 package requires certain skills, it's staffed up. When the  
15 package is done, it is reduced.

16           I would not call this any increased cost. If you  
17 wanted to see an hourly comparison of what an engineering  
18 services provider charges for engineering services versus  
19 what we pay our staff, I think there is other information  
20 that's been made available through the hearing on what OPG  
21 pays its employees. You know, there are standard pay  
22 scales that we pay our folks. When we look at the cost for  
23 this --

24           MR. CROCKER: Let me just stop you there.

25           MR. REINER: Yes.

26           MR. CROCKER: You were the one -- number one, Modus  
27 says there will be an increased cost. I didn't create  
28 that, number one.

1           And number two, you were the one who said there will  
2   be an increased hourly cost. I didn't invent that either.

3           MR. REINER: Yes. No, there is an -- so the amount  
4   per hour that a contractor charges is different than the  
5   amount per hour we pay an OPG employee, and it's typically  
6   higher because the contractor has overheads and other costs  
7   associated with it, and our hourly salary doesn't include  
8   all of those overheads. We have pension liabilities and  
9   benefit liabilities that are accrued elsewhere.

10          So that's why, on an hourly salary basis, the cost of  
11   a contractor is higher than the cost of an OPG employee.  
12   So that, I will agree with.

13          Has that increased the cost of refurbishment? And the  
14   answer to that, I will say, is no, it has not. When we  
15   look at our costs for completing the definition phase work,  
16   which includes completing all of the engineering work, with  
17   the exception of these cost increases that we talked about  
18   on the facilities projects, on the campus-plan projects, we  
19   are still tracking to plan on our definition-phase work.

20          MR. GOULD: If I can add something on top of that,  
21   sir, that I think is important. So the words that we use  
22   here are that there will be increased costs for the  
23   development of the MDRs, but you cannot just look at the  
24   MDRs -- you can look at the MDRs as a single line item  
25   within the budget. You can see what that cost is. But the  
26   real issue here that we are talking about in this report is  
27   the impact that the MDRs were having on the project, and  
28   what we commented on here and elsewhere in our reports, is

1 that the owner giving more definition to the contractors  
2 will result in better engineering quality down the road.  
3 And the better engineering quality down the road means that  
4 the work will be easier to execute when you have several  
5 thousand people on-site with tools in their hands.

6 So there may be a cost today that increases relative  
7 to the development of these initial scope-definition  
8 documents, but that cost pays dividends over and over again  
9 during the life of a project if it's done well.

10 MR. CROCKER: All right. You go on on page 27, the  
11 second bullet, just to continue the discussion of this way  
12 of doing things. You say:

13 "There have been OPG-caused delays in approval of  
14 the OSS vendor's work, and the team needs to  
15 eliminate such constrictions where possible."

16 What caused those delays? And have the supervisory  
17 people eased up a little bit?

18 MR. GOULD: So start with the end of the story first.  
19 The engineering team, despite the struggles that we  
20 documented in this report, ultimately met its milestone for  
21 the production of this first tranche of MDP packages  
22 actually two to three weeks ahead of schedule.

23 So the issue there is, did they meet schedule? Yes.  
24 I think in this report, as in the rest of our reports,  
25 where you see that we are focusing intensely on something  
26 like this, we are very concerned that we are seeing some  
27 early warnings about the urgency required to complete work  
28 on time.

1           We raised those red flags, the project team responded,  
2   and the fact that they completed on time or actually ahead  
3   of schedule is evidence of that.

4           MR. REINER:  If I can add just a point to that.  A key  
5   change that we made to address this is we actually  
6   physically co-located the vendor's team and our team in the  
7   same place, and what that immediately did is it allowed for  
8   that interaction between the teams and allowed for the  
9   review cycles and the feedback to happen in real time.  
10   That was the big change that helped us sort of shorten the  
11   time lines here.

12          MR. CROCKER:  The bullet below that you talk about  
13   audits.  There was a lot of talk about audits yesterday.  
14   Are those the kind -- the audits that were discussed  
15   yesterday, are they the audit program that the next bullet  
16   discusses?

17          MR. GOULD:  Could you -- which page are you on, sir?

18          MR. CROCKER:  Still on page 27.  I am on the third  
19   bullet.

20          MR. GOULD:  Third bullet, okay.

21          MR. CROCKER:  I am just asking whether the audit  
22   program that you are recommending in that bullet is the  
23   audit program that you were talking about yesterday?

24          MR. GOULD:  Well, so yesterday I think the question  
25   came about a statement in our report that there was audit  
26   fatigue on the project, so I would say, no, that this type  
27   of audit is more of a normal course of business type audit  
28   within the nuclear oversight group, that they would look

1 into the overall quality of the engineering.

2 MR. CROCKER: Is this auditing -- this kind of  
3 auditing then being done?

4 MR. GOULD: I will let Mr. Reiner -- I believe it is.  
5 I will let Mr. Reiner answer that.

6 MR. CROCKER: The follow-up question --

7 MR. REINER: It is being done.

8 MR. CROCKER: -- to that will be, is there the similar  
9 kind of fatigue that was described as Mr. Gould describes  
10 it?

11 MR. REINER: This is a little different, I think, than  
12 the audit fatigue that was described, because this type of  
13 audit is more about the quality of work that we receive  
14 from the contractor, and so the nuclear oversight function  
15 that Mr. Gould talked about serves a purpose here, and they  
16 do those kinds of audits. But we do -- we do in the  
17 project our own internal audits as well.

18 So the type of thing that we would do, for example, we  
19 require the contractor to demonstrate to us that qualified  
20 people are executing the work. The qualification has to be  
21 documented in the system. There has to be evidence that  
22 the people working on the job have been trained and have  
23 successfully completed their training. That has to be  
24 logged and recorded, and those are the kinds of checks that  
25 we do. And then the other quality assessment that occurs  
26 is --

27 MR. CROCKER: Is that -- let me interrupt you again.  
28 Is that new? That seems like something that --

1           MR. REINER: It isn't new. It is something that is  
2 the normal course of business when a contractor performs  
3 work in order for us --

4           MR. CROCKER: And why is Mr. Gould having to recommend  
5 it at bullet 3 that you do it, if it's being done normal in  
6 the course of business?

7           MR. REINER: Yeah, I mean, I can't speak to why he  
8 recommended that, but what I will tell you, it is part of  
9 our course of doing business, that when we have contractors  
10 do work for us, we have to assess the quality of that work,  
11 and it happens in engineering directly as part of the  
12 review process.

13           It happens -- it's sort of once removed through  
14 nuclear oversight. It also happens through our supply-  
15 chain organization. I think what Mr. Gould may have been  
16 identifying is the volume of work that contractors are  
17 doing is increasing and therefore your ability to audit and  
18 stay on top of the quality issues needs to be there.

19           I don't foresee this as an issue. We are dealing with  
20 this. I don't see this as a problem.

21           MR. CROCKER: All right. If we can go forward to page  
22 35 of the same report. In the second bullet on that page,  
23 you describe the way in which you're proposing to approach  
24 the issue. And then at the bottom of the page, the bottom  
25 of the bullet, you say, in the last three lines:

26                   "Even the best in the industry avoid this  
27                   scenario. In our experience, limiting the  
28                   transparency of the schedule risks, the value of

1           the schedule is an essential planning and  
2           communication tool needed to hold the contractors  
3           accountable."

4           If the best in the industry avoid this scenario, why  
5 does OPG choose it?

6           MR. GOULD: They are not.

7           MR. CROCKER: Have I misread?

8           MR. GOULD: No, you didn't misread.

9           MR. CROCKER: All right.

10          MR. GOULD: The way that OPG is approaching the  
11 schedule is in conformance with what's best in the  
12 industry. They -- we examined this issue. We had many  
13 intense discussions with the project team about this. This  
14 is something that we believe very strongly about.

15          We believe that in some ways the approach that they  
16 set out to take would have flaws. We raised those red  
17 flags probably two years before you'd ever see a problem  
18 because of it based on our experience in knowing schedules  
19 and knowing projects, and we came to -- through meetings  
20 with the project team -- came to a consensus opinion that  
21 some of the observations that we made here that were very  
22 critical would be changed, and the path that OPG is now  
23 going down we would say is in conformance with what's best  
24 in the industry.

25          MR. CROCKER: So your summary paragraph at the end of  
26 these bullets, when you say "in summary, Modus sees  
27 significant risk associated with the plan for tracking,  
28 scheduling", et cetera, "and are sceptical that the end

1 project OPG intends to create will be useful, or a useful  
2 tool, let alone a...", how has that changed? How has --  
3 point to me where I can see the changes.

4 MR. GOULD: So if you bear with me for just one  
5 moment.

6 MR. REINER: While Mr. Gould is looking for that, I  
7 can give you the OPG project perspective on this.

8 So this was an area, as Mr. Gould identified -- so I  
9 describe the process whereby all the observations and  
10 recommendations get discussed between our teams. This is  
11 an area where we felt quite strongly that we have adopted  
12 best practices. And we wanted the Modus team to revisit  
13 this area in particular, and reassess their views.

14 And as part of that, the outcome was there were some  
15 adjustments we made in our process, and I think the Modus  
16 team at the end concluded that, yes, this is an appropriate  
17 method of integrating. We have got the right visibility  
18 into each of the schedules.

19 There has been -- there has been a lot of evolution in  
20 the scheduling area since this particular report was  
21 written. An example that I will give you, so this CNC  
22 schedule, it's the coordinating and control schedule. We  
23 have multiple contractors doing work and we have to have  
24 the ability to see how that integrates and where there are  
25 milestones that might conflict each other. And so the  
26 visibility across that and those interferences become  
27 critical.

28 We have now got in process a meeting that's held



1 monthly with all contractors. The scheduling folks from  
2 the contractors' offices attend that meeting. They speak  
3 to those specific schedules and their milestones. Every  
4 other contractor in the room is able to hear the status of  
5 schedule and what their key milestones are. We provide a  
6 view of the integration across the projects, and that's an  
7 opportunity for everybody to see what those interferences  
8 are, and for us and OPG to be able to identify: Is there  
9 an issue that requires us to have a contractor change a  
10 plan or advance some work or delay some work?

11 And that's what happens in that forum at the  
12 coordination level, at the level 2 in the schedule. And  
13 that has evolved since this report was written.

14 MR. GOULD: So if I can direct your attention to  
15 Exhibit 2, to the main exhibit, which is our fourth quarter  
16 2013 report, sir.

17 MR. CROCKER: June 26th report?

18 MR. GOULD: No, it's dated November 12th, 2013. If  
19 you look at page -- the bottom of page 9, you will see a  
20 section there under Roman numeral IV, "Functional group  
21 update." It's an A schedule, A period schedule.

22 So if you look at that, in this first paragraph we  
23 summarize many of the conclusions that were in the prior  
24 report, which was the initial project assessment from  
25 August 2013. And then we talk about -- this document, what  
26 I was discussing earlier, the discussions that we had with  
27 the project team where we revealed our concerns to the  
28 project team, and on page 9 and through page 10, those five

1 bullet points identify how they were proceeding with the  
2 recommendations that we made, and that our conclusion was  
3 that this was an appropriate methodology for proceeding  
4 with the project schedule.

5       So we documented -- we identified the issues in  
6 August, we had a number of discussions with the team, we  
7 went through all of these issues with the team, and then  
8 this report reflects the end result of those discussions  
9 and the pivot that we believe management took in  
10 association with our recommendations.

11       MR. CROCKER: I think I will just leave the rest of my  
12 questions on this report, because they have been dealt with  
13 yesterday, and ask you to turn to attachment 1, the  
14 attachment with all of the reports indicated.

15       I just want to request from Mr. Keizer some of these  
16 reports.

17       MR. GOULD: Oh, you are referring to the document list  
18 that's attached to the August report?

19       MR. CROCKER: Yes. So I am looking at page 1, and  
20 almost at the middle of the page it says: "Scope strategy  
21 and plan, 12/15/11."

22       Could I ask that we have that report, please?

23       MR. KEIZER: Sorry, I will just ask the panel, is that  
24 something we have already produced in evidence or is that -  
25 - do we know what that is?

26       MR. ROSE: I would have to go back and validate  
27 exactly what that is and -- I don't recall if we produced  
28 it. Do you, Dietmar?

1           MR. REINER: We will check at break whether it's in  
2 one of the management plans. It is possible that that one  
3 is covered in a management plan, but we will check that at  
4 break.

5           MR. KEIZER: To the extent it isn't, we had a series  
6 of caveats that attached to the same kind of production  
7 yesterday with Mr. Shepherd in his request for documents.  
8 I am assuming to the extent we undertake to do that, it  
9 would be subject to the same caveats.

10          MR. MILLAR: Yes. I am assuming the answer is that  
11 you will either, A, show him where it is in the evidence,  
12 B, produce it, or C, explain why you won't produce it.

13          MR. KEIZER: That's fine.

14          MR. MILLAR: That will be JT4.1.

15           **UNDERTAKING NO. JT4.1: WITH REFERENCE TO REPORTS**  
16           **ENTITLED "SCOPE STRATEGY AND PLAN, 12/15/11," "OTHER**  
17           **ENGINEERING, 24 MAY, 2013, VBO OUTAGE STATUS, MDR WORK**  
18           **STREAMS ENGINEERING STUDIES", "DR ENGINEERING WEEKLY**  
19           **TACTICAL UPDATE" DATED APRIL 19, 2013; "DR ENGINEERING**  
20           **WEEKLY TACTICAL UPDATE"; "ENGINEERING WEEKLY TACTICAL**  
21           **UPDATE," DATED MARCH 15TH, 2013; "OPG PROPOSAL, ORG**  
22           **AND LABOUR RESOURCES REVIEW, A, ORGANIZATIONAL LABOUR**  
23           **STRATEGY," DATED MAY 11, 2010: A, TO INDICATE WHERE**  
24           **THEY ARE IN THE EVIDENCE; B, TO PRODUCE THEM; OR C,**  
25           **EXPLAIN WHY THEY CANNOT BE PRODUCED.**

26          MR. CROCKER: And if we could go to page 2 of that  
27 list, and the third report on that page, it's entitled:  
28 "Other engineering, 24 May, 2013, VBO outage status, MDR

1 work streams engineering studies."

2 MR. REINER: That's one that I don't recognize, and I  
3 am going to have to rely on Mr. Gould identifying what it  
4 was that he looked at there, because there is no document  
5 number. There is a description.

6 MR. GOULD: We can certainly check that at the break.

7 MR. CROCKER: Thank you.

8 On page 3 --

9 MR. MILLAR: Is that another undertaking, Mr. Crocker?

10 MR. CROCKER: We can do all of this in one undertaking  
11 or separate undertakings.

12 MR. MILLAR: How many do you have?

13 MR. CROCKER: I have four more.

14 MR. MILLAR: Let's keep them all as part of the same  
15 undertaking. That's probably easiest.

16 MR. CROCKER: Okay. On page 3, there are three weekly  
17 reports described there about a third of the way down the  
18 page: "DR engineering weekly tactical update," dated April  
19 19, 2013; "DR engineering weekly tactical update";  
20 "Engineering weekly tactical update," March 15th, 2013.

21 They also aren't numbered.

22 MR. REINER: These I do recognize. So yeah, we can  
23 provide those. They haven't been submitted as part of our  
24 evidence.

25 MR. CROCKER: I just have one more on page 5, two-  
26 thirds of the way down the page, "OPG proposal, org and  
27 labour resources review," I guess, "A, organizational  
28 labour strategy," dated May 11, 2010.

1           MR. REINER: We will look at this one at break as  
2 well, because that may be covered in our management plans  
3 as well.

4           MR. ROSE: Yeah, based on the date of this being May  
5 2010, it may have been an early document that ultimately  
6 got culminated into our program management plans. So we  
7 would have to go back and verify that.

8           MR. CROCKER: That's fine.

9           I have a few questions on the June 26th report.

10          On page 6, in the paragraph immediately above the  
11 heading "B: Timelines and key events," you talk about the  
12 construction, among other things, the construction and the  
13 use of a full-scale mock-up for re-tube and refurbishment  
14 replacement. Do you see that?

15          MR. GOULD: Yes.

16          MR. CROCKER: This is probably small potatoes in the  
17 grand scheme of things, and if it is we can move on. How  
18 much does that cost?

19          MR. ROSE: I will need to verify exactly the cost, but  
20 I believe it was in the 35- to \$38 million range, by  
21 memory.

22          MR. CROCKER: Okay. So not that small potatoes.

23          MR. REINER: So, yeah, it will be in that range. We  
24 can get you an exact number, so I would say it's not small  
25 potatoes, but let me maybe provide some characterization of  
26 it.

27          So part of our strategy for the refurbishment -- and  
28 the key lesson learned is the mock-up. Every refurbishment

1 that was done prior to the Darlington refurbishment found  
2 that with -- they did not have the type of mock-up that we  
3 have constructed and found that that created significant  
4 issues for them, so we are going to achieve a couple of  
5 things with this mock-up. One is ensure that the tooling  
6 operates to the required specification before we deploy  
7 them on the reactor face. Every refurbishment prior to  
8 Darlington had a burn-in period for tooling on critical  
9 path on the reactor face that caused them significant  
10 delays.

11 The other thing that we are going to achieve with this  
12 is training of employees. In the other refurbishments --  
13 and we see this sometimes in our own outages -- the first  
14 time an external contractor is ever in a plastic suit  
15 wearing the radiological protective equipment is on the job  
16 site, and there is a, you know, there is a burn-in period,  
17 a ramp-up period, that is required in order for them to get  
18 productive, wearing double rubber gloves, wearing plastic  
19 suits, breathing apparatus. We are going to do all of that  
20 offline. Everybody that will work on refurbishment in the  
21 reactor vault is going to rehearse on the mock-up.

22 MR. CROCKER: They couldn't do that at home with the  
23 stove?

24 [Laughter]

25 MR. REINER: We might try that.

26 If you look at when we are at peak in refurbishment, a  
27 Darlington unit being offline costs the company about  
28 a million dollars a day. Our run rate at peak with the

1 number of resources that we'll have on-site is going to be  
2 about another million dollars a day.

3 So at \$2 million a day it doesn't take many days to  
4 have a mock-up pay for itself. We believe that this is  
5 actually a very critical investment that will allow us to  
6 really manage the critical path on this job.

7 MR. CROCKER: I was going to ask you as a follow-up  
8 question whether you have done an analysis of the return on  
9 that investment, but I gather you have.

10 MR. REINER: Yes, we absolutely have.

11 MR. GOULD: If I can, maybe I can add a little bit  
12 more perspective on this from another project. It was a  
13 project in the States, in the United States, a steam  
14 generator replacement project that -- I was part of the  
15 team that provided oversight, and on that project the first  
16 unit -- there were two units that were replacing steam  
17 generators. The first unit had the longest steam generator  
18 replacement outage of its type of that type of unit in  
19 history.

20 So the company involved devoted, not to the extent of  
21 this type of mock-up, but significant resources to develop  
22 a mock-up to mock up the exact conditions under which the  
23 workers would be working going forward, and they went from  
24 having the worst outage ever to the best outage ever, and  
25 they reduced their critical path on that project by 46 days  
26 just by doing the work in the mock-up.

27 So we have seen tangible results from using mock-ups  
28 under these circumstances in the past. This is an

1 extraordinary -- and the whole point of this paragraph was  
2 to show what OPG is doing to provide confidence behind RQE.

3 And, you know, sometimes -- sometimes in looking at  
4 the different elements we see -- you know, you get a little  
5 bit too close to the flame, you look at one individual  
6 element like you talked about with engineering and schedule  
7 that we raised before.

8 We see this as an extraordinary effort on the part of  
9 OPG to do a lot of advance planning, more advance planning  
10 than I have ever seen on a project of this type, well, well  
11 in advance of execution.

12 MR. REINER: As Mr. Gould had identified, as part of  
13 establishing the release quality estimate, we will have  
14 tested every sequence of work that will take place on  
15 critical path during the refurbishment outages, and that is  
16 what is going to give us a very high degree of confidence  
17 on this schedule, because we will have tested the tools, we  
18 will have tested the abilities of the workers to utilize  
19 those tools, the setup, the tear-down, the actual execution  
20 of the work, that will all be done on the mock-up, and that  
21 will feed into the release quality estimate.

22 MR. CROCKER: I wanted to talk, actually, a little bit  
23 about the release quality estimate. You say, Mr. Gould, on  
24 page 8 of your report that mega-projects like this need  
25 clear, visible objectives, and the release quality estimate  
26 is one of those.

27 Exactly when -- exactly what do you mean when you  
28 describe a release quality estimate? What has to come



1 together for that to be meaningful?

2 MR. GOULD: So let me start the answer and we can let  
3 the project team answer for themselves. What we are looking  
4 for in the release quality estimate is high confidence  
5 behind the up-front engineering, high confidence in the  
6 schedule, high confidence in the cost estimate, and that  
7 the risks have been fully identified, the known risks have  
8 been fully identified and contemplated as part of the  
9 overall review of the project.

10 It really goes into those four major elements of the  
11 underpinnings of the job. Everything really flows through  
12 those four things, so that there are no guarantees when you  
13 get into the execution of a mega-project of this type, but  
14 having that type of information available so that it's  
15 fully vetted, so that not just our team, but all of the  
16 external groups that are looking at this project that need  
17 to have this information can see it.

18 Those would be the objectives for the RQE, and it's  
19 really getting into the underpinnings of -- that it's not  
20 just a number. They are taking several years over a  
21 progressive process to develop this number over time, and  
22 there are a lot of different activities that build towards  
23 that date. It's important for us, and it's essentially  
24 part of our scope -- it is the main part of our scope to  
25 characterize that effort to the board of directors to give  
26 them confidence that RQE is not just a number that was  
27 pulled out of the air.

28 MR. CROCKER: So is it the date which is the important

1 objective, or is it the analysis which gets you to the  
2 confidence level that's the important objective?

3 MR. GOULD: It's the analysis, it's not the date.

4 MR. CROCKER: Okay. On page 10 on this chart in the  
5 third box, you talk about gaps with the Long-Term Energy  
6 Plan. What are the gaps? What kind of gaps are we talking  
7 about?

8 MR. GOULD: So if you want to go through the first-  
9 quarter report in detail, I am happy to do that, but we  
10 identified certain of those. I think some of that gets  
11 into the closed session, so if you want to do that I am  
12 happy to do that, but that's --

13 MR. CROCKER: No, we can wait. But are there -- have  
14 those gaps closed?

15 MR. GOULD: I don't know that I can comment on that  
16 until we go into closed session.

17 MR. CROCKER: Okay.

18 MR. MILLAR: Mr. Crocker, how are you doing for time?

19 MR. CROCKER: I am almost done.

20 MR. MILLAR: Okay. Thank you.

21 MR. CROCKER: And I would have told you that even if I  
22 weren't almost done.

23 [Laughter]

24 On the bottom of page 11 you talk about, also on this  
25 chart, shoulder-to-shoulder work?

26 MR. GOULD: Yes.

27 MR. CROCKER: Is the shoulder-to-shoulder work that  
28 you are talking about there the kind of circumstances that

1 Mr. Reiner talked about earlier?

2 MR. GOULD: Yes, the collaborative process, yes.

3 MR. CROCKER: Okay. On page 15, in the middle, you  
4 talk about the projects and modifications organization  
5 hadn't adopted procedures developed by the design  
6 refurbishment team. This is just above the heading "1:  
7 Extent and condition of budget scheduling, campus."

8 Why was that the case, or why is that the case?

9 MR. GOULD: Why did they not adopt the procedures?

10 MR. CROCKER: Yes.

11 MR. GOULD: So I will answer and I will see if Mr.  
12 Reiner wants to append to it.

13 What we found from the evidence is --

14 MR. CROCKER: My guess in advance is that he will.

15 [Laughter]

16 MR. GOULD: What we found from the evidences was that  
17 projects and modifications was set up as a different  
18 organization.

19 The refurbishment project has its own governance, and  
20 it's exactly as it says here. The projects and  
21 modifications was an existing organization that was out  
22 ahead of refurbishment, had been in existence for I don't  
23 know how many years. I won't speculate on that.

24 But they were already doing quite a bit of work within  
25 the plants, and so these initial projects were assigned to  
26 them because they were -- it was believed that they had the  
27 capability to proceed with that under their procedures.

28 So what we identify here is simply a fact.

1           MR. REINER: Just to add to that, so the project and  
2   modifications organization, they -- prior to taking on some  
3   of this prerequisite work for refurbishment, their function  
4   was to execute the nuclear project portfolio work that --  
5   the allocation of funds, the business cases, approvals of  
6   business cases, is done by the nuclear business and follows  
7   the processes, the business planning processes and the  
8   financial processes used in the nuclear business.

9           For refurbishment, we started from the outset in  
10   building systems and reporting capability and financial  
11   tracking capability that is more project-focused.

12          So an example would be, when you look at the  
13   operations business, annual costs become very important.  
14   They are also important for a project because we have  
15   obviously got to be able to manage the cash flows  
16   associated with the project, but life-to-date and forecast  
17   to completion become far more important.

18          So we have built systems and capability around a large  
19   project model.

20          In the case of the projects and modifications  
21   organization, there weren't a lot of those kinds of  
22   projects in their history, so those systems, the systems  
23   that were used to do the tracking, were different.

24          We are correcting that. We are in process, as we  
25   speak, of rolling out the exact same systems for reporting,  
26   for tracking, for doing earned value management on the work  
27   that the projects and modifications organization is doing  
28   that is being used on the refurbishment project. And that

1 is underway as we speak. It's part of the corrective  
2 actions that we are implementing as a result of the  
3 increases in estimates that we have seen on the D20 storage  
4 project and the auxiliary heating system project. So these  
5 are changes that are in process of being made.

6 MR. CROCKER: Is there someone supervising this who is  
7 saying to the P&M group: Get on board?

8 MR. REINER: They now report to me, the projects and  
9 modifications group, so I take direct accountability for  
10 that.

11 MR. CROCKER: You are telling them to get on board?

12 MR. REINER: I am telling them to get on board.

13 MR. CROCKER: One last question, and it was discussed  
14 yesterday to some extent, but on page 17 you are talking  
15 about the auxiliary heating project, the delay, at the  
16 bottom of the page, the delay in that project and how it  
17 might impact the vacuum building outage.

18 And I think my question is: Which one of those two  
19 projects is going to get out of the way of the other? And  
20 will that -- is that the way it will be -- the scheduling  
21 problem will be resolved, or will it be resolved in another  
22 way?

23 MR. REINER: When you say which project will get out  
24 of -- you are talking auxiliary heating system and vacuum  
25 building outage?

26 MR. CROCKER: Yes.

27 MR. REINER: So the vacuum building outage creates an  
28 environment where the auxiliary heating system is required,

1 because we are shutting down four units in the spring and  
2 we could be -- during that time period there could be a day  
3 of cold weather and we could have some event that might  
4 require the system to be available.

5 So the current schedule has the auxiliary heating  
6 system get out of the way of the vacuum building outage, in  
7 that it will get completed prior to the start of the vacuum  
8 building outage. It's not going run concurrently; it will  
9 be in service prior to the start of the vacuum building  
10 outage.

11 MR. CROCKER: And are you flexible with the scheduling  
12 of the vacuum building outage, that it can be delayed?

13 MR. REINER: No. There is some limited flexibility,  
14 but the vacuum building outage can't be delayed. As a risk  
15 mitigation measure, if we needed to implement a risk  
16 mitigation measure, we would need to find a way to provide  
17 heating steam to the plant by other means, and the other  
18 means would be the construction boiler house. We would  
19 ensure that that stays available to be the backup supply.

20 There are other backup alternatives that could be  
21 implemented, but the vacuum building outage is the one  
22 that's fixed. The auxiliary heating system is the one that  
23 we would move.

24 MR. CROCKER: Thank you. I have nothing further.  
25 Thanks.

26 MR. MILLAR: Thank you, Mr. Crocker. Ms. Blanchard?

27 **QUESTIONS BY MS. BLANCHARD:**

28 MS. BLANCHARD: I have a few questions on behalf of

1 Canadian Manufacturers & Exporters, and I will try not to  
2 cover any ground that's already been covered extensively.  
3 I am just going to start generally.

4 It's my understanding that the key purpose of the  
5 update is, one, to update the evidence relating to the  
6 campus plan, and secondly, to present the Modus reports for  
7 the first time. So I would just like to confirm that the  
8 Modus -- none of the Modus reports were initially provided  
9 in the filing?

10 MR. REINER: That's correct.

11 MS. BLANCHARD: And with respect to the campus plan  
12 projects, my understanding is there are really two themes  
13 that come out of the update.

14 And the first one is that the variances from the  
15 initial budget and scheduling estimates that are identified  
16 in the May 2014 Modus report are not material, because they  
17 don't trigger changes to the test period payment amounts.

18 So one of the key statements in the updated evidence -  
19 - and we heard this yesterday following questions from Ms.  
20 Girvan -- is the variances are not considered material  
21 because they don't meet the threshold for triggering a  
22 change in the payment amount.

23 MR. ROSE: Let me break that down in two ways. I  
24 think you referenced the Modus report. And so Modus would  
25 not comment on the materiality of our impact on our rates.

26 MS. BLANCHARD: Right.

27 MR. ROSE: They would impact on the materiality of the  
28 cost increase. We look at every cost increase as being

1 serious and material through our project management  
2 approach, but from a perspective of looking at the rate  
3 impact, the calculations were performed -- as Mr. Barrett  
4 had alluded to yesterday -- and that the impact on this  
5 rate period was not the material of those cost increases of  
6 the in-service amounts, the revised in-service amounts for  
7 this period.

8 MS. BLANCHARD: Okay. So if we go to the update at  
9 page 7, we see those calculations that you are referring  
10 to. So that's Exhibit D2, tab 2, schedule 2, page 7, just  
11 above the "Oversight processes."

12 Those are the calculations that you are referring to?

13 MR. ROSE: Page 7 provides the recalculated in-service  
14 amounts, per the latest filing.

15 MS. BLANCHARD: Right, so there was an overall cost  
16 increase of 213 million, but these are not considered  
17 material for the purposes of this application because of  
18 the in-service timing?

19 MR. KEIZER: I think it's because the revenue  
20 requirement increase associated with the in-service amounts  
21 are not material, based upon OPG's materiality threshold  
22 that they generally apply as part of updates.

23 MS. BLANCHARD: Right, but if the timing of the in-  
24 service additions had been different, or the -- for  
25 example, the scheduling for the storage, the heavy water  
26 storage facility had been on track or in accordance with  
27 the earlier estimates, it might have been material for the  
28 purposes of this application?



1           MR. KEIZER: Sorry, I think if it created an in-  
2   service amount that would have been higher and therefore  
3   triggered a higher revenue-requirement calculation, it  
4   could have crossed that materiality threshold and put it in  
5   rates, yes.

6           MS. BLANCHARD: Right. And so ultimately that  
7   213 million will be seen likely in the next rate  
8   application?

9           MR. ROSE: That is correct. It will be in the  
10   application related to when it goes into service.

11          MS. BLANCHARD: Thank you. So as I understand it, the  
12   other -- the other takeaway from the update, really, is  
13   that the various red flags, as we have heard them called,  
14   identified in the May 2014 Modus report relating to the  
15   heavy-water storage facility and the auxiliary heating  
16   system to a lesser degree, the process of -- or at least  
17   the issues experienced there were invited to consider those  
18   a learning experience that could be reviewed in an effort  
19   to improve processes for the larger refurbishment.

20          MR. REINER: That's correct.

21          MS. BLANCHARD: And it's referred to in the June 26  
22   report at the top of the page as sort of an unintended  
23   pilot project, so that is page 16 of 21 in the June 26  
24   report, where Modus was really contextualizing the heavy-  
25   water storage and auxiliary heating plant projects in the  
26   larger scheme of the Darlington project.

27          MR. GOULD: I don't know that it was unintended. You  
28   used the word "unintended".

1 MS. BLANCHARD: Well, the wording is the project was  
2 unfortunately used as a pilot project.

3 MR. GOULD: Okay. It resulted in being a pilot  
4 project, yes.

5 MS. BLANCHARD: So I suggested "unintended", because  
6 presumably -- or was it intended to be a pilot for the  
7 larger project?

8 MR. GOULD: I will let Mr. Reiner answer that.

9 MR. REINER: We did -- we did run a pilot to test the  
10 EPC model. There was a project run. It was specifically a  
11 pilot project. There were some learnings that came out of  
12 that, that they were incorporated into the management  
13 plans.

14 For the -- it was a smaller project, and it was  
15 executed at Pickering. I can't remember the exact nature  
16 of it. I think it might have been a heat exchanger  
17 replacement project.

18 For the Darlington refurbishment itself, this is the  
19 leading project. It's the one that's furthest ahead, so it  
20 naturally becomes the learning project, and that's -- I  
21 think that's what is being described by Modus.

22 MR. GOULD: I don't believe that OPG set out with the  
23 intent of having a cost overrun on those two projects, so  
24 the unintended part would be the cost overrun.

25 MS. BLANCHARD: Okay. But because of a timing it de  
26 facto became a pilot for the larger Darlington.

27 MR. REINER: It has become a pilot in the sense that  
28 it has resulted in some learnings. Those learnings are

1 being applied to the larger project. As you have seen in  
2 reviewing these reports, some of the learnings are  
3 applicable -- more applicable to the other campus-plan  
4 projects. There were already changes in strategy from the  
5 outset on the larger refurbishment execution project.

6 So, for example, getting to engineering complete  
7 before establishing a definitive baseline cost and  
8 schedule, that's the concept around release quality  
9 estimate that has been built into the refurbishment from  
10 the start.

11 For the campus-plan projects it's a little different,  
12 because they are stand-alone projects on a much shorter  
13 time line. That same approach wasn't built into those  
14 projects. So the learning from D20 storage is being  
15 applied to the other campus-plan projects.

16 MS. BLANCHARD: So -- so in terms of, you know,  
17 following the theme of learning -- and we have had a lot of  
18 discussion about budgeting, and as I understand it, you  
19 know, the two key concepts are budgeting and schedule, and  
20 those are the two risks that really have to be managed. We  
21 have got an undertaking that we are going to have an  
22 updated chart, so an update to the chart that's currently  
23 provided in the application, so that's at page 6 of the  
24 updated evidence, and that's the chart that shows the  
25 current forecasted amounts.

26 And so the chart that's contained there in the update  
27 shows the evolution of the campus-plan projects in terms of  
28 budgeting over the last almost year since September filing,

1 and so I think what would be helpful would be to also  
2 understand the evolution of scheduling over the same  
3 period.

4 So -- because right now, you know, we are seeing final  
5 in-service dates for -- that were provided in September,  
6 but it's not totally clear to me how the schedule has  
7 evolved in lock step.

8 And so it seems to me that it would be useful if,  
9 either in this chart or separately, we had a sense of how  
10 the scheduling for those campus-plan projects has evolved  
11 in the last year, because it sounds like it has kind of  
12 gone in and out a few times over that period, and I think  
13 the evolution of both of those processes would be useful  
14 for the process.

15 So whether that's incorporated into the updated chart  
16 or whether it's given separately, if we could have an  
17 expansion of what the actual scheduled milestones were in  
18 September 2013 relative to as currently forecasted, that  
19 would be helpful.

20 And I think I understood from your evidence yesterday  
21 that we are still waiting for the heavy-water storage to be  
22 presented to the board of directors?

23 MR. REINER: That's correct.

24 MS. BLANCHARD: So I don't know what the timing would  
25 be or whether the current scheduling is available for the  
26 heavy-water storage, but we would like to be able to look  
27 at those.

28 MR. KEIZER: So just to clarify, what you want to see

1 is what was the projected milestones for these campus-plan  
2 projects, let's say at the time we filed the application in  
3 September 2013.

4 MS. BLANCHARD: Yes.

5 MR. KEIZER: And what are the revised milestone dates  
6 as of now.

7 MS. BLANCHARD: Yes.

8 MR. ROSE: Is the focus on the in-service dates that  
9 you are looking for, so the fact that we show only partial  
10 amounts of the heavy-water storage project being in service  
11 in the test period -- in the rate period, are you looking  
12 for the actual -- the final in-service dates or the entire  
13 schedule of all the in-service dates for that project as  
14 compared to what it was in our original filing?

15 MS. BLANCHARD: Yes, that would be very helpful.

16 MR. ROSE: Okay. We can -- I think we can build that  
17 right on to the JT3.5 request, I believe it was.

18 MS. BLANCHARD: That would be helpful, or if it's  
19 easier to do it in another format that's fine, but...

20 MR. ROSE: I mean, I think we already have the in-  
21 service dates for the -- the changes in the in-service  
22 dates for the items going into service listed here. You  
23 know, I think the addition from yesterday's 3.5 is you want  
24 to understand the stuff that wasn't going into service and  
25 its cash flow --

26 MR. KEIZER: No, she wants to understand that you had  
27 a certain milestone in-service date for each of these  
28 projects in September of 2013, and what are the current

1 projected milestone in-service dates as of now.

2 MR. REINER: Yes, yes.

3 MR. ROSE: Okay.

4 MR. KEIZER: So that she would be able to see what  
5 ones are delayed and which ones are on time; is that  
6 correct?

7 MS. BLANCHARD: Thank you very much, Mr. Keizer.

8 MR. REINER: Okay.

9 MR. MILLAR: So will that be provided as part of the  
10 existing undertaking, or would you like to assign it a  
11 separate number?

12 MR. REINER: I think we can do it as part of the  
13 existing undertaking and capture it all.

14 MR. KEIZER: That's fine. One less document for us to  
15 keep track of.

16 MS. BLANCHARD: Thank you.

17 And so just continuing on the theme, so there has been  
18 some learning that's happened associated with the campus-  
19 plan projects, and we have seen some fairly significant  
20 variances, and I think we have heard that a lot of that has  
21 to do with issues relating to the initial scoping of the  
22 project relative to the scoping that's recently occurred.

23 So I am looking at the Modus comparison of the 4C  
24 estimate relative to the current forecast, and I understand  
25 that that might not be a perfect comparison, but at least  
26 for discussion purposes I am going to go there. So it's at  
27 page 16 of the June 26 report, just because it's an easy  
28 representation of those variances.

1           So we are seeing the variance there on the water  
2 storage that goes from 110 million to approximately 276,  
3 you know, qualified, as we have heard. And I understand,  
4 as I said, that a lot of that has to do with scoping, but I  
5 am assuming that in that number, there also may be other  
6 items.

7           And, Mr. Reiner, you mentioned yesterday, just for  
8 example, that to deal with this scheduling crunch around  
9 the vacuum building outage or around the commencement of  
10 the Darlington refurbishment, OPG might consider taking  
11 measures like, for example, making use of multiple shifts  
12 or using other tools to accelerate the schedule for the  
13 heavy water storage.

14           And so one of the questions I have got is: Does that  
15 updated forecast contemplate that type of measure?

16           MR. REINER: Yes, it will. That updated forecast will  
17 look at -- I talked about an effort on our part to bring  
18 back the in-service date for that facility to August of  
19 2016, so it will incorporate the measures required to the  
20 achieve that.

21           MS. BLANCHARD: Okay. And so has there been any  
22 effort to isolate costs that would be associated with that  
23 type of measure?

24           MR. REINER: That's part of the work that is currently  
25 underway.

26           MS. BLANCHARD: And given that those costs might be  
27 attributed to sort of the learning aspect or the pilot  
28 project aspect of these additional -- that these costs

1 might be attributed to those -- whatever you want to call  
2 them -- hick-ups or speed bumps, has there been any thought  
3 given to removing those from the amount that's going to be  
4 included in the rate base?

5 MR. REINER: I wouldn't characterize them as costs  
6 associated with learning. I think one of the points that I  
7 was attempting to make yesterday is the issue that we have  
8 on the D20 storage project is an estimate was produced  
9 before the scope of work was understood. It would be false  
10 to use that as the starting point. That estimate is not  
11 reflective of the work.

12 The estimate that will be reflective of the work and  
13 schedule is the one that will be produced here, that we  
14 will update.

15 So the time period that we are working towards hasn't  
16 changed. This isn't a learning thing; this is get the job  
17 executed, given the scope that we are dealing with in the  
18 period of time that we have available to us.

19 So I would not characterize these as learning costs.  
20 These are part of the facilities that are needed to execute  
21 refurbishment. It's part of the cost for the overall  
22 refurbishment. So I don't believe that's a correct  
23 characterization of the costs.

24 MS. BLANCHARD: Is there any sense that any part of  
25 the delays are attributable to the management issues that  
26 are identified in the May 2014 report?

27 MR. REINER: We have made improvements in the  
28 engineering processes, for example, to streamline and



1 shorten approvals. Those sorts of benefits have been  
2 factored in. Again, to -- you know, to call these learning  
3 costs or call these -- you know, the thing about a project  
4 like this, there isn't sort of a template on the table and:  
5 Here is how it should be done and this is the schedule you  
6 should be following. Now, let's see where you are and  
7 let's do a comparison and then we will try to distinguish  
8 what's learning, what's not learning.

9 To me, this is part and parcel of project management.  
10 You look at the risks, you look at the challenges, you  
11 correct them and you move forward.

12 So that kind of a segregation, I wouldn't know how to  
13 do that and it is not something that we would contemplate.  
14 I think what becomes important is, you know, how have we  
15 responded to the risks that have emerged, the risks that  
16 Modus has identified in their report, risks that we have  
17 seen, how have we responded and what actions have we taken  
18 in order to ensure that we can manage those risks inside  
19 the project envelope that we are talking about.

20 MR. GOULD: If I could add something to that that I  
21 think will be helpful, I think you also have to look at the  
22 overall cost of the entire program, because as Mr. Reiner  
23 discussed, you have to look at the risk of that particular  
24 project within the overall scope of the work. So what risk  
25 does completing D20 storage take off of the table for  
26 refurbishment, which is a much larger set of risks.

27 So all of that would have to be analyzed. That's a  
28 long way off from even being in a position to do that.

1 MS. BLANCHARD: Okay. Well, maybe I will move on,  
2 then. And so I am now on page 5 of the May Modus report.

3 And at the top of the page, Modus is commenting on  
4 some of the management -- problems with the management  
5 model employed. And one of the items that's flagged is the  
6 use of inexperienced project managers.

7 So who were these people? Were they -- were they  
8 internal OPG staff?

9 MR. GOULD: Yes.

10 MS. BLANCHARD: And they were not -- they were  
11 inexperienced how? They were inexperienced because of the  
12 scale of the project, or they were -- what was meant by  
13 "inexperienced"?

14 MR. GOULD: So I think you were on the right track.  
15 As Mr. Reiner discussed, the projects and modifications  
16 organization was set up to do smaller modification and non-  
17 modification work within the operating plants. And it, in  
18 some ways, is a different skill set to the approach a very  
19 large, complex new construction project from the ground up  
20 that are represented by these campus plan projects.

21 MS. BLANCHARD: So is this group of project managers  
22 no longer participating -- are they not participating in  
23 the Darlington refurbishment? They are going back to doing  
24 the smaller-scale projects?

25 MR. REINER: No, these -- this group of -- I mean, we  
26 always -- people always move around, get reassigned. We  
27 always look at career paths and development for staff, and  
28 if they are not suited for certain jobs we will encourage

1    them to move into other jobs.

2           But in general, the project management that's in place  
3    is still in place. What we have done is we have augmented  
4    it. We have brought in a new and very senior construction  
5    -- large project construction-type director that can  
6    provide some of that experience that was lacking. What we  
7    then do with our staff is part of their development is to  
8    work under some of these -- under the more experienced  
9    project managers and project directors, and to learn,  
10   because we want to develop their capability. We are  
11   dealing with a project that's going to take until 2025 to  
12   close, and we do have to develop the capability and make  
13   sure we have succession plans in place and we have a stream  
14   of resources that are able to take these projects on.

15           So this is being built into our succession planning  
16   and development planning approach for project managers.

17           MS. BLANCHARD: So is this new and experienced  
18   director, was that person already an OPG employee?

19           MR. REINER: That person was not an OPG employee, is  
20   now an OPG employee. It is one of the changes that were  
21   made that I think was identified.

22           We have a couple of others that were OPG employees.  
23   OPG had seconded a couple of individuals to Atomic Energy  
24   of Canada for the Point Lepreau refurbishment. Those folks  
25   are back on the refurbishment project, and they have taken  
26   on senior roles on the project, so we are making direct use  
27   of the experience that they gained there. And they were --  
28   they were former OPG employees, and we just ran them

1 through a development process.

2 MS. BLANCHARD: So it sounds like there has been some  
3 fairly significant new hires, and has all of that happened  
4 since May of 2014?

5 MR. REINER: No, some of that happened much earlier on  
6 and would have started around -- the changes were starting  
7 to be made around mid-2013. The new person that came on to  
8 take on that senior role arrived in early 2014. I think it  
9 was around January -- it was in early 2014.

10 MR. GOULD: And I think we document not only the new  
11 VP's arrival, but also that as of the time of this report  
12 many of these changes had already been -- had been jump-  
13 started, and some of the -- some of the new things that Mr.  
14 Reiner is talking about had already begun.

15 MS. BLANCHARD: So the person that you are describing  
16 is a new vice-president?

17 MR. REINER: Yes.

18 MS. BLANCHARD: And that person replaced Bill  
19 Robinson?

20 MR. REINER: No, that person -- that person replaced  
21 the former vice-president of the projects and modifications  
22 organization, which would have -- which would have been  
23 Mike Peckham. Bill Robinson came in in May of 2013 to  
24 augment the project. He came back from retirement, spent a  
25 year with us to help the project, and he came in to oversee  
26 the project, so that was a change that was made at the CEO,  
27 board level.

28 MS. BLANCHARD: Okay. I am going to switch gears a

1 little bit and go to page 8 of the Modus report. So one of  
2 the significant issues that's been flagged here at the  
3 second-last paragraph on page 8 is that the lack of  
4 accurate reporting deprived senior management and the board  
5 the option of revisiting the original BCS analysis in order  
6 to determine if building a new AHS facility continues to be  
7 the preferred option.

8 And that's particularly true in light of the fact that  
9 there were three competing options to building the AHS that  
10 were priced at less than 50 million.

11 So one question is, have these other options been  
12 reconsidered, or were they reconsidered after this report  
13 was produced?

14 MR. GOULD: So you accurately summarized what -- or  
15 you accurately stated what's in the report, so we were just  
16 highlighting that as a red flag to OPG that they do need to  
17 revisit that, so in the updated BCS that was provided as  
18 part of the board materials for the approval of this  
19 project, I believe that those issues were reinvestigated.

20 MR. ROSE: I am sorry, I am having a tough time  
21 following you. You said page 8 of which report?

22 MS. BLANCHARD: Of the May report, I apologize.

23 MR. ROSE: And which paragraph are you referring to?

24 MS. BLANCHARD: It's, I guess the third from the  
25 bottom. There is some redacted language, and just above  
26 that there is a discussion about options that were priced  
27 -- or options to building the auxiliary heating system.

28 MR. ROSE: And, sorry, can you repeat your question

1 specifically? Now I found the place I can understand the  
2 context.

3 MS. BLANCHARD: The question was whether those options  
4 had been reconsidered by the board as recommended by the  
5 report in May.

6 MR. ROSE: Yes, so we would have -- in updating our  
7 business case we would have done an assessment of the  
8 options still available and considered whether a  
9 refurbishment of the existing construction boiler house was  
10 or was not an option. That would have been considered in  
11 that business case. The conclusion is it is not an option  
12 because of the size requirement of the new boiler house.

13 I know I took an undertaking yesterday to provide the  
14 latest copy of that, and you will see that analysis in that  
15 business case.

16 MS. BLANCHARD: Thank you. And so what would have  
17 triggered the recommendation to reconsider those options  
18 was the variance from the original budget estimate?

19 MR. GOULD: That's correct, and what we are saying  
20 here is they had to go back to the board with revised  
21 business case, so they needed to go back and re-examine all  
22 alternatives, that it would be prudent on OPG's part to re-  
23 examine all alternatives going forward from that point, and  
24 as Mr. Rose just stated, they did do that.

25 MS. BLANCHARD: Okay. And so what kind of variance  
26 acts as a trigger? Is it a variance that's above the bands  
27 described in your various class estimates or, you know, is  
28 there some kind of red line where this obligation or

1 recommendation to reconsider is triggered?

2 MR. GOULD: Well, let me just state my own belief  
3 about this. Mr. Reiner may have a different one. If you  
4 have gone to the board for approval and you need to go back  
5 to the board for additional funds, you need to re-examine  
6 the basis by which you are asking for additional funds.

7 So I don't know that there is a dollar amount that I  
8 would put on that, but if you had to go back and ask for  
9 more money, you probably should go with justification for  
10 why you are asking for it.

11 MS. BLANCHARD: And that would include reconsidering  
12 options that would require, for example, cancelling  
13 contracts?

14 MR. GOULD: It could, if that was the most prudent  
15 course at that time.

16 MR. ROSE: To elaborate on that point, you asked what  
17 the threshold is. For the business cases that we take to  
18 the board -- we are talking about the individual project  
19 business cases like the auxiliary heating system or the  
20 heavy-water storage -- anytime the variance is greater than  
21 10 percent of the amount of the business case, we re-  
22 evaluate that business case and for incremental funding we  
23 would have to go back to our board.

24 We sometimes, as I talked to yesterday, that we have  
25 funding that was released in November of 2013 at the  
26 program level, and then we have individual business cases  
27 for the facility and infrastructure projects, so sometimes  
28 we are going to the board and we are providing them an

1 update on the cost estimate, and the funding may already be  
2 released in our overall program, it's just a discussion of  
3 the allocation of that funding that's in there. There are  
4 other times where we may require incremental funding.

5 MS. BLANCHARD: Would there be any other triggers for  
6 this kind of reconsideration other than a variance in cost  
7 of 10 percent?

8 MR. REINER: I suppose, hypothetically speaking, if  
9 you got into some -- I mean, ultimately the issues would  
10 manifest themselves in costs, but if you got into some  
11 technical complexity that just had you realize that what  
12 you are constructing is just not going to work, but the end  
13 result in that would be, you know, would come back to a  
14 cost impact.

15 MS. BLANCHARD: Okay. So Mr. Shepherd had asked for -  
16 - I guess, Mr. Shepherd, you originally asked for a copy of  
17 the agreement with SNC-Lavalin Aecon, and the suggestion  
18 was that a summary would be provided, and then later in the  
19 day there was some discussion about termination for  
20 convenience clauses, and it seems to me that it would be  
21 useful if those clauses could be produced specifically.

22 So I would like to add to that undertaking and say we  
23 would like the summary, but we would like to specifically  
24 see the termination for convenience clauses.

25 MR. SHEPHERD: Let me just step in. I'd like you to  
26 make that a separate undertaking.

27 MR. KEIZER: For, sorry, sorry, what was that, Jay?

28 MR. SHEPHERD: I don't want that added to mine. I am



1 happy with mine as it stands.

2 MS. BLANCHARD: Okay. So I'd like a separate  
3 undertaking to receive a copy of the termination for  
4 convenience clauses contained in the agreement with SNC-  
5 Lavalin and Aecon.

6 MR. KEIZER: Can we actually -- well, it's 11. Could  
7 we actually -- maybe if I have a chance to discuss it with  
8 the panel over the break, and then I could come back.

9 MS. BLANCHARD: Sure. And I actually have a related  
10 request, which is that I would also like to see those  
11 provisions of the contract which tie the contractor to  
12 scheduling estimates, if those are in the contract, if  
13 there are specific provisions of the contract that transfer  
14 scheduling risk to the contractor.

15 MR. KEIZER: We will include that in the same  
16 discussion.

17 MS. BLANCHARD: Thank you.

18 MR. MILLAR: We should take a break. Ms. Blanchard,  
19 how are you doing for time? You are almost at 40 minutes  
20 now.

21 MS. BLANCHARD: I had one last question and it's  
22 probably short.

23 MR. MILLAR: Why don't we do the last question? And  
24 then we may not have to return to Ms. Blanchard after the  
25 break.

26 MS. BLANCHARD: So the last question is in your update  
27 you mentioned that your September filing contained an  
28 endorsement of OPG's commercial and contracting model by

1 Concentric Energy Advisors.

2 And one question I had was: Did Concentric get an  
3 opportunity to review Modus's report?

4 MR. REINER: Yes, they did review Modus's reports.

5 MS. BLANCHARD: So they reviewed them in September  
6 before they submitted the 2013 report? They reviewed the  
7 August Modus report?

8 MR. REINER: We had Concentric review, just recently,  
9 all of the Modus reports to see if that would change their  
10 views on the approach being taken by OPG management.

11 MR. KEIZER: Sorry, just to clarify, though, my  
12 understanding, as well, is that they did see the Modus  
13 reports prior to rendering their opinion as of December  
14 31st, 2013.

15 MS. BLANCHARD: Thank you.

16 MR. SHEPHERD: Can I just ask a follow-up to that  
17 before you take the break?

18 So are we going to get an update from Concentric on  
19 their review of the contracting strategy?

20 MR. KEIZER: We are going to make Mr. Reid available  
21 for you to cross-examine.

22 MR. SHEPHERD: Well, if he has new information, I  
23 think we need to see that in advance of his evidence.

24 MR. KEIZER: My understanding is he does not have any  
25 new information to provide.

26 MR. SHEPHERD: Well, he has read the Modus reports  
27 now.

28 MR. KEIZER: My understanding is that his opinion has

1 not changed as a result of reading the Modus reports.

2 MR. SHEPHERD: Why isn't he here today?

3 MR. KEIZER: We assumed that, quite frankly, he was  
4 self-contained in his own opinions, and so it wasn't  
5 related directly to the update.

6 MR. SHEPHERD: Okay. Thanks.

7 MR. MILLAR: Let's take our break. We are running  
8 behind schedule, so can we come back -- I guess we better  
9 make it 11:20.

10 --- Recess taken at 11:03 a.m.

11 --- On resuming at 11:23 a.m.

12 MR. MILLAR: Okay. Welcome back, everyone. We will  
13 get started again.

14 We are now moving to Mr. Battista, who I think has the  
15 last questions that will go on the public version, and --

16 MR. KEIZER: Sorry, Mr. Millar, can we, though, before  
17 -- when we break for lunch, because I am assuming that we  
18 are going to go through to the lunch hour, just before we  
19 break, maybe I could take five minutes and just update  
20 people on where we are with GEC's undertaking request.

21 MR. MILLAR: Did you want to do that now?

22 MR. POCH: Let's do it now. Let's do it now. It's  
23 fresh in our hands.

24 MR. KEIZER: Yes, because otherwise...

25 So I think where we're at is, I -- and hopefully I can  
26 summarize this correctly, and I am sure that regulatory  
27 affairs from OPG will jump in and advise me if I have got  
28 it wrong -- that Mr. Poch asked us to do a calculation to

1 see what the impact would be of taking, let's say  
2 \$20 billion, spreading that over the various work packages,  
3 and what implications it would be in terms of contractor  
4 responsibility or OPG responsibility or otherwise.

5 Our view is that -- OPG's view is that to take the  
6 20 billion is not a number we feel comfortable with,  
7 because we think it's an unrealistic one, but what we have  
8 in terms of trying to do to satisfy Mr. Poch's request is  
9 to put him in a position where he can calculate or  
10 extrapolate whatever scenario he wishes to do so.

11 And so what we would like to try to do is effectively,  
12 for the various work packages, to be able to identify what  
13 percentage is fixed cost, identify on a dollar basis, you  
14 know, for every dollar below the target price, this is the  
15 implication, and for every dollar above the target price,  
16 this is the implication; and that then he would be in a  
17 position to be able to extrapolate as to the consequences  
18 of whatever number of excess above the 10 billion that we  
19 are currently discussing.

20 So what we are attempting to do is put together that,  
21 and I have had a discussion with Mr. Poch, but I will allow  
22 him to speak for himself in terms of his feeling with  
23 respect to that.

24 MR. POCH: Well, I don't see the problem with running  
25 hard numbers, but if that's OPG's preference, that's fine,  
26 we can try that, and in the end I will probably run some  
27 numbers and then put those to OPG witnesses in the main  
28 proceeding just for them to confirm the math. I just don't

1 want us to spend time in front of the Board doing math, but  
2 that's fine.

3 And perhaps in the next few days as they do that we  
4 will stay in touch and make sure that we can avoid any  
5 prolonged discussion before the Board later.

6 MR. KEIZER: That would be fine, sure.

7 MR. MILLAR: So this was the --

8 MR. POCH: JT3.17.

9 MR. MILLAR: That's right. Okay. So is everybody  
10 happy?

11 MR. POCH: For now.

12 MR. KEIZER: Under the circumstances, yes.

13 MR. MILLAR: Okay. So we will move to Mr. Battista  
14 now. When he is finished we will have to go in camera, so  
15 we will take a very short break to set that up, but for now  
16 Mr. Battista.

17 **QUESTIONS BY MR. BATTISTA:**

18 MR. BATTISTA: Yeah, I shouldn't be very long. Some  
19 of my questions are really points in clarification.

20 In the material in the updated evidence, two terms are  
21 used interchangeably: "Campus-plan projects" and  
22 "facilities infrastructure projects". The latter is often  
23 mentioned in the original evidence. The Modus report talks  
24 about the campus plan.

25 So that things are clear going forward, can we assume  
26 that they are exactly the same, or do they differ? And if  
27 they differ, just identify what projects are excluded from  
28 that one generic statement versus the other? Not to take

1 up time now, if it's -- the answer is the same you can say  
2 so. If it's not the same you can undertake to show where  
3 projects are included or projects are excluded through  
4 undertaking.

5 MR. ROSE: So the facilities and infrastructure  
6 projects and the campus-plan projects are the same  
7 projects.

8 MR. BATTISTA: So when we see those words we don't  
9 have to worry about --

10 MR. ROSE: That is correct.

11 MR. BATTISTA: Okay. Thank you.

12 The other thing I just would like clarified, I guess,  
13 going forward, because today when we have been talking  
14 about business -- the cost estimates, we have been using  
15 business-case summary dates. Now we are all talking about  
16 4B, 4C, 4D. It gets a bit confusing.

17 Just to confirm, is 4B the July 2009 business-case  
18 summary?

19 MR. ROSE: 4B would be our November 2012 --

20 MR. BATTISTA: November 2012?

21 MR. ROSE: -- business case, which was filed in the  
22 original evidence. We go to our board annually, so release  
23 4C went to our board of directors in November 2013, and we  
24 filed that in impact statement number 1.

25 MR. BATTISTA: Right. And then 4D would be November  
26 '14.

27 MR. ROSE: 4D would be November 2014.

28 MR. BATTISTA: Okay. So they are annual events.

1           MR. ROSE: That's correct. Until we get to RQE, which  
2 will be --

3           MR. BATTISTA: October.

4           MR. ROSE: -- October 2015. RQE, that will be release  
5 5, and it will cover the first unit.

6           MR. BATTISTA: That's release 5. Okay.

7           And then mention has been made that, in August, OPG's  
8 management will be going to its board of directors with a  
9 report or a cost estimate. What exactly will be the  
10 content of that?

11          MR. ROSE: So at the program level on the annual  
12 programs we provide the board of directors our latest  
13 information on each of the projects, including the --  
14 generally the estimate for the BCSs that went before the  
15 board in that year.

16          So when we go -- so in release 4C, in November 2013,  
17 the estimate for the heavy water would have been equal to  
18 the business case that went to the board in that year.

19          We will update the business case for the heavy-water  
20 storage facility in August of 2014 and provide the board  
21 with a new estimate for that project and also discuss the  
22 impact on the overall program and the current release that  
23 we have that we are working with within -- that was  
24 released under 4C.

25          MR. BATTISTA: So there will be no amendment to or  
26 adjustment to the 4D or November 2014 business-case summary  
27 for the whole project?

28          MR. ROSE: 4D? Will we --

1 MR. BATTISTA: Sorry, 4C. Sorry --

2 MR. ROSE: 4C; that is correct. 4D will reflect the  
3 best information that we have at that point in time.

4 MR. BATTISTA: Right. But in August it is just the  
5 heavy-water unit.

6 MR. ROSE: That is correct.

7 MR. BATTISTA: Okay. Thanks.

8 Okay. I understand that the contract with Burns and  
9 McDonnell/Modus was awarded in February 2013. Now, when  
10 did the request for proposal for that contract go out?

11 MR. GOULD: Best as I recall, the request for proposal  
12 went out in the summer of 2012. I can't remember the exact  
13 date.

14 MR. REINER: If you require, we can get you an exact  
15 date as to when that was issued.

16 MR. BATTISTA: Okay. And was that described in the  
17 evidence that was filed in the fall?

18 MR. GOULD: Our response was in the fall.

19 MR. BATTISTA: No, I meant in --

20 MR. GOULD: Oh, I'm sorry.

21 MR. BATTISTA: -- the OPG evidence filed in the fall.

22 MR. KEIZER: I don't believe so.

23 MR. REINER: I don't believe we touched on the Modus  
24 arrangement or the process for engaging Modus.

25 MR. BATTISTA: Okay. I guess you didn't think it was  
26 material to the case?

27 MR. REINER: I guess, just a clarification, the  
28 evidence that we did file in the fall included a program



1 assurance plan. That assurance plan does identify Modus  
2 and external oversight and the model that the project has  
3 employed.

4 MR. BATTISTA: Okay.

5 **QUESTIONS BY MR. SHEPHERD:**

6 MR. SHEPHERD: Can I just ask a follow-up question,  
7 Richard? You had the original Modus report before you  
8 filed your application; right?

9 MR. REINER: The -- Modus provides a report -- Modus  
10 provided their first report to the board in August of 2013.

11 MR. GOULD: Yes.

12 MR. REINER: And provides a report at each nuclear  
13 oversight committee meeting.

14 MR. SHEPHERD: Right. So you had their initial --  
15 what they call their initial project assessment report  
16 before you filed your application?

17 MR. REINER: It -- the timing for the filing of the  
18 application -- I think we filed in very early September,  
19 late September. The board review would have been around  
20 August. I think we had it in hand, yes.

21 MR. SHEPHERD: Okay. The reason I am asking that is  
22 because the initial assessment report does specifically  
23 talk about your contracting strategies. and I would have  
24 thought that was relevant if you were asking for approval  
25 of your contracting strategies. I don't know why you  
26 wouldn't have included it at least at some point.

27 MR. REINER: Yeah, we had contemplated including, and  
28 have done so in the update, the concentric reviews of the

1 contracting strategy, but fair point.

2 MR. SHEPHERD: Thanks.

3 **QUESTIONS BY MR. BATTISTA:**

4 MR. BATTISTA: Okay. Thank you. In the update, D2,  
5 tab 2, schedule 2, at page 3 and at page 8, it's mentioned  
6 that concerns were identified by OPG regarding the heavy  
7 water storage and the HSS projects, and Modus was asked to  
8 come in and review that.

9 I guess just quickly, what were the nature of the  
10 concerns, and when were they initially communicated to  
11 Modus for investigation?

12 MR. REINER: So the nature of the concerns were  
13 related to the schedules and the difficulties that were  
14 being encountered by both the contractor and the project  
15 management team in developing the schedules, and also the  
16 cost estimates.

17 So those were issues that were becoming apparent to  
18 management, and therefore OPG had asked Modus to do a  
19 specific deep dive into the campus plan projects.

20 MR. BATTISTA: And what was the timing of that as to  
21 when you -- management became aware: We got a problem, and  
22 calling -- adding it to the Modus contract, so to speak, to  
23 investigate? What was the timing of that?

24 MR. GOULD: First quarter of 2014.

25 MR. BATTISTA: So management didn't have concern --  
26 wasn't aware of these problems until January 1st, no  
27 earlier than January 1st, 2014? Or...

28 MR. REINER: We always provide and look at updates in

1 schedules and forecasts and project status, so there was an  
2 awareness that the projects were having difficulty.

3 The kind of root cause that we asked Modus to do that  
4 started to look at what are the underlying issues that are  
5 contributing to these problems, the Modus report certainly  
6 provided insights into that.

7 MR. BATTISTA: Were you aware of that before your 4C  
8 business case summary in November 2013?

9 MR. ROSE: The 4C business case summary reflected the  
10 latest estimate that we had for both projects.

11 MR. BATTISTA: Right?

12 MR. ROSE: Which did not include any cost growth, so  
13 we were not aware of any cost growth. We were aware of  
14 some early slippages on schedule, and we were assessing the  
15 impact of the schedule and its impact on the in-service  
16 dates. The latest in-service dates, to our knowledge at  
17 that point in time, would have been included in the release  
18 4C.

19 MR. BATTISTA: Right. So the concerns that prompted  
20 calling Modus in weren't strong enough or material enough  
21 for you to flag it in your report to your board of  
22 directors in November?

23 MR. REINER: The magnitude of the cost increases were  
24 not understood at that point.

25 MR. BATTISTA: So it became apparent between November  
26 and early January?

27 MR. REINER: The -- yeah.

28 MR. BATTISTA: Okay. I would like to take you to page

1 9 of Exhibit D2, tab 2, schedule 2, the third paragraph.  
2 And it explains, I guess, the reasoning for the problems  
3 with the projects and modifications.

4 And I was wondering, did OPG senior management view  
5 the campus plan or the infrastructure projects as a minor  
6 maintenance or modification type of activity? Which was  
7 the -- you know, that's the kind of work that modifications  
8 was good at, so to speak.

9 MR. REINER: Yes. I mean, we didn't -- we viewed them  
10 as projects that projects and modifications could execute.

11 I mean, they are different and were recognized as  
12 different than minor modifications from the outset, because  
13 they are largely buildings and facilities versus systems.

14 But we had embarked on a strategy to utilize the  
15 projects and modifications organization on these  
16 prerequisite projects, and then to continue to use that  
17 organization to manage the balance of plant projects in  
18 refurbishment. So this was sort of a ramp-up to prepare  
19 that organization to execute those projects.

20 So we did view it as something that was manageable by  
21 projects and modifications.

22 MR. BATTISTA: Right. I think yesterday you mentioned  
23 that heavy water storage, comparatively, is more  
24 complicated than re-tubing, because there has been a lot of  
25 history and a lot of sites on re-tubing, but this is one of  
26 the first heavy water storage initiatives.

27 So I was wondering if -- since you knew that, why  
28 would you give a maintenance kind of group the

1 responsibility for something that was so novel and so new?

2 MR. REINER: I mean, initially when we embarked on the  
3 project and what we had understood at the time, it was  
4 heavy water storage only, which -- you know, the complexity  
5 arose as the needs were understood and as the integration  
6 to the tritium removal facility was understood and all of  
7 the sort of life-cycle management-type improvements that  
8 were also being made to the tritium removal facility as  
9 part of this.

10 So as we understood what the scope of work was and the  
11 complexity that was actually inherent in that scope of  
12 work, that is when we recognized that the projects and  
13 modifications organization wasn't equipped with the tools  
14 that they currently had to be able to manage that.

15 Now, that's not to say that, you know, therefore this  
16 organization should not be used. That gets back to the  
17 kinds of changes that we have implemented: augment the team  
18 with more expertise, make changes to processes, enhance the  
19 reporting, apply earned value management techniques.

20 So those changes were being implemented to support  
21 that effort.

22 MR. ROSE: I think it's worth it to clarify, though,  
23 your characterization of the projects and modifications  
24 organization as just being a group that did maintenance  
25 projects is not -- I don't see that as the proper  
26 clarification and how we term maintenance to be. The  
27 projects and modifications does support what we call  
28 maintenance overflow work in our outages, but they also do

1 modification work on nuclear systems, and they have in the  
2 past done some facility projects within our fleet.

3 So it wasn't that they -- this was taking them out  
4 into a paradigm that they have never done. We had  
5 experiences with them. I think that the paradigm was the  
6 EPC model approach was relatively new, and then the  
7 complexity of the D20 with relation to the design, the  
8 seismic requirements, et cetera was what complicated the  
9 project.

10 So it wasn't that we went in blindly, giving them  
11 something that they had never -- you know, making that type  
12 of a leap.

13 MR. BATTISTA: Yeah, but it does say here:

14 "PM was chosen to manage the project since the DR  
15 team was at an early stage of being organized."

16 So it sounds like you weren't ready to do it the right  
17 way, I guess, but so that is why projects and managements  
18 got it?

19 MR. REINER: It isn't that we weren't ready to do it  
20 the right way. I think we still view this as being the  
21 right way, and there are learnings that are being built in  
22 to ensure that we can manage this appropriately.

23 The Darlington refurbishment team was really focused  
24 on getting the work, the definition phase work done by the  
25 release quality estimate, and then to ramp up its  
26 construction capability in time for breaker open on the  
27 refurbishments. So we didn't anticipate doing that kind of  
28 a ramp-up to manage construction-type work in that

1 definition phase.

2 And I believe it was the right strategy to utilize an  
3 organization that had already -- that had that capability,  
4 and then to grow that and enhance it and make sure that it  
5 can be done in an effective way.

6 MR. BATTISTA: On this area, just one last question.

7 Obviously there has been a bit of a hiccup -- well, to  
8 be, you know, kind about it. What is the financial impact,  
9 if you had gone -- if this work had been done under the DR  
10 team initially versus the maintenance team, would the  
11 overall costs related to these campus projects come in at  
12 the same amount, or at a higher amount?

13 MR. REINER: I would say the cost impact is probably  
14 pretty negligible. There were some inefficiencies, and  
15 there's some churn that obviously results in cost, but the  
16 change in estimate is a result of scope of work not being  
17 understood.

18 The difference -- the difference would have been that  
19 before an estimate was tabled the scope of work would have  
20 been understood, and the estimate we would be talking about  
21 here for D20 storage would be a \$300 million estimate, not  
22 a \$110 million estimate. That is what the difference would  
23 be.

24 It would still be part and parcel of the overall  
25 project envelope. We wouldn't change -- we wouldn't have  
26 changed the project envelope as a result of that, because  
27 it is within our abilities to manage that.

28 MR. BATTISTA: Right. So is it -- in terms of the

1 incremental costs as a result of the hiccup, though, are we  
2 talking 10 million, 50 million, 5 million?

3 MR. REINER: Again, I want to clarify "hiccup".  
4 "Hiccup" means the estimate was not right and now we are  
5 working to a correct estimate. That is the hiccup we are  
6 talking about.

7 MR. BATTISTA: So just to be clear, you are not  
8 incurring any incremental costs as a result in this switch.  
9 You had an original plan using maintenance? Now --

10 MR. REINER: There may be some inefficiencies in terms  
11 of getting the engineering -- the interaction with  
12 engineering set up the right way and making sure the  
13 reviews get done in flight and we can cut time out of  
14 review cycles, but we are not talking about many millions  
15 of dollars. We are talking small numbers.

16 The change is the scope of work, is the actual  
17 physical work. What would not have changed is the seismic  
18 design requirement, which added a significant complexity,  
19 or the tritium-removal requirements in that facility, which  
20 added complexity. That would not have changed.

21 MR. BATTISTA: So ballpark, less than 5 million?

22 MR. REINER: I would say, yes, you know, just ballpark  
23 off the top, definitely less than 5 million.

24 MR. BATTISTA: Then I would like to take you to  
25 attachment 1 of the Modus report, so that's the June 26th  
26 item. On page 7, on the table, the last event, second-  
27 quarter 2014, says:

28 "Revised BCSs, business case summaries, presented



1 to the board of directors for approval."

2 When were these provided to the board of directors?

3 Like, in just this past -- which month? Was it in June or  
4 May?

5 MR. ROSE: It was provided to the board of directors  
6 in May.

7 MR. BATTISTA: This was May. Okay. And this is just  
8 relating to those subsets of the campus-plan project;  
9 right?

10 MR. ROSE: So each of our projects have a different  
11 schedule of going to our gate review boards and then our  
12 board of directors. These three were the only ones that  
13 went to the board of directors in May 2014.

14 MR. BATTISTA: Okay. And I would like to take you to  
15 Exhibit D2, tab 2, schedule 2, page 6. In the table for  
16 the heavy-water storage facility, the original dollars and  
17 schedule as filed show April 15th and an amount of  
18 83 million going into the in-service, and then it was  
19 updated in February, still in-service in '15, and then  
20 based on the updated evidence that we received a few days  
21 ago the in-service becomes 19 -- January 2017.

22 I was wondering why there are still amounts going into  
23 service, let's say, for '14 and '15? Like, what part of  
24 the storage facility is going to be used and useful?

25 MR. ROSE: So there are -- and I know we discussed  
26 this yesterday, and it will be -- we will include this in  
27 the undertaking JT3.5, but it is related to buried  
28 services. So the location that the heavy-water storage

1 facility is going, there is buried services, operating  
2 services, today that needed to be relocated, so those  
3 services will be going into service, so we will be  
4 relocating, and they will be used and useful by operations  
5 immediately upon completion of those work programs.

6 MR. BATTISTA: And as discussed yesterday, the revenue  
7 requirement currently being proposed by OPG assumes  
8 \$83 million of rate base in the storage facility, and the  
9 new plan is for 15 million, because things are going to be  
10 moved forward and the project is going to almost double in  
11 cost, and I appreciate the methodological approach about  
12 materiality and impact on revenue requirement, but it is  
13 the case that right now in our cost-of-service application  
14 there is 83 million for the storage facility when only 15-  
15 is going into rate base, planned to go into rate base,  
16 truly in 2014.

17 Okay. So that concludes my questions.

18 MR. MILLAR: Thank you, Mr. Battista.

19 We are going to go in camera now, so we will just take  
20 a couple of minutes to get everything set up.

21 --- On commencing in camera at 11:52 a.m.

22 MR. MILLAR: Okay. We are ready to continue.  
23 Everyone in the room is either with staff, OPG, or has  
24 signed the undertaking.

25 Mr. -- oh, I'm sorry, Mr. Poch, you are going to  
26 begin.

27 MR. POCH: Yes, thank you very much.

28 **QUESTIONS BY MR. POCH:**

1           Gentlemen, when I left off with you last day, I think  
2   the last thing we touched on was the turbine control sub-  
3   project, which you indicated had been taken out of the  
4   Darlington refurbishment capital costs, would be dealt with  
5   in the future, would presumably therefore still be in the  
6   LUEC, but was part of the 179 that came out.

7           Can you turn to the August 13th report at page 19.  
8   And there, just under the graphic, it says:

9                   "The turbine generator scope grew by 287 million  
10                   or 484 percent due to the addition of the turbine  
11                   controls system and general scope finalization."

12          So I just wanted to get a -- is the difference between  
13   the 287 and the -- whatever part of the -- first of all,  
14   what part of the 179 was the turbine control deferral? And  
15   then can you confirm to me the difference between the 287  
16   and that is because this escalation had yet to be built  
17   into the 10 billion, so it will also be dealt with in the  
18   future?

19          MR. ROSE: My recollection of the turbine generator  
20   control system costs that were excluded and removed as part  
21   of the blue ribbon was approximately \$30 million for Unit 2  
22   only. We -- and that's for the execution costs on Unit 2,  
23   again, \$30 million, subject to check, but I know that's the  
24   ballpark.

25          And the other three units, the costs for the other  
26   three units as well as the design for the turbine controls,  
27   remains within our base estimate.

28          MR. POCH: Okay. So it's only the unit -- so why

1 would you defer Unit 2 and not defer the other out of the  
2 Darlington project costs?

3 MR. REINER: There's a couple of factors that weigh  
4 into the decision for deferral.

5 There is still useful life left in the existing  
6 control system on Unit 2. Unit 2 is coming down prior to  
7 really reaching end of life of that equipment, so that's  
8 one factor that weighed in. So time value for money.

9 Another factor that weighed in is we did make also a  
10 conscious risk mitigation decision by deferring that  
11 particular upgrade in the first unit refurbishment. From a  
12 project perspective, it's a good risk mitigation measure.

13 There have been complex -- there have been challenges  
14 encountered by each of the other refurbishments that have  
15 taken place that have done turbine generator control system  
16 upgrades. The burn-in periods are longer than initially  
17 anticipated. We wanted to have the opportunity to  
18 understand the design, do simulator testing, and really be  
19 in a position to focus -- to focus on that particular  
20 upgrade and dealing with it separate, outside of the first  
21 unit refurbishment.

22 MR. POCH: All right. So this is really an example of  
23 getting it out of the critical path because it has a lot of  
24 uncertainties --

25 MR. REINER: Because it's got uncertainties. And it  
26 shows up on critical path at unit start-up, typically.

27 MR. POCH: Okay. Can we turn to the November 12th  
28 attachment B? That was the spreadsheet that was talked

1 about at the outset this morning.

2 And can we just identify -- are the campus projects  
3 synonymous with the box there that says, I guess, "Included  
4 CS projects"? I am sorry, just the "F&IP CS projects."

5 MR. ROSE: So the campus plan projects encompass the  
6 "Infrastructure projects" line under the -- it says "DPP  
7 EPC," top quadrant of this table. Refurbishment in-  
8 station.

9 It also includes facility and infrastructure projects,  
10 CR projects, "CR" meaning core refurbishment projects,  
11 projects that are necessary for the refurbishment outage.

12 MR. POCH: Where is that, sorry?

13 MR. ROSE: Just about a third down the page. It is  
14 titled "Facilities and infrastructure projects, CR  
15 projects."

16 MR. POCH: Yes. So all of that section?

17 MR. ROSE: That one line.

18 MR. POCH: Oh, just the one line -- oh, I am sorry,  
19 yes.

20 MR. ROSE: Yes. And the F&IP CS projects near the  
21 bottom.

22 MR. POCH: Right. Where there are four lines?

23 MR. ROSE: And I am going to correct myself. The  
24 infrastructure projects refurbishment in-station are not  
25 considered campus plan facility infrastructure projects;  
26 these are projects that are being done as part of our  
27 shutdown and lay-up project, sorry. I am thinking of the  
28 project manager. I couldn't get to the name of the project

1 The shutdown and lay-up component.

2 So the facility and infrastructure projects that we  
3 were referring to are spread on these two lines, "facility  
4 and infrastructure projects, CR" and "facility and  
5 infrastructure projects, CS," "CR" meaning needed for  
6 refurbishment, "CS" meaning in support of extended station  
7 life.

8 MR. POCH: Okay. Thank you. Turning to the May 13th  
9 report, and attachment C, right at the back of your bundle,  
10 page 1 of that attachment, there is an indication there in  
11 the bottom box that with the exception of phase 1  
12 engineering design and award, long-lead procurement, which  
13 was contracted on a fixed-price basis -- so this is  
14 referring to the D2O storage and drum handling.

15 I am just trying to get a fix. You have indicated  
16 roughly 270 million overrun on your campus projects, a lot  
17 of it having to do with D2O. And then this indicates that  
18 some of this was -- some of the engineering was on a fixed-  
19 price basis.

20 Have there been, to your knowledge, cost overruns on  
21 the fixed-price portion that aren't showing up in your 270,  
22 because your contractors are eating that?

23 MR. ROSE: Not to my knowledge. The fixed-price  
24 engineering is the fixed-price engineering. If there is  
25 additional engineering required through the scoping, that  
26 would be added on. But no, I don't believe there would be  
27 any expenditures beyond the fixed-price amount.

28 MR. POCH: Okay. And just while we are here, on the next

1 page, on page 2, in the first block there, "[redacted] labour  
2 material rentals," where there is, at least in percentage  
3 terms, a very high cost run-up of 535 percent, was any of  
4 that fixed? Or is that all -- was that all target pricing  
5 cost-reimbursable?

6 MR. ROSE: We believe that was all target price cost-  
7 reimbursable.

8 MR. POCH: Okay. And overleaf on page 3 -- not to  
9 argue the motion about what should be confidential or not -  
10 - I am just trying to understand, first of all, you give  
11 these numbers in -- boxed in red, the increase from 3,000  
12 meters of piping to 14,000 metres, for example.

13 Why is that confidential? I don't want to get into an  
14 argument about this. I am just trying to wrap my head  
15 around what the concern there is.

16 MR. ROSE: So I will just tell you the general basis  
17 for our redactions were based on commercial harm and/or  
18 harm to the vendor relationships that we have. So where  
19 there was a clear deficiency in the vendor's performance or  
20 information that would put us at a commercial disadvantage  
21 for -- we redacted.

22 This was probably under the guise of performance,  
23 vendor performance.

24 MR. POCH: All right. So this would have been -- your  
25 assumption here is that this was indicative -- this was due  
26 to the contractor just not appreciating what needed to get  
27 done, and so they underestimated?

28 MR. ROSE: The contractor not appreciating the

1 complexity of the scope of this project at the time that  
2 they submitted their bid.

3 MR. POCH: Okay. Going to the June 26th report at  
4 page 10, I think this was just touched on earlier, but you  
5 indicated you couldn't answer in open session. There was a  
6 box there where you refer to gaps in complying with the  
7 LTEP.

8 And I am wondering if -- Mr. Gould, I think it was you  
9 -- if you can just elaborate on that now.

10 MR. GOULD: So this was a major topic of discussion  
11 for our report from November of 2013. So perhaps it would  
12 be better to discuss it in the context of that report  
13 rather than --

14 MR. POCH: Whatever you can --

15 MR. GOULD: This is a summary of -- a very high-level  
16 summary of that report.

17 MR. POCH: Fine.

18 MR. GOULD: So if you want to go to that document,  
19 it's the --

20 MR. POCH: Yes, fourth-quarter 2013 report?

21 MR. GOULD: I'm sorry, it's the first-quarter 2014.

22 MR. POCH: All right. So that's the August -- I'm  
23 sorry, let's go to 2014.

24 MR. GOULD: March 4th, 2014.

25 MR. POCH: Yes.

26 MR. GOULD: So beginning on page 3, there is a table,  
27 so first we discuss -- we discuss the approach that we took  
28 in the second paragraph of this report, where we looked at



1 the principles set forth in the Long-Term Energy Plan and  
2 looked at ways of -- ways in which OPG was in compliance,  
3 and we also identify ways for strengthening OPG's planning  
4 for completion of the release quality estimate related to  
5 that.

6 So we -- in -- from pages 3 through 7 of this report  
7 we go through each of the relevant pieces of the Long-Term  
8 Energy Plan and our assessment of the project's compliance  
9 with that plan.

10 MR. POCH: Okay. So the gaps then that you in your  
11 cover report, you just mention the word "gaps", are the  
12 ones where you have actually said potential gaps in the  
13 various boxes here? Is that what you are referring to?

14 MR. GOULD: That's correct.

15 MR. POCH: Okay. We will come back to that in a  
16 minute, I think.

17 August 13th report at page 4.

18 MR. GOULD: So I should put this one aside for now?

19 MR. POCH: Yes, sorry to jump around. It's just, this  
20 way I won't lose track.

21 MR. GOULD: Page 24, you said?

22 MR. POCH: Page 4.

23 MR. GOULD: Page 4.

24 MR. POCH: And I just wanted to make sure I understand  
25 what numbers we are working with here.

26 The point-estimate numbers you recite there, there's  
27 the 2009 point estimate of 7.7 billion and change, and then  
28 2012 third-quarter of 9.273 billion.

1           How does that compare to the point estimate? Can we  
2 just -- sorry, Mr. Reiner, I imagine this is for you. I  
3 thought the point estimate now associated with the  
4 10 billion number was less than that. Am I wrong?

5           MR. REINER: The point estimate is in the business  
6 case that was filed as attachment 5 in D2-2-1 --

7           MR. POCH: Yeah, just from memory I recall it was  
8 around 7.5.

9           MR. REINER: No, no, it's in that same range. I think  
10 it's --

11          MR. POCH: Oh, okay.

12          MR. REINER: -- I think it's pretty close to that  
13 number, actually. Let me just pull it up here --

14          MR. POCH: So by "point estimate" what do you mean?  
15 The estimate without contingencies and without --

16          MR. REINER: No, that does have contingencies  
17 included. That would be a --

18          MR. POCH: Ah.

19          MR. REINER: -- high-confidence estimate.

20          MR. POCH: Okay. I'm sorry. All right. So the only  
21 thing that's not --

22          MR. REINER: Without contingencies it would be down to  
23 the number that you were talking about --

24          MR. POCH: Okay. And so that's what was -- confusion  
25 of language here.

26          And does that number include management reserve or  
27 not?

28          MR. REINER: No, that number doesn't include

1 management reserve --

2 MR. POCH: All right. And management reserve is the  
3 difference between that and 10 billion, basically?

4 MR. REINER: Right.

5 MR. POCH: Okay. And at page 53 of this same report  
6 there is a discussion of -- at the very bottom of that page  
7 there's -- and going over the next, there is discussion of  
8 this "perfect" reference plant which is -- comes freighted  
9 with ambiguity -- your words, Mr. Gould -- and you are  
10 referring there to -- I take it from context you are  
11 referring there to the references -- the use of the  
12 experience at Wolsong on schedule management; is that  
13 right?

14 MR. GOULD: No, we are referring more generally to the  
15 use of Wolsong as a reference plant.

16 MR. POCH: Okay. And so just tell me your  
17 understanding of how Wolsong was used as a reference plant.

18 MR. GOULD: Well, I think it's explained fairly well  
19 within the context of the report. So if you want to go  
20 through any specifics, but my understanding is that Wolsong  
21 was used primarily for purposes of the class 4 estimate by  
22 the joint venture of SNC and Aecon --

23 MR. POCH: Right.

24 MR. GOULD: -- for purposes of preparing their class 4  
25 estimate.

26 MR. POCH: Right. And you are -- your concern in  
27 plain language is that they have used that in an  
28 oversimplified fashion. They haven't accounted for things

1 that went wrong at Wolsong. Is that right? Perhaps you  
2 can explain this 19 percent of it as as-built durations, so  
3 -- I am not familiar with the language there.

4 MR. GOULD: So first off, our concern was that the  
5 approach that they took to the overall development of the  
6 class 4 estimate using Wolsong as the reference plant was  
7 an attempt to, in essence, get down to the absolute perfect  
8 version of the project that was performed at Wolsong as  
9 scaled up for the size of the -- the size differential for  
10 Darlington, and that without appropriate qualification  
11 around that estimate, that it could be -- it could lead to  
12 some misunderstanding about the nature of the estimate  
13 itself.

14 MR. POCH: In other words, how realistic it is to  
15 simply apply this perfect Wolsong example.

16 MR. GOULD: That's correct.

17 MR. POCH: Okay. And can you just tell us, what are  
18 the differences which you think need to get recognized, in  
19 broad terms, between the experience at Wolsong and what was  
20 to be anticipated here that they didn't recognize? One of  
21 these things is this 19 percent figure. You can tell me  
22 what that is.

23 MR. GOULD: Let's start with that. Let's go point by  
24 point, if we can.

25 So the 19 point -- the 19 percent refers to the amount  
26 of time that -- in the review of Wolsong's as-built  
27 durations they looked at any inefficiencies that may have  
28 occurred on Wolsong and stripped that time out of the

1 Wolsong duration. It is the --

2 MR. POCH: I see.

3 MR. GOULD: So to get down to brass tacks --

4 MR. POCH: So their perfect version --

5 MR. GOULD: -- on what the unimpacted schedule for  
6 Wolsong would look like.

7 MR. POCH: All right. So they took Wolsong's schedule  
8 and said, We can do it 19 percent faster because we can  
9 eliminate some of the problems they had.

10 MR. GOULD: No, that is not what they said at all.  
11 What they --

12 MR. POCH: Okay.

13 MR. GOULD: -- said was, if you take Wolsong's  
14 schedule and take out any evidence of any inefficiency of a  
15 guy not showing up for work that day or a ship not coming  
16 in with an important part on the exact day that you need  
17 it, this is what you would get.

18 MR. POCH: Okay. And that was the wholly unrealistic  
19 -- part of the wholly unrealistic mile post that -- as you  
20 refer to it.

21 MR. GOULD: What we are saying is -- what we are  
22 saying there is that you're -- in the attempt to strip it  
23 down, you create a mile post that can be misunderstood.

24 MR. POCH: Okay. And so may I summarize it that this  
25 -- the concern that you are getting at ultimately is this  
26 has led to -- may have led to some of the -- some  
27 underestimation by the contractors, and hence you're  
28 advising OPG to exercise more oversight to correct for

1 that? Is that --

2 MR. GOULD: No, I wouldn't say that at all, sir.

3 MR. POCH: Why is this an issue then?

4 MR. GOULD: What we were looking at is, in a more  
5 broad perspective here, as I said yesterday, OPG has hinged  
6 itself to the AACE recommendations on how to classify cost  
7 estimates. And what was done here and labelled a class 4  
8 estimate by the contractor does not neatly fit into the  
9 AACE definition of a class 4 estimate. So what we were  
10 attempting to do is to characterize the effort that was  
11 done by the contractor at class 4 for what it was, and just  
12 to call out for both the good and the bad, and in fact we  
13 say that they probably should have -- that OPG should look  
14 at this for what it is and not attempt to pigeonhole it as  
15 a class 4 estimate in the broader sense.

16 MR. POCH: Okay. All right. I notice in that same  
17 box on page 53 there is a reference to the fact that the  
18 class 5 through class 3 estimates don't include contingency  
19 amounts, and that is another example you are citing of it  
20 not following the AACE recommended procedure; correct?

21 MR. GOULD: That's correct.

22 MR. POCH: I want to ask a little bit now -- I am  
23 going to move on to some references where you talk about  
24 monetizing risk and target pricing. I assume that's  
25 related?

26 MR. GOULD: Yes.

27 MR. POCH: Let's look at the June 26th report at page  
28 13.

1 And at the bottom of the page there you say:

2 "There is ambiguity in pricing risk for the RFR  
3 target price. The contract monetizes contingency  
4 as part of the target price, not before."

5 MR. GOULD: Yes.

6 MR. POCH: And you indicate that, in "Status," that  
7 they have undertaken to -- SNC-Aecon has committed to  
8 modelling contingency in the 4D estimate, and I assume the  
9 earlier one we were talking about was the 4C estimate.

10 So I am wondering what the implications of -- in terms  
11 of the numbers that the OPG board has seen and this Board  
12 has seen, not including this monetization of contingency.

13 MR. GOULD: Let me clarify that. And perhaps Mr.  
14 Reiner or Mr. Rose would like to add on to it.

15 What the board has seen relative to this estimate is  
16 it was fully anticipated by the contract that the  
17 contingency would not be monetized until the negotiation.  
18 What they have seen up until now, including in class 5 and  
19 class 4 in the prior releases, is OPG's assessment of  
20 contingency around this project. So it's not devoid of  
21 contingency.

22 What we are saying here is to get a more refined  
23 number from the contractor, you should get -- it would be  
24 preferable to get the contingency monetized from the  
25 source.

26 MR. POCH: Okay. And then once that -- you get that  
27 contingency monetized, presumably it becomes part of a  
28 particular contractor bundle and would be -- there would be

1 a corresponding reduction or -- in OPG's broader  
2 contingency allowance; is that fair?

3 MR. ROSE: That's correct. So what happens is we have  
4 a contingency set aside for our owner's assessment of their  
5 estimate and the risks associated with that project,  
6 obviously highly informed with the ongoing conversations  
7 and relationship we have with these vendors.

8 As we get to the target price, the target price will  
9 include an amount for contingency. We'll transfer the  
10 allocatable amount and control it at the project level.

11 MR. POCH: Okay. And that -- from page 8 of your  
12 August 13 report, I take it that at that time you didn't  
13 expect SNC-Aecon to do that monetization until May 2015; is  
14 that still accurate?

15 MR. GOULD: I think what we identified here was that  
16 this is a potential gap, and in August of 2013 we raised  
17 that issue. And subsequent to that, my understanding is  
18 that Mr. Reiner and Mr. Rose would have gotten some  
19 agreement from the contractor that they will provide some  
20 input on this.

21 MR. ROSE: At the project team level, there has been a  
22 big effort in understanding what the risks are. You want  
23 to understand what the risks are early so that in the  
24 vendor's estimate they can actually put in their plan  
25 methodologies how to resolve those risks. So you are not  
26 going to ultimately need the contingency.

27 That being said, we are now going through a process of  
28 understanding that contingency and doing an analysis



1 collaboratively with the R&FR vendor, to get a much better  
2 perspective on their opinion of contingency and building  
3 that into our 4Delta estimate.

4 MR. POCH: Let me take you to two references, then, to  
5 see how that gets followed on.

6 And one is the August 13th report at page 38, where it  
7 says:

8 "Making OPG's risk register the foundation of the  
9 project contingency analysis potentially  
10 transfers quantifying risk and the exercise of  
11 estimating contingency not only away from the  
12 cost estimating function, but from the contractor  
13 to the owner. As yet, we have not had a chance  
14 to fully review how the items in the risk  
15 register are monetized and how contingency is  
16 actually calculated. The opportunity to do so  
17 will come with our vetting of the 2014 business  
18 plan budget process."

19 So I want to just tie that to what we were just  
20 talking about. Can you help me there?

21 MR. GOULD: This is a broader context than just the  
22 SNC-Aecon contract.

23 MR. POCH: Yes. I understand.

24 MR. GOULD: This is for the entire project. So what  
25 we were advising as of that time was to ensure that you are  
26 getting as much information as you go forward from the  
27 contractors in evaluating and monetizing risks as possible.

28 MR. POCH: Okay. And on page 48 it says -- at the

1 bottom it says:

2 "Once there is an agreement, the target costs  
3 with only be increased for those risks that were  
4 identified, unless the risk is an excusable  
5 event."

6 And that means identified in the risk register, I take  
7 it from if earlier sentence.

8 So it's not just a matter of getting a better fix on  
9 risk; this is the mechanism by which you are going to  
10 determine who is going to bear the risk; is that right?

11 MR. ROSE: Yeah. As part of the target price  
12 determination, the risks that are best controllable by --  
13 the risks that are best controllable by the R&FR vendor, we  
14 will allocate contingency to them and manage and control.  
15 There may be other risks associated with that project that  
16 we feel that we are in the best position to monitor and  
17 control, and/or we would rather be the party holding the  
18 contingency.

19 MR. POCH: Right. Okay. And I take it that, Mr.  
20 Gould, in your experience, the more that goes in the risk  
21 register, the higher the target price is likely to be,  
22 because the contractor is being asked to bear more risk?  
23 It's that simple?

24 MR. GOULD: In general, that could be the case, but  
25 what we have seen in the last year since we made these  
26 observations is a significant reduction in the number of  
27 risks identified within this particular contract that we  
28 are talking about.

1           MR. POCH: Leaving aside, of course, that you may have  
2 better understanding because your engineering is more  
3 complex, for example -- I understand all that. I am just  
4 saying all else being equal, the more of the risks that  
5 gets put into the risk register and therefore into the  
6 contracts, the higher you would expect the target price you  
7 can negotiate with them would be?

8           MR. GOULD: It creates ambiguity. And what I would  
9 say to that is -- and I am not trying to parse words here.  
10 I am just trying to explain.

11           What we have been looking for in our observation of  
12 the development of this risk register, in particular for  
13 the RFR contract, is the movement of what you would assume  
14 to be business as usual risk, that -- into the actual  
15 contract estimates, so that if the contractor is  
16 anticipating that they will spend that money, rather than  
17 have it lingering out there as a potential risk, let's --  
18 that should be included in its base cost estimate, as  
19 opposed to on a register, and in the event that it occurs,  
20 then it has a whole lot of transaction costs associated  
21 with it, and all other kinds of things.

22           MR. POCH: You are going to be maybe be in litigation  
23 for that matter, if it's not foreseen and --

24           MR. GOULD: Well, you would certainly want to avoid  
25 that at all costs.

26           MR. ROSE: Just let me add too from an owner's  
27 perspective, I think your point is that the vendor may be  
28 motivated to populate their risk register as high as they

1 can to drive up the target price and maximize their  
2 opportunity for incentive. I think that's maybe where you  
3 are going there.

4 We recognize that, and the effort to truly understand  
5 every single risk early, understand the ones that are  
6 included in their base cost as business as usual risks to  
7 ensure there is an additional opportunity for incremental  
8 revenues, and for the ones that are truly theirs to manage,  
9 that we want them to manage, give them the risks; the ones  
10 that are truly ours to manage, we hold that, so that it's  
11 not on the target price and give the opportunity for  
12 incremental incentive.

13 MR. POCH: Right. So the ones in the risk register --  
14 I might have had it backwards -- the ones in the risk  
15 register are the ones where the target price can rise  
16 because you control them?

17 MR. ROSE: The ones that are in the R&FR vendors' risk  
18 register would be included in their target price. So if  
19 that risk didn't come to bear, theoretically they are less  
20 than the target price. They have -- there is an incentive.

21 MR. POCH: Right. Okay.

22 MR. ROSE: The risks that we carry are not in their  
23 target price. And if they come to bear we may adjust their  
24 target price accordingly, but that is better for us to be  
25 in that control.

26 MR. POCH: Okay. Changing topics, June 26th report at  
27 page 14 says:

28 "With respect to the RFR class 3 estimate, OPG

1           needs to hold the RFR contractor accountable for  
2           meeting the required schedule dates."

3           Were you there, Mr. Gould -- just saying the schedule  
4     date you are referring to is for the production of the  
5     class 3 estimate?

6           MR. GOULD:   Yes.

7           MR. POCH:   Okay.  And do I take it then that the  
8     contract that's in place at -- now prior to the final  
9     target price contracts being secured don't have in them  
10    explicit dates for production of these estimates as we go,  
11    these refined estimates and penalties and so on, for that  
12    analysis work?

13          MR. REINER:  They do have dates, and there is a  
14    schedule currently under the -- for the work that they are  
15    currently doing in this phase of the contract.

16          MR. POCH:   So --

17          MR. REINER:  I think what Mr. Gould was identifying --  
18    so this is a little dated -- it was a huge amount of effort  
19    required to get this class 3 estimate completed.  What we  
20    saw --and as we were progressing through the development of  
21    the class 3 there were some early packages developed that  
22    gave us an opportunity to vet the methodology, but there  
23    was a big bow wave yet to come, and this was a heads-up to  
24    OPG, there's a bow wave, and you need to be cautious of the  
25    fact that a major project milestone may be missed.  Now,  
26    they did actually achieve the milestone, so this is now  
27    history.

28          MR. POCH:   Okay.  And just a couple more questions.

1 Yes. If you turn to August 13th report at page 34, there  
2 Modus observes:

3 "In our view the contracts executed to date do  
4 not present clear and unambiguous rules to hold  
5 contractors accountable in schedule development.  
6 They rely on the parties reaching mutual  
7 agreement on the schedule, which is a concept  
8 fraught with risk."

9 Et cetera.

10 What's the status of that? Have you crystallized yet  
11 -- have you crystallized schedule milestones, you know,  
12 with penalties and so on in the contracts, or is that still  
13 work to be done, negotiations still to happen?

14 MR. ROSE: There is two points here.

15 MR. GOULD: Yeah, there's -- you kind of mixed two  
16 different pieces here.

17 MR. POCH: Help me out.

18 MR. GOULD: So this section of our report deals with  
19 the fact that we believe that the contracts themselves  
20 needed to have stronger identification of the precise  
21 scheduling and project controls requirements that the --  
22 that OPG would require from their contractors.

23 So that was the basis of this comment. And my  
24 understanding -- and I will let Mr. Rose comment on this --  
25 is that because of the size and the representative value of  
26 the RFR contract, that -- and the fact that the RFR  
27 contract was very early out of the box for -- to advance  
28 the schedule for the overall project, the thought was that

1 the methodology used for the RFR contract would be the  
2 basis for all the other contracts that OPG would enter  
3 into, and thus those requirements would emanate from the  
4 development of the RFR schedule.

5 MR. ROSE: And that is correct. I mean, our -- when  
6 we went into the R&FR contract, being the lead contractor,  
7 we ended up with a partner, SNC-Lavalin, that had good  
8 experience, and some of our early observations were, let's  
9 actually understand their experience and how they have  
10 developed schedules for large construction projects and  
11 ensure that we partner that together with our needs.

12 We went through that exercise, and we have now set a  
13 scheduling standard and a common work breakdown structure  
14 that's required for all of our contractors, and it's a part  
15 of the contracts that we issue.

16 MR. POCH: So in other words, you are suggesting this  
17 concern that was at the outset has been rectified both in  
18 the particular contract for RFR with your main contract  
19 with SNC-Aecon, but also in all your other contracts you  
20 are now putting in place more explicit schedule milestones  
21 at the outset.

22 MR. ROSE: Schedule standards, NWBS. The milestones  
23 are a different part of that exercise, in accordance with  
24 the schedule standards and milestones. There was a  
25 deliverable -- a milestone deliverable from the R&FR  
26 contract that required them to submit their schedule  
27 management plan, which we had the opportunity to vet and  
28 make sure that was in accordance with our needs. We then

1 applied that methodology and how they are going to do the  
2 schedule, the adapted methodology, which included our  
3 impact into it, to all of the other contractors that  
4 come --

5 MR. POCH: Let me just ask this. By the time you get  
6 to your release quality estimates, will you actually have,  
7 not just a requirement that they provide schedules, but  
8 will you have schedules for all your contractors, for all  
9 the steps?

10 MR. REINER: Yes.

11 MR. ROSE: Absolutely, without a doubt.

12 MR. POCH: All right. Okay. And then in the May 13th  
13 report at pages 19 and 20 there is a discussion at the  
14 bottom of page 19 starting there of RFR commercial risks,  
15 and first of all, this is your most recent report, other  
16 than the cover report, which takes this into account, or  
17 was this -- I guess this is just prior to your cover --  
18 your June report, obviously, so it's May report.

19 Never mind that. It's obvious from the dates.

20 You close that discussion, Mr. Gould -- your group  
21 closes that discussion with a comment that the -- you found  
22 some reluctance on the part of OPG people to consider  
23 modifying the contracts, which you obviously feel there  
24 would be appropriate to consider.

25 Where does that stand now? Is that something that...

26 MR. REINER: Maybe I can answer that.

27 MR. POCH: Yes.

28 MR. REINER: We have launched an initiative, and this



1 is through our internal contract management organization  
2 and process, to have a look at the contract and just see if  
3 it aligns precisely with everything that we are trying to  
4 achieve. I think one of the areas that Modus has  
5 highlighted where there may be some misalignment with the  
6 LTEP principles is the incentive structure that's built  
7 into the contract, drives towards the best outcome across  
8 four units, not necessarily the best outcome on the first  
9 unit. There are unit-over-unit contractual improvements  
10 that are embedded in that contract.

11 That might put us in a position where we are  
12 misaligned with the LTEP, which says, you know, based on  
13 how well you do on the first unit we will make a decision  
14 on the second, so those are the things that we are  
15 revisiting, and we will embark in discussions with the R&FR  
16 contractor. And as we -- in terms of where we stand on  
17 that, our timing for that is, as we get into the discussion  
18 around target price we would also discuss any amendments  
19 that would need to be made to the contracts at the same  
20 time, so this would all culminate with the release quality  
21 estimate.

22 MR. POCH: Okay. But there -- in that -- in the  
23 previous sentence is they refer to things like "whether a  
24 negotiated guaranteed maximum price once engineering is  
25 complete". That would be a significant change to your  
26 target pricing approach; right?

27 MR. REINER: That would be a significant change.  
28 That's, you know, that's an observation -- I view that as

1 an observation from Modus as something to consider. We  
2 would not necessarily go down that path.

3 MR. POCH: All right. So that's still a  
4 consideration, but you are not saying -- at this point you  
5 are not ready to --

6 MR. REINER: We are not saying at this point that we  
7 would go down that path, because a guaranteed maximum  
8 price, I mean, it is obvious what that would mean. You'd  
9 pay a premium to achieve that.

10 MR. POCH: Understood.

11 MR. REINER: And we'd need to understand what that  
12 premium is and whether there is value in paying that.

13 MR. POCH: Okay. Thank you. Those are my questions.

14 MR. MILLAR: Thank you, Mr. Poch. We are getting  
15 close to a lunch break, but Mr. Crocker, you had just a  
16 couple of minutes to do. Would you like to get that in  
17 before lunch?

18 MR. CROCKER: Mr. Poch stole my thunder and asked my  
19 question. It had to do with gaps between the program plan  
20 and the Long-Term Energy Plan, and so I don't have any  
21 questions.

22 MR. MILLAR: Okay. So you have no questions?

23 Why don't we take our lunch break, then? It's 12:30.  
24 We will come back at 25 minutes to 1:00, and we will still  
25 be in camera -- I am sorry, to 2:00, not to 1:00.

26 --- Luncheon recess taken at 12:34 p.m.

27 --- On resuming at 1:38 p.m.

28 MR. MILLAR: Good afternoon, everyone. We'll get

1 started again. We are still in camera, and we will move  
2 now to Ms. Blanchard.

3 **QUESTIONS BY MS. BLANCHARD:**

4 MS. BLANCHARD: So I just have a few brief questions,  
5 and I am going to start with the update materials on  
6 page 1. So this is OPG's update on the project.

7 The first question is, there is a statement at line 6  
8 that the heavy-water storage and the auxiliary heating  
9 projects represent less than 5 percent of the total planned  
10 expenditures for the DRP, and I just wondered if you could  
11 clarify how that percentage was derived.

12 MR. ROSE: The current projection for the D2O of  
13 287 million plus the approved estimate for the auxiliary  
14 heating system, which I believe is \$85 million, totals 380-  
15 ish million dollars. It's less than 5 percent of the  
16 \$10 billion.

17 MS. BLANCHARD: Thank you.

18 MR. ROSE: You're welcome.

19 MS. BLANCHARD: My next question is on this range. So  
20 we have seen reference to the 6- to \$10 billion range.  
21 It's referred to in this update report on page 5. So  
22 that's the DRP cost range of 6- to 10 billion. And I  
23 understand that that range has been in place since 2009; is  
24 that accurate?

25 MR. REINER: The 6 to 10 has been in place since 2009,  
26 but we have lowered the 10. The 10 billion in 2013 dollars  
27 would translate to 10.8 billion, roughly, and we have  
28 reduced the upper bound to 10 billion in 2013 dollars.

1 MS. BLANCHARD: So just focusing on the lower end of  
2 the range for a moment, based on what OPG knows today, is  
3 there any reasonable scenario where 6 billion represents --  
4 still represents a possible lower range?

5 MR. ROSE: So the \$6 billion, in 2009 we had a Monte  
6 Carlo, an S curve, on our 2009 business case, the P50  
7 amount was approximately \$6 billion, the P90 amount was  
8 about \$10 billion -- \$10 billion. So our probability of  
9 getting to \$6 billion today would be well less than the 50  
10 percent confidence. We haven't done that assessment. You  
11 know, our current estimate -- our high confidence estimate,  
12 P90, is our -- generally around our point estimate. Our  
13 \$10 billion is our high confidence beyond P90 level  
14 estimate.

15 The likelihood of us getting to \$6 billion today based  
16 on the advanced planning that we have done and  
17 understanding of our scope is certainly different than it  
18 would have been in 2009, and a probability that would be  
19 less than 50 percent.

20 MS. BLANCHARD: I have to admit that there was a fair  
21 amount of terminology in that answer that escaped me.

22 [Laughter]

23 But I guess, umm, I guess as a follow-up question I  
24 would ask, does OPG still think it's appropriate to show  
25 6 billion as a possible outcome?

26 MR. REINER: I can point you maybe in the direction of  
27 the updated business case that was filed with the 2-2-1,  
28 attachment 5. On page 38 there is a -- there are a series

1 of S curves that are the result of the analysis that Mr.  
2 Rose spoke about, and you will see how those have changed  
3 over time.

4 So if you took the same P50 to P90 point you will see  
5 that that starts to move upwards. So it's the result of  
6 the Monte Carlo analysis and the mathematical modelling.  
7 So probabilistically from a mathematical point of view,  
8 yes, there is that potential kind of an outcome.

9 We have been careful to talk about the project as a  
10 less-than-\$10 billion project, rather than a 6- to  
11 \$10 billion project.

12 MS. BLANCHARD: Okay. But you are still -- in your  
13 application materials you are still referring to a 6- to  
14 \$10 billion project. At page 5, line 6.

15 MR. REINER: Yes, no, I see that, and I would -- I  
16 would say that that -- without clarifying exactly what that  
17 means, I wouldn't -- I wouldn't conclude from this that  
18 there is an outcome that could result in a \$6 billion  
19 project.

20 MS. BLANCHARD: Thank you. That's all I have,  
21 actually, thank you.

22 MR. MILLAR: Thank you, Ms. Blanchard.

23 Mr. Shepherd, are you ready to go?

24 MS. BLANCHARD: Oh, actually, just before I go, I had  
25 a brief discussion with Mr. Keizer before lunch, and I am  
26 going to try to catch a plane now, and I just wanted to  
27 indicate for the record that Mr. Keizer and I spoke, and I  
28 am in agreement with what he will propose in terms of my

1 requested undertaking.

2 MR. KEIZER: So the response is that there was two  
3 aspects to the request: The early termination provisions  
4 and also provisions -- a provision relating to the  
5 adherence to schedule. So obviously the contract itself is  
6 confidential, and OPG can produce the early termination  
7 provisions, obviously, in a confidential basis. They  
8 wouldn't be partly redacted, they would be wholly redacted,  
9 because they don't mean anything unless in its entirety.

10 With respect to the issue of adherence to schedule,  
11 that's not as simple, because there isn't just one  
12 provision like an early termination provision in a  
13 contract, and that weaves itself through all number of  
14 areas within this very voluminous contract, whether it's  
15 in, you know, incentive areas or whatever else. So what we  
16 think, that aspects relating to that is captured within the  
17 summary of the contract that we are proposing to produce,  
18 and so my colleague is fine with us producing the early  
19 termination provisions on a confidential basis and  
20 providing the summary in response to the earlier  
21 undertaking question.

22 MR. MILLAR: Okay. So that's a new undertaking for  
23 the termination provisions?

24 MR. KEIZER: Yeah, I don't know if we gave a number  
25 that time. I am not sure if we did or not.

26 MS. BLANCHARD: We might not have.

27 MR. MILLAR: I don't think we did.

28 MS. BLANCHARD: Yeah.

1 MR. MILLAR: So we'll call it --

2 MR. KEIZER: So anyway, we just wanted to clarify  
3 that.

4 MR. MILLAR: Very good, so JT4.2, and that's just to  
5 provide the termination provisions --

6 MR. KEIZER: Yes, in confidence.

7 MR. MILLAR: -- in confidence, and the rest will be  
8 provided as part of Mr. Shepherd's undertaking.

9 MR. KEIZER: Yeah, by way of the summary.

10 MR. MILLAR: Yes.

11 **UNDERTAKING NO. JTX4.2 (IN CONFIDENCE): TO PROVIDE**  
12 **THE TERMINATION PROVISIONS.**

13 MS. BLANCHARD: Thank you.

14 **QUESTIONS BY MR. SHEPHERD:**

15 MR. SHEPHERD: I have questions on a number of areas.  
16 I just came in at the end of that discussion, and I take it  
17 you were talking about the point estimate; is that right?

18 MR. REINER: We were talking about the 6- to  
19 \$10 billion range.

20 MR. SHEPHERD: All right. The current point estimate  
21 is the one in the business-case summary from December;  
22 right?

23 MR. REINER: Yes.

24 MR. SHEPHERD: And that's 9.3 billion?

25 MR. REINER: Yes, and just -- and maybe one additional  
26 thing. It's that estimate adjusted by the growth that we  
27 have identified in the campus-plan projects.

28 MR. SHEPHERD: So now it's 9.6 billion.

1           MR. REINER:  It's -- let me turn to Mr. Rose on what  
2   our current estimate is.

3           MR. ROSE:  Yes, we have lifted that point estimate by  
4   \$260 million.

5           MR. SHEPHERD:  So it's now 9.6 billion; is that right?

6           MR. ROSE:  That is correct.

7           MR. SHEPHERD:  And is that -- that includes  
8   contingency of 2.1 billion; is that right?

9           MR. REINER:  That's correct.

10          MR. SHEPHERD:  And it includes management reserve of  
11   0.8 billion?

12          MR. REINER:  The management reserve would be the  
13   difference between the 10 billion and the revised point  
14   estimate.

15          MR. SHEPHERD:  Okay.  So it's 0.4 now.

16          MR. REINER:  It would be reduced, yes.

17          MR. SHEPHERD:  Okay.  And now, Mr. Gould, I guess you  
18   are the expert in estimates.  The -- or maybe I will ask  
19   Mr. Reiner first or Mr. Rose.  Is this a class 4 estimate?

20          MR. REINER:  This is a class 4, and in some cases a  
21   class 3 for some of the projects.

22          MR. SHEPHERD:  So then what are your upper and lower  
23   bounds on that number?  Do you have them?

24          MR. ROSE:  Sorry, the upper and lower bounds on the  
25   estimate, when we put together the estimate we -- in  
26   calculating the contingency we would look at the  
27   classification of each of the direct costs, so the -- of  
28   the direct work, approximately \$5 billion of direct work,



1 we would look at the R&FR and understand its classification  
2 of estimate class 4, and we would apply the AACE bounds  
3 which are in the Modus report.

4 MR. SHEPHERD: But they are a range, so that's why I  
5 am asking. Where on the range is your confidence band?  
6 Because you a range from, what, 20 to 50 -- no, 20 to 30  
7 down and 50 to 100 up, something like that?

8 MR. ROSE: So my understanding is how this is run is  
9 that for a specific - it's an aggregate, the contingency is  
10 an aggregate of all of the elements that make up this --  
11 what we do we take an element, we add the range to it, so  
12 minus 50, plus 100 on a class 5 element. Our contingency  
13 based on a Monte Carlo assessment that we do, and it's  
14 reported on a P 90 basis.

15 MR. SHEPHERD: So I obviously misunderstood something.  
16 I thought the contingency was an amount that you expected  
17 to spend. This is what Mr. Gould said yesterday, I think,  
18 that when you put a contingency into a number, that's an  
19 amount you expect to spend; you don't know what you are  
20 going to spend it on, but you expect to spend it, right?

21 MR. ROSE: That is what contingency is. That's  
22 correct.

23 MR. SHEPHERD: So contingency is not the same as  
24 confidence band, is it?

25 MR. ROSE: No. Contingency, included in our  
26 contingency is a level of uncertainty. I said -- I don't  
27 know it was this morning or yesterday -- that about  
28 a billion dollars' worth of our contingency is based on

1 estimating uncertainty.

2 MR. SHEPHERD: So that's only a 10 percent confidence  
3 band. That would be a class 1 estimate?

4 MR. REINER: You're -- I think you are double-counting  
5 things here. You are applying a billion to 10 billion and  
6 that 10 billion includes the contingency. So I think what  
7 you need to do is go to that business case breakdown and  
8 look at the direct project work, because those uncertainty  
9 bands apply to the direct project work. And you will see  
10 that that 10 billion includes a number of costs and --  
11 fixed costs.

12 For example, there are costs in there for CNSC fees,  
13 there are costs in there for what we essentially call  
14 tipping fees, fees that we have to pay for storing nuclear  
15 waste, there are insurance fees in there.

16 Those are fixed costs; they don't have those kinds of  
17 uncertainty bands associated with them. When you break the  
18 estimate down, really what you are looking at is the direct  
19 project costs, and applying what Mr. Rose identified as the  
20 uncertainty bands around those direct project costs, and in  
21 that calculation coming up with a contingency number.

22 So it's not as simple as take 10 billion number and  
23 apply a 10 percent band.

24 MR. SHEPHERD: No, I understand. That is why I am  
25 asking the questions. It's a technical conference.

26 I went to the business case summary, trying to get a  
27 list that said: Here is a number. Here is the low, here  
28 is the high for that number. I couldn't find that. Is

1 that in there somewhere?

2 MR. ROSE: No. What we have presented is an aggregate  
3 of our contingency calculation of all of the scope  
4 elements. We went through the Monte Carlo of that scope  
5 elements to understand the contingency impact.

6 MR. SHEPHERD: Sorry, again I'm confused. You keep  
7 talking about contingency, but I thought contingency was a  
8 budget item. It's not an uncertainty item. It is a budget  
9 item, right? They are different?

10 MR. ROSE: Contingency is the calculation of  
11 uncertainty within a project. Some of it is estimating  
12 uncertainty, some of it is discrete risks. It's  
13 uncertainties within a project, what we call, in the  
14 industry would call known unknowns.

15 We know that the cost may be a little bit higher than  
16 what I have projected it to be, but I don't know exactly  
17 what the amount is going to be. It's in a range.

18 MR. SHEPHERD: Mr. Gould, you talked about in your  
19 reports about monetizing uncertainty, contingencies, right?

20 MR. GOULD: Monetizing risk, yes.

21 MR. SHEPHERD: So I thought you said a number of times  
22 monetizing contingencies.

23 MR. GOULD: Okay.

24 MR. SHEPHERD: Didn't you say that?

25 MR. GOULD: Yes. I mean, I believe the contingencies  
26 should be monetized. Is there a question?

27 MR. SHEPHERD: And -- see, I guess I understood you to  
28 be saying identify what the risks are with more rigour than

1 you are doing, and put numbers attached to those and  
2 include those in your budget. That's the only way you have  
3 a really solid budget; is that -- am I understanding that  
4 right?

5 MR. GOULD: So let's unpack that a little bit.

6 So at different levels you would have different  
7 approaches to how you would assess both your uncertainty  
8 band and your contingency. So when you are at a class 5,  
9 with very little definition -- if you look on page 5 of our  
10 most recent report, June 26 report, it has the -- it has  
11 the table from the AACE. So when you are at that stage,  
12 you could be -- it's certainly acceptable to be looking at  
13 risk from a very -- what's called a very stochastic  
14 formula, where you are looking at it in terms of high  
15 ranges, because you don't have a lot of project definition  
16 yet to pin any specific events.

17 As the estimate will mature for the project, and as  
18 the nature, the underlying nature of the estimate matures,  
19 then you can have a better and more specific idea of the  
20 specific risks that you may face, the known unknowns that  
21 Mr. Rose referred to.

22 MR. SHEPHERD: Is there something different,  
23 technically is there something different between a  
24 contingency that you put in a budget and a confidence band  
25 that you put around your estimate?

26 MR. GOULD: Well, the contingency should reflect the  
27 confidence band.

28 MR. SHEPHERD: So they are the same thing, in effect?

1           MR. GOULD: They should work hand in hand. There are  
2 times when you make decisions -- there are times when a  
3 company will make a decision about the size of contingency,  
4 to make it either larger or smaller, depending on the  
5 nature of the project, that you may not incorporate the  
6 entirety of all of your potential uncertainties. That's a  
7 decision that can be made. And it's just one that needs to  
8 be vetted in the case of any particular estimate, to see if  
9 it's appropriate.

10          MR. SHEPHERD: So when we look at these confidence  
11 bands, then, the what is it, AC triple-E?

12          MR. ROSE: AACE.

13          MR. SHEPHERD: AACE confidence bands, those are really  
14 the contingencies that you would have in a budget, and so  
15 you would expect to always come in at the top of that  
16 range?

17          MR. GOULD: No, I would not say that. I would say  
18 there is a reason why -- and if you look at the underlying  
19 materials behind this chart and the various studies that  
20 have been performed, there is a reason why these things are  
21 represented in ranges, so that it gives the owner or the  
22 project owner who has -- who is applying these standards or  
23 anybody who is applying these standards some room within a  
24 bandwidth to apportion the expected accuracy range of the  
25 estimate.

26          MR. SHEPHERD: Here is how -- you can see I am  
27 confused, right? Here is how I understood this, from past  
28 history with seeing construction contracts.

1           In a construction contract you identify the costs that  
2   you know you are going to have, and then you put in a  
3   contingency that's based on your experience of the types of  
4   things that are going to come up in that type of contract.

5           And that -- you expect to actually spend that money.  
6   If you spend the whole contingency, you are on budget?

7           MR. GOULD:   Mm-hmm.

8           MR. SHEPHERD:   And then in addition to that, you then  
9   have a confidence band around your result, that you say:  
10   That's my number, my number is \$800 million, but it could  
11   be as low as 700 and as high as a billion?  That is  
12   different from the contingency, right?

13          Have I described it correctly?

14          MR. GOULD:   So I think that what you have just  
15   described is a much more mature estimate than the one we  
16   are currently talking about, so that -- I think that is  
17   where I know I am struggling.  I think that may be where  
18   you are struggling.

19          MR. SHEPHERD:   Okay.

20          MR. GOULD:   I think that ultimately where OPG is  
21   planning to achieve that level of accuracy, that is at the  
22   class 2 -- or at the RQE milestone in October of 2015.

23          MR. SHEPHERD:   So when -- like, the business-case  
24   summary, for example, refers to the point estimate, the 9.3  
25   or whatever it is, as a high-confidence estimate.  That's  
26   high confidence for a class 4, right?  It's not high  
27   confidence as a layperson would see it.  You don't actually  
28   have high confidence, because you haven't yet done all your

1 design; right?

2 MR. GOULD: It's within the understanding of the  
3 industry, yes, that this classification system is something  
4 that is utilized for a reason so that there is a  
5 commonality of understanding, so when you say "class 4" you  
6 can go to this guideline and you can say, well, so a class  
7 4 would represent something that has a maturity level of 1  
8 per cent to 15 per cent, it's at the study or feasibility  
9 stage, the methodology employed would be equipment factored  
10 or parametric modelling for purposes of the estimate, and  
11 it would have an expected accuracy range with typical  
12 variation and low and high ranges of on the low side minus  
13 15 to minus 30 per cent and on the high side plus 20 to  
14 plus 50 per cent.

15 So you can tether that to a common understanding.  
16 It's not something that -- as we saw in -- with the SNC-  
17 Aecon contract, you have to look at the specifics of the  
18 estimate in order to understand how it gets applied. Does  
19 that help?

20 MR. SHEPHERD: Okay. No, I understand. I didn't  
21 realize that before. I thought you could just take a  
22 number and say, okay, add 50 or deduct 15.

23 MR. GOULD: No, it's not formulaic -- it's not a form  
24 -- it's a guideline. It's not a formulaic -- it's not an  
25 arithmetic calculation. It's something that requires  
26 understanding, vetting, and some decision-making for  
27 determination.

28 MR. SHEPHERD: Okay. And so in your -- in your, Mr.

1 Rose, \$9.6 billion current point estimate, there is built  
2 in this AACE on certainty, but it's done on a line-by-line  
3 basis; right?

4 MR. ROSE: On a line-by-line basis we take -- we put a  
5 range on a line item and we run a Monte Carlo to get to a  
6 P90 confidence and what that estimate item would be --

7 MR. SHEPHERD: Okay.

8 MR. ROSE: -- aggregated together into the contingency  
9 amount.

10 MR. SHEPHERD: So do we have the list anywhere of the  
11 lower and upper bands of each of your numbers?

12 MR. ROSE: Each of the -- well, it's based on the  
13 scope elements, the detailed scope elements, for every  
14 element of scope, so the 300-plus DSRs that we currently  
15 have in scope.

16 MR. SHEPHERD: Each has a range.

17 MR. ROSE: Correct, based on its classification of  
18 estimate of classification based on its progress of  
19 definition.

20 MR. SHEPHERD: But when you talk to your board of  
21 directors you don't -- or your nuclear oversight committee,  
22 you don't say, Well, here is the list of 300, right? You  
23 aggregate it into groups and say, Here is a group. These  
24 are all class 4. This is the low, this is the high, right?

25 MR. ROSE: And I think that we would generally  
26 classify there is some class 5, there's some class 3, but  
27 generally we are in the class 4 range right now. That is  
28 how we would characterize this.



1           MR. SHEPHERD: But you can't take the full number and  
2 simply apply class 4 uncertainty bands to it.

3           MR. ROSE: No.

4           MR. SHEPHERD: You have to do each individual number.

5           MR. ROSE: The way we have done it bottoms up based on  
6 the details that we have in our planning, we have done a --  
7 done that exercise bottoms up and present it.

8           MR. SHEPHERD: But that's not in the evidence  
9 anywhere.

10          MR. ROSE: I am not certain if it's in the evidence or  
11 not. I would have to review the BCS. But generally  
12 speaking, the overall view of our current estimate is  
13 somewhere in that class 4 range.

14          MR. SHEPHERD: Well, but I am not actually trying to  
15 catch you out here. I am trying to actually understand it.  
16 The fact that it's all in the class 4 range doesn't help me  
17 figure out what the range is around the number or around  
18 the point estimate, right, because you have to calculate it  
19 on a line-by-line basis; true?

20          MR. ROSE: That is how we have done it, yes.

21          MR. SHEPHERD: Well, and that's the right way to do  
22 it, right, Mr. Gould?

23          MR. GOULD: I would agree.

24          MR. SHEPHERD: Okay. So how can we then look at what  
25 the range is around the 9.6? How can we get that  
26 calculation? There must be a calculation somewhere; right?

27          MR. REINER: I mean, I want to take you back to page  
28 34 in that business case, because that shows you the

1 breakdown of the direct project work, and you will see that  
2 that totals \$5.4 billion, and --

3 MR. SHEPHERD: Just let me get to page 34, okay? Here  
4 we go. Okay. Mine is all blacked out, but I understand.  
5 Okay.

6 MR. REINER: Okay. So that's the direct project work,  
7 so what Mr. Rose described inside each of those categories,  
8 R&FR, balance of plant, there are these Darlington scope  
9 request items. The analysis is done. The uncertainty  
10 bands are run based on class of estimate, and that output  
11 is collected in the line that you see that's identified as  
12 contingency and management reserve, \$2.09 billion. That's  
13 where the output of that number is. So that's where that  
14 range --

15 MR. SHEPHERD: So then the total direct plus indirect  
16 work is your real point estimate.

17 MR. REINER: I call the real point estimates the  
18 total, because until we get to release quality estimate and  
19 we have done sufficient analysis to understand precisely  
20 what do we need to retain in contingencies to deal with  
21 discrete risks and then what do we need to have in  
22 management reserve to deal with the unknown/unknowns, this  
23 is a methodology that will get refined as we work towards  
24 RQE, but you should -- yes, I think it is fair to look at  
25 that 5.4 billion, as that is our estimate of the executable  
26 work, and that is part and parcel of our point estimate.

27 MR. SHEPHERD: Okay. I am going have to think about  
28 that. I thought I understood it, and clearly I don't

1 understand it as well as I thought I did.

2 All right. Let me move to another area. Let me start  
3 with -- and this is for you Mr. Gould, I think -- your  
4 fourth-quarter 2013 report, which is the one from November  
5 12th, and I am looking attachment C.

6 MR. GOULD: Yes, sir.

7 MR. SHEPHERD: And maybe you can just describe what  
8 this document is briefly?

9 MR. GOULD: So as I described in previous testimony,  
10 one of our key -- one key component of our role in  
11 providing oversight to the nuclear oversight committee is  
12 to review and characterize the ongoing effort to develop  
13 and mature the estimate.

14 So what this section of the report deals with with  
15 attachment C, these are some in-depth observations related  
16 to the work that we did to -- in the vetting of the  
17 business plan from 2014, also known as 4C or 4Charlie.

18 MR. SHEPHERD: Yes. So you actually looked at  
19 components of that totalling 64 per cent, right, of the  
20 estimate?

21 MR. GOULD: Yes.

22 MR. SHEPHERD: Right?

23 MR. GOULD: Yes, that's what's indicated in  
24 attachment 1.

25 MR. SHEPHERD: And that 64 per cent, that's not the  
26 same as the 67-million that you see in the second bullet,  
27 six DSRs in the BOP scope? That 64 per cent is of the  
28 whole project. The 67-million is of one component of the

1 project.

2 MR. GOULD: That's correct.

3 MR. SHEPHERD: Okay. And I just have a couple of  
4 questions on this. You have -- in A1 you see -- you talked  
5 about a refresh of the basis of estimates.

6 MR. GOULD: Yes, sir.

7 MR. SHEPHERD: Give us some context on that. What  
8 does that mean?

9 MR. GOULD: So Mr. Rose described the bottoms-up  
10 effort that the project team utilized to develop the  
11 initial business plan for the project, and what we were  
12 looking at for the 4C, 4Charlie estimate was in essence a  
13 comparison or a variance from the previous year. So  
14 anything that had changed, any new information that revised  
15 any of the estimates, those were used to in essence refresh  
16 the numbers from the prior year's business plan.

17 MR. SHEPHERD: Okay. Sorry, let me just be clear on  
18 this. Are you talking about how you did your review or how  
19 4C was actually created relative to 4B?

20 MR. GOULD: That's how 4C was actually created.

21 MR. SHEPHERD: Okay. So this was not a new bottoms-up  
22 budget, it was an adjustment to an existing budget based on  
23 delta.

24 MR. GOULD: That's correct.

25 MR. SHEPHERD: Okay. And that's quite a different way  
26 of budgeting; right? It's --

27 MR. GOULD: Well, it's not a budget, it's an estimate.

28 MR. SHEPHERD: I'm sorry; estimating, yeah, that's

1 right. The -- you can do an estimate that you do from  
2 scratch in which you question everything or you can do an  
3 estimate saying let's assume for now that the last estimate  
4 was right and look at what new information we have. And  
5 that is what this one is?

6 MR. GOULD: Yes.

7 MR. SHEPHERD: Okay. I understand.

8 MR. GOULD: I think that's a fair characterization.

9 MR. SHEPHERD: On the next page, on page 2 of 5 of  
10 this material, you talk about how labour hours are  
11 adjusted, and tell me whether this is right.

12 You take gross labour hours, how long you think people  
13 will actually have to work and get paid, and you say:  
14 Well, how much -- A, how much productivity will we get out  
15 of them while they are working? And B, how much known  
16 wasted time are we going to have for height? Because they  
17 have to walk up and down scaffolding, right?

18 Those are the two adjustments?

19 MR. GOULD: I wouldn't call it -- well, those are two  
20 of the adjustments that you would look for in analyzing  
21 productivity. There are a number of different types of  
22 adjustments, depending on the type of the project.

23 But what we are talking about here is -- what we are  
24 talking about here is specific to how this estimate, the  
25 underpinnings of this particular estimate, those were two  
26 of the labour hours that were -- are two of the factors  
27 that were associated with adjusting the labour hours for  
28 purposes of this estimate.

1 MR. SHEPHERD: Well, okay. So, sorry, I am just --  
2 let me just be clear on this.

3 The way I read this, there is a productivity factor.  
4 So you take the labour hours, you adjust them for a  
5 productivity factor?

6 MR. GOULD: Mm-hmm.

7 MR. SHEPHERD: And that does not include the height  
8 factor?

9 MR. GOULD: No, in this case.

10 MR. SHEPHERD: Height factor, then, is an additional  
11 adjustment?

12 MR. GOULD: Yes, sir.

13 MR. SHEPHERD: Those are the only two adjustments to  
14 the labour hours in this estimate?

15 MR. GOULD: In this particular estimate.

16 MR. SHEPHERD: There are others you can do, right?

17 MR. GOULD: Absolutely.

18 MR. SHEPHERD: Did you look at the range of 35 to 45  
19 percent productivity?

20 MR. GOULD: Our team did, sure.

21 MR. SHEPHERD: And what did you conclude about that?

22 MR. GOULD: We were just reporting it here, that  
23 getting to -- in trying to understand the nature of the  
24 estimate, we weren't -- we didn't draw any specific  
25 conclusion about those numbers at that time.

26 MR. SHEPHERD: You weren't assessing whether that was  
27 a good productivity or a bad productivity, or benchmarking  
28 or anything like that? This is how you got the number?

1           MR. GOULD: Yes. It would be premature for us to get  
2 too deep into those factors, based on where this estimate  
3 was a year ago.

4           MR. SHEPHERD: And, Mr. Rose, this is your estimate,  
5 right?

6           MR. ROSE: This is our, OPG's, estimate. That's  
7 correct.

8           MR. SHEPHERD: Were you the one who actually did it,  
9 or is this somebody else?

10          MR. ROSE: No, I wouldn't -- no. Somebody in my  
11 organization would have done the estimate. In fact, we  
12 have our estimating done by an external company that we  
13 have hired to do estimating for us.

14          We were a construction business. We got out of the  
15 construction business. We let all of our estimators go.  
16 So we didn't have that expertise, so we hired it.

17          MR. SHEPHERD: And now you are not getting back into  
18 the construction business. In fact, you are going to be a  
19 general contractor, but --

20          MR. ROSE: That's correct. So we do not have the  
21 estimating expertise; we have hired the estimating  
22 expertise. I have folks that supervise and understand and  
23 do QA reviews of the estimates that are put together by a  
24 third party.

25          MR. SHEPHERD: Interesting.

26          MR. ROSE: And that third party is co-located with us.  
27 They interface with our project team, our project managers  
28 on a continuous basis.

1 MR. SHEPHERD: Are they former Ontario Hydro  
2 employees?

3 MR. ROSE: The estimators themselves are not. We have  
4 a couple of folks that we recently brought in, actually, to  
5 help with the interface between the estimating group and  
6 the OPG, but they are not the estimators. The estimators  
7 are from the industry.

8 MR. SHEPHERD: Okay. So have you benchmarked this 35  
9 to 45 percent number?

10 MR. ROSE: I haven't personally.

11 MR. SHEPHERD: No, has your organization?

12 MR. ROSE: I think it says here that we have compiled  
13 it over the past three years. I am not certain that it has  
14 been benchmarked. It's based on our experiences and the  
15 way the work has been performed at OPG.

16 MR. SHEPHERD: So what you have done is you've gone  
17 back and looked at -- "you," I don't mean you personally.  
18 I mean OPG has gone back and looked at past projects, and  
19 said: From an empirical point of view, what has our actual  
20 productivity been on those projects, because we know we can  
21 deliver that, right? That is what we have done; is that  
22 fair?

23 MR. ROSE: That is what it says here: "Have been  
24 compiled over the past three years while estimating  
25 projects..."

26 MR. SHEPHERD: Well, it's your group that does it,  
27 right? So...

28 MR. ROSE: That is correct. I don't know that it's



1    been benchmarked.

2           MR. SHEPHERD:   Okay.   You don't think it has or you  
3   don't know?

4           MR. ROSE:   I don't know that it has been benchmarked.

5           MR. SHEPHERD:   Can you undertake to find out?

6           MR. ROSE:   I can undertake to find out.

7           MR. SHEPHERD:   What I would actually like is an  
8   undertaking to -- this is probably more to the point -- to  
9   give us some more details on this.   This is going to be a  
10   big issue, I think.   So more details on how you got to the  
11   numbers and how you've assessed how reasonable they are;  
12   can you do that?

13          MR. ROSE:   Yes.

14          MR. MILLAR:   JT4.3.

15           **UNDERTAKING NO. JTX4.3 (IN CONFIDENCE):   TO PROVIDE**  
16           **MORE DETAIL ON HOW OPG ARRIVED AT THE 35 TO 45 PERCENT**  
17           **RANGE, AND HOW REASONABLE THE NUMBERS ARE.**

18          MR. KEIZER:   And the numbers you're referencing is the  
19   35 to 45 --

20          MR. SHEPHERD:   35 to 45 percent.   That's right.

21          MR. MILLAR:   Mr. Keizer, these will be confidential  
22   responses, I take it?

23          MR. KEIZER:   I assume so, since they are tied to the  
24   confidential material.

25          MR. MILLAR:   It is our practice to mark those with an  
26   X, and I should have done this for the previous one as  
27   well.   So our previous undertaking will be JTX4.2 and the  
28   current one JTX4.3.

1           MR. SHEPHERD: I guess -- and maybe you can't tell me  
2 until you do the undertaking, but my reaction to getting  
3 three and a half hours work out of 10 hours of paid work,  
4 it seems like it's not very much. I mean, in a consulting  
5 business if you had employees that you got three and a half  
6 hours work on 10 hours of paid work, you would fire them,  
7 right?

8           MR. GOULD: No.

9           MR. SHEPHERD: Is there something unique about this,  
10 that --

11          MR. REINER: Maybe I can explain some of what weighs  
12 into this. So I wouldn't read this as, you know, hours  
13 spent working. This is productivity in relation to  
14 critical path of the job being executed.

15          In the re-tube and feeder replacement job, there is a  
16 significant amount of continuous training to be ready to  
17 execute in the field that takes place. So the crews that  
18 do pressure tube removal, for example, they will spend a  
19 certain amount of time on the reactor face, removing  
20 pressure tubes. They will spend as much time training and  
21 preparing and rehearsing for that.

22          In the nuclear environment, you then also need to  
23 factor in things like the briefings that need to take place  
24 because of the radiological environment. So as conditions  
25 change, all of those other things that impact, potentially,  
26 the ability to be on tools doing the work, just in  
27 reflection of the earn environment.

28          So those sorts of things factor into these numbers.

1 MR. SHEPHERD: So this is not taking long coffee  
2 breaks? This is actually --

3 MR. REINER: This is the no taking long coffee breaks.  
4 This is training, this is pre-job briefs, this is showing  
5 up in the shift office at the beginning of the meeting and  
6 signing on to work permits and getting ready to execute  
7 work. It's all of those factors.

8 MR. SHEPHERD: And there is presumably lots of  
9 paperwork and stuff associated with this sort of job that  
10 takes away from the time people can actually be at the  
11 reactor face, right?

12 MR. REINER: There is an element of paperwork. To the  
13 extent possible for trades labour, we are automating that.

14 So for example, time sheets, you know, we are not  
15 requiring people to fill out time sheets. There is going  
16 to be an automated process when people walk in and out;  
17 their entry time and exit time to the work site is going to  
18 be recorded, so that will take away from that sort of an  
19 exercise.

20 But there is project management that does do a lot of  
21 paperwork related to the job that --

22 MR. SHEPHERD: That's not included in these  
23 productivity numbers? Project management is separate?

24 MR. REINER: Right.

25 MR. SHEPHERD: Okay. So this is the productivity you  
26 have assumed for BOP, which is balance of plan, right?

27 MR. GOULD: Maybe I can answer that. I don't know  
28 that it's limited strictly to balance of plan, sir.

1           MR. SHEPHERD: It says for BOP, the productive  
2 information --

3           MR. GOULD: Oh, I am sorry, that specific note. This  
4 entire section is about the overall basis --

5           MR. SHEPHERD: No, understood, but what I am going for  
6 is --

7           MR. GOULD: Oh, this productivity?

8           MR. SHEPHERD: What is the productivity assumed for  
9 rest of the work?

10          MR. ROSE: I don't know that. We will take that as  
11 part of the undertaking. My assumption would be that this  
12 productivity is -- maybe I shouldn't assume. I'll leave it  
13 at that. Let me take the undertaking and get back to you.

14          MR. SHEPHERD: Okay. Then the second thing is the  
15 height factors. And again, this is empirical data, right?  
16 You have gone out and you are looked at how much time do  
17 people spend climbing up and down, because it's actually a  
18 material amount of time that is, in a sense wasted? It's  
19 not wasted, but you know what I mean, because they have to  
20 go up 30 feet to start work, right?

21          MR. GOULD: There is also the element of -- there is  
22 also the element of hazard of working at that height as  
23 well.

24          MR. SHEPHERD: No, understood. So this is, again,  
25 empirical data that you have collected on how much time it  
26 takes; is that right?

27          MR. ROSE: Again, it would be a similar -- it's  
28 empirical data on what the factors are that we would apply

1 to our estimates. It's not necessarily what it would  
2 actually take. Right now it's based on our estimates, and  
3 until I go back and take the -- and understand the basis of  
4 that, I am not certain that it is informed by -- I mean,  
5 ultimately the estimate is based on our experiences of true  
6 productive work.

7 MR. SHEPHERD: Yes.

8 MR. ROSE: So -- but it is also going to be based on  
9 some industry metrics that we also bring into play. We  
10 don't -- we use means data, we call it, like data sets on  
11 -- industry data sets on factors that we may build in as  
12 well.

13 MR. SHEPHERD: Okay. So, now, this labour-hour  
14 calculation, in item 9 here, where you have the labour-hour  
15 calculation, am I right that what you do is you say, okay,  
16 it should take three hours to fix this thing, let's say,  
17 and so to get three hours of productive time we are going  
18 to have to pay this person for nine hours, say, because he  
19 is going to have to be trained and all this other stuff,  
20 plus another hour for climbing up and down scaffolding, so  
21 we have to budget ten hours to get that three hours of work  
22 done. Is that -- am I understanding that correctly?  
23 Estimate, sorry. I don't mean budget, I mean estimate.

24 MR. ROSE: Yes, that is the basis for how it would be  
25 used; that is correct.

26 MR. SHEPHERD: Okay. Good. In the -- on page 3 of  
27 this cost estimate review -- and I am assuming, Mr. Gould,  
28 that none of this stuff is benchmarked from your point of

1 view, that you are observing things, you are not assessing  
2 -- you are not assessing the reasonableness of these  
3 things, you are just observing.

4 MR. GOULD: No, we're not -- we didn't do this for  
5 that purpose.

6 MR. SHEPHERD: I understand, I understand.

7 MR. GOULD: Ultimately all of this will be assessed  
8 against the actual estimates that are provided by the  
9 contractors as well, so --

10 MR. SHEPHERD: Oh, of course, of course.

11 MR. GOULD: -- these are just the standards that were  
12 being utilized within OPG.

13 MR. SHEPHERD: So on page 3 at the top of the page you  
14 have what you call an experience factor, and I am not sure  
15 whether this is a question for you, Mr. Gould, or it's a  
16 question for Mr. Rose, but if I understand this correctly,  
17 it's saying that if the work -- doing something on the  
18 first unit costs a dollar, then by the fourth unit you  
19 should be three-and-a-half percent more efficient; is that  
20 fair?

21 MR. ROSE: That is what it says, yes. That is how it  
22 would be applied.

23 MR. SHEPHERD: Okay. So where does that come from?

24 MR. ROSE: I don't -- again, I don't have the details  
25 of how that was put together, but, you know, it would  
26 probably be done in the same manner as the other ones are,  
27 based on experience from an estimating perspective and our  
28 own experiences.

1 MR. SHEPHERD: Okay. Well, because I would have  
2 assumed that the industry has some standards, some  
3 expectations, wouldn't it?

4 MR. GOULD: This is very unique work, so you would  
5 have to apply a lot of different things into that level of  
6 experience.

7 MR. SHEPHERD: Okay. Well, so I wonder if you could  
8 undertake to give us some sort of more background, and  
9 this, I think, is a separate undertaking, more background  
10 on this experience factor and how you derived it and how it  
11 relates to -- and how you benchmarked it, if you did, and  
12 that sort of thing. Do you understand what I am looking  
13 for?

14 MR. ROSE: I am. So experience factor, how it was  
15 derived, and how it was benchmarked.

16 MR. SHEPHERD: Yes, thanks.

17 MR. ROSE: Got it.

18 MR. MILLAR: JTX4.4.

19 **UNDERTAKING NO. JTX4.4: TO PROVIDE MORE BACKGROUND ON**  
20 **THE EXPERIENCE FACTOR AND HOW IT WAS DERIVED AND HOW**  
21 **IT WAS BENCHMARKED**

22 MR. SHEPHERD: Where am I here? All right. Still on  
23 estimating, you had a problem with the project and  
24 modifications group with your estimating; right? With  
25 their estimating, not your estimating, theirs. And I am  
26 looking, for example, at Mr. Gould's report, second-quarter  
27 2014. This is the May 13th report. And page 6, going over  
28 to page 7, you said:

1            "It appears these initial BSC estimates..."  
2            That's the estimates from the business case summary.  
3            "...were poorly characterized as part of a  
4            deliberate management strategy directed by the  
5            former VP of P&M."

6            And then you go on to say that it looks like they -- I  
7            am characterizing it -- like they told the contractors,  
8            Don't put in all the costs; assume everything is going to  
9            be perfect, because we don't want to have a high cost. Is  
10           that fair? Is that a fair characterization?

11           MR. GOULD: What we saw from the evidence was that the  
12           former VP from projects and modifications believed that the  
13           costs of these projects could be constrained by sort of a  
14           top-down management style.

15           MR. SHEPHERD: You can't spend more than X and find a  
16           way.

17           MR. GOULD: That was what the evidence showed, and  
18           that's from talking to people within the organization.  
19           That's essentially what they reflected.

20           MR. SHEPHERD: So this -- and I have obviously  
21           misunderstood this -- this wasn't intended to be  
22           duplicitous in any way. It was actually intended to be  
23           sort of tough management.

24           MR. GOULD: I don't know what's in anybody's hearts  
25           and minds that I haven't talked to, but I would agree that  
26           that is a better characterization.

27           MR. SHEPHERD: Okay.

28           MR. GOULD: I don't think that they had the intent of



1   hiding information. I think that this was an attempt to  
2   rule with an iron fist.

3           MR. SHEPHERD: Ah, so that's also a style that you can  
4   use in managing projects that works sometimes; right?

5           MR. GOULD: It can, it can work.

6           MR. SHEPHERD: I mean, this is part of how the company  
7   is dealing with SNC-Aecon right now, right? Tougher,  
8   expecting more from them. Is that fair?

9           MR. REINER: Just so I understand your question, is  
10   this is how we are dealing with SNC-Aecon right now?

11          MR. SHEPHERD: Sorry, what I mean is that you  
12   toughened up your approach to them. You demanded more of  
13   them; is that fair?

14          MR. REINER: We are demanding more transparency, and  
15   we are demanding visibility into their detailed planning.  
16   This isn't, pound your fist on the table and say we want  
17   more. That is not what we are talking about here with SNC-  
18   Lavalin.

19          The approach with SNC-Lavalin, SNC-Lavalin had  
20   initially -- so this is under a fixed-price contract on  
21   their tooling work.

22          MR. SHEPHERD: Tooling work, yes.

23          MR. REINER: So the price is locked in, milestones are  
24   established, you meet the milestone, you get paid, you  
25   don't meet the milestone, you don't get paid, very strong  
26   incentives, and the price is capped.

27          However, from an OPG project management perspective we  
28   want to understand what potential risks are inherent in the

1 work. The only way for us to determine that was to have  
2 visibility into the schedule that they were working to. We  
3 had asked for visibility into that schedule, and they  
4 provided it.

5 When we had visibility into that schedule and we saw  
6 that there were challenges, we asked for, What are you  
7 doing about those challenges? Show us what your recovery  
8 plans are, and they provided it, so it's not, demand more  
9 and let's sit back and see what happens. It's, set clear  
10 expectations, make sure that they are understood, ensure  
11 that what they are doing meets the requirements, and then  
12 ensure that it's actually being fulfilled.

13 MR. SHEPHERD: What I understood Mr. Gould's report to  
14 say, and I think you said the same thing yesterday, is that  
15 with SNC-Lavalin -- SNC-Aecon, AECL, whoever --

16 MR. REINER: Just to clear the record, it's not Atomic  
17 Energy of Canada.

18 MR. SHEPHERD: No, it's actually CANDU Energy, right?

19 MR. REINER: And it's not CANDU Energy. Our contract  
20 is with SNC-Lavalin. CANDU Energy is a subsidiary company  
21 that SNC-Lavalin does own. Any work that they do on this -  
22 - on this is done in a formal contractual way, so they are  
23 a subcontractor that has been contracted to provide some  
24 services to the project, but it is SNC-Lavalin that is  
25 running this project. It is not AECL. It is not CANDU  
26 Energy Inc. CANDU Energy Inc. have some specific  
27 deliverables, and we see those, and it's the CANDU Energy  
28 Inc. management team, and they're managed by SNC-Lavalin,

1 but that's only a very small subset of the -- of the job.

2 MR. SHEPHERD: And you did that on purpose because you  
3 have used the same people before and have had some cost  
4 overruns, right, and so you wanted more control over the  
5 situation?

6 MR. REINER: When we embarked on negotiating the  
7 contract, the contract -- the partners in the contract  
8 negotiations were SNC-Lavalin and Aecon. They were the  
9 bidders, so it's not something we did -- we ran an RFP, and  
10 they were the bidders on the job.

11 As that bid was progressing, Atomic Energy in its  
12 former state was actually a bidder on this job as well.

13 As the process, the procurement process was making its  
14 way through to conclusion, the sale of CANDU Energy Inc.  
15 occurred, and SNC-Lavalin acquired CANDU Energy Inc., and  
16 as a result of that, the partnerships in the bidding  
17 process realigned.

18 So it's not something we had demanded. It's the  
19 procurement process. It's the partnerships that were  
20 formed as part of the procurement process. SNC-Lavalin was  
21 always the prime in that particular consortium.

22 MR. SHEPHERD: You had -- there's references here to  
23 the JV. The JV is SNC and Aecon, right?

24 MR. REINER: Yes.

25 MR. SHEPHERD: And you hadn't actually selected SNC-  
26 Lavalin prior to their acquisition of AECL, right?

27 MR. REINER: We were in the midst of the procurement  
28 process when that acquisition occurred.

1 MR. SHEPHERD: So you hadn't made the selection yet?

2 MR. REINER: So we had not made the selection.

3 MR. SHEPHERD: Of course that strengthened their  
4 position, because now they had more expertise?

5 MR. REINER: You would expect it would strengthen then  
6 their position because they've got technical expertise,  
7 absolutely.

8 MR. SHEPHERD: All right. I don't know how we got off  
9 over there, but --

10 MR. REINER: I just wanted to clarify that the  
11 contract is not with AECL.

12 MR. SHEPHERD: No, that was very useful, but now I  
13 have forgotten where I was. I have actually forgotten  
14 where I was.

15 I will go to another subject. I will remember  
16 eventually. Let's talk about the class 3 estimate from  
17 SNC-Aecon.

18 You -- your reports, Mr. Gould, a number of times say  
19 they are way behind schedule, they are not doing enough  
20 work on this, they haven't got enough hours into it. In  
21 fact, at one point you said they must have made a mistake  
22 because they couldn't possibly be this slowly along on it.

23 And you expressed a concern that because they really  
24 didn't have enough time anymore, that it was not really  
25 technically possible for them to do a good estimate by the  
26 deadline, that the estimate would not be very good; do you  
27 recall those?

28 MR. GOULD: Yes. From our earlier reports, that

1 summarizes our concerns.

2 MR. SHEPHERD: And that was right until the March  
3 report you were saying that, right?

4 MR. GOULD: Yes.

5 MR. SHEPHERD: Okay. And then they did deliver on  
6 time, right? Did they deliver, actually, the class 3  
7 report on time?

8 MR. GOULD: Yes, they did.

9 MR. SHEPHERD: Okay. And so have you looked at that  
10 yet?

11 MR. GOULD: Yes.

12 MR. SHEPHERD: Okay. Did you look at it, then, before  
13 the Darlington refurbishment team, because they are still  
14 looking at it, right? You are still looking at that  
15 estimate?

16 MR. REINER: We obviously are, because this estimate  
17 is now the basis for the next -- for the next estimate for  
18 getting to a class 2, which we need to get to for RQE.

19 MR. SHEPHERD: Well, my understanding was that in fact  
20 the -- you don't expect to complete your review of the  
21 class 3 estimate until August; is that right?

22 MR. REINER: Yeah. That's correct.

23 MR. SHEPHERD: You say at attachment A to the May 13th  
24 report, under the "Risk of class 3 estimate," you say:

25 "Ultimate goal of delivery by August 2014 is  
26 acceptable."

27 So that's -- after you vetted it. you then go back to  
28 SNC-Aecon, say: There's some things we don't like about

1 it. Right?

2 And then they have to deliver one that you are happy  
3 with by August?

4 MR. REINER: No, we -- we have accepted the class 3  
5 estimate that they delivered.

6 MR. SHEPHERD: Well, then what does this mean?

7 MR. REINER: If you give me a second to --

8 MR. KEIZER: Where are you looking at, Jay?

9 MR. SHEPHERD: I am looking attachment A to the May  
10 13th report.

11 MR. REINER: What that means is we had looked at -- at  
12 one point in time when the concern was raised, that there  
13 might be a problem achieving the delivery milestone for the  
14 class 3 estimate.

15 Mr. Gould and I actually talked about this  
16 specifically. We had a look at our schedule, and we said:  
17 In terms of contingency, what is the outlying date by which  
18 we could accept that class 3 and not affect the project?  
19 That is where that August date came from.

20 MR. SHEPHERD: Let me just stop you. In terms of  
21 contingency, you don't mean dollar contingency, you mean  
22 schedule contingency?

23 MR. REINER: Schedule contingency, in terms of not  
24 impacting the next phase of work, which is the development  
25 of the class 2 and starting to do the tool proving and the  
26 time trials of the tooling. What is the latest by which we  
27 could accept the class 3? That is what that August date  
28 refers to in that report.

1           And I have got to validate with Mr. Gould, but I  
2 believe that is what that date refers to.

3           MR. GOULD: And that's reflected in the body of the  
4 report as well, I believe.

5           MR. SHEPHERD: Here is what I am trying to understand.  
6 By this time, this is already delivered, right?

7           MR. GOULD: No. Well, you have to reflect the timing  
8 of the generation of the reports and the meetings. This is  
9 as -- this report was generated as of April 30th.

10          MR. SHEPHERD: Okay.

11          MR. GOULD: There was a tremendous amount of effort  
12 that went into the final stages of the estimate. The  
13 actual -- the actual deadline for the acceptance was June  
14 15th. So...

15          MR. SHEPHERD: June?

16          MR. GOULD: Well, the initial submittal was May 15th,  
17 and then there were vetting activities that occurred out to  
18 June 15th.

19          MR. SHEPHERD: This says:

20                "Completing thorough OPG review by May 15th will  
21                be challenging."

22          MR. GOULD: This was the progression of the documents  
23 that they were presenting.

24          MR. SHEPHERD: Now I am confused. When was SNC-Aecon  
25 supposed to deliver this?

26          MR. ROSE: Let me try and elaborate on the process a  
27 little bit.

28                So the process for preparing the class 3 estimate is

1 that the JV prepared -- they prepare what we call a  
2 comprehensive work package, so they actually look at all of  
3 the work that needs to be done. They had 180-plus  
4 comprehensive work packages.

5 MR. SHEPHERD: That is what is referred to as a CWP?

6 MR. ROSE: CWP, that is correct, yes.

7 So the first part of their estimating process is to  
8 develop this comprehensive work package to understand how  
9 the work was going to be performed, then they apply an  
10 estimate to that, and it gets grouped together into what we  
11 call estimating reports. Okay?

12 So those reviews are going along throughout the March,  
13 April, early May period. OPG staff are receiving,  
14 reviewing, commenting, participating in that process.

15 On May 15th all of those estimate reports were bundled  
16 and provided in to us in a summary estimate report for  
17 OPG's final review.

18 We then had a series -- we actually seconded people to  
19 the Oakville office for about three weeks, to do a deep  
20 dive in their estimate report and to deal with issues,  
21 resolve issues, get to a point of final submission on June  
22 13th and our acceptance.

23 MR. SHEPHERD: Okay. So they were late by a month?

24 MR. ROSE: No, they were not late by a month. They  
25 submitted it on May 15th. We used the month to do OPG  
26 review, as per our schedule. The final milestone date was  
27 June 15th; they submitted it on June 13th.

28 MR. SHEPHERD: I see. Okay.



1           So in March, Mr. Gould, you said that SNC-Aecon was --  
2   achieving the May 15th delivery of the class 3 estimate was  
3   significantly challenged; right?

4           MR. GOULD:   Yes.

5           MR. SHEPHERD:   What happened, then, between March and  
6   May to change that?  I mean, you said here:

7                   "SNC-Aecon's class 3 estimate recovery plan  
8                   actually assumes it will prepare CWP's at a rate  
9                   50 percent faster than its best single weak  
10                  performance to date."

11          And you are obviously saying that's not reasonable,  
12   right?

13          MR. GOULD:   We were questioning whether that was  
14   possible.

15          MR. SHEPHERD:   But they were able to do it?  What  
16   happened?

17          MR. GOULD:   They were able to do it.

18          MR. SHEPHERD:   Do you know how this happened?

19          MR. GOULD:   They devoted a significant number of  
20   resources to get the work done.

21          MR. ROSE:   I would also say they started late; they  
22   had a learning curve; they got over that learning curve;  
23   they got the people in place; they got the production rate  
24   up.

25          They created a bow wave for OPG folks in reviewing and  
26   understanding and ensuring the quality of that, but we  
27   committed to make sure it was done.

28          I know Eric and I had conversations about -- you know,

1 about whether or not we should give them more time to do  
2 it. And our choice was no. We wanted to -- we didn't want  
3 to give up on that date in the March and the May time  
4 frame. We wanted to make sure that we performed effective  
5 oversight and helped them achieve that milestone.

6 MR. SHEPHERD: So you expressed, Mr. Gould, a concern  
7 that the speed at which they would have to do this would --  
8 and I'm quoting again -- "degrade the quality of the class  
9 3 estimate". In your view that didn't end up happening.

10 MR. GOULD: At the end of the day, no, it did not.

11 MR. SHEPHERD: Okay. And you are satisfied now with  
12 the estimate that you have.

13 MR. ROSE: We have accepted the estimate and approved  
14 it, so they are now off to preparing and planning and  
15 getting going on class 2 estimate.

16 MR. SHEPHERD: And you said at one point, Mr. Gould --  
17 and I don't have this here, but I know you said it -- that  
18 rather than wait for the class 2 estimate SNC-Aecon should  
19 be required or asked to do the -- to monetize the  
20 contingency in the class 3 estimate. Do you recall that?

21 MR. GOULD: I recall that we made a recommendation  
22 along those lines.

23 MR. SHEPHERD: Is that what happened?

24 MR. GOULD: So under the contract they are not  
25 required to do that.

26 MR. SHEPHERD: I understand.

27 MR. GOULD: But there is an -- my understanding is  
28 that there is an agreement with the parties that they will

1 help OPG with a view of what that contingency looks like so  
2 that the next business plan can be appropriately monetized  
3 for contingency.

4 MR. SHEPHERD: So where are you on that, Mr. Rose?

5 MR. ROSE: So I spoke of this earlier this morning  
6 that there was -- throughout the early parts of this year  
7 there was a scrubbing of the risk register, getting -- you  
8 know, eliminating the business-as-usual risks, getting down  
9 to a -- the true set of true risks that would impact  
10 contingency.

11 Now that the class 3 is done, we are working with JV  
12 over the summer months to truly understand what their  
13 contingency is, and that will be input into our 4 delta  
14 release in November.

15 MR. SHEPHERD: All right. I want to go back to the  
16 May 13th report for a second and ask you a couple of things  
17 about the Black and Mac (sic) estimates, if you could. And  
18 I am looking at -- right now at page 9.

19 MR. GOULD: Yes, sir.

20 MR. SHEPHERD: And I take it that this stuff that's  
21 blacked out, the confidential stuff, rather than going  
22 through it in detail, I take it that you are saying -- you  
23 are being [redacted]

24 [line 24 redacted]

25 MR. GOULD: I would say that's a fair  
26 characterization.

27 MR. SHEPHERD: And on page 10 -- and this is what I am  
28 getting to here -- near the bottom of that box you say:

1 [Lines 1 to 7 redacted]

2

3

4

5

6

7

8 And you go on to say all their estimates now are  
9 doubtful. Do you still believe that? Or has that been --

10 MR. GOULD: Yes, and that is why they are being looked  
11 at very closely right now by OPG, and with us providing  
12 oversight.

13 MR. SHEPHERD: And the key one here is that  
14 272 million for the D20; right? [redacted]  
15 [redacted].

16 MR. GOULD: Yes.

17 MR. ROSE: That is correct. That is the key estimate,  
18 yes.

19 MR. SHEPHERD: And you are looking at that in detail  
20 right now.

21 MR. ROSE: We have people right now working day in,  
22 day out with Black and Mac, with Modus folks, to ensure  
23 that we get the best estimate possible to be able to  
24 provide a good update to our board in August.

25 MR. SHEPHERD: All right. So I am looking at -- now  
26 at the supplementary report, the June 26th report. And you  
27 have -- on page 16 you have the 200 -- it's actually  
28 \$276 million forecast; right? But --

1 MR. GOULD: Hang on. Just one moment, please.

2 Yes, on the wrong tab. Yes, sir.

3 MR. SHEPHERD: And then I am looking at the same time  
4 at attachment C to the -- attachment C? No. Hang on.  
5 Just give me a second.

6 Sorry, I am looking at -- yeah, at attachment C to the  
7 May 13th report, and if you look at page 2, you have --  
8 what does EAC mean?

9 MR. GOULD: Estimate at completion.

10 MR. SHEPHERD: Okay. So this is not actually at  
11 completion. This is what you now think will be your final  
12 cost once you are finished.

13 MR. GOULD: It's a projection of your final cost.

14 MR. SHEPHERD: Okay. Good. So you have -- in this  
15 top table you have an estimate for the D20 of 314 million.  
16 How does that relate to the 276 million?

17 MR. GOULD: So 314 million that we looked at on May  
18 13th was the estimate that was presented as of that time,  
19 and recall my testimony a moment ago that you just asked me  
20 about, about the quality of the estimate?

21 MR. SHEPHERD: Yes.

22 MR. GOULD: We had some serious questions about the  
23 quality of the estimate, and between the April 30th time  
24 frame when this report was submitted and generated until  
25 June 26th there were a number of different -- a number of  
26 different vetting exercises as of that time to continue to  
27 look at the numbers.

28 MR. SHEPHERD: What are the SIO projects?

1 MR. REINER: SIOs are safety improvement  
2 opportunities. There is a list of five projects. They are  
3 tied to environmental assessment requirements. They are  
4 also prerequisite projects that need to be completed prior  
5 to breaker open.

6 MR. SHEPHERD: Are they in this list of 314 million  
7 for D20?

8 MR. REINER: No.

9 MR. GOULD: When you say "this list" what are you  
10 talking about?

11 MR. SHEPHERD: The one on page 2 of attachment C to  
12 the May 13th report.

13 MR. GOULD: No, this is just for D20 storage, sir.

14 MR. REINER: That is just a single project, D20  
15 storage. The SIO projects are a separate set of projects.

16 MR. SHEPHERD: They are separate. Okay.

17 So do I understand correctly then that the 314 is what  
18 Black and Mac came to you with; is that right?

19 MR. GOULD: Came to OPG with.

20 MR. SHEPHERD: Yes. No, I --

21 MR. GOULD: As of that time.

22 MR. SHEPHERD: -- was speaking to you collectively.

23 And you have been working on that vetting it, and you  
24 are now at 276 as of the 26th.

25 MR. ROSE: The estimate that I have in -- that, you  
26 know, I keep saying it's OPG's estimate that we have, is  
27 287. That was --

28 MR. SHEPHERD: 287.

1 MR. ROSE: That was the estimate that we have in our  
2 D2-2-2 evidence and supporting document.

3 MR. SHEPHERD: That was going to be my next  
4 reconciliation, so thank you.

5 MR. ROSE: So we have -- you know, we have talked  
6 about a range. We've got a number that we put out there,  
7 but we've also talked about a 2- to \$300 million range  
8 because we are still working through the details of the  
9 D20.

10 I am optimistic that the number that we will finally  
11 land on will be less than \$287 million.

12 MR. SHEPHERD: Okay. So --

13 MR. ROSE: But it will be a right number.

14 MR. SHEPHERD: So Black and Mac hasn't accepted your  
15 287 yet.

16 MR. ROSE: There are no changes approved on the  
17 estimate as of today.

18 MR. SHEPHERD: All right. So the official estimate  
19 then is still 314.

20 MR. ROSE: The official estimate is still, my opinion,  
21 \$110 million project.

22 MR. SHEPHERD: Oh, good. All right.

23 MR. ROSE: We have not approved, to my knowledge, any  
24 change orders to change that estimate at this point.

25 MR. SHEPHERD: Understood, but Black and Mac isn't  
26 going to do the work if you say, By the way, we are only  
27 going to pay you \$110 million.

28 MR. ROSE: Correct.

1 MR. SHEPHERD: Okay.

2 MR. ROSE: We also understand that.

3 MR. SHEPHERD: So they think that they are going to  
4 get 314 million, or that's going to be the total cost, of  
5 which they are going to get some of it, right?

6 MR. ROSE: I guess, quite frankly, I don't care what  
7 they think today. We will ultimately agree on what the  
8 number is as an outcome of this exercise.

9 MR. GOULD: Okay. And let me just clarify something.  
10 What you keep coming back to is the 314 million. That was  
11 the estimate that existed as of this date. So like Mr.  
12 Rose said, there are literally meetings happening right now  
13 to further examine this number. This is not a fixed-price  
14 proposal --

15 MR. SHEPHERD: Oh, no, I understand, it is a cost plus  
16 contract, right?

17 MR. GOULD: It was -- it was -- it was a -- it was  
18 their -- their best estimate at the time, and that is being  
19 vetted very thoroughly.

20 MR. SHEPHERD: But what I was asking was -- and I  
21 understand what you are saying. What I was asking was,  
22 Black and Mac hasn't yet said, No, a different number is  
23 fine with us, right? They are still at 314, until you  
24 finish these discussions?

25 MR. ROSE: I don't know what number Black & McDonald  
26 is at, but whatever number it is, it will be agreed to by  
27 both parties before it gets...

28 MR. SHEPHERD: Now, just looking at this table on page



1 2, some of the things leapt out at me. What is B&M -- B&M  
2 is Black and Mac, right?

3 MR. GOULD: That's correct.

4 MR. SHEPHERD: So labour, materials, rentals goes from  
5 13 to 83 million. That -- is that because they were pushed  
6 down at the beginning? They were told they had to get it  
7 down to an unreasonably low number? Or is that because  
8 they just didn't control their costs well enough, or  
9 something else?

10 MR. GOULD: I think that while, again, this -- this  
11 estimate is a point in time from April 22nd, so let's not  
12 attribute too much significant to the actual number.

13 But in terms of looking at what underlies that  
14 range of numbers, I think this goes to what Mr. Reiner was  
15 saying about this estimate all along, that what was in the  
16 original BCS was not for the scope that is being built.

17 MR. SHEPHERD: All right. The -- one thing here is  
18 OPG costs. Just what's included in OPG's costs there?

19 I think this is for you, Mr. Rose.

20 MR. ROSE: Generally would be OPG's oversight, project  
21 management, engineering oversight, any operations support,  
22 commissioning support.

23 MR. SHEPHERD: These are allocations from your group,  
24 right? Basically? Or mostly?

25 MR. ROSE: The OPG costs are our assessment of what  
26 it's going to cost to perform our role in having this  
27 project executed.

28 MR. SHEPHERD: What I am saying is you don't have a

1 separate group of people that you have hired for this  
2 \$27 million; right? It's part of your overall group?

3 MR. ROSE: So some of the folks that -- this is the  
4 projects and modifications organization that is overseeing  
5 this project, so it is their cost to be on this project.  
6 It is not, you know, the DRP cost.

7 But it is also costs from people from the station  
8 and/or engineering organizations that are brought in to do  
9 the owner's role.

10 MR. SHEPHERD: So if this one is low by -- it was only  
11 -- the estimate was only a third of what you now expect it  
12 to be -- because this is your number, right? The 27,846 is  
13 your number; it's not Black and Mac, is it?

14 MR. ROSE: Eric, I am not certain the basis of the  
15 \$27 million. You'll have to respond to that.

16 MR. GOULD: As of that time, that was the best  
17 estimate from the projects and modifications organization  
18 for the support of the scope of work that was being  
19 developed.

20 MR. SHEPHERD: So, Mr. Reiner, then, they now report  
21 to you, right? So you are presumably working with them  
22 to --

23 MR. REINER: That's right. That is not a contractor  
24 number; that is going to be an OPG number.

25 MR. SHEPHERD: It's not necessarily the final number?  
26 You are still working on it?

27 MR. REINER: It's not necessarily the final number.

28 MR. SHEPHERD: Okay. Let me move to a different area,

1 and that is -- and the best place -- oh, by the way, let me  
2 just clear something up first.

3 The May 13th report is your second quarter 2014  
4 report, right?

5 MR. GOULD: Yes.

6 MR. SHEPHERD: If you go to attachment A -- which is  
7 your risk thing, right? The histograms, right. It's  
8 labelled "1Q 2014"; is that just a typo?

9 MR. GOULD: That's a typo.

10 MR. SHEPHERD: Okay. I didn't want to go relying on  
11 it and then find out later: Oh, no, it's the wrong one.

12 MR. GOULD: It's a typo.

13 MR. SHEPHERD: I want to ask some questions, just a  
14 couple of questions about how you re -- how you re-look at  
15 some of the costs and how you treat them.

16 I want to start with -- if you go to the fourth  
17 quarter 2013 report, we talked about this a little  
18 yesterday but we didn't have the numbers so we couldn't get  
19 into it.

20 You see page 6 of this report? This is -- now, this  
21 is you, Mr. Gould, looking at the 4C cost estimate, but you  
22 see here that one of the opportunities for cost reduction  
23 that you are talking about is reallocating costs outside of  
24 the project; do you see that? \$871 million?

25 MR. GOULD: Sorry, I'm on the wrong report. You are  
26 on the June...

27 MR. SHEPHERD: No, I am on the November, November  
28 12th, page 6.

1 MR. GOULD: I am sorry, I am sorry.

2 MR. SHEPHERD: You see where that blacked out part is  
3 there? That's 871 million?

4 MR. GOULD: Yes, sir.

5 MR. SHEPHERD: So what you are saying is even if you  
6 have to spend some of this, maybe it doesn't belong to the  
7 project; is that fair?

8 MR. GOULD: That is what we are getting at here, yes.

9 MR. SHEPHERD: Have you taken any action on this yet,  
10 Mr. Reiner, Mr. Rose?

11 MR. REINER: We are looking at this. I mean, we  
12 understand what those costs are. I think I described that  
13 yesterday. There is a portion of that cost that's  
14 associated with maintaining the equipment in the units  
15 that's currently being refurbished, and we are having a  
16 look to see what's the most appropriate way to capture and  
17 carry those costs.

18 MR. SHEPHERD: And do you have any -- well, let me put  
19 it this way. Right now all those costs are included in the  
20 Darlington refurbishment project, and none of those, that  
21 871 million, are included in the revenue requirement for  
22 the test period; is that right?

23 MR. REINER: I think this falls outside of the revenue  
24 requirement for the test period. These are costs that are  
25 incurred during the period that the units are on outage, so  
26 starting in 2016 and ending in about 2024.

27 MR. SHEPHERD: All right. So what I am going to ask  
28 you to do, because -- and I accept your answer, I'm just --

1 it's \$871 million. I want to make sure I get it right. I  
2 am going to ask you to undertake to confirm that none of  
3 that \$871 million is currently included in the revenue  
4 requirement proposed for the test period.

5 MR. KEIZER: That's fine.

6 MR. SHEPHERD: Thanks.

7 MR. MILLAR: JTX4.5.

8 **UNDERTAKING NO. JTX4.5: TO CONFIRM THAT NONE OF THAT**  
9 **\$871 MILLION IS CURRENTLY INCLUDED IN THE REVENUE**  
10 **REQUIREMENT PROPOSED FOR THE TEST PERIOD.**

11 MR. SHEPHERD: Now, you don't yet have a report or an  
12 analysis or anything that says how much you're actually  
13 going to put where and when, right? You are still working  
14 on it?

15 MR. REINER: In relation to this cost, that's correct.  
16 We don't yet have that.

17 MR. SHEPHERD: Do you know when you are going to have  
18 that?

19 MR. REINER: It would be a little early for me to say.  
20 I think what we will do -- I mean, this is going to require  
21 sort of an internal approval.

22 Our plan would be to highlight this in the 4Delta  
23 estimate, so when the 4Delta estimate goes forward this  
24 November, that is where we would provide the breakout of  
25 that cost and then make a recommendation to our board on  
26 how that cost should get accounted for.

27 MR. SHEPHERD: All right. And the effect of that is  
28 if you reallocate some of it, is to make it easier to stay

1 within your \$10 billion, right?

2 MR. REINER: No.

3 MR. SHEPHERD: I am not suggesting something bad.

4 MR. REINER: No, if this is gets reallocated, we would  
5 adjust our project estimate accordingly.

6 MR. SHEPHERD: Okay. If you could take a look at the  
7 first quarter 2014 report, which is -- no, sorry, the --  
8 yeah, the first quarter, which is the March 4th report, at  
9 page 5.

10 It says -- this is -- Mr. Gould, tell me whether this  
11 is right. This is your analysis of how the Darlington  
12 refurbishment team is complying with the Minister's  
13 requirements in the Long-Term Energy Plan, right?

14 MR. GOULD: That's my earlier testimony, yes.

15 MR. SHEPHERD: Okay. So on page 5, you have -- in  
16 this section "Current initiatives," it says:

17 "OPG has fully examined the scope of the Unit 2  
18 refurbishment project and redistributed or  
19 cancelled work based on OPG's regulatory  
20 commitments."

21 Tell us what that is, Mr. Rose, I guess, probably, or  
22 is it Mr. Reiner? I don't know.

23 MR. ROSE: I would actually like Eric to comment on it  
24 first, if you could.

25 MR. GOULD: I want to make sure I am on the right  
26 page.

27 MR. SHEPHERD: Page 5 under item 3:

28 "Entrench appropriate and realistic off-ramps in

1           scoping."

2           So you have re-scoped the Unit 2 refurbishment, or OPG  
3 has. And I understand some of the work has been cancelled,  
4 but some of it has been redistributed. That is what I am  
5 interested in.

6           MR. GOULD: Okay. So what we say here is this is a  
7 comment that reflects the blue-ribbon panel process that we  
8 discussed quite a bit yesterday.

9           MR. SHEPHERD: Sure.

10          MR. GOULD: So there was some scope that was  
11 completely eliminated as being unnecessary. There was some  
12 scope that was put back into life-cycle maintenance. I  
13 think Mr. Reiner described that at length yesterday.

14          MR. SHEPHERD: Okay. And that was the 125 million or  
15 something?

16          MR. ROSE: 179-, \$180 million range. I would like to  
17 also add to that. I mean, the blue ribbon was a specific  
18 review of scope through -- Mr. Reiner spoke about our  
19 inspection process, and there is certain things that were  
20 identified as scope, regulatory scope, depending on results  
21 of inspection that we would or would not have to do, so  
22 through those, the results of those inspection, we would --  
23 we may have inspected something that was in good condition  
24 and did not need to be replaced, and through our integrated  
25 implementation plan that was submitted to the CNSC we would  
26 have submitted it that way and excluded that from scope.

27          MR. SHEPHERD: So that 179 million is stuff that was  
28 in your business-case summary and has been removed from it,

1 and you are still going to do the work, you are just not  
2 going to do it as part of this project; is that right?

3 MR. ROSE: A subset of that 179 million was cancelled.  
4 The balance of that would have been carried into our  
5 business case for future work after refurbishment.

6 MR. SHEPHERD: But it's not part of your refurb --

7 MR. ROSE: Not part of refurbishment, capital direct  
8 cost.

9 MR. SHEPHERD: So did you reduce your point estimate  
10 for that?

11 MR. ROSE: We did. Mr. Reiner spoke of the fact that  
12 we reduced our point estimate by \$800 million, our --  
13 sorry, our high-confidence estimate, but our point estimate  
14 would have reflected the results of all of those analysis,  
15 so the scope would have been removed for the point estimate  
16 as well.

17 MR. SHEPHERD: Okay. But I thought this work was in  
18 your business-case summary that was approved. Your 4C  
19 include that stuff, right?

20 MR. ROSE: No, the scope was actually removed from our  
21 4C.

22 MR. SHEPHERD: Oh, it was already out. Okay.

23 MR. ROSE: It was already out.

24 MR. SHEPHERD: Okay. What are the AISC programs? It  
25 is the next item down.

26 MR. ROSE: AISC stands for the asset investment  
27 screening committee. It's the committee that projects and  
28 modifications -- the projects that are executed for the



1 balance of the nuclear organization go through. So we  
2 control the projects, the funding for the projects, that  
3 are funded by the Darlington refurbishment program. The  
4 asset investment screening committee manages the funding  
5 related to the portfolio in the nuclear part of our  
6 business.

7 MR. SHEPHERD: So is this sort of the same type of  
8 thing? This is then, you had some stuff that was in the  
9 Darlington refurbishment plan as part of its scope, and  
10 you've said, no, that's not really part of that any more.  
11 These are now -- we are going to hand these over to AISC  
12 and that's their problem now?

13 MR. ROSE: So the \$180 million, the plant would look  
14 at it and say, How do I execute that work? Do I execute it  
15 as part of our maintenance program? Do I execute it as  
16 part of our station program? Or do I execute it as a  
17 project within the AISC -- funded by the AISC portfolio?

18 MR. SHEPHERD: I see, I see. Okay. And then the last  
19 question on this, and then I will be happy to take a break,  
20 is, you see it says -- just -- under "potential gaps" it  
21 says:

22 "Ensuring the scope that is provided for  
23 refurbishment though performed outside of the DR  
24 project is staffed, funded, and executable."

25 So this is your words, Mr. Gould. Can you describe  
26 what that means?

27 MR. GOULD: So what we were saying here is that the  
28 scope that was moved into the AISC program that was just

1 discussed to ensure that if in fact it is needed for the  
2 plant, that the plant have preparation -- have the capacity  
3 to perform that work whenever it's been rescheduled.

4 Now, we see it as a benefit to the project, because it  
5 simplifies the project to get whatever work you don't have  
6 to do during that time frame. The real issue here is if  
7 you don't need to perform the work for another ten or 15  
8 years, so that OPG makes sure that they have the capacity  
9 to perform that work whenever it was required.

10 MR. SHEPHERD: Well, this sounds like you are saying  
11 that some of those things still have to be done in order  
12 for you to proceed with the refurbishment; is that right?

13 MR. GOULD: Some of the -- maybe Mr. Reiner should  
14 answer.

15 MR. SHEPHERD: Yes, yes.

16 MR. REINER: They are not prerequisites to  
17 refurbishment, so we can proceed with the refurbishment,  
18 but there are some items that -- from -- that our  
19 regulator, for example the Canadian Nuclear Safety  
20 Commission, will look at as being part and parcel of the  
21 life extension of Darlington.

22 So when they look in at the plant, they look at it as  
23 a station that we are planning to operate for another 30  
24 years. They are not concerned about how we manage the  
25 work, whether it's done through ASIC or through maintenance  
26 or through a refurbishment project. They will look at it  
27 in totality.

28 So we have -- all of this work has been -- it's part

1 of the scope request process that we have in place. It's  
2 earmarked as either going into a maintenance program or  
3 being managed through the AISC portfolio, and it does get  
4 tracked so that we are able to demonstrate that we have met  
5 the regulatory requirements.

6 MR. SHEPHERD: All right, all right. Do you want to  
7 take a break?

8 MR. MILLAR: How much longer are you going to be, Mr.  
9 Shepherd?

10 MR. SHEPHERD: Not more than 30 minutes.

11 MR. MILLAR: Okay. Why don't we come back at 3:20.

12 --- Recess taken at 3:04 p.m.

13 --- On resuming at 3:22 p.m.

14 MR. MILLAR: Okay. Why don't we resume? We are in  
15 the home stretch now. Mr. Shepherd, back to you.

16 MR. SHEPHERD: You said that with a hopeful tone in  
17 your voice?

18 MR. MILLAR: I did.

19 [Laughter]

20 MR. SHEPHERD: You are not finding this just riveting?

21 MR. MILLAR: I am finding it riveting.

22 MR. SHEPHERD: You had to say that, I know.

23 I want to ask you a question about the RWPB building.  
24 What is that? Remind me, please.

25 MR. REINER: That's re-tube waste processing building.  
26 So all of the reactor components that come out of reactors  
27 get --

28 MR. SHEPHERD: This is the one we talked about

1 yesterday, where you chop it up and put it in bins and  
2 leave it out for the trash collection.

3 MR. REINER: Yeah.

4 [Laughter]

5 MR. SHEPHERD: So to speak. All right. My impression  
6 is -- and I am looking now at the May 13th report, and if  
7 you see on page 19 of that report, there is a discussion of  
8 the RWPB building, Mr. Gould, in which you say that it's  
9 facing some of the same issues as D20 and AHS; you see  
10 that?

11 MR. GOULD: Yes, I see that.

12 MR. SHEPHERD: And -- but this is being done by SNC-  
13 Aecon, right?

14 MR. GOULD: That's correct.

15 MR. SHEPHERD: So this is not a problem with a  
16 contractor estimating badly or not being -- I thought you  
17 were managing these projects differently, Mr. Reiner?

18 MR. REINER: I think -- so in terms of the challenges  
19 that that project faces in general, facilities that are  
20 built at the site -- and I went through this yesterday --  
21 we are encountering the same challenges everywhere.

22 Soil tends to be contaminated, and that needs to be  
23 dealt with. There are buried services that need to get  
24 relocated before foundations can be put into place. And if  
25 anything during excavation gets dug up that isn't  
26 documented in a drawing somewhere, it needs to be  
27 dispositioned in some way to understand whether or not it's  
28 energized and presents some sort of a safety hazard.

1           So that project will undergo many of those same  
2 challenges. Now, we believe --

3           MR. SHEPHERD: You knew about all of those already,  
4 though, right? These are not news?

5           MR. REINER: Some of this is news, yes. We know now,  
6 based on the fact that projects like D2O storage, the R&FR  
7 island annex -- which are all recent projects -- have  
8 encountered this. So that learning is being incorporated.

9           I mean, it's news in the sense that it isn't something  
10 that we would have necessarily -- the extent to which we  
11 are having to deal with these issues isn't something we  
12 would have thought we would get at this sort of level.

13           There is a significant amount of construction waste  
14 that's buried at the site, and we encounter it every time  
15 we dig.

16           MR. SHEPHERD: But didn't you know that? That is what  
17 I am trying to --

18           MR. REINER: Knew that when?

19           MR. SHEPHERD: Like, before you even started this,  
20 didn't you know that Darlington was built there and there  
21 would be construction waste all over the place?

22           MR. REINER: Not -- we didn't anticipate it to the  
23 degree that we are encountering this. Like -- and I will  
24 give you an example. The water and sewer project which is  
25 being built essentially offsite, that encountered the same  
26 kinds of challenges with buried -- with buried materials.

27           MR. SHEPHERD: Okay. So this -- when, Mr. Gould,  
28 then, when you are saying that RWPB is facing the same

1 issues, you are not saying it's in as bad shape as D20?  
2 You are saying that the same technical issues are arising?

3 MR. REINER: The same technical issues and the same  
4 challenges, you know. That project will have to address  
5 those same challenges, and that is being built into our  
6 plans.

7 MR. SHEPHERD: So is it going to be also over budget  
8 by a similar amount?

9 MR. REINER: No. We -- the -- now, the RWPB, it's a  
10 very -- the building itself is a very basic building. It  
11 doesn't -- you know, we are currently looking at, but it  
12 won't have to meet the same kind of seismic requirement,  
13 for example, that the D20 storage facility needs to meet.  
14 It's essentially going to be concrete slab on grade and a  
15 shell around the building.

16 So the building itself isn't a sophisticated building;  
17 it's a simple building. What's inside the building is the  
18 sophistication, but that's part of the -- that's part of  
19 the tool set, the re-tube and feeder replacement tool set,  
20 the inside of the building.

21 MR. SHEPHERD: This is the same one that SNC-Aecon is  
22 working on, that they are behind on?

23 MR. REINER: Yes. It's -- they are not behind on  
24 this. SNC-Aecon, they are having challenges with one tool.  
25 This is not a tool that they are behind on.

26 MR. SHEPHERD: So they are responsible for the tooling  
27 project and they are way behind on it; isn't that true?

28 MR. REINER: Well, we flagged them as being behind

1 schedule on tooling, yes, but the reason they are behind  
2 schedule on tooling is one of the tools, the re-tube  
3 platform, which ends up being a fairly sophisticated tool -  
4 - it's the one in the reactor vault that moves up and down  
5 in front of the face of the reactor, that everything sits  
6 on -- they are having challenges with that particular tool,  
7 and that's what has set them behind schedule.

8 And so we are monitoring their progress on that. They  
9 have a recovery plan in place to get back to their desired  
10 control schedule, which is what we are measuring their  
11 performance to -- they are hitting their contract  
12 milestones -- but back to their control schedule, that's  
13 what we are currently monitoring. And we see them being --  
14 based on the progress they are making on their recovery  
15 plan, they will be back on plan by around September  
16 timeframe.

17 MR. SHEPHERD: All right. Okay. I am just looking  
18 for a reference, because I was sure I saw commentary from  
19 Mr. Gould on the problems with tooling and that the  
20 milestone would be missed.

21 Didn't you say that?

22 MR. GOULD: Yes.

23 MR. REINER: There were interim milestones that had  
24 slipped. I think engineering completion, design completion  
25 for tooling was one of those, but the contract milestones  
26 haven't been missed.

27 MR. SHEPHERD: Oh, so that is something different?

28 MR. REINER: The contract milestones typically tie to

1 -- they are rolled up at a higher level, is payment  
2 received for work done.

3 When we look at this project, the change we have made  
4 to this project as a result of the challenges that they  
5 were having with this particular tool, we now look at a  
6 much more granular -- we are seeing a level 2 schedule for  
7 the tooling work, and we are seeing that level 2 for the  
8 subcontractors. We've got complete visibility into all  
9 aspects of that, so we can see how the subcontractors are  
10 performing relative to the milestones that SNC-Lavalin has  
11 set inside their schedules for their subcontractors.

12 MR. SHEPHERD: And that, you don't have any control  
13 over that, right? It's just...

14 MR. ROSE: Sorry just to clarify Mr. Reiner's comment,  
15 we are actually seeing level 3 schedules, so more detail  
16 than what he was alluding to.

17 MR. SHEPHERD: Yes. You have more visibility, but you  
18 don't actually have control over the subcontractors, right?  
19 That's SNC-Aecon?

20 MR. REINER: That's right, and we don't -- it's an EPC  
21 contract. We don't want control over them.

22 MR. SHEPHERD: But it allows you to keep on top of  
23 your schedule, your overall project schedule?

24 MR. REINER: Well, and it allows us to challenge them  
25 and demonstrate to us how they are staying on top of their  
26 schedule.

27 MR. SHEPHERD: Now, when you talked about project and  
28 modifications, those were fixed-price contracts and you



1 didn't really have any right to ask for visibility at all,  
2 right? Under the contracts?

3 MR. REINER: Are you referring to the facilities  
4 projects, D2O storage and --

5 MR. SHEPHERD: Yes.

6 MR. REINER: No, they are not fixed-price contracts.

7 MR. SHEPHERD: No, but they were contracts in which  
8 you didn't have a right to have any control over them,  
9 right?

10 MR. REINER: Well, in -- we don't -- we don't have a  
11 right to take control on any of the EPC work, because as  
12 soon as we do that, the liabilities for the work --

13 MR. SHEPHERD: You take the risks?

14 MR. REINER: We take all the risks, right. So I think  
15 the contractor would be happy for us to do that in some  
16 cases, but -- so we have very careful about how to provide  
17 the oversight, in an intrusive way, but not in a way where  
18 we say we would like you to drop that tool and pick up that  
19 tool and do that work.

20 MR. SHEPHERD: No, no, I understand that, but what I  
21 am trying to get at here is that originally when you did  
22 those contracts with ES Fox and Black and Mac, those  
23 contracts were, You go do it. Let us know when you are  
24 done.

25 MR. REINER: That's the way that the projects and  
26 modification organization was managing them initially, sort  
27 of a hands-off approach. That is what Modus had  
28 identified, that the oversight wasn't at the level it

1 needed to be.

2 MR. SHEPHERD: Understood. And then you changed that,  
3 and you actually didn't have a right under the contract to  
4 change it. You just said, We are going to change it,  
5 right?

6 MR. REINER: Yes, we changed that. I mean, we have a  
7 -- we can provide oversight. There is nothing  
8 contractually that prevents us from doing that. We have  
9 the right to provide oversight. What we can't do is give  
10 work direction, because that then moves risk.

11 MR. SHEPHERD: No, but you can tell them you are  
12 unhappy, and --

13 MR. REINER: We can tell them we are unhappy and we  
14 would like to see a demonstration of what's being done to,  
15 for example, deal with whatever issues or complexities they  
16 may be running into.

17 MR. SHEPHERD: Right. The -- I wonder if you can take  
18 a look at the May 13th report. And I am looking -- this is  
19 at page 18. And this is under the heading "work status,  
20 tooling, definition, and mock-up". Do you see that?

21 MR. GOULD: Yes.

22 MR. SHEPHERD: And so here is what I am concerned  
23 with. In addition to JV -- that's SNC-Aecon, right? -- is  
24 trending over budget for the target-price portion of its  
25 definition-phase work, and it goes below, 15 to 25 percent  
26 above target.

27 So can you help us understand, like, fill us in on  
28 that?

1           MR. GOULD: So this, again, is the situation where we  
2 are looking at the reports from the contractors and we are  
3 trying to identify if there are any positive or negative  
4 trends, and as of that time that was the case, that based  
5 on the number of hours that they had earned on the  
6 schedule, we looked at the number of actual hours that it  
7 took to earn those hours and saw the level of effort that  
8 was required to get to the end of the work, the end of the  
9 schedule, the definition phase, and we saw that there was a  
10 chance that they could be 15 to 25 percent if they  
11 continued on at the same -- at the same velocity.

12           MR. SHEPHERD: Okay. Well, let me understand this.  
13 This says that the JV is projecting to complete it at 15 to  
14 25 percent above target. So that is not your number,  
15 right? That's --

16           MR. GOULD: Actually, it is.

17           MR. SHEPHERD: -- SNC-Aecon saying, We are going to be  
18 higher.

19           MR. GOULD: What we showed in -- what we did in this  
20 report was to look at their report and try and characterize  
21 it, and this is our characterization of the variance that  
22 they were showing.

23           MR. SHEPHERD: Okay. So it's their forecast.

24           MR. GOULD: It's their forecast. It's our  
25 characterization of their forecast.

26           MR. SHEPHERD: And so this is a \$1.6 billion contract,  
27 something like that?

28           MR. GOULD: No.

1           MR. ROSE: No, we are talking about the -- if I am  
2 correct, we are talking about the work that is being done  
3 in the definition phase, that is not fixed price. The  
4 fixed-price components are the tooling and the mock-up,  
5 which are in the neighbourhood of 420 million in total. We  
6 are talking about the definition-phase work which I want to  
7 say is less than \$100 million from memory.

8           MR. SHEPHERD: This is 100 million? All -- the  
9 engineering --

10          MR. ROSE: Yes, this definition-phase work that we are  
11 referring to here is less than \$100 million --

12          MR. SHEPHERD: Engineering, schedule and estimate  
13 development, and construction management planning, that is  
14 less than 100.

15          MR. GOULD: Yes.

16          MR. SHEPHERD: So you are thinking that you are going  
17 to have an extra 15- or \$20 million cost associated with  
18 this.

19          MR. GOULD: That is what they were projecting at the  
20 time, so we raised a red flag that their productivity was  
21 showing that this was the result of their productivity at  
22 the time. I think that we have seen some correction to  
23 that subsequent to this report, where in some cases the way  
24 that you earn -- the way a contractor earns its payments  
25 takes time to catch up.

26          So a deliverable is in process. You may be 90 percent  
27 complete with a deliverable, but you don't get paid until  
28 you're 100 percent, but you have expended a tremendous

1 amount of effort to get there.

2 MR. SHEPHERD: There is a table here somewhere -- let  
3 me just see if I can find it -- that has -- it would be  
4 easier if we actually had the table to look at, I think.  
5 Here it is.

6 In the fourth-quarter 2013 report, on page 2, there is  
7 a table that is headed up "SNC-Aecon monthly progress  
8 summary" -- I can't even say it -- which have in it planned  
9 earned actual, and this is just a three-month snapshot.

10 So can you tell us what planned, earned, and actual  
11 are?

12 MR. GOULD: So the planned, which is signified by the  
13 blue columns here, would be what's in the current schedule,  
14 the number of man hours and the dollars associated -- in  
15 this case it's -- this is in dollars, so it's the dollars  
16 associated with the work effort on a planned basis.

17 So these blue bars -- these vertical blue bars  
18 represent what they had planned to do that's in the  
19 schedule. So --

20 MR. SHEPHERD: So is that how much work they should  
21 have had done?

22 MR. GOULD: That is how much work they planned to have  
23 done.

24 MR. SHEPHERD: And that's -- is that in the contract?

25 MR. GOULD: Is what in the contract?

26 MR. SHEPHERD: These numbers, are these in the  
27 contract? This is the expected rate at which you are going  
28 to be doing this stuff.

1           MR. REINER: These are not laid out in the contract as  
2 you see them here. So this is a combination of tooling,  
3 mock-up, and definition-phase work, so it's a look at the  
4 schedule and what is loaded into the schedule. The  
5 schedule meets the contract, the contract divides that work  
6 into components, tooling is all fixed price, so there is no  
7 change in price. Mock-up was fixed price as well. The  
8 definition-phase work is -- the 100 million that we talked  
9 about, that's target price, so that's essentially if they  
10 exceed target they work for no profit or overheads.

11          MR. SHEPHERD: Okay. All right. So you have the  
12 planned items, and then you have -- in red you have  
13 "earned". What does "earned" mean, and how is earned  
14 different from actual?

15          MR. GOULD: "Earned" means that's the value of the  
16 work that is in place.

17          MR. SHEPHERD: For that month?

18          MR. GOULD: In this case for that month, but in  
19 general "earned" means the value of whatever the  
20 deliverable is to the person paying for it.

21          MR. ROSE: So we use the term you have earned your  
22 plan. I planned to spend \$100 to deliver a widget. I  
23 delivered that widget, so I earned \$100. It may have cost  
24 90 or 110.

25          MR. SHEPHERD: So let's just take July, for example.  
26 The plan was they were going to do \$15.1 million of work.  
27 They actually earned \$11.4 million, but what's the  
28 16.1 million there then?

1           MR. GOULD: That was their actual payroll to achieve  
2 that level of earning.

3           MR. SHEPHERD: So they actually spent \$16.1 million to  
4 earn 11.4 million?

5           MR. GOULD: Yes, which you will see in the next  
6 month --

7           MR. SHEPHERD: That doesn't sound like a good idea.

8           MR. GOULD: But, sir, you see in the next month there  
9 will be variations from month to month. You will see in  
10 the next month that the earned value is actually  
11 considerably higher than the actual value.

12          MR. SHEPHERD: Ah.

13          MR. GOULD: So sometimes these things tend to even out  
14 over time.

15          MR. REINER: There isn't -- so when you look at this  
16 from a project-management perspective, you don't look for a  
17 precise alignment of all three of those each and every  
18 month. The earning rule, that gives you sort of an  
19 indicator, you know, have they underestimated the job, have  
20 they overestimated it, have they under-resourced it. It  
21 gives you a forward look on, you know, how much work is  
22 left, how much work got done, how much budget got consumed  
23 in getting to that point, so you need to take those  
24 indicators and then look at trends, at what happens month  
25 over month, to see if problems are arising or if challenges  
26 are arising.

27          MR. SHEPHERD: I would have thought your key number  
28 then would be your cumulative number; right?

1 MR. ROSE: That was kind of -- my comment is that we  
2 tend to look at cumulative. It gets rid of the ups and  
3 downs month over month --

4 MR. SHEPHERD: And that's --

5 MR. ROSE: And those ups and downs are --

6 MR. SHEPHERD: -- (inaudible) anyway, right?

7 MR. ROSE: Yeah, those good ups and downs are good  
8 indicators, because if you are not earning one month and  
9 that's a trend, obviously your cumulative would reflect  
10 that, but when you get into the actual costs specifically,  
11 sometimes it's to do with timing of billings, right, and  
12 ability to do accruals for those billings that have yet to  
13 hit your books, so you try to norm that up. That is why  
14 again they are indicators, but it is the cumulative SPI,  
15 which is cumulative SPICPI earned plan, which are the focus  
16 areas for us in our reporting.

17 MR. SHEPHERD: So this \$100 million on this  
18 definition-phase stuff -- let's just -- let's call it  
19 \$100 million just for argument's sake -- if they -- their  
20 target price is 100 million, let's say. It's a target  
21 price contract?

22 MR. ROSE: Their target price for the definition plan  
23 work is actually \$102 million.

24 MR. SHEPHERD: Okay. So if they go 25 percent over,  
25 what does that do to them? How does that work?

26 MR. ROSE: Without -- I don't have the specifics of  
27 it, but if they went 25 percent over they would start  
28 losing their -- parts of their fee. Their fee is at risk.



1           So different from the ESMSA that we talked about  
2 yesterday, the -- JV's fee for the entire definition phase  
3 is at risk, as well as their overheads.

4           MR. SHEPHERD: Okay. So I recall this discussion. So  
5 if -- so if their costs are -- were forecast to be 100 and  
6 they are 120, they still get the 120 for their costs but  
7 the additional amounts that they were going to get to cover  
8 their general overheads and their profits are going to be  
9 eaten up?

10          MR. ROSE: It starts to get reduced. That is correct.  
11 For the entire amount, so they could -- you know, if they  
12 got so far over, they would lose their fee and overheads up  
13 to the caps that we would have in the contract.

14          MR. SHEPHERD: But it is only for the definition phase  
15 contract?

16          MR. ROSE: For that definition phase.

17          MR. SHEPHERD: That's not integrated with your other  
18 contracts with them?

19          MR. ROSE: For the target price for the unit execution  
20 phase, no, it is a separate piece.

21          MR. SHEPHERD: Each one is an island?

22          MR. ROSE: Yes. And I believe in the R&FR there is  
23 ability -- I can't recall correctly, but I thought there  
24 was some ability, unit over unit, to apply parts of the  
25 incentive as well.

26          MR. SHEPHERD: So in the actual RFR, the big contract  
27 -- that's the big contract, right? You haven't negotiated  
28 that yet, right?

1           MR. REINER: So the terms and conditions under which  
2 the execution work would be done, those have been  
3 negotiated and agreed to.

4           What hasn't been agreed to is the target price.

5           MR. SHEPHERD: Ah. Which is the one that matters?

6           MR. REINER: Yeah. So the incentives, the  
7 disincentives, the liabilities, the warranties, the  
8 intellectual property rights, all of those things have been  
9 negotiated and agreed to.

10          MR. SHEPHERD: The schedule also has to be negotiated,  
11 presumably?

12          MR. REINER: The schedule has to be negotiated, and so  
13 the process is, you know, this is where we go through the  
14 mock-up to do the testing of tools, we do time trials, and  
15 then we establish a schedule on the basis of tool  
16 performance.

17          MR. SHEPHERD: And that negotiation is this fall,  
18 right?

19          MR. REINER: That negotiation culminates next fall in  
20 the release quality estimate, but it is year-long process,  
21 starting this fall as these tools arrive, to get to that  
22 point.

23          MR. SHEPHERD: All right. All right.

24          And so that contract is going to be a separate target  
25 price for each unit; is that right?

26          MR. REINER: That's right.

27          MR. SHEPHERD: So they are individual islands? If  
28 they screw up on one they could lose all their profit, but

1 they still get to make money on the next one, if they do it  
2 better?

3 MR. REINER: Yesterday we talked a little bit about  
4 [lines 4 to 14 redacted]

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15 MR. SHEPHERD: So for example, if you had an incentive  
16 for doing better, having a lower cost on unit -- on the  
17 second unit than the first one, then they could get that  
18 incentive two ways. One is by going low on the second one  
19 and the other is going high on the first one.

20 So that is bad?

21 MR. REINER: Right.

22 MR. SHEPHERD: So you want to recast those incentives.

23 Is that part of your target price methodology, or is  
24 that a separate aspect?

25 MR. REINER: That would be separate. We would have to  
26 do that as an amendment to the contract, but we would do it  
27 at the same time as we are negotiating the target price.

28 MR. SHEPHERD: So I guess what I am saying is that the

1 -- you have already agreed to some incentives now, right?

2 MR. REINER: Yes.

3 MR. SHEPHERD: And that is not part of your target  
4 price approach. The target price is really a single  
5 concept, right?

6 MR. REINER: Yes, yes.

7 MR. ROSE: But just to clarify, the incentives, I  
8 believe, are based on the bands.

9 MR. REINER: Yes.

10 MR. ROSE: So the incentive for a \$1.5 billion target  
11 price for the entire execution is a certain range. The 1.6  
12 is a certain range, right? So we have --

13 MR. REINER: It's a percentage, yes.

14 MR. ROSE: A percentage, yeah. So I think we have  
15 built that in, that flexibility in.

16 MR. SHEPHERD: So then my last question is, again, on  
17 this contract stuff so I can understand it.

18 You have given SNC-Aecon the containment building and  
19 the steam generator contracts as well, right?

20 MR. REINER: SNC-Aecon have also got the turbine  
21 generator contract, a piece of the turbine generator  
22 contract. It's being done under two contracts, the OEM,  
23 which is the original equipment manufacturer, which is  
24 Alstom, they are doing the --

25 MR. SHEPHERD: They manufacture the turbines?

26 MR. REINER: They are doing the engineering, the  
27 manufacture, they're doing the design work, as well as they  
28 will provide the components that need to be replaced.

1           SNC-Aecon will install the components in the field on  
2 the --

3           MR. SHEPHERD: It's still a big contract?

4           MR. REINER: It's still a sizable contract, yes.

5           MR. SHEPHERD: And they also have the containment  
6 building contract?

7           MR. REINER: And they have -- so they have got the re-  
8 tube and feeder replacement contract. We have moved into  
9 that contract the re-tube waste processing building.

10          MR. SHEPHERD: The one we were talking about earlier?

11          MR. REINER: The one we were talking about. And it's  
12 because that building, it's not about the building. It's  
13 about the purpose that it serves, and it has a direct  
14 impact on critical path for that project.

15          MR. SHEPHERD: Sure. And so that's -- I thought I  
16 read somewhere that they also were getting a containment  
17 building? Or is that something separate?

18          MR. REINER: No. You may have read -- there is a  
19 containment bulkhead that needs to be designed and  
20 fabricated and installed, and SNC-Aecon also have that  
21 containment bulkhead work. And that essentially is a  
22 barrier to isolate the refurbishment unit from the  
23 operating units.

24          Again, because it's critical path element of the job,  
25 it didn't make sense to have another contractor take that  
26 on.

27          MR. SHEPHERD: So the question I am driving at with  
28 these is all of those contracts are going to be separate

1 target prices in which they can earn or be penalized,  
2 depending on how well they do on each of them.

3 MR. GOULD: Yes.

4 MR. SHEPHERD: So one of the problems you had with  
5 Niagara Tunnel -- or you didn't, but OPG did -- is that you  
6 got to a certain point where it's not in the contractor's  
7 interest to be around anymore, because they are just  
8 getting whacked too much, right?

9 And so in this case, because you have all these  
10 separate contracts, am I right in understanding even if  
11 they do badly on one, they can still make money by doing  
12 well on the other ones?

13 [Witness panel confers]

14 MR. REINER: They -- okay. They are -- I am just  
15 getting the clarification on the details.

16 These are being done as change orders to the contract,  
17 so it essentially increases the target price or fixed  
18 price, whatever component these fall into, of the existing  
19 contract.

20 So they are not separate contracts. And so you are  
21 right, we could sort of run a risk of -- you know, if you  
22 are getting hit on pieces of work, it impacts one contract.

23 MR. SHEPHERD: So they have one profit pot, if you  
24 like? This is exactly -- you are going exactly where I was  
25 going with this. They have one profit pot, and if they do  
26 badly on Unit 2, they could use it all up?

27 MR. REINER: It is -- each unit is a separate profit  
28 pot.

1 MR. SHEPHERD: Ah.

2 MR. REINER: But the bulkhead and the re-tube waste  
3 process -- the re-tube waste processing building is getting  
4 added -- I believe it's into the definition phase work,  
5 since that's prerequisite work. The bulkhead is -- there  
6 is going to be -- we are installing bulkheads four times,  
7 for each of the four units, and this gets --

8 MR. SHEPHERD: One on each unit?

9 MR. REINER: Yes.

10 MR. SHEPHERD: All right. So each unit is an island,  
11 a profit island, and the definition phase is a profit  
12 island, but with -- there is only the five of them, if you  
13 like, right now?

14 MR. REINER: Right.

15 MR. SHEPHERD: Okay. That is all my questions.  
16 Thanks.

17 MR. MILLAR: Thank you, Mr. Shepherd.

18 I think that concludes our technical conference, so we  
19 are adjourned until -- oh, one final thing. Mr. Keizer,  
20 OPG will remember to have a look through the transcript and  
21 see what, if anything, can be released publicly, as is the  
22 normal practice?

23 MR. KEIZER: Yes, we will.

24 MR. MILLAR: Thank you for that.

25 So we are adjourned until Monday.

26 --- Whereupon the conference concluded at 3:52 p.m.

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