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ONTARIO ENERGY BOARD

FILE NO.:	EB-2016-0152	Ontario Power Generation Inc.
VOLUME:	2	UNREDACTED - CONFIDENTIAL
DATE:	February 28, 2017	
BEFORE:	Christine Long	Presiding Member and Vice-Chair
	Ellen Fry	Member
	Cathy Spoel	Member

THE ONTARIO ENERGY BOARD

Ontario Power Generation Inc.

Application for payment amounts for the period from
January 1, 2017 to December 31, 2021

Hearing held at 2300 Yonge Street,
25th Floor, Toronto, Ontario,
on Tuesday, February 28, 2017,
commencing at 9:33 a.m.

VOLUME 2

BEFORE:

CHRISTINE LONG	Presiding Member and Vice-Chair
ELLEN FRY	Member
CATHY SPOEL	Member

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MICHAEL JANIGAN	Vulnerable Energy Consumers Coalition

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1 Tuesday, February 28, 2017

2 --- On commencing at 9:33 a.m.

3 MS. LONG: Good morning, everyone. Please be seated.

4 Mr. Keizer, are there any preliminary matters?

5 **PRELIMINARY MATTERS:**

6 MR. KEIZER: Yeah, there actually are two preliminary
7 matters. The first relates to the undertakings. You may
8 recall yesterday there were three documents that OPG agreed
9 to disclose before the appearance of panel 1B, and there
10 was concerns about their confidential status.

11 So what we have done this morning is distributed to
12 people in the hearing room that had signed the undertaking
13 by giving them full copies of the documents in confidence
14 in sealed envelopes. So they have them.

15 We are working on the redactions, and so we hope to be
16 in a position to file redacted copies with the Board
17 tomorrow along with, in sealed envelopes, according to
18 protocols, the unredacted version. So that would be
19 formally filed.

20 But the parties that did need them for purposes of
21 preparation, I believe, do have them, and if they don't,
22 they can speak to us at the break to make sure that they
23 have received the appropriate documents.

24 MS. LONG: And do you have a copy for the Panel?

25 MR. KEIZER: Yes, we did provide that this morning as
26 well --

27 MS. LONG: Thank you.

28 MR. KEIZER: -- so you have that.

1 That's the first preliminary matter.

2 The second is, yesterday during cross, I believe, by
3 Mr. Poch, and I also believe by Mr. Yauch from Energy
4 Probe, there were two questions which prompted the view
5 that they were best answered by the regulatory panel,
6 which, just to clarify whether that's panel 2 or panel 5,
7 our view is, based on the questions, that panel 5 is best
8 appropriate to deal with the questions that were asked, and
9 we just want it to be clear so that people could deal with
10 that accordingly.

11 I believe Mr. Poch's questions related to the issues
12 of prudence and I think Energy Probe related to the CRVA.

13 MS. LONG: Mr. Poch, you have taken to note of that?

14 MR. POCH: I have, thank you.

15 MS. LONG: Okay.

16 MR. KEIZER: But, other than that, I have no other
17 preliminary matters.

18 MS. LONG: Any other matters, Mr. Richler?

19 MR. RICHLER: No.

20 MS. LONG: Okay. Then we will start with you,
21 Mr. Mondrow.

22 **ONTARIO POWER GENERATION - PANEL 1A, RESUMED**

23 **Mr. J. Lyash,**

24 **Mr. D. Reiner; Previously Affirmed.**

25 **CROSS-EXAMINATION BY MR. MONDROW:**

26 MR. MONDROW: Good morning, Madam Chair. Thank you.

27 Good morning, gentlemen. As you know, I'm counsel for
28 AMPCO on this matter and, in particular, in respect of the

1 DRP, which is what you're here to talk about, so I look
2 forward to our conversation.

3 I want to start with you this morning to talk a little
4 bit about the planning process for the DRP, and I've been
5 struck, I must say -- I'm a relatively late arrival to this
6 proceeding, but I've been struck over the last few weeks
7 trying to catch up to all of you on the amount of evidence
8 dedicated to describing the planning and the project
9 control processes, and I know, Mr. Lyash, you talked about
10 that yesterday.

11 And so I just want to start on that topic, and just to
12 set the context for that, I would like to ask you to turn
13 to Exhibit D2, tab 2, schedule 4 of your prefiled evidence,
14 and starting at page 1, under the overview section, I'm
15 just going to read this to you. It says right upfront:

16 "To ensure successful execution of the Darlington
17 refurbishment program, OPG made a major
18 investment in planning during the definition
19 phase. This has enabled OPG to establish
20 detailed scope and a high-confidence schedule and
21 cost estimate, thereby minimizing the risk of
22 scope creep, schedule delays, and resulting
23 increases in cost."

24 And this exhibit, it says, goes on to describe that
25 extensive planning effort.

26 And in the very next subsection, the Subsection 2.1 of
27 this document is headed "Investment in Planning," and I
28 won't read this all to you, but I just want to make sure

1 that we have the road map for the planning activities. And
2 this first paragraph under Section 2.1 tells us, I believe,
3 that the first phase of planning, the initiation phase,
4 started about ten years ago in 2007 and ran until 2009, and
5 it was a preliminary assessment of the feasibility of DRP,
6 and it got Board approval, as I understand it, at the end
7 of 2009.

8 Mr. Reiner, that's correct?

9 MR. REINER: Yes, that's correct.

10 MR. MONDROW: And then we moved to -- well, you moved
11 to the definition phase, and that was about five years
12 long, and than ran from 2010 to 2015, and if I'm not
13 mistaken, the culmination of that phase would have been the
14 release quality estimate, or the RQE that's been discussed,
15 that was approved in December 2015, I believe.

16 MR. REINER: That's correct.

17 MR. MONDROW: And then, if we look at line 23, still
18 on this page 1 of this planning evidence, there is a note
19 that the life-to-date expenditures to the end of 2015
20 includes extensive planning work carried out during the
21 initiation phase and definition phase, and there's a number
22 quoted of \$2.2 billion inclusive of interest and
23 escalation.

24 Do we have somewhere on the record in this proceeding
25 how much of that \$2.2 billion has already been approved by
26 the Ontario Energy Board for recovery? Do you know?

27 MR. REINER: I believe that is -- that is in --

28 MR. MILLAR: Microphone.

1 MR. REINER: I believe that is in evidence. I would
2 have to get back to you on exactly where you can find that,
3 but I believe that has been included, yes.

4 MR. MONDROW: That would be appreciated. And I'm
5 hoping that that evidence also has both the amounts and the
6 dockets, the OEB dockets, in which those amounts were
7 approved. So I'm happy to leave that with you. Maybe
8 we'll get an undertaking just to track it. And if the
9 dockets aren't there, if someone could add those, that
10 would be appreciated, but my expectation is that it is
11 there. I just haven't been able to locate it. So that
12 would be great.

13 MR. RICHLER: That would be Undertaking J2.1.

14 **UNDERTAKING NO. J2.1: TO ADVISE HOW MUCH OF THE \$2.2**
15 **BILLION HAS ALREADY BEEN APPROVED BY THE ONTARIO**
16 **ENERGY BOARD FOR RECOVERY**

17 MR. MONDROW: Thank you, Mr. Reiner. And then the
18 amount of the 2.2 billion that's not covered by that
19 undertaking that you're going to provide is being sought
20 for recovery, of course, in this application.

21 MR. REINER: Yes.

22 MR. MONDROW: So that will bring us up to date.

23 And if we just stay in this Exhibit D2, tab 2,
24 schedule 4 and we look at page 2, there's a figure here.
25 It's at one of these built-up bar graphs, Figure 1, and it
26 provides a summary of life-to-date, definition-phase
27 spending to December 2015 in billions of dollars, and I
28 just want to spend a minute with these various items. And

1 what I'm trying to understand, gentlemen, is which of these
2 items are kind of squarely planning expenditures and which
3 are actual program expenditures. So -- and what I'm trying
4 to do is establish an understanding of how much you spent
5 in order to really get your collective heads around this
6 project and what's going to be required, which is the basis
7 for your confidence that you're going to be able to execute
8 it to budget and/or under budget and on time.

9 So if we look at the first bar, the RFR mock-up and
10 tooling, it seems to me that that would have legitimately
11 been a preparatory step to allow you to properly plan the
12 execution of the project. Would that be fair?

13 MR. REINER: Yes, that's correct. Part of our
14 planning effort was about ensuring that we can do the
15 necessary training that's required to execute the work and,
16 also, in terms of establishing the fidelity that we need in
17 the execution schedule. That was a key contributor to
18 establishing that schedule.

19 MR. MONDROW: Okay. And then the next item, the
20 turbine generator parts, is that actually just a pre-order
21 of parts that you would need, that you are going to be
22 needing, or will need as you proceed through execution,
23 rather than preparation investment?

24 MR. REINER: It's a combination. There are some
25 included in this phase. Our expenditures associated with
26 long lead materials, so materials that need to be ordered
27 well in advance because of the lead time that's required.
28 But there is also an element in this associated with what

1 specifically is required in terms of parts to actually
2 execute the scope of work.

3 MR. MONDROW: That's a good distinction. Thank you,
4 Mr. Reiner. So I gather that, unless there was a long lead
5 time or some availability risk with the parts, you wouldn't
6 order them farther in advance than you needed to, so if you
7 pre-ordered them this far in advance, you wanted to be sure
8 that you had them when needed.

9 MR. REINER: Yeah. That's correct. The general
10 philosophy that we built into the planning and one that is,
11 again, based on a key lesson learned, one of the things
12 that have caused prior refurbishments to go beyond their
13 scheduled duration is the availability of parts for
14 execution.

15 So we established a mechanism to ensure that we have a
16 minimum window. In general, we selected six months as the
17 window. Our goal was to have parts available on-site six
18 months prior to the requirement for installation. And then
19 when you work backwards from that and you look at
20 manufacturing time and all the lead times, engineering
21 associated with fabricating certain parts, that determines
22 the schedule by which you then begin the order process.

23 MR. MONDROW: Thank you. The next part, the \$500
24 million in vendor/EPC definition-phase planning, clearly
25 that's a straight planning investment?

26 MR. REINER: That's a straight planning cost, yes.

27 MR. MONDROW: Then we have the next two bars, and
28 we're going to come back to these, and others have talked

1 to you about these two categories of projects, the
2 facility, the infrastructure, and the safety improvement.
3 Those are projects that, as I understand it, you determined
4 needed to be done early, prior to the start of the unit 2
5 refurbishment. But not they're not necessarily planning
6 investments. Is that a --

7 MR. REINER: So there is a planning element in the
8 facility and infrastructure project. So, for example, what
9 we needed to ensure is that, as the construction workforces
10 arrive at site, we have an efficient flow in and out of the
11 site so that we don't impact productivity during execution
12 and that we also do not disrupt the operations of the power
13 plant. So there's a very clear segregation between
14 operation staff that have to make their way in and out of
15 the site versus the workforces that will come in to do the
16 construction work. So there was a significant amount of
17 work related to this that went into the design and
18 establishment of that infrastructure that ensured that we
19 could productive execute that field construction work.

20 I'll just add that, on the safety improvements
21 themselves, as part of our environmental assessment and the
22 integrated implementation plan, we talked previously at the
23 last hearing about the Canadian Nuclear Safety Commission
24 regulatory requirements associated with extending the life
25 a of a nuclear plant. There are a series of safety
26 enhancements that were required in order to provide us the
27 licence to operate the plant in its second life, and those
28 safety improvements are associated with that element of the

1 project.

2 MR. MONDROW: That's very helpful. Thank you.

3 Then we've got the \$400 million, obviously, again,
4 strictly a definition-phase and planning investment there?

5 MR. REINER: Yes. And that is the OPG-related cost.
6 The previous one, the vendor/EPC, that's the contractor
7 cost.

8 MR. MONDROW: And then we've got interest, and we
9 total it up. So that's helpful. Thank you.

10 That brings us to the filing date of this evidence,
11 which was May, the end of May 2016. And then breaker
12 opening was, as I recall -- October 15th, I think, was the
13 auspicious date.

14 MR. REINER: That is correct.

15 MR. MONDROW: And you talked about that yesterday, and
16 that's formally the start of the execution phase?

17 MR. REINER: That is where unit 2 gets disconnected
18 from the power grid, and we begin to shut down unit 2 and
19 essentially start the critical path for execution of
20 unit 2.

21 MR. MONDROW: And do you continue, or have you
22 continued planning expenditures between the breaker open
23 and today?

24 MR. REINER: Yes. There are still some outstanding
25 definition-phase, planning-related items, and those will
26 carry on in 2017. There are still some project milestones
27 related to definition-phase work that are still in the
28 process of being completed, and they tie primarily to the

1 retube and feeder replacement project work.

2 MR. MONDROW: So are those costs in addition to the
3 2.2 billion figure that's provided here in the evidence?

4 MR. REINER: They would be in addition. The 2.2 here,
5 I believe, are actual life-to-date costs, so these have not
6 been incurred yet. They would be in addition to.

7 MR. MONDROW: Could you -- not necessarily on the
8 spot, but could you tell us, by way of undertaking, if it's
9 easier, how much more cost is in this category of planning
10 so that we can get a full picture of the planning
11 investment?

12 MR. REINER: Maybe, if I may, we could take that
13 question in panel 1B, because we will have additional
14 resources there that can get into the details of the
15 numbers, and we can likely answer your question.

16 MR. MONDROW: That's fine. I've marked it down, so
17 I'll come back to you on that. Thank you.

18 So with all that, Mr. Lyash, on a scale of one to ten,
19 how -- ten being the most prepared, how prepared is OPG for
20 this project?

21 MR. LYASH: I'm not going to use the scale of one to
22 ten, because it's an arbitrary --

23 MR. MONDROW: Well, you have to. That's the rule.
24 Didn't anyone tell you about the rule?

25 MR. LYASH: In that case, can you please define
26 numbers one through ten, the critical attributes that I can
27 use as the --

28 MR. MONDROW: Fair enough. However you want to answer

1 the question.

2 MR. LYASH: I think the preparations were very well
3 done. If I compare it to my personal experience, this is
4 as robust a planning and preparation activity as I've seen
5 for a project of this nature. But probably more
6 importantly, the assessments that we've had done all the
7 way through, whether those were by outside parties or our
8 own internal audits, which I view as having been very
9 aggressive and very critical, give me confidence that we're
10 well prepared to undertake this.

11 MR. MONDROW: I would define that as a ten, just for
12 your reference. But I'm not giving evidence here.

13 MR. LYASH: I'll cede to your judgment.

14 MR. MONDROW: Thank you very much. And all of that
15 gives you confidence, Mr. Lyash -- and you said this a few
16 times yesterday -- that you will be able to complete -- OPG
17 will be able to complete the DRP on time and within budget?

18 MR. LYASH: Yes. That is not to ignore the fact that
19 the projects are very difficult and carry significant risk,
20 so very challenging, but I think the company is well
21 positioned at the outset to execute.

22 MR. MONDROW: All right. And I will come back to some
23 of those challenges. I know you've talked about it, and I
24 will try not to repeat that. But I will have some areas to
25 discuss with you in a few minutes.

26 But if I asked that same question about your
27 confidence level but asked you to assume that you didn't
28 have the P90 contingency for cost and schedule, what would

1 your confidence level be in that scenario?

2 MR. LYASH: I'm sorry. Can you ask that again? I
3 didn't hear the first part of the question.

4 MR. MONDROW: If I asked you the same question, how
5 confident are you that you can complete on time and under
6 budget, but didn't have a P90 schedule and budget; you had
7 your planning schedule and budget, how confident would you
8 be in that case?

9 MR. LYASH: I'm not sure what you're referring to as
10 the planning schedule.

11 MR. MONDROW: Mr. Reiner talked about that yesterday
12 actually.

13 MR. LYASH: The planning schedule?

14 MR. MONDROW: The schedule you're actually working to.

15 MR. LYASH: Oh, the working schedule.

16 MR. MONDROW: I'm sorry. I misspoke. Let's call it
17 the working schedule.

18 MR. LYASH: As we discussed yesterday, there is risk
19 in any project, and risk has to be managed as part of the
20 project, so schedule and cost contingency, a very active
21 risk management program.

22 My confidence has, in part, to do with the aggregate
23 of all that upfront work, the preparation, the development
24 of the cost and the schedule, the risk register. In
25 selecting what kind of contingency to apply to that, one
26 implied by a P50 or a P90, I think you have to make some
27 additional judgment to select the right one to provide the
28 requisite level of confidence.

1 In this case, I think P90 is the right selection. I
2 think that, as you move away from that to some lower
3 probability, you are, by its nature, reducing your
4 confidence in your ability to execute. And so the farther
5 you move from what we think is the right balance point,
6 P90, from that point in a lowering direction -- say P50 or
7 P25 -- the less likely you are to be successful.

8 We chose a working schedule that is more aggressive
9 than P90, which I believe is an industry best practice, for
10 a few reasons. One is such that, if risks aren't realized,
11 you can take advantage of that pull forward in schedule as
12 you work your way through so that you can keep the project
13 moving toward an early conclusion.

14 The other is so that you can measure project
15 performance against a more aggressive set of objectives
16 and, by doing that, have earlier indications of performance
17 or productivity issues and a more straightforward approach
18 to mitigating them before they impinge on the high-
19 confidence schedule.

20 MR. MONDROW: Let me pick up on a couple things I
21 think you've said, Mr. Lyash. You said you chose a working
22 schedule that was more aggressive than the P90 schedule.
23 Does that mean you developed a P90 schedule first and then
24 worked back and developed a working schedule from that?

25 MR. LYASH: The schedule development question, the
26 details on that, are probably better for panel 1B.

27 MR. MONDROW: But you've got overall responsibility
28 for this project; you signed off on a schedule, a working

1 schedule. Is it your understanding that working schedule
2 was a back-cast from a P90 schedule? Is that how it
3 worked?

4 MR. REINER: It is not a back-cast. It's actually the
5 opposite. So the methodology that was used to develop the
6 schedules, in fact, we took efforts to build it up from a
7 P0, a zero-risk perspective, and then build it up from
8 there.

9 Now, that is a very difficult thing to do, and so I
10 wouldn't call it precisely that. In the working schedule
11 currently, I mean, there is the work done by the
12 contractors; there is a 50 percent confidence associated
13 with the risks that the contractors carry inside that
14 working schedule.

15 So it is a bottom-up where we land on a working
16 schedule, and then we do a risk analysis of all the things
17 that could go wrong on that working schedule to determine
18 what additional amount of time do we need to carry in
19 contingency to mitigate those risks and based on a
20 probabilistic assessment. So it is that calculation that
21 then gets you to the P90.

22 MR. MONDROW: Right. I understand.

23 So, Mr. Lyash, with that colour, and if your answer to
24 my first -- the first time I asked about your confidence,
25 and you described how confident you are, if that's a ten,
26 without the P90, if you move back to a P50, does that mean
27 you're about -- between one and ten, you're at a five for
28 confidence that you can do this under budget and on

1 schedule?

2 MR. LYASH: Well, I think the working schedule is
3 certainly possible to achieve, but significantly less
4 likely to achieve than the working schedule plus the
5 schedule contingency, which is the P90.

6 MR. MONDROW: Okay. So, Mr. Reiner, a P50 schedule,
7 as I understand it, means that the odds are about fifty-
8 fifty that you'll come in under schedule, at a high level.

9 MR. REINER: Mathematically, a P50 suggests that,
10 yeah, it's a roll of the dice. You might be ahead of
11 schedule; you might be behind schedule, and it's equal
12 probability.

13 MR. MONDROW: And is that your working schedule? Is
14 that a P50 schedule?

15 MR. REINER: The working schedule is not a P50
16 schedule. If -- it actually lands -- so the working
17 schedule, given it's a bottom-up assessment of, if
18 everything went correctly exactly as planned, how long
19 would it take to execute that schedule. There are, as I
20 said, elements of risk for contractor work that are in
21 there, but there is no risk -- there's a significant amount
22 of OPG work in this schedule as well, for example, about a
23 year of the critical path rests with OPG, the front end, to
24 do the defuelling and all the interfaces associated with
25 islanding the unit and, on the back end, bringing the unit
26 back in-service.

27 So all of the risks associated with that sit in the
28 P90, so there a combination in the working schedule. If I

1 were to align it with a probability level, it is something
2 less than a P50.

3 MR. MONDROW: Okay. You produced -- and I'm sorry I
4 don't have the number with me, but I saw it last night.
5 There is an interrogatory response that describes a
6 calculation that the Monte Carlo simulation that was used
7 for this probability analysis produced schedules and cost
8 levels at -- right from 1 to 99 along a curve.

9 So I'm assuming you know what your working schedule
10 is. I'm assuming that you could tell us what P50 or what P
11 -- sorry, what P level that working schedule corresponds
12 with. Could you do that? Not necessarily on the spot, but
13 can that be done?

14 MR. REINER: I'd have to take that back to have a look
15 if that could be done.

16 MR. MONDROW: Could you do that, both for schedule and
17 cost?

18 MR. RICHLER: We'll call that J2 point --

19 MR. MONDROW: Well, that's fine. So the undertaking
20 will be to -- let me be clear, because I just said schedule
21 and cost, and cost isn't actually relevant to this
22 question. So you've got a working schedule, and my
23 question is: What P level does that working schedule
24 correspond to? And you've undertaken to (a) see if you can
25 give me that number, and if you can, you'll give me the
26 number. Is that -- that's appropriate?

27 MR. REINER: Yeah, that's fine.

28 MR. MONDROW: Okay. Thanks.

1 MR. RICHLER: J2.2.

2 MS. LONG: J2.2?

3 **UNDERTAKING NO. J2.2: TO ADVISE RE THE WORKING**
4 **SCHEDULE, WHAT P LEVEL DOES THAT WORKING SCHEDULE**
5 **CORRESPOND TO**

6 MR. MONDROW: So, Mr. Reiner, I assume my next
7 question here is P50, what you actually planned to spend,
8 and based on your previous answer, I think you're going to
9 say, no, that's not exactly right. P50 is not what you
10 actually planned to spend.

11 MR. REINER: What we planned to do is execute the
12 project within the high-confidence estimate. And that is
13 why currently we're still forecasting that the cost at
14 completion of unit 2 is going to be 4.8 billion and the
15 cost of completion of the four units is going to be \$12.8
16 billion. And, at this stage, it's too early for us to
17 determine whether we are going to -- there hasn't been
18 enough time yet expended in execution to know whether that
19 -- there is a risk there. We don't see that.

20 Certainly, in the early execution, we were ahead of
21 the working schedule in defuelling; and in bulkhead
22 installation, we were behind, slightly behind, the allotted
23 time for doing that work. So, in aggregate, we're roughly
24 on the working schedule currently. But it is still very
25 early days at this stage.

26 MR. MONDROW: You've got a working schedule. Have you
27 got a working budget?

28 MR. REINER: There is only one budget. It's the

1 budget that was released to the project as part of the unit
2 2 execution estimate.

3 MR. MONDROW: That's the P90 budget?

4 MR. REINER: That's the P90 budget, yes. And the way
5 it is segregated is there are elements of that that are
6 held in contingency that are not budgeted for projects, and
7 then there is an element that is budgeted for project work
8 that is held by the project management team.

9 MR. MONDROW: If I took -- and the contingency
10 portions of those budgets are -- and we're going to come
11 back to this, but they're pretty clear on the evidence. So
12 if I took the budget for unit 2 and I took out the
13 contingency line item for unit 2, would I get a number that
14 you are at least as likely to come in under as you are to
15 come in over?

16 MR. REINER: No, you would not.

17 MR. MONDROW: Why not?

18 MR. REINER: You would not, because the -- so the
19 budget -- the baseline budget would be associated with that
20 -- the budget without contingency would be associated to
21 the schedule without contingency.

22 MR. MONDROW: Right.

23 MR. REINER: Which is -- which is, as I indicated
24 earlier, you know, we will see if we can come up with a
25 probability level for that, but it is less than P50.

26 MR. MONDROW: Okay. So, when you do that, could you
27 give us a budget associated with that schedule?

28 MR. REINER: So we'll look to see if we can actually

1 do that. This is sort of a backwards derivation of a
2 schedule that was built from the bottom up. We will see if
3 we can do that.

4 MR. MONDROW: What is your working schedule for unit
5 2?

6 MR. REINER: In terms of?

7 MR. MONDROW: For unit 2, for completion of unit 2.

8 MR. REINER: Completion of unit 2? It's 35 months,
9 1,071 days.

10 MR. MONDROW: And your P90 is 40 months; right?

11 MR. REINER: And the P90 is 40 months.

12 MR. MONDROW: So can we just add to Undertaking J2.2
13 that, if you can derive a P50 schedule, you will also
14 consider and, if possible, provide a budget associated with
15 that schedule? Is that okay?

16 MR. REINER: So just --

17 MS. LONG: I'm not sure I understand, Mr. Mondrow.
18 You've lost me a little bit. So you're asking him to take
19 the contingency out, and so contingency on schedule and
20 contingency on budget out, and that's what you're
21 interested in?

22 MR. MONDROW: I'm interested in -- kind of.

23 MS. LONG: Maybe you can --

24 MR. MONDROW: That's perhaps a clear way to put it,
25 but let me see if I can come at this from the other side of
26 the question.

27 Mr. Reiner, we've been talking about a -- I've been
28 trying to determine a schedule that you're at least as

1 likely to come in under as over, so your actual
2 expectation, in my language. And I'm also trying to
3 determine whether there is a budget like that that you are
4 at least as likely to come in under as you are over, all in
5 respect of unit 2.

6 MR. REINER: So just -- maybe I'll repeat back, and
7 you can tell me if I've got it. You are looking for a P50
8 schedule and a P50 cost estimate for unit 2?

9 MR. MONDROW: Yes, let's do that.

10 MR. REINER: Okay. So we'll take that back and see if
11 we can do that. At this point, I couldn't tell you how
12 much work that that would require. There is no P50
13 schedule. There is a working schedule and a P90 schedule,
14 and the working schedule is less than the P50 probability.
15 So what you're looking for to us derive is what would a 50
16 percent probability schedule look like.

17 MR. MONDROW: If it's easier, let's look at it this
18 way: You have a working schedule; you have a P90 schedule.

19 MR. REINER: Yes.

20 MR. MONDROW: You have a P90 budget.

21 MR. REINER: Yes.

22 MR. MONDROW: Can you give me a budget associated with
23 the working schedule? That may be easier.

24 MR. REINER: Okay.

25 MR. MONDROW: Why don't we amend undertaking J2.2,
26 Madam Chair, if that's okay with you? That sounds like the
27 most straightforward exercise and perhaps more relevant to
28 your deliberations.

1 MS. LONG: But that would not be a P50 schedule, as I
2 understand it.

3 MR. MONDROW: It would not.

4 MS. LONG: I think what you're saying to me is that it
5 would be less than P50, if you backed out contingency,
6 timing, and contingency cost.

7 MR. MONDROW: Maybe, Mr. Reiner, just to complete this
8 analysis, or what I'm trying to analyze, if you could add
9 -- if it's possible without too much work, to add the P
10 level to the working schedule in the response. That would
11 be helpful so that we can understand how far off it is from
12 a P50.

13 MR. REINER: I think that was your question in the
14 previous undertaking.

15 MR. MONDROW: It was. So we can do this all under
16 J2.2, now that I've clarified it with your assistance.

17 MS. LONG: Are you clear on that, Mr. Reiner? Mr.
18 Keizer?

19 MR. KEIZER: I just want to make sure that we have it.
20 So we're determining what P level the working schedule is
21 and what cost level is --

22 MR. MONDROW: Associated with the working schedule.

23 MR. KEIZER: And that's it?

24 MR. MONDROW: Let's do that. That would be fine for
25 me.

26 MS. LONG: Okay. So that's the amended J2.2.

27 MR. MONDROW: Thank you for your assistance, Madam
28 Chair.

1 Now, Mr. Lyash, if you obtain approval from this
2 Hearing Panel for the test period payment amounts that
3 you're requesting, which is at a P90 contingency level, as
4 I understand it, and then you ultimately come in under
5 budget on unit 2, I think you said yesterday the difference
6 between the approved revenue requirement and your actual
7 expenditure in respect of the unit 2 refurbishment and your
8 actual expenditure on the unit 2 refurbishment would go in
9 the CRVA for disposition, and ultimately back to
10 ratepayers. Is that right?

11 MR. LYASH: That's correct.

12 MR. MONDROW: In that scenario, you will have, by
13 definition, overcollected during the test period; right?

14 MR. LYASH: Yes, I would assume so.

15 MR. MONDROW: And, indeed, with a P90 contingency
16 level, that's the likely result, isn't it? That's 90
17 percent probable?

18 MR. LYASH: First of all, I'm not sure how the CRVA
19 will be cleared or when. So with respect to how that plays
20 out in the particular test period, I can't say.

21 The P90, I think we have to always keep this in a
22 broader context. We have done our best and used the best
23 available tools and expert judgment to build a model of
24 probability and risk whose purpose it is to identify and
25 manage those risks very actively all the way through the
26 project to produce the best possible result.

27 The output of that, we call P90; that's what the tool
28 produces. But the project considerations are larger than

1 that. And so there is a significant amount of judgment to
2 be applied, and the selection of what the appropriate basis
3 for the project is depends on the nature of the project. A
4 very short-duration project, fairly straightforward, you
5 may select as the planning basis a much lower model output
6 as a reasonable measure of success, because it's unlikely
7 that unanticipated complexities will arise. It's unlikely
8 that the passage of longer period of time would create
9 issues.

10 And so my personal view is that, while the output of
11 the tool is a P90, I wouldn't say that, in the end, the
12 project result would be less than that nine out of ten
13 times, because to do so would be to ignore all the other
14 factors we have to manage. And I think this is shown true
15 particularly on megaprojects where the selection of a less
16 conservative planning basis contributes to a delta in
17 performance.

18 MR. MONDROW: P90, Mr. Lyash, there is a 90 percent
19 probability you are going to come in under budget; right?
20 By definition, that's what P90 means?

21 MR. REINER: May I make a comment?

22 MR. MONDROW: I would like an answer first, and then
23 you can expand on it.

24 MR. LYASH: With respect to the Monte Carlo analysis
25 and that element of our project planning, yes.

26 MR. MONDROW: So the odds are you're going to
27 overcollect in the test period? There is no other possible
28 mathematical result than to answer yes to that question?

1 MR. REINER: I'm going to --

2 MR. MONDROW: Sorry, but I think Mr. Lyash is about to
3 acknowledge that, mathematically, that is correct.

4 MR. KEIZER: When you say overcollect in the test
5 period, the evidence is that, if you come under, it gets
6 recorded in the CRVA. So I think there is, and I'm not --
7 I think if there's questions about how that CRVA amount
8 gets calculated and the recovery of the revenue requirement
9 over the period that's attributable to the ratepayer as a
10 result of coming in under, I don't necessarily believe that
11 you can assert that there is a full overcollection.

12 So you can ask your question, but you may also want to
13 raise the question with respect to the CRVA with the
14 appropriate panel to ensure the record is clear as to what
15 the implications are in clearing that account and the
16 treatment of the ratepayer.

17 MR. MONDROW: Thank you, Mr. Keizer. You've given
18 Mr. Lyash some time to think about his answer. But that's
19 not what I asked. I asked about collection. We both know
20 that putting overcollection in a variance account and
21 refunding it has nothing to do with how much you collect.

22 Mr. Lyash, during the test period, odds are you're
23 going to overcollect if you get the approvals you've asked
24 for, by definition?

25 MR. LYASH: I don't agree.

26 MR. MONDROW: Why don't you tell me why you don't
27 agree with that?

28 MR. LYASH: First, as I've said, this risk modelling

1 in the Monte Carlo is one of a number of elements of how
2 you think about planning and executing the project. But
3 even if I just focus on this analysis and the P90 output,
4 that is a result that was created on a four-unit basis, not
5 on a single-unit basis. That is a four-unit Monte Carlo
6 analysis.

7 Secondly, risks aren't realized in the probability or
8 percentages that are calculated in the model. Any
9 particular risk is given a probability and then a
10 consequence, and the sum of those is placed into the
11 contingencies. Risks don't occur in pieces or percentages;
12 they occur in whole. And when they occur in whole, they
13 bring the entirety of that cost with them. And so it is --
14 while the tool is very useful, because it's a four-unit
15 analysis and because risks occur in large chunks, not in
16 percentages, I don't agree that you can use the P90 Monte
17 Carlo analysis all by itself to extend to the notion that
18 the project will be under budget 90 percent of the time for
19 a single unit.

20 MR. MONDROW: I appreciate your answer. I respect
21 that answer.

22 You allocated 40 percent of your DRP contingency to
23 unit 2; right?

24 MR. LYASH: Correct.

25 MR. MONDROW: And you're telling me now that you do
26 not expect to come in under budget on unit 2 at P90?

27 MR. LYASH: My expectation is to hit the P90. I would
28 be very happy if we come in under budget, and I would be

1 very pleased if those funds accumulate into the CRVA. But
2 that is not our planning basis.

3 MR. MONDROW: You expect that all the risks that went
4 into the Monte Carlo as inputs are all going to
5 materialize, and you're going to hit P90?

6 MR. LYASH: No. Because all risks materializing would
7 be a far greater number.

8 MR. MONDROW: It would be a P100?

9 MR. LYASH: Yes. Which is a substantial amount of
10 additional money and schedule than a P90.

11 MR. MONDROW: Indeed, it's probably a hockey stick
12 type curve; right?

13 MR. LYASH: Right.

14 MR. MONDROW: So you're near the top of the curve, but
15 there's a lot of upside after 90?

16 MR. LYASH: There certainly is.

17 MR. MONDROW: Have you produced a graph of that curve
18 anywhere?

19 MR. REINER: I believe, if you go into the evidence
20 and you look up the information that was provided for the
21 release quality estimates, there is a business case
22 document in there, and there are graphs associated with
23 that in that document.

24 MR. MONDROW: Okay. Apparently we've seen that.
25 Thank you very much. I will check that out.

26 I can take you to the evidence, but maybe I don't have
27 to, just to short-circuit it. There is an interrogatory
28 response, AMPCO 70, and my understanding is that, at P50,

1 the total DRP project cost is reduced by \$400 million.

2 Mr. Reiner, is that familiar to you? Would you rather
3 go to the response?

4 MR. REINER: If that is directly out of the
5 interrogatory response, then yes.

6 MR. MONDROW: Let's do that. So this would be Exhibit
7 L4.3, schedule 2, AMPCO 070. And we see there in this
8 chart total project cost, billions of dollars. At P50,
9 it's 12.4, and that compares to the 12.8 at P90, I think.
10 Is that right?

11 MR. REINER: Correct.

12 MR. MONDROW: Okay. So \$400 million less project cost
13 at a P50 for the entire DRP; right? That's just math.

14 MR. REINER: That's just the outcome of the modelling.

15 MR. MONDROW: Right.

16 MR. REINER: Yes.

17 MR. MONDROW: I just mean, 12.8 minus 12.4 is --

18 MR. REINER: Oh, and that's just -- yes, exactly.
19 That's just subtraction.

20 MR. MONDROW: Okay. And so, at a P50, would you still
21 allocate 40 percent of that saving, which would equate to
22 160 million to unit 2? Would that be a way for me to
23 determine, if I wanted to argue this Hearing Panel should
24 work with P50, that the unit 2 should be reduced -- the
25 unit 2 revenue requirement should be reduced by \$160
26 million? I know you don't agree with the argument, but
27 would that be a mathematically appropriate way to couch the
28 argument? The allocation proportion remain the same?

1 MR. REINER: I'd have to give that some thought,
2 whether that is -- whether that is precisely true, whether
3 the allocation would occur precisely that way.

4 MR. MONDROW: If you could do that, I would appreciate
5 that. And feel free to say you don't agree with the
6 premise. I fully expect that in your answer --

7 MR. KEIZER: Is that a question maybe that you could
8 also maybe, instead of us taking an undertaking, put it to
9 panel 1B? And if we can answer it there, that may save
10 having to do an undertaking.

11 MR. MONDROW: Well, this way at least -- we cannot --

12 MS. LONG: Why don't we mark it as an undertaking, but
13 I would like panel 1B to address it, because I think the
14 panel is interested in hearing that in live evidence rather
15 than through an undertaking response. We may have some
16 questions about that.

17 MR. LYASH: Just to be clear about the question, and
18 there may be some issues with the premise, but it wouldn't
19 be the difference between 12.8 and 12.4. It would be the
20 difference between 1.7 and 1.4 if you're asking
21 specifically about contingency.

22 MR. MONDROW: Sorry, if you're asking specifically
23 about --

24 MR. LYASH: About contingency changes. I think you
25 mentioned contingency versus total project cost. The
26 contingency difference is 300 million. The project cost is
27 400 million difference.

28 MR. MONDROW: The difference being interest and

1 escalation?

2 MR. LYASH: I think that's probably the difference,
3 but I'm not sure. I'm just not sure which one you were
4 asking about --

5 MR. MONDROW: Okay. So account interest and
6 escalation, we sort of counted everywhere, but I take your
7 point, Mr. Lyash, and when we come back on panel 1B, we'll
8 make sure to clarify that. Thanks.

9 MR. RICHLER: Mr. Mondrow, I should have given an
10 undertaking number. It's J2.3.

11 MR. MONDROW: Thank you.

12 **UNDERTAKING NO. J2.3: TO DETERMINE THE REVENUE-**
13 **REQUIREMENT IMPACT MOVING FROM A P90 TO A P50 IN THIS**
14 **APPLICATION**

15 MS. LONG: So, sorry, Mr. Mondrow, is the nub of your
16 question, if you take -- if you go from P90 to P50 on the
17 contingency level, is it OPG's view that it should be
18 divided equally, let's say, when you look at all four
19 units? And that means -- I mean, is that what you're
20 looking for with respect to unit 2?

21 MR. MONDROW: I'm looking for the revenue-requirement
22 impact in this application moving from a P90 to a P50. So
23 that would be --

24 MS. LONG: Right. Just based on unit 2, though.

25 MR. MONDROW: Unit 2 is the only unit they're --

26 MS. LONG: Right. Okay.

27 MR. MONDROW: -- asking for revenue requirement. Yes.

28 MR. REINER: Yeah. The -- and I'll just repeat back

1 as well so I'm clear. So the \$400 million number that you
2 identify here in the mathematics, you're looking for the
3 amount that would be allocated to unit 2?

4 MR. MONDROW: Well, kind of. So you've already
5 allocated 40 percent of contingency on a total --

6 MR. REINER: Yes.

7 MR. MONDROW: -- DRP basis --

8 MR. REINER: Yes.

9 MR. MONDROW: -- to unit 2?

10 MR. REINER: Yes.

11 MR. MONDROW: P90. So I'm assuming a proportional
12 allocation if we move to P50 --

13 MR. REINER: -- P50, does that allocation still hold?

14 MR. MONDROW: And you may conclude --

15 MR. REINER: Yeah.

16 MR. MONDROW: -- not, and if not, I would be
17 interested --

18 MR. REINER: Yeah.

19 MR. MONDROW: -- in why not. So I think we have an
20 undertaking number, but we've agreed we're going to talk
21 about it --

22 MS. LONG: Well, let's just mark it so we don't lose
23 it --

24 MR. MONDROW: Yeah, yeah. I would appreciate --

25 MS. LONG: -- and -- but we'll deal with it on 1B.

26 MR. MONDROW: So that's J2.3 then. Thank you very
27 much.

28 Mr. Reiner, there's something else I want to ask you

1 about from your testimony yesterday, and I'm sorry; I
2 actually didn't receive the transcript last night. I think
3 I've corrected that this morning. So I don't have a
4 reference for you, but I'm sure you will remember. You
5 mentioned a few times yesterday morning in particular the
6 expert support that you have on the record already for your
7 P90 selection and why that's appropriate. I think Schiff
8 Hardin you referred to a couple of times.

9 I must admit I haven't seen any of those experts say
10 P90 is the right selection. I have seen them talk a lot
11 about your methodology and how you conducted the analysis
12 appropriately and Monte Carlo is appropriate for this kind
13 of project, et cetera, et cetera, but I didn't see anyone
14 say, "We agree with P90." Is that what you intended to say
15 yesterday?

16 MR. REINER: So what the experts have told us is that
17 the -- so I think we had said yesterday there is no
18 prescribed method of contingency allocation to projects
19 that you can go to and say, "Hey, this is my project, and
20 this is the number that goes with it."

21 The nature of a megaproject and the decision we made
22 in OPG to utilize a P90 confidence level given the nature
23 of the project, the experts looked at that, and the
24 conclusions provided were that it's an appropriate
25 allocation of contingency given the nature of the project.
26 So P90 is an appropriate contingency allocation.

27 MR. MONDROW: Okay. Can you take an undertaking to
28 tell me, perhaps with the assistance of some of your

1 colleagues, where precisely in the evidence there is an
2 expert that says P90 is an appropriate allocation? Because
3 I didn't see that anywhere, and I may just have missed it,
4 so if you're pretty confident about that, I would like to
5 understand the basis for that position. Could we have an
6 undertaking for that?

7 MR. REINER: I believe, in the Pegasus testimony,
8 there is some information that talks about the
9 reasonableness of P90; that that is seen to be a reasonable
10 allocation of contingency.

11 MR. MONDROW: That's interesting, because that's the
12 piece I read most carefully, and I didn't read it that way,
13 so I would actually like a cite from you for where you
14 believe Dr. Galloway said that. Could you undertake to
15 give me that?

16 MR. REINER: Okay.

17 MR. MONDROW: And any other piece of evidence. I'm
18 not going to limit you to Pegasus, but you seem pretty sure
19 about this, and I just haven't seen it, so I would like to
20 understand the basis for that position.

21 MS. LONG: So, in any of the expert reports you're
22 looking for that, Mr. --

23 MR. MONDROW: Any of the evidence, but I assume expert
24 reports, yes. I'm sorry. Any of the expert reports,
25 because it's external validation of that --

26 MS. LONG: I assume that's what you're looking for.

27 MR. MONDROW: Thank you. J2.4?

28 MR. RICHLER: Yes.

1 UNDERTAKING NO. J2.4: TO ADVISE PRECISELY WHERE IN
2 THE EVIDENCE THERE IS AN EXPERT THAT SAYS P90 IS AN
3 APPROPRIATE ALLOCATION

4 MR. MONDROW: Thank you, Mr. Reiner. And I don't want
5 to put you on the spot today, so take that away and you can
6 let me know where you've seen that. I know we all see
7 things that we remember, and I would be curious where that
8 is.

9 Can I go to Exhibit D2 -- still on contingency, D2-2-
10 7, so it's Exhibit D2, tab 2, schedule 7, page 7. I'm
11 looking at chart 1.

12 And if you have that, Mr. Reiner, there are two
13 columns there on contingency. Well, there's three --

14 MS. LONG: Mr. Mondrow, could you just wait --

15 MR. MONDROW: Oh, I'm sorry.

16 MS. LONG: -- until we get it in front of us. Thank
17 you.

18 MR. MONDROW: Sorry.

19 MS. LONG: We have it now. Thanks.

20 MR. MONDROW: I did provide these yesterday. I
21 understand sometimes it takes some time to find. It's
22 not --

23 MS. LONG: I know it's a hard job to get those
24 documents up, so we appreciate it. Thank you.

25 MR. MONDROW: It was only late last night, I must
26 confess, so completely understandable.

27 So I'm looking at D2, tab 2, schedule 7, page 7. It's
28 chart number 1 --

1 MR. REINER: Yes.

2 MR. MONDROW: -- Mr. Reiner, and there are, apart from
3 the "Total" column, two separate columns on contingency.
4 And I know you answered a couple interrogatories on this.
5 I looked at those answers. I still don't quite get it. I
6 wonder if you could just explain the difference between
7 project contingency and program contingency. Maybe take
8 the RFR, which we all are focused on, as an example and
9 just explain what the difference is there.

10 MR. REINER: So, in general, project contingency is
11 contingency that is allocated specifically to a project
12 bundle, and program contingency would be something that
13 would cut across all projects and is not directly allocated
14 to a project, is held at program level. So, for example,
15 radiation protection support would be something -- there is
16 a risk associated with that. It is attributable to RFR but
17 would be held at a program level.

18 MR. MONDROW: And so, if we look at project execution
19 operations and maintenance, I didn't understand that
20 category to be -- to have specific projects under it. I
21 thought it was a kind of a project management office. Am I
22 wrong on that?

23 MR. REINER: So the -- there are operations and
24 maintenance. There is an allocation of operations and
25 maintenance effort to projects specifically.

26 MR. MONDROW: Ah.

27 MR. REINER: And there is also -- if you look at the
28 project in its entirety in the defuel phase, that is all

1 work executed by operations and maintenance. And in the
2 return-to-service phase, that is all work largely executed
3 by operations and maintenance.

4 MR. MONDROW: At the program level, the contingency
5 would relate, I assume, more how the projects interact with
6 each other as opposed to the risk inherent in an isolated
7 project.

8 MR. REINER: Yes. And I think that's generally the
9 allocation here. If it's specific to a project, it sits in
10 the project. We can get into this in more detail on panel
11 1B. Panel 1B will be able to drill down into the specifics
12 on what's in program level versus project level.

13 MR. MONDROW: That will help me prepare for that.
14 Thank you very much.

15 One more question on this table: Unallocated program
16 contingency, what's that?

17 MR. REINER: Unallocated is something that isn't
18 specifically allocated to a piece of work. So, for
19 example, there is a -- if you look at the resources between
20 the execution of unit 2 and unit 3, the resources diminish,
21 and then they ramp back up again. We call that the trough
22 between units 2 and 3. It may have been referenced that
23 way in our evidence, and there are risks associated with
24 ramping those resources back up.

25 So the availability of the resources, the training
26 that goes with it, the costs associated with doing that,
27 there is an element of risk. That would be an unallocated
28 risk, because its a not attributable to any specific

1 project activity. It's just the nature of the program, the
2 way the schedule is structured.

3 MR. MONDROW: Does some of that get allocated to unit
4 2, ultimately? I guess only if you call on it.

5 MR. REINER: Again, I would ask -- we can deal with
6 that on panel 1B, what the exact allocation is into the
7 unit 2 contingency. I believe there is information that's
8 been provided that breaks the unit 2 contingency down into
9 the same categories.

10 MR. MONDROW: Okay. I'll come back to that. Thanks.

11 Mr. Lyash, when OPG obtained government approval for
12 the DRP, was there a total cost number that you provided to
13 the government?

14 MR. LYASH: We provided the government the RQE in
15 obtaining approval to proceed.

16 MR. MONDROW: And would you have provided the
17 government with a specific unit 2 number in addition to the
18 total DRP number?

19 MR. LYASH: I can't recall whether that -- the focus
20 was on RQE for the 12.8 billion. I can't recall whether we
21 included the unit 2 number in that approval process or not.
22 We can certainly check.

23 MR. MONDROW: Can you check? J2.5?

24 MR. RICHLER: Yes, J2.5.

25 **UNDERTAKING NO. J2.5: TO ADVISE WHETHER THE**
26 **GOVERNMENT WAS PROVIDED WITH A SPECIFIC UNIT 2 NUMBER**
27 **IN ADDITION TO THE TOTAL DRP NUMBER**

28 MR. MONDROW: Thank you. I'm going to go through

1 some detail here, Mr. Reiner, just to understand, and this
2 is on unit 2 contingency included in the application there.
3 I think they're different numbers, and I'm not sure why
4 that is. So let's just do this chronologically and take a
5 couple of minutes to do this.

6 So if we can start at D2, 2-8, please, page 9. So
7 this is Exhibit D2, tab 2, schedule 8, page 9, chart number
8 4. This is for the Darlington unit, so the 2020 revenue
9 requirement and service amounts that you're requesting in
10 this application.

11 As of the filing date of this evidence, which I guess
12 is May 2016, you had a contingency amount, if you look at
13 the second-last row on this table, of \$694.1 million, so
14 just remember that number for a minute.

15 Now I'm going to take you to Mr. Rubenstein's
16 compendium from yesterday, which is Exhibit K1.2, page 19.
17 I was struck with this yesterday. There is a unit 2 cost
18 summary, which is an appendix to a board of directors
19 report, the date of which was August 2016, and I can take
20 you back to the date in a minute. But just relative to the
21 May 2016 number we just looked at, in August 2016 on this
22 chart here, page 19 of K1.2, there is an RQE contingency
23 number of 689.5 million, and that compares to the 694.1
24 million.

25 I don't understand why that's a different number. Do
26 you?

27 MR. REINER: So you're referring to row 17 on that
28 table, the difference between the RQE number and the

1 current U2EE number?

2 MR. MONDROW: I'm referring to the difference between
3 the RQE on this table and the prefiled number in your
4 prefiled evidence, which I thought was also an RQE number.
5 I may be wrong.

6 MR. REINER: We would have to undertake to get you an
7 answer to that. I don't have the answer off the top
8 precisely. I think the 1B panel may have that answer, so
9 maybe we can come back on the 1B panel.

10 MR. MONDROW: Okay. I know it's only \$5 million, but
11 it seems like a reasonable question.

12 MR. REINER: I see the delta that you're talking
13 about.

14 MR. MONDROW: I made a note to come back to that, if
15 you want to make your own note.

16 And then as you pointed out, we have, really for this
17 Hearing Panel going forward, the current U2EE contingency
18 number of 677.5 million. That's the current number and the
19 number you mentioned yesterday, I believe, Mr. Reiner?

20 MR. REINER: Yes, that's correct.

21 MR. MONDROW: Okay. And why was the unit 2
22 contingency reduced to 677.5?

23 MR. REINER: The release quality estimate was an
24 estimate at a point in time at the end of 2015. And the
25 unit 2 estimate is the budget that we released for unit 2
26 in 2016, and it is just a reflection of the continuation of
27 the work that was done in getting ready for unit 2
28 execution and in refining some of the estimates that were

1 still at a higher class and having progressed some of the
2 engineering work and the details that feed into that
3 estimate. So that reduced the amount of contingency that
4 we required at the time of the release of funds to the
5 project.

6 MR. MONDROW: Okay. And you've now removed the water
7 facility from the approvals requested in this application.
8 Will that reduce the unit 2 contingency request at all?

9 MR. REINER: That does not reduce the unit 2
10 contingency request.

11 MR. MONDROW: I assume there was contingency
12 associated with that facility originally?

13 MR. REINER: There was an allocation of contingency
14 that was allowed for within the project itself. And so,
15 based on the outcome of the analysis that is now underway
16 to understand what is the exact completion date and
17 estimate to completion for that project, that will inform
18 us on whether that amount of contingency is sufficient to
19 cover any cost increases.

20 There was also a contingency amount held as program
21 level for the whole suite of facility and infrastructure
22 and safety improvement projects. Based on current
23 estimates where they stand, we have allocated all of that
24 contingency to projects. If there is a requirement for
25 additional contingencies to be utilized to execute the tool
26 storage, that would come out of the refurbishment program
27 contingency.

28 MR. MONDROW: Thank you for that. But just stepping

1 back, the D20 facility had a budget with a contingency?

2 MR. REINER: Yes.

3 MR. MONDROW: And some portion, perhaps all the D20's
4 facilities costs were actually allocated to unit 2 for the
5 purposes of this application?

6 MR. REINER: No. Those costs -- so the 4.8 billion is
7 a unit 2 cost, and then initially in the application, there
8 was a cost identified for the early in-service, the
9 facility and infrastructure and SAO projects, and it's in
10 that number.

11 MR. MONDROW: Okay. And the contingency amount, I
12 think it was 1.7 million overall for the project, 40
13 percent of which was included in this application.

14 MR. REINER: Yes.

15 MR. MONDROW: I think I asked you the wrong question.
16 Thank you for your clarification. So the \$677.5 million of
17 contingency, that is the current contingency amount before
18 this Hearing Panel. That's -- is that just a unit 2
19 contingency, or is that -- that's just a unit 2 --

20 MR. REINER: That is a unit 2 contingency, yes.

21 MR. MONDROW: So there is additional contingency
22 before this Hearing Panel for approval other than the 677.5
23 because of the early in-service projects that haven't
24 closed to rate base yet that you're going to close at the
25 same time as unit 2?

26 MR. REINER: Yes. So whatever the actual costs are
27 for those projects when they close, that will determine how
28 much of that program-level contingency was actually

1 consumed for those projects.

2 MR. MONDROW: So if I look at the updated -- and we're
3 going to do this at the end of my questions -- at the
4 updated approvals requested, you have got revenue-
5 requirement numbers for each year. Those numbers are net
6 of the removal of the D20 facility from this application.
7 Is that right?

8 MR. REINER: Yes.

9 MR. MONDROW: Those are the final numbers as of today
10 that you're asking for approval?

11 MR. REINER: They are the final numbers as of today,
12 yes.

13 MR. MONDROW: And "as of today" means after taking D20
14 out?

15 MR. REINER: After removing D20 storage from the
16 application, yes.

17 MR. MONDROW: Good enough. Thank you.

18 Mr. Reiner, I think the evidence now reveals that, in
19 respect of the early in-service projects, there has been
20 some schedule delay on some of the projects.

21 MR. REINER: Yes.

22 MR. MONDROW: We'll get into details with panel 1B,
23 but that is correct; right?

24 MR. REINER: That is correct.

25 MR. MONDROW: Okay. And do any of those projects
26 impact the critical path for the unit 2 refurbishment?

27 MR. REINER: Those projects do not. There were
28 commitments that were made in our integrated implementation

1 plan to the Canadian Nuclear Safety Commission in relation
2 to some of those projects. We do have a change control
3 mechanism that is built into the tracking of those
4 regulatory commitments which we have executed to notify the
5 Canadian Nuclear Safety Commission that we are going to be
6 late on a couple of those commitments.

7 But they do not -- those are systems that will be in-
8 service to support the licence that we require to obtain
9 for continued operation of Darlington, but they do not
10 actually impact critical path on execution of
11 refurbishment.

12 MR. MONDROW: Okay. Is there somewhere in the
13 evidence a description or an illustration or some
14 combination of what the critical path is for unit 2?

15 MR. REINER: Yes, I believe so. There is a layout.
16 We walked through it yesterday at a very high level in its
17 large blocks, and there is also what we call a level 1
18 schedule, which provides a level of detail. I believe it's
19 an attachment to the evidence that speaks to the schedule.

20 MR. MONDROW: So if we look at K1.1 from yesterday,
21 there was this foldout sheet, which is -- this was Board
22 Staff's compendium at page -- I guess it would be nine.

23 MR. LYASH: Yes, that is the one.

24 MR. MONDROW: And so if I'm looking at this gorgeous
25 diagram, I must say -- matches my tie, Mr. Keizer -- is the
26 red bar here the critical path?

27 MR. REINER: The red bar is the critical path, yes.

28 MR. MONDROW: And some of these other coloured bars

1 which have arrows coming in and out of the red bar, I
2 assume some of them would impact the critical path if they
3 were delayed?

4 MR. REINER: So those are -- those arrows indicate
5 logic ties back to critical path, so those activities would
6 need to be completed prior to getting to that point on
7 critical path. And so they do have -- they do have a
8 potential of impacting critical path if they run behind
9 schedule. That's correct.

10 MR. MONDROW: So anywhere where I see an arrow
11 directly from a project that's not highlighted in red to
12 the red bar, that would be a critical path interface of
13 that other project with the critical path?

14 MR. REINER: That would be an interface where there is
15 a requirement to have that activity done --

16 MR. MONDROW: Right.

17 MR. REINER: -- in order to proceed to the next step
18 on critical path.

19 MR. MONDROW: Okay. So thank you for that. We can
20 study that for panel 1B, use that as a reference.

21 Just let me ask you: Are there any of the early in-
22 service projects, the facilities and infrastructure
23 projects, the safety improvement opportunity projects, that
24 have critical-path relationships?

25 MR. REINER: The -- what I would say on D20 storage, I
26 mean, D20 storage is required in order to allow for two
27 units of refurbishment to be executed simultaneously, so we
28 do need that facility before we get into that point in the

1 schedule. So that would be at the point in time where unit
2 3 and unit 1 overlap.

3 MR. MONDROW: Is that the only one from that group of
4 SIO and F&P projects -- or F&I projects, sorry?

5 MR. REINER: If you point me to the list of projects
6 that --

7 MR. MONDROW: Sure.

8 MR. REINER: -- you're looking at, then I can just
9 take a look and let you know.

10 MR. MONDROW: Sure. So I'll tell you the list I use.
11 Let me see here. Let's start with Exhibit D2, tab 2,
12 schedule 8, page 9, my notes tell me. Oops, that can't be
13 right. Sorry. Sorry, just give me a minute.

14 Maybe if we go to AMPCO response 30, that would be a
15 better place for me. So I will have to take you into the
16 interrogatory responses, and I will give you the exhibit
17 number. So it's Exhibit L-4.3, schedule 2, AMPCO 030.
18 Okay. Sorry, maybe there's -- sorry for the confusion.

19 Maybe there's an even better place, and this will save
20 me a question later on, actually, so why don't we go to
21 Exhibit D2, tab 2, schedule 10, table 2. It's Exhibit D2,
22 tab 2, schedule 10, table 2. It says schedule 10 of this
23 exhibit, table 2. It's Adobe page 135 of 331, PDF page
24 135. Oh, sorry, I've got it broken up in the next exhibit.
25 Schedule 10. There we go. Thank you.

26 So here we have a list of projects, Mr. Reiner, that's
27 actually called ongoing projects from EB-2013-0321, and my
28 question was: You talked about the water storage facility,

1 and whether any of these other projects have critical-path
2 impacts.

3 MR. REINER: We talked about the heavy water storage
4 facility already. The water and sewer project is complete.
5 The Darlington energy complex is also complete. The retube
6 and feeder replacement island support annex is complete.
7 The refurbishment project office is complete. The
8 electrical power distribution system is complete. The
9 third emergency power generator is not yet in-service, but
10 is expected to be in-service before the end of the month.
11 It does not have a critical-path impact on unit 2. The
12 containment filtered venting system also is expected to be
13 in-service by end of March, and it does not have a
14 critical-path impact on unit 2.

15 MR. MONDROW: For the projects not yet in-service but
16 expected to be in service shortly, do we have updated
17 costs? Do you have updated costs, updated from this table?

18 MR. REINER: I believe we do have updated costs.

19 MR. MONDROW: I don't want to take the time now to go
20 through each of them. I think that's a panel 1B discussion
21 perhaps. But I wonder if, for table 2 and table 3, which
22 lists further ongoing projects, whether we could get
23 updated in-service and cost information prior to panel 1B.
24 Would that be possible?

25 MR. REINER: Yes, we can provide that.

26 MS. LONG: So an updated column H?

27 MR. RICHLER: J2.6.

28 **UNDERTAKING NO. J2.6: TO PROVIDE A FINAL IN-SERVICE**

1 **DATE UPDATED AND AN UPDATED COLUMN H, 2016 ACTUALS FOR**
2 **THE PROJECTS THAT ARE IN-SERVICE**

3 MR. MONDROW: For both schedule and dollars. So a
4 final in service date updated, and an updated column H.

5 MS. LONG: D and H.

6 MR. MONDROW: Thank you. I'm told 2016 actuals for
7 the projects that are in service; I assume that's what
8 we'll get. Okay, Mr. Reiner?

9 MS. LONG: Are you asking for that as an undertaking,
10 or asking that be addressed by panel 1B?

11 MR. MONDROW: I am asking for that as an undertaking,
12 so we have the information in order to explore the
13 variances with panel 1B, if there are material variances.

14 MR. REINER: Yes.

15 MR. MONDROW: Okay?

16 MR. REINER: Yes.

17 MR. MONDROW: Thank you.

18 MS. LONG: Is that 2.6?

19 MR. RICHLER: Yes, that's J2.6.

20 MR. MONDROW: If I could have a moment? I didn't want
21 to ask redundant questions. Thank you.

22 Mr. Reiner, you talked a few minutes ago about some
23 contingency updates because you now have, a little further
24 along in execution, more information. That makes sense as
25 you go.

26 I assume, gentlemen, and Mr. Lyash in particular,
27 that, in 2019, you'll have greater certainty on unit 2
28 schedule and cost than you do today?

1 MR. LYASH: Yes. I would expect we should be closing
2 in on completion of the unit at that point.

3 MR. MONDROW: And I just want -- you had some
4 discussion yesterday about your midterm update. I know the
5 original proposal for the midterm update was to adjust
6 rates for 2020 and 2021, if required, based on an updated
7 nuclear production forecast.

8 Your nuclear production forecast, Mr. Reiner, is it a
9 P level determination, or is it just kind of a conventional
10 forecast?

11 MR. REINER: I would have to ask that you take that
12 question to the nuclear panel. I'm not in -- I don't have
13 the background needed to be able to talk about how the
14 nuclear production forecast is done, and I believe the
15 nuclear panel is prepared to talk to that in detail.

16 MR. MONDROW: Do you know if there was a Monte Carlo
17 simulation done on that nuclear production?

18 MR. REINER: I don't know.

19 MR. MONDROW: Okay. I made a note to come back to
20 that.

21 So the midterm review is going to look at an updated
22 nuclear production forecast. You're now also going to seek
23 a prudence review for the heavy water facility at the
24 midterm, Mr. Lyash? That's the plan at the moment?

25 MR. LYASH: Correct.

26 MR. MONDROW: You're going to be updating the Board
27 annually on the DRP, as I understand it. That's part of
28 your filing proposal?

1 MR. LYASH: Yes. We plan to file an annual report
2 with a cost schedule and performance information.

3 MR. MONDROW: And to the extent there are material
4 changes between now and then, that would be an appropriate
5 subject for the midterm review, I assume?

6 MR. LYASH: I would assume so.

7 MR. MONDROW: The CRVA clearance, is that -- I think,
8 Mr. Lyash, you said a few minutes ago that you're not sure
9 how and when that's going to be clear. I thought that was
10 a midterm review issue, but maybe I am mistaken about that.
11 Is that a midterm review issue?

12 MR. KEIZER: It is a midterm review issue.

13 MR. MONDROW: Okay. So we're going to do that at the
14 midterm as well. All right.

15 Mr. Lyash, you'd agree with me, I trust, that there is
16 a real concern in this province about consumer electricity
17 costs?

18 MR. LYASH: I agree.

19 MR. MONDROW: You're acutely aware of that, I would
20 imagine.

21 MR. LYASH: Yes.

22 MR. MONDROW: And you'd agree with me that OPG has a
23 significant role to play in respect of electricity cost
24 control, not the only agency, but certainly a major player?

25 MR. LYASH: Yes, I agree.

26 MR. MONDROW: In fact, your recent proposal for
27 regulation change in respect of rate smoothing, about which
28 we are all waiting with bated breath, as you are, I'm sure,

1 for more detail, is a proposal specifically to address cost
2 impacts on electricity consumers in Ontario?

3 MR. LYASH: Yes.

4 MR. MONDROW: Mr. Lyash, are you cognizant of the fact
5 that this Board has a very strong focus, in particular of
6 late, on building incentives into rate approvals in order
7 to reward and encourage efficiencies in the entities
8 regulated by the Board?

9 MR. LYASH: Yes, I'm aware of that, and we have
10 undertaken to build that into the application that's
11 pending before the Board currently.

12 MR. MONDROW: Right. Your application in this docket
13 includes express efficiency incentives in some areas, but
14 not in respect of the DRP. You went over this yesterday,
15 but that's a correct understanding, no express incentives
16 in respect of the DRP?

17 MR. LYASH: In the application that is pending,
18 correct, other than those that I have described yesterday.

19 MR. MONDROW: Okay. And you talked about that, and
20 you did talk about how the company is incented to do well
21 on this project, and you were very clear about that a few
22 times yesterday. But I'm still not sure why you wouldn't
23 -- given that emphasis and given the sensitivity about
24 costs, why you wouldn't build some sort of express
25 incentive into the biggest project in electricity in
26 provincial history. Can you help me with that?

27 MR. LYASH: Well, I'm not sure what type of incentive
28 you're postulating, so I'll have to make some assumptions

1 in answering the question. We have done what we think is a
2 very strong job of planning and preparing to execute it
3 with very well based cost schedules and defensible
4 contingencies. I'm not sure what incentive you would
5 suggest is applied, but perhaps if I assume your proposal
6 was to somehow apply a lower capital investment number as
7 an incentive for the company to hit, then I think you have
8 to take great care in doing that, because the objective
9 here is to deliver the maximum value to the customers over
10 the 30-plus-year life of Darlington. It's a very long-term
11 investment.

12 And in terms of sensitivity to how much value the
13 customer gets over that period of time, two of the factors
14 that are very substantial are capacity factor and
15 production costs, total generation cost. Achieving those
16 numbers don't always perfectly align with lowering your
17 capital or OM&A cost in a project. And so I'm always very
18 cautious about the type of behaviours and incentive it's
19 designed to produce and whether those behaviours really are
20 in the best interests of the customers or not. Lowering
21 capital cost by extending the schedule and having customers
22 absorb lower replacement power costs, lowering capital
23 costs in a way that adversely impacts system capacity
24 factor in the long term, lowering capital costs in a way
25 that adds in ongoing O&M costs, that balance, I think you
26 have to be careful to maintain it.

27 So your answer (sic) is why not a hard incentive on
28 capital. I that's your question, those are my thoughts on

1 why that is not necessarily an appropriate thing to oppose
2 on this project.

3 MR. MONDROW: That's very helpful.

4 I gather, Mr. Lyash, that you don't want to skimp and
5 save at the expense of robust longer-term performance and
6 safety?

7 MR. LYASH: That's correct.

8 MR. MONDROW: And, in your perspective, it's important
9 to keep an eye on that longer-term value when evaluating
10 the approvals requested in this application for the first
11 chunk of the DRP?

12 MR. LYASH: Yes.

13 MR. MONDROW: So, essentially, it's we're going to
14 spend what we have to spend to get this right.

15 MR. LYASH: We're going to get this right, and we're
16 going to spend as little as possible in doing so.

17 MR. MONDROW: And your incentive for that is to get it
18 right?

19 MR. LYASH: The incentives are as I described
20 yesterday, yes.

21 MR. MONDROW: Right. So you made some assumptions
22 about what I might have in mind. So bearing in mind you
23 have a variance account or you're asking for a variance
24 account, if this Board approved a P50 contingency budget
25 and schedule rather than a P90 contingency budget and
26 schedule -- I guess it's the other way around, schedule and
27 associated budget -- given that you have variance account
28 treatment, would that be an appropriate way to control --

1 communicate the importance of cost control without putting
2 you in a position where you have to sacrifice robustness or
3 safety on this project?

4 MR. LYASH: The Board can certainly decide to select a
5 different probabilistic basis for unit 2. I'm not sure
6 what the basis for that number would be, but that's
7 certainly something that the Board could do. I wouldn't
8 take away from that an incentive to lower costs beyond that
9 which I already have. The cost would be the lowest number
10 we can produce to achieve the result we're looking for.

11 So, in my mind, that's just a question of what the
12 Board cares to examine, not in a cost incentive for us.

13 MR. MONDROW: So that's heartening, Mr. Lyash, as long
14 as you're at the helm there, that you feel the same
15 pressure either way, but I guess the difference is, if you
16 get a P50 approval, if you spend more than that, you need
17 to justify the prudence of that at the time.

18 MR. LYASH: I think -- as we said, I think the -- what
19 we are saying is that what we've done -- and the \$4.8
20 billion number that we've established is a reasonable
21 number based on industry best practice for a project of
22 this complexity and nature, and that is the standard
23 against which we think the project should be measured.

24 A different standard could certainly be established,
25 but that 4.8 billion is the standard that we think
26 demonstrates reasonableness on the part of OPG.

27 MR. MONDROW: The Board set your payment amounts based
28 on a P50. Those payment amounts are more likely

1 mathematically to match your actual costs at the end of the
2 day.

3 MR. LYASH: Well, I don't agree that just pure
4 mathematics is the way to make this decision.

5 MR. MONDROW: Okay. I understand.

6 I did want to ask you one question about some of the
7 testimony you gave yesterday on incentives, and one of the
8 incentives you mentioned is the link between compensation
9 amounts and performance on this project. Do you recall
10 that testimony?

11 MR. LYASH: I do.

12 MR. MONDROW: And we're a bit puzzled by that, because
13 my understanding is you're asking for an envelope, but
14 compensation obviously is determined on an annual basis.
15 So how do you bridge that timing difference for
16 compensation purposes?

17 MR. LYASH: Well, this is perhaps better -- better for
18 the compensation panel 4 to take up since it's a direct
19 question to them. But compensation has certainly got base
20 salary; it's got elements of incentives. The company has
21 goals. Those goals extend beyond the current calendar
22 year. Managers are assessed on their performance, not only
23 in obtaining annual goals, but achieving the goals in the
24 business plan. And those goals in the business plan, as
25 you might guess, are heavily weighted around refurbishment.

26 MR. MONDROW: Do you have annual milestones that you
27 and your other senior management team have to meet in order
28 to --

1 MR. LYASH: We do.

2 MR. MONDROW: -- get compensated?

3 MR. LYASH: Yes.

4 MR. MONDROW: And those would be kind of schedule and
5 cost milestones on the DRP?

6 MR. LYASH: Yes. Yeah.

7 MR. MONDROW: So isn't that how you bridge the gap?
8 You actually have broken the overall envelope for both
9 schedule and costs down into milestones which include
10 milestones within each compensation year?

11 MR. LYASH: Correct.

12 MR. MONDROW: Okay. And, presumably, that's how your
13 portion of the compensation is evaluated.

14 MR. LYASH: As an example -- and I think the
15 compensation committee or the compensation panel can go
16 into this in detail -- in 2015 -- or 2016, there were
17 specific management goals for the number of channels
18 defuelled, because that was the end for the completion of
19 the campus plan and SIO projects, and those milestones for
20 '16 were numbers taken directly down from the project plan
21 and budget.

22 MR. MONDROW: Okay. Thank you.

23 The break is about 11:30, Madam Chair? Is that...

24 MS. LONG: 11:15.

25 MR. MONDROW: 11:15.

26 MS. LONG: Do you have about 15 minutes more or...

27 MR. MONDROW: I wish I could say that with a P90
28 confidence level. I cannot. But I'll certainly do a break

1 at 11:15, and I'll be able to --

2 MS. LONG: Let's break at 11:15.

3 MR. MONDROW: That would be P100 at 11:15 for a break.
4 That, I can manage.

5 Mr. Lyash, your contractors will have built
6 contingency into their contract fees; right?

7 MR. LYASH: Yes.

8 MR. MONDROW: Do you know what contingency levels they
9 use?

10 MR. LYASH: This is a panel 1B question in detail, but
11 generally we have visibility into contingencies for those
12 contracts that are, for example, target price, not for
13 those that are fixed price.

14 MR. MONDROW: Right. So the fixed-price contracts you
15 assume have contingency, but you don't know how much they
16 budgeted for contingency?

17 MR. LYASH: Correct.

18 MR. MONDROW: The target-price contracts, there's
19 actually an express contingency amount built in is my
20 understanding.

21 MR. LYASH: There is, generally speaking, an open-book
22 approach on the target price, so we have visibility into
23 the contractor's cost and contingency. And, again, panel
24 1B can go through this in quite a lot of detail.

25 MR. MONDROW: Okay. Fair enough. And I won't go into
26 too much more detail with you gentlemen, but I do want to
27 check conceptually something, but I want to reference a
28 number to do so. If you could look at Exhibit -- these are

1 the interrogatory responses again, so it's Exhibit L, tab
2 4.3, schedule 2. I'm pretty sure it's AMPCO 072. And we
3 asked about -- well, my colleagues asked about some of
4 this. So it's Exhibit L, tab 4.3, schedule 2, AMPCO 072.
5 There we go.

6 And if we look at the response to part F, we see that
7 the contingency amounts for the RFR, EPC, and the turbine
8 generator EPC agreements are set out there at 371 million
9 and 28.4 million respectively, Mr. Reiner, so those would
10 be the express contingency amounts for these two contracts;
11 right?

12 MR. REINER: That's correct.

13 MR. MONDROW: And these numbers and others like them
14 would be in addition to the contingency being requested by
15 OPG; right?

16 MR. REINER: Yes. That is correct.

17 MR. MONDROW: So the overall contingency request
18 before this Panel is actually a P90-plus. It's something
19 more than P90, isn't it?

20 MR. REINER: No.

21 MR. MONDROW: No? Why not?

22 MR. REINER: So these numbers are embedded in the --
23 so they essentially are a P50 for the contractor. We don't
24 double-count contingency, so if the contractor has
25 contingency to cover a specific task and the execution of
26 that task, we don't layer on top of that another amount of
27 contingency to cover that same risk. That's with the
28 contractor to manage. Our contingency looks at the risk

1 that sit with OPG and that sit with the program and are on
2 top of what the contractors would have embedded in their
3 costs.

4 MR. MONDROW: If I'm understanding you correctly --
5 and that's comforting for me, thank you -- you calculate
6 your P90 based on the OPG responsibilities excluding, for
7 example, these two EPC contracts. Is that correct?
8 Excluding the contractor responsibilities under these?

9 MR. REINER: So the details of that calculation, I
10 would ask that we defer to 1B, because that panel can go
11 through the details and explain to you how the mathematics
12 is done to get to our P90.

13 MR. LYASH: I think it is --

14 MR. MONDROW: Sorry, Mr. Lyash. So for today's
15 purposes, the answer is you're not double counting, and we
16 can explore 1B how that result is obtained. Sorry, I
17 interrupted you.

18 MR. LYASH: I was going to emphasize that we can see
19 the contingency in the contractors and don't double that up
20 in developing the OPG contingency.

21 MR. MONDROW: Okay. We'll come back to that.

22 I want to move to the topic of scope for the DRP and
23 to do so, hopefully clearly, I want to start at Exhibit
24 D2.2.5, in particular page 3. And in particular -- that's
25 fine, what's on the screen, because, in particular, I want
26 to just emphasize two process bodies or mechanisms that I
27 understand OPG employed in order to ensure that it defines
28 the scope of the DRP with confidence, Mr. Lyash, and

1 precision.

2 So this evidence talks about your project scope review
3 board, and if we look at line 10 on this page, the
4 responsibility of that organization was primarily whether
5 the proposed scope needed to be included in the DRP or
6 could be performed through normal station work processes,
7 bracket, or was required at all, close bracket.

8 So that's one entity. And if we look down starting at
9 line 20 on the same page, we see reference to what I gather
10 is a separate and distinct entity, the Darlington Nuclear
11 Refurbishment Scope Review Panel, so review on the first
12 entity essentially, also referred to as the blue ribbon
13 task force, which was formed in late 2013 to form a
14 detailed review of all scope requests that the PSRB
15 intended.

16 If we look at the footnote on that page 3, which is in
17 reference to the blue ribbon task force, we're told that
18 the objective of that task force was to ensure only scope
19 requests required to support the refurbishment of
20 Darlington units are included in the approved DRP scope.
21 So that's pretty comprehensive, and you can agree with
22 that. But I'm not actually asking you a question. I
23 wanted to set that context for the questions I have to
24 come.

25 So if we -- unless you want to comment on that at all,
26 but you don't have to. Okay. So I'm going to move on.

27 If we can go to D2, tab 2, schedule 2, page 13,
28 attachment 2 - sorry, D2, tab 2, schedule 2, attachment 2,

1 page 13, just to identify this document.

2 So this is the Darlington Refurbishment Charter, and
3 if we scroll down a little bit, we see, Mr. Reiner, that
4 you have senior sign-off on this document; right?

5 MR. REINER: Yes.

6 MR. MONDROW: Okay. And if we look at page 4 of the
7 document -- so, for that, you need to look in the page
8 boxes at the top right corner under the "Internal Use
9 Only." Those are the page numbers I'm referring to, and if
10 we go to page 4, we see the revision dates.

11 The first issue date here was June 2008, and the final
12 so far date for this document is much more recent. It's
13 January 2016. I'm reading that right, Mr. Reiner?

14 MR. REINER: That's correct.

15 MR. MONDROW: And you've been involved in this
16 document throughout that time period?

17 MR. REINER: I was not involved with revision 0 and
18 revision 1, but was with revision 2 and 3.

19 MR. MONDROW: So sometime between 2009 and 2014?

20 MR. REINER: Yes.

21 MR. MONDROW: So if we look at page 9 of the document,
22 we see a heading, "DRP scope," and if we look at the
23 paragraph following the bullet list, I want to read that.

24 "A program scope review board --"

25 We just looked at that.

26 "-- with supporting governance was put in place
27 to approve the technical scope of the DRP. The
28 technical scope for the DRP was initially

1 confirmed in May 2012."

2 You were involved at that point, Mr. Reiner?

3 MR. REINER: Yes.

4 MR. MONDROW: "Since that time, as a result of
5 engineering studies and analysis, results of
6 planned inspections and completion of regulatory
7 submittals, including the integrated safety
8 review and environmental assessment, scope has
9 been finalized."

10 So, clearly, as of January 2016, the scope of the DRP
11 had been finalized. That was the latest sign-off date we
12 looked at a minute ago; right?

13 MR. REINER: That's -- yes, that's correct. Now, I
14 will say that doesn't -- this doesn't necessarily finalize
15 100 percent of the scope. There are elements of scope that
16 we've identified that do still require inspection work, and
17 that inspection work can't be conducted until the unit is
18 shut down and defuelled, because we require access to
19 certain parts of the plant that we don't have access to
20 currently in order to establish that precise scope.

21 MR. MONDROW: That's helpful. Let's break that down.
22 Between January 2016 and now, there have been some changes
23 in scope?

24 MR. REINER: Yes.

25 MR. MONDROW: And is there some sort of continuity
26 schedule in the evidence that isolates what those changes
27 have been and what the cost implication that might have on
28 the project?

1 MR. REINER: So, in terms of cost implications, where
2 you would see that in the evidence is the difference
3 between the unit 2 execution estimate and the release
4 quality estimate. We talked earlier about how contingency
5 has changed. You'll see there are some variations in the
6 numbers, so that's a reflection of the progression of that
7 work.

8 MR. MONDROW: But is there actually a continuity piece
9 that tells us what has changed between this -- remember,
10 this followed all of that careful scoping exercise. What
11 I'm trying to do is understand -- and I understand why
12 things might change. You described that, and you'll
13 describe that a little more, I expect, in the coming
14 moments. But I'm trying to isolate what has changed
15 between the time of this approval and essentially now. Is
16 there some piece of evidence that tells us that, that
17 collects all of that comprehensively?

18 MR. REINER: You're talking about the precise changes
19 in scope, whether that has been submitted?

20 MR. MONDROW: Yes.

21 MR. REINER: I would have to see -- I would have to
22 ask whether we have submitted all of that detail of scope
23 change in the evidence. Certainly, internally, we have a
24 process for tracking all scope, and the scope has been
25 tracked since the initiation phase of the project.

26 MR. MONDROW: I would say at a project level. I'm not
27 interested if you needed a different screwdriver. I know
28 I'm vastly oversimplifying, but I don't want that kind of

1 detail. But projects moving in and out is what I'm
2 interested in. Could you undertake to see if you can
3 produce a kind of a continuity schedule of some sort on
4 those scope changes between the filing -- well, between
5 this date --

6 MR. REINER: When you say "this date"?

7 MR. MONDROW: January 2016 was the last sign-off on
8 this document, so between your sign-off and today.

9 MR. REINER: This document isn't -- this isn't a scope
10 document; right? It's a project charter is what this
11 document is.

12 MR. MONDROW: Right. And it says the scope was
13 finalized as of then. I appreciate that changes as the
14 project progresses, and I'm trying to get a sense of what
15 is still changing.

16 MR. REINER: So you're looking between January 2016
17 and what point in time?

18 MR. MONDROW: Today.

19 MR. REINER: What the major changes of scope were in
20 the project?

21 MR. MONDROW: Right. Is that possible?

22 MR. REINER: I think we can undertake to do that.

23 MR. KEIZER: It's just not clear to me that the
24 January date may be the best date, but we'll see what we
25 can figure out.

26 MR. MONDROW: I wonder --

27 MR. RICHLER: Sorry, that will be J2.7, Mr. Mondrow.

28 **UNDERTAKING NO. J2.7: TO ADVISE WHAT THE MAJOR**

1 **CHANGES OF SCOPE WERE IN THE PROJECT BETWEEN JANUARY**
2 **2016 AND TODAY**

3 MS. LONG: I think what Mr. Mondrow is looking for is
4 when the scope was finalized and how it's changed up until
5 the time -- well, today's date. Is that fair?

6 MR. MONDROW: That's right --

7 MS. LONG: Okay.

8 MR. MONDROW: -- Madam Chair. Thank you.

9 MS. LONG: Can I just ask you a question, Mr. Reiner?

10 MR. REINER: Yes.

11 MS. LONG: When you talk about scope change, and
12 you've told us that, obviously, you know the scope will
13 change because you're going to get in and do certain
14 investigations, and it may lead to future work that you
15 don't know about because you haven't gone in yet to see.

16 MR. REINER: Yes.

17 MS. LONG: Does something like that, then, require a
18 scope change? I mean, is it built in that you have
19 identified five areas where you need to go in and do an
20 assessment, and there may be a scope change or there may
21 not. You may go in and see nothing needs to be done. Is
22 that built in already?

23 MR. REINER: That is -- so the processes for executing
24 that are all built in, and it's done through our change
25 control process. In terms of where it is captured in
26 schedule and contingency, there are contingency items
27 identified for contingent scope where we have not -- we
28 have not yet identified a need to execute a certain piece

1 of work, but we're holding in contingency some dollars in
2 the event that that is needed. And some of the schedule
3 contingency is also attributed to that.

4 So. if a scope of work needs to be executed that has
5 the potential to impact schedule, that's what schedule
6 contingency would then cover. So, when we break down all
7 the details, that is covered in the project, and there's a
8 very prescriptive process that we run internally where we
9 have -- we do reconstitute periodically the scope review
10 board, because, at times, there are large items that may
11 move in and out of scope.

12 Primary heat transport pump motors was one example
13 like that. They were in scope at one point in time. The
14 reliability of those motors didn't allow the performance to
15 reach the refurbishment time period, and so they were
16 removed from scope, and so that decision-making and that
17 tracking is all recorded, and processes are in place to do
18 that for every line item of scope.

19 And the reason for that is because we do have to
20 precisely establish a schedule for executing that, and we
21 want to be confident that we've got the costs covered in
22 our contingency or in our base cost, so it was a very
23 prescriptive process for doing this.

24 MR. LYASH: And just to add, that will continue over
25 the refurbishment. So, as we open up systems, as we get
26 in, as we inspect, we'll find repairs that couldn't have
27 been anticipated. Those repairs will be scoped, added.
28 There will be a cost impact, the schedule impact. The

1 contingency is used to fund those efforts if they can't be
2 mitigated and accomplished under the base budget.

3 MS. LONG: Okay. I'm sure we will hear more about
4 that in schedule (sic) 1B, but I am interested, I guess, in
5 how you balance, obviously, the documentation and being
6 able to move ahead with doing things in a timely basis.

7 Mr. Mondrow has asked you for an extension of a chart
8 showing how scope changes, but I think the Panel is very
9 interested in how you balance being able to move quickly on
10 issues and being able to make sure that there is correct
11 oversight. So you can address that in panel 1B.

12 MR. MONDROW: Thank you, Madam Chair.

13 I know it's break time. I just want to finish one
14 question on scope if I could. And so we got Undertaking
15 J2.7, which is to kind of provide continuity on the scope
16 changes, and I also said, I just want to be clear, and
17 associated costs, so whether the costs have come out of the
18 program or been added to the program in consequence of
19 those scope changes, if you have that information
20 available.

21 MR. REINER: Yes. And you also said you don't want
22 all the details. You're looking for the big -- the large
23 items; right?

24 MR. MONDROW: Yes. That's fine.

25 MR. REINER: So we'll make an assumption on what kind
26 of a materiality threshold that would be --

27 MR. MONDROW: Just tell us what that assumption was.

28 MR. REINER: Yes.

1 MR. MONDROW: Thank you.

2 And just one -- so, Mr. Reiner, you mentioned a minute
3 ago why, I think it was steam generators, if I'm not
4 mistaken, came out of scope, something about --

5 MR. REINER: Heat transport --

6 MR. MONDROW: -- heat transport.

7 MR. REINER: -- pump motors.

8 MR. MONDROW: Pump motors, because they weren't
9 available in time to keep them in scope, or...

10 MR. REINER: So the initial -- the initial plan was
11 for some of the heat transport pump motors to be replaced
12 during the refurbishment of the plant. In actual fact,
13 what has transpired over the course of time is the
14 reliability of those motors deteriorated significantly, and
15 we have had failures. And so that's an item that had to be
16 addressed by the station outside of refurbishment. It was
17 required just to keep the plant running.

18 MR. MONDROW: Sooner rather than waiting --

19 MR. REINER: Sooner, sooner rather than later.

20 MR. LYASH: Couldn't wait for refurbishment.

21 MR. MONDROW: Couldn't wait. Right. Okay.

22 All right. Let's leave it at that, Madam Chair, and
23 I'll regroup over the break. Thank you.

24 MS. LONG: Thank you, Mr. Mondrow.

25 We're going to take 15 minutes.

26 --- Recess taken at 11:19 a.m.

27 --- On resuming at 11:40 a.m.

28 MS. LONG: Mr. Mondrow?

1 MR. MONDROW: Thank you, Madam Chair.

2 Mr. Lyash was kind enough to point out to me on the
3 way out of the room that I exceeded my P100 schedule, which
4 we both thought was a mathematical impossibility. So I
5 apologize for that.

6 I am conscious of those that are following me in your
7 schedule, Madam Chair. I have gone through my questions
8 and taken a number out. I'm estimating up to another 30
9 minutes, and, with your leave, I will continue and try to
10 finish my examination.

11 MS. LONG: That's about 30 more minutes than we had
12 estimated.

13 MR. MONDROW: I think I'm at the top of my estimate,
14 yes, so that's 30 more minutes than estimated. I have
15 looked at the schedule with Board Staff. I believe there
16 is some play in it for today to finish this panel, and I
17 don't think it will jeopardize that. It may mean that
18 someone on panel 1B doesn't proceed today. I know
19 Mr. DeRose needs to, because he is going home.

20 MS. LONG: Yes, he does.

21 Mr. McLeod, you're good to go on Thursday?

22 MR. MCLEOD: Thursday is perfect.

23 MS. LONG: That's fine for you. Okay. I would
24 suggest, Mr. Mondrow, on a go-forward basis, maybe having a
25 compendium would help speed things up. We are spending a
26 bit of time looking for documents, and I appreciate it's
27 hard to do.

28 MR. MONDROW: I appreciate that.

1 MS. LONG: We're going to give you the indulgence
2 today. But on a go-forward basis, that may help.

3 MR. MONDROW: I take your point. I made the mistake
4 of giving you my planning estimate rather than my
5 probability estimate. I will not make that mistake again.
6 But I will pay attention to that. Thank you.

7 With that background, Mr. Reiner, we talked together
8 about the hockey stick contingency curve, you will recall,
9 before the break, and you said it was in the evidence.
10 Apparently we can't find it, and I wonder -- and it doesn't
11 have to be now, but I wonder if you could just identify for
12 us, perhaps over the lunch break, where that is.

13 MR. REINER: We can do that. I believe it was
14 actually in the 2013 business case that was filed in the
15 previous hearing. It's in that business case that you can
16 see that S-curve.

17 MR. MONDROW: Perhaps, Madam Chair, just to keep the
18 record straight, if Mr. Keizer doesn't mind, we'll get an
19 undertaking number to identify where that is. If it's not
20 on the record, then we can thereby put it on this record.
21 I'm happy to do that over lunch.

22 MS. LONG: Just a minute, please.

23 MR. KEIZER: We'll hopefully clarify over lunch; we
24 can do it on the record.

25 MS. LONG: All right.

26 MR. RICHLER: J2.8.

27 **UNDERTAKING NO. J2.8: TO ADVISE WHERE THE HOCKEY**
28 **STICK CONTINGENCY CURVE IS IN THE EVIDENCE**

1 MR. MONDROW: Thank you very much. Because none of us
2 are techies, we're all fascinated with the heavy water
3 facility. So even though it's out of the application,
4 you've had some questions on it. I have very few questions
5 on it, which I would like to ask you.

6 So my understanding is unit 2 has now been drained,
7 Mr. Reiner, of the heavy water.

8 MR. REINER: It hasn't. The draining has begun; it is
9 not yet completely drained.

10 MR. MONDROW: And the water that's been taken out is
11 sitting in -- obviously, it is sitting in an appropriate
12 storage facility at the moment?

13 MR. REINER: That's correct.

14 MR. MONDROW: And that facility has the capacity to
15 receive the rest of the unit 2 water?

16 MR. REINER: The station is equipped with storage
17 capability, and as part of normal operations, there is a
18 requirement to be able to facilitate one unit of heavy
19 water in storage capacity. With the project utilizing that
20 storage, it does present some operations risk in terms of
21 utilizing that storage capability, so we have implemented a
22 mitigation plan to allow the project to make use of that
23 capability.

24 MR. MONDROW: What's the operations risk?

25 MR. REINER: So if a unit were required to drain for
26 whatever reason, to drain heavy water due to some
27 maintenance-related issue that needed to be resolved, then
28 we are potentially in a risk situation to accommodate that

1 water. The existing facilities are not equipped to handle
2 two units' worth of heavy water.

3 MR. MONDROW: And is that the point of the D20
4 facility that you're proceeding with, as I understand it?

5 MR. REINER: Yes.

6 MR. MONDROW: To handle more than one unit's worth of
7 water?

8 MR. REINER: Yes. You had asked me previously is
9 there a critical-path impact, and that would be the
10 critical-path impact.

11 MR. MONDROW: When units 3 and 4 overlap?

12 THE DEPONENT: When three and one overlap.

13 MR. MONDROW: What's the time expectation for that?
14 Do you recall?

15 MR. REINER: That happens midway through unit 3, so
16 around about 2021-2022, in that time frame.

17 MR. MONDROW: Thanks.

18 MR. REINER: The easiest place to read that is in the
19 schedule section of the evidence. There's a high-level
20 schedule there that shows you where that overlap occurs.

21 MR. MONDROW: I'll remember that. That's perfect.
22 Thanks. So let me at least leave heavy water.

23 Can you go with me, please, to -- I'm going to explore
24 for a few minutes the costs that are being included in your
25 request for relief in this application, but that relate
26 perhaps more broadly to the DRP. I know you've explained
27 why that is, and I want to explore that explanation a bit.
28 So to do that, I would like to go to Exhibit D2, tab 2,

1 schedule 1, page 3.

2 These, I believe, are the two categories of the so-
3 called early in-service projects. The category I want to
4 talk about are the safety improvement opportunity
5 initiatives, and if you go to Exhibit D 2, tab 2, schedule
6 1, page 3, at the bottom is one place where those SIO
7 projects are talked about. And starting at the very end of
8 line 17, the justification, I believe, that you're giving
9 for including the full cost of those projects in the
10 revenue requirement relief at 2020, so unit 2 expected in-
11 service, is stated as follows:

12 "The SIO are useful to OPG's current and future
13 and current nuclear operations independent of
14 whether the DRP is completed."

15 As I understand it, Mr. Lyash, that's the essential
16 reason why OPG says the full costs of those SIO projects
17 should be included at the time the first unit goes into
18 service, rather than allocated across the various in-
19 service dates for the four units.

20 MR. LYASH: That's correct, when the SIO projects go
21 into service. For example, this month, when we place the
22 containment filter vent system in-service, it will be a
23 significant safety improvement for all four units,
24 including those currently operating.

25 MR. MONDROW: Am I correct that, but for the
26 refurbishment, these SIO initiatives would not have been
27 required?

28 MR. LYASH: What I would say is to obtain the ten-year

1 licence, which was an important risk mitigator, ten years
2 covering -- allowing regulatory stability over the entire
3 pendency of the refurb. The requirements from the CNSC
4 were to install the safety improvement opportunities, so
5 they're embedded in that risk mitigation strategy.

6 MR. MONDROW: Okay. Then if we go to page 4, the
7 second category of these early in-service projects is the
8 facilities and infrastructure projects. And if we look at
9 line 1 on page 4, it says:

10 "The FNIP are projects that do not involve
11 refurbishment of units, but which are necessary
12 to enable execution of the unit refurbishments."

13 And if we look at line 7 on that page:

14 "The FNIP are expected to remain useful to OPG's
15 current and future nuclear operations,
16 independent of whether the DRP is completed."

17 Am I correct, Mr. Lyash, that those projects would not
18 have been required if there had not been a mandate to
19 refurbish?

20 MR. LYASH: Certainly -- I'm not clear whether they
21 might have been required in the future, but in the present
22 time, they were necessary to refurbishment of all four
23 units, including the first unit.

24 MR. MONDROW: And they will support continued
25 operation of the Darlington nuclear site beyond the
26 refurbishment schedule?

27 MR. LYASH: Yes, they will continue to be used beyond
28 refurbishment.

1 MR. MONDROW: If I can take to you Exhibit D 2, tab 2,
2 schedule 5, page 6. And we'll go back in a minute to page
3 5, where there is a list of specific projects, but I just
4 want to look at this paragraph starting at line 4:

5 "Because the scope is not the same for each unit,
6 the cost will not be the same for each unit.

7 Unit 2 is expected to be the most costly unit to
8 refurbish because it includes more scope than the
9 subsequent units, and due to station
10 configuration and various requirements that are
11 common across the station many engineering
12 changes and other supporting scope is only
13 required for unit 2 as they would already be in
14 place for the remaining units."

15 So this paragraph refers, at least in part, as I
16 understand it, to those two categories of early in-service
17 projects which you need to complete in order to refurbish
18 unit 2 but which will continue to serve the balance of the
19 DRP program and, indeed, the Darlington nuclear facility
20 beyond refurbishment of unit 2. Is that fair?

21 MR. REINER: That is -- yeah. That's partially
22 correct. There are also specific in-station elements of
23 scope that do not need to be repeated once they've been
24 executed for unit 2. They relate to -- because Darlington
25 is an integrated multi-unit station, there are systems on
26 unit 2 specifically that are required to operate the
27 remainder of the power plant. And we have had to make
28 modifications to those systems in order to island unit 2

1 and not impact the operation of the plant. So that work
2 does not need to be repeated in subsequent units.

3 MR. MONDROW: Right. And you talked about that
4 yesterday, and we'll come back to some of those details
5 with the next panel. But if we just go up to page 5 of
6 this same exhibit, if I look at line 16, it says:

7 "Some examples of projects completed during the
8 Unit 2 outage that are not completed for other
9 units include..."

10 And then there's a list. And I'm not going to take
11 you through the list at the moment. But my question is:
12 Given the language some examples, is there someplace where
13 we can find a full list of those projects that will have
14 use beyond the unit 2 refurbishment but that are being
15 charged to rates or close to rate base at the same time as
16 the unit 2 expenditures are being close to rate base in
17 2020? Is there a list of those that we can see somewhere?
18 And if you want to take an undertaking, that's fine.

19 MR. REINER: Yeah, we can address that in panel 1B. I
20 would say that is probably appropriate to pose that
21 question for panel 1B.

22 MR. MONDROW: Well, so my question is slightly
23 different, Mr. Reiner. What I would like to have is a list
24 of those so that --

25 MR. REINER: Yes.

26 MR. MONDROW: -- we can look at those and ask
27 questions about those when we get to panel 1B. So if we
28 could have the list in advance, which is why I asked for

1 the undertaking, that would be helpful for me. Can we do
2 that?

3 MR. REINER: I think we can undertake to --

4 MR. KEIZER: Well, I think what we can do is look to
5 see if we can find an evidence reference for -- I mean,
6 sorry, just so I clarify your question, you want a list of
7 projects -- other than when it says, some examples of
8 projects, you want anything else that's over and above the
9 some, basically.

10 MR. MONDROW: Right. Exactly. And a list of
11 references would be fine. So we can make sure that we
12 cover them all off as relevant when we get to panel 1B.

13 MS. LONG: I'm not sure I understand what you mean, a
14 list of references. Are you looking for references in the
15 evidence?

16 MR. MONDROW: Well, so Mr. Keizer said, "Well, rather
17 than a list of projects, we can give you a list of
18 references." I just need a list so that I know I have a
19 comprehensive picture of the projects that are going to be
20 if OPG's request is granted by your Panel, Madam Chair, put
21 into rates effective 2020, and usefulness which extends
22 beyond the unit 2 refurbishment. That's what I'm looking
23 for so that I can explore the relationship between those
24 projects and the longer program.

25 MS. LONG: Mr. Keizer?

26 MR. KEIZER: Well, we'll do our best to get what we
27 can. I mean, there is a lot of projects, some of which are
28 very small. There's 560 specific projects, according to

1 the evidence that appears on the screen, but -- so whether
2 we can actually have them all ready for the appearance of
3 panel 1B, which may be on this afternoon, I find that
4 doubtful.

5 MR. MONDROW: I won't be on this afternoon. But let
6 me be clear, Madam Chair. I'm not looking for a list of
7 560 projects. We can do -- I'm trying to think of how to
8 make this manageable for you. You've been dealing with
9 programs, I guess, rather than individual projects.

10 So if you look at -- Mr. Reiner, if you look at this
11 list of examples, that's the level of detail I'm interested
12 in. If there are major items not on this list that fall
13 into this category, that's what I'm after, if that helps.

14 MR. REINER: Okay. What we would then propose to do
15 is we'll, again, make a materiality assumption here in
16 terms of what signifies major, and we'll come up with a
17 list.

18 MR. MONDROW: That's fine. If it wraps around this
19 list and anything like it, that would be perfect. Thank
20 you very much.

21 MR. REINER: Yes. Thank you.

22 MR. MONDROW: So I don't know if we got a number.

23 MR. RICHLER: J2.9.

24 MS. LONG: J2.9.

25 MR. MONDROW: Thank you.

26 MS. LONG: Point 9.

27 **UNDERTAKING NO. J2.9: TO PROVIDE A FULL LIST OF THOSE**
28 **PROJECTS THAT WILL HAVE USE BEYOND THE UNIT 2**

1 REFURBISHMENT BUT THAT ARE BEING CHARGED TO RATES OR
2 CLOSE TO RATE BASE AT THE SAME TIME AS THE UNIT 2
3 EXPENDITURES ARE BEING CLOSE TO RATE BASE IN 2020

4 MR. MONDROW: Mr. Lyash, I understand -- I recall, and
5 someone actually wrote this down for me -- that this
6 morning you said in answer to some of my -- some of our
7 discussion that this project, being the DRP, is, quote, as
8 robust as you have seen -- as I have seen for a project of
9 this nature, close quote, as robust as I have seen for a
10 project of this nature.

11 And the question I would like to ask you about that
12 is: What other projects were you thinking of that are of
13 this nature that you've seen to compare this project to?

14 MR. LYASH: Yeah. And we were discussing planning and
15 preparation --

16 MR. MONDROW: Yes.

17 MR. LYASH: -- the degree of effort that went into the
18 project before the commencement of execution on unit 2, the
19 breaker open. And so, as I make that statement, I'm
20 comparing it to a range of new builds, from very large gas-
21 fired combined cycle, super-critical coal, nuclear power up
22 rates, plant life extensions, and nuclear new build.

23 MR. MONDROW: And some of those are listed in the
24 Pegasus evidence and other pieces --

25 MR. LYASH: Some of them are, yes.

26 MR. MONDROW: Just while we're on the topic of
27 Pegasus, Dr. Galloway mentions in her evidence -- and I can
28 give you the reference for this -- some U.S. precedent for

1 regulatory commissions allowing costs to go into rate base
2 before a project is complete. And that puzzled me a bit,
3 because I don't think you're asking for that. My
4 understanding is you're asking on a forecast basis to put
5 the unit 2 costs into rates when unit 2 goes into service
6 in 2020.

7 MR. LYASH: That's correct.

8 MR. MONDROW: But you're not asking in this
9 application for the inclusion in rates of any costs for
10 facilities that will not at the time those costs are
11 included -- facilities that are not in rate base at that
12 time.

13 MR. LYASH: That's correct.

14 MR. MONDROW: Okay. Unless, of course, you get
15 approval here and you fall behind schedule on unit 2, in
16 which case you would have approval for costs for facilities
17 that aren't ready to rate base; right?

18 MR. LYASH: I'm sorry. Could you say that again?

19 MR. MONDROW: If you got the approvals you requested
20 in this case, which include rate-basing -- which includes
21 rate-basing \$4.8 billion in 2020, and unit 2 is not ready
22 until 2022, that approval will have costs approved for
23 rates for facilities not yet in-service; right?

24 MR. LYASH: Yes. And when you asked me about Dr.
25 Galloway's comments, I think that is -- the way I
26 understood that is approval for collecting revenues against
27 a project that would not go in-service in the test period.
28 So we're not asking for that. There are cases where very

1 long-term, expensive projects that are in-service outside
2 the test period are included in rates.

3 Here what we're asking for is what is, not unique,
4 what is done with -- across various jurisdictions with
5 transmission construction or generating station
6 construction within the test period of major assets coming
7 into service, and it's asked to come into rate base --

8 MR. MONDROW: Right.

9 MR. LYASH: -- at that time.

10 MR. MONDROW: And, indeed, the way you calculate the
11 rate impact of that is -- and the evidence makes some
12 assumptions about the timing for rate-basing of those costs
13 --

14 MR. LYASH: Correct.

15 MR. MONDROW: -- in 2020, some in February, some later
16 in the year, as I recall.

17 MR. LYASH: Yeah. That's correct.

18 MR. MONDROW: Okay. But in the event you got the
19 approvals you sought here and something came off the rails,
20 even at P90, and unit 2 wasn't in-service in 2020, unless
21 you came back to this Board, you would have rates that
22 included collection for assets not in-service, so you would
23 have to come back to the Board; right?

24 MR. LYASH: Yes. Or if the project comes into service
25 early or late, then those would be accumulated, as I
26 understand it, to the CRVA and dispositioned as part of
27 that process.

28 MR. MONDROW: Okay. That's fine.

1 Two questions following up on some of your testimony
2 yesterday, and I'm going back down into, not the weeds, but
3 at least the trees here.

4 I believe you told Mr. Rubenstein yesterday that there
5 was a November quarterly OPG board meeting. Do you recall
6 that, Mr. Reiner?

7 MR. LYASH: Yes.

8 MR. MONDROW: Mr. Lyash? Okay. And there has not
9 been a board meeting since then?

10 MR. LYASH: That's correct.

11 MR. MONDROW: When is the next one scheduled for?

12 MR. LYASH: It begins next Wednesday.

13 MR. MONDROW: And will there be a DRP status report at
14 that meeting?

15 MR. LYASH: Yes, there will.

16 MR. MONDROW: When will that be available?

17 MR. LYASH: That will be issued to the Darlington
18 Review Committee, the subcommittee of the board, sometime
19 early next week.

20 MR. MONDROW: Could we get an undertaking to file that
21 once it's been issued?

22 MR. KEIZER: I guess my concern is that, you know, the
23 -- I think we've filed schedules related to what we had,
24 and that's part of the undertaking from the November
25 meeting, I believe, if I'm correct. But my concern is that
26 we continue to file the quarterly arrangements with respect
27 to the board. I'm not quite sure what it's to reflect. I
28 mean, the request here is based upon -- and we understand

1 the current status of the project, based on the testimony
2 that's been given.

3 We also are looking out on a forecast which goes over
4 a series of years, based on the plan and execution. And
5 the report that's given isn't in respect of, for example,
6 such as RQE, where there is a definitive decision made by
7 the board; it's purely for information.

8 So I'm not quite sure why or what it leads to since it
9 really doesn't lead to any other information that's already
10 been put on the record in respect of the project and also
11 doesn't lead to any formal deliberations by the board that
12 is impactful in respect of the project, such as RQE.

13 MS. LONG: What if Mr. Mondrow was to make the
14 argument that this panel is talking about oversight? This,
15 to me, seems to go to the heart of oversight, what senior
16 management is reporting to the board as to the status of
17 this project. Am I wrong on that?

18 MR. KEIZER: I think we've been clear with respect to
19 the nature of the reporting. I guess I go to the purpose
20 of it. I guess I struggle with, you know, at some point
21 our evidence goes in, but every meeting that happens, we
22 end up putting more and more information in which already
23 is a vast record. I'm not sure what it actually gains,
24 given the fact that the information in respect of the
25 project is being given here by the people who are leading
26 the project as to live witnesses.

27 In terms of the oversight, the nature and content of
28 it, I think, certainly can be described. But I'm in your

1 hands; obviously you determine what is relevant. But I get
2 concerned about, you know, more and more just for sake of
3 disclosure when, in fact, the evidence in respect of it is
4 already either available through the examination of these
5 witnesses and is simply just an interim update on, like,
6 anything that would have happened with RQE, or as the
7 description of the project already given.

8 MS. LONG: Maybe we'll ask Mr. Mondrow why he needs
9 it.

10 MR. MONDROW: Madam Chair, I don't have any precedence
11 on whether the report is going to have anything relevant or
12 not, unlike Mr. Keizer, it appears. So it may be there is
13 nothing in the update that causes any concern or prompts
14 any questions, but obviously I wouldn't know that until I
15 saw it.

16 We're in the middle of a proceeding. There is a
17 principle of having the most current useful information
18 before the Board. We've got some tens of thousands of
19 pages of disclosures, of various reports over time. We're
20 sitting here with the OPG witnesses this week and in coming
21 weeks, and it seems to me if the reports are innocuous, it
22 validates everything is on course, and if the report has
23 something of interest, we have an opportunity to ask about
24 it, and you have an opportunity to consider it prior to
25 your approval.

26 So it seems to me that that's relevant if it's not
27 onerous to produce this. I was actually going to ask for
28 two things. One is quarterly OPG board meeting report, and

1 there is a Darlington Refurbishment Committee, which meets
2 monthly, as I understand it from yesterday's testimony, and
3 I wanted to get a copy of the latest report for that.

4 If we don't have the information disclosed while the
5 witnesses are here to get information from them, I'm not
6 sure what questions to ask them. That's what the
7 disclosure allows parties to do is determine what areas
8 might be relevant for the Board that further information
9 could be examined or the witnesses could be asked to
10 clarify. That's the whole point of disclosure from the
11 outset. Why we would cut it off now is a bit of a puzzle
12 to me.

13 I understand, once your decision is made, you've made
14 your decision. But you are in the process of doing that
15 now, and I would have thought this was helpful. But if
16 it's not helpful, I'm in your hand.

17 MS. LONG: I agree it would be helpful, so I would
18 like you to file that.

19 MR. KEIZER: The only question is I don't know what
20 the status of the report is, given the board is meeting
21 next week. So that's the only question we --

22 MS. LONG: I don't expect we would get it before the
23 board saw it. But once it is provided to the board, I
24 would expect it to be filed.

25 MR. KEIZER: Thank you, Madam Chair.

26 MR. MONDROW: That would be?

27 MR. RICHLER: J2.10.

28 **UNDERTAKING NO. J2.10: TO PROVIDE AN UPDATED STATUS**

1 **REPORT ONCE IT'S PROVIDED TO THE BOARD**

2 MR. MONDROW: To be clear, as I alluded to a minute
3 ago, this was the report to the quarterly board meeting,
4 and I did mention a minute ago -- I didn't get your
5 evidence on it, Mr. Lyash, but I understand there is a
6 monthly Darlington Refurbishment Committee report; is that
7 right?

8 MR. LYASH: No. Let me just make sure we all have the
9 right context. We've got a rather layered and robust
10 oversight process. If I focus on the board for a minute,
11 the board of directors has established a committee of the
12 board, the Darlington Refurbishment Committee, with
13 independent directors who are charged -- that committee's
14 sole responsibility is the oversight of the Darlington
15 refurbishment program.

16 The board meets nominally quarterly. The Darlington
17 Review Committee meets quarterly, in advance of the full
18 board. They tour the site, look at projects and progress,
19 and then the leadership team provides a report to that
20 refurbishment committee in their committee meeting, and
21 then the DRC, that committee, reports to the full board on
22 the status of the project quarterly.

23 We elected to -- in order to maintain that
24 refurbishment committee, their level of engagement in
25 oversight at yet a slightly higher level, we do a monthly
26 conference call with the Darlington Refurbishment Committee
27 of the board to update them on what has transpired in the
28 last month and what is planned in the upcoming month. So

1 that conference call happens, for example, in month 1, in
2 month 2, and then in month 3 is the DRC visit to the site,
3 the committee meeting, and the full board at which we
4 present a report.

5 MR. MONDROW: The conference call would include the
6 leads of all the various work streams?

7 MR. LYASH: Yes. It includes the senior management
8 team, myself, Mr. Reiner, the program leads presenting --
9 discussing with the board, as I said, what performance has
10 been experienced in the last month and what the next month
11 lookahead is.

12 MR. MONDROW: And all of that is eventually rolled up
13 to the quarterly report to the board?

14 MR. LYASH: In a manner. The relevant issues are in
15 the quarterly report. The intent of the monthly meeting is
16 to help the DRC members maintain a very high level of
17 understanding of the flow of DRC so that, when they sit as
18 a committee, they have that as a basis.

19 MR. MONDROW: Thank you very much.

20 Thank you, Madam Chair, for your indulgence. Those
21 are my questions.

22 Thank you, gentlemen.

23 MS. LONG: Thank you.

24 MR. MONDROW: Was there something else?

25 MR. LYASH: I was going to add that these same things
26 that we discuss on a quarterly basis, this level of detail
27 is -- if you look at our proposal for the annual report to
28 the OEB, it's a parallel set of information.

1 MS. LONG: Thank you.

2 MR. KEIZER: Just to be clear in terms of what we're
3 providing then is the -- and whether we have the capability
4 of doing so is the DRC report for March?

5 MR. LYASH: For March, yes.

6 MR. KEIZER: Once presented to the board of directors?

7 MR. LYASH: Yes. And I think, Charles, just one
8 thing: We ought to consider -- the board should see that
9 first, and then I want to be careful about whether there
10 are any fiduciary issues between that and our MD&A that
11 gets issued coming out of the board.

12 MR. MONDROW: Does that report include a Modus update?

13 MR. LYASH: Pardon me?

14 MR. MONDROW: Does that quarterly report to the board
15 include an update from Modus?

16 MR. LYASH: The report we provide does not. Burns &
17 McDonnell provide their report separately from the
18 management team.

19 MR. MONDROW: To the board?

20 MR. LYASH: To the Darlington Refurbishment Committee.

21 MR. MONDROW: And that separate report is not attached
22 to the board report?

23 MR. LYASH: No -- well, it's not attached to the
24 management report to the DRC.

25 MS. LONG: Can I be clear? There is a management
26 report to the DRC. Then there is the DRC report to the
27 full board, and then Burns & McDonnell does a separate
28 report to the board -- or to the DRC.

1 MR. REINER: To the DRC.

2 MR. LYASH: Management provides a report to the DRC,
3 and that's the report we've been discussing, as far as I
4 understand. The board retains an independent consultant,
5 Burns & McDonnell, who reports independently to the board
6 -- independently to the DRC in the DRC meeting and then in
7 camera with those directors. The DRC then provides an oral
8 report to the board of directors in the full board meeting.

9 MR. KEIZER: And layered on to that is the aspect
10 Mr. Lyash references, which is the MD&A, which is the
11 disclosure document that OPG makes for Securities Act
12 purposes. So there's a bridge of time between it going to
13 the Board and then ultimately being disclosed within the
14 context of that document under the Securities Act.

15 MR. MONDROW: In the meeting next week, there will be
16 a written DRC report released to the board.

17 MR. LYASH: Released to the Darlington refurbishment
18 committee of the board.

19 MR. MONDROW: And in your understanding, that's the
20 undertaking that you provided, subject to your disclosure
21 and obligation concerns?

22 MR. LYASH: Correct.

23 MR. MONDROW: And a companion or an input into that
24 report to the DRC is the periodic, what I call the Modus
25 report.

26 MR. LYASH: No.

27 MR. MONDROW: No.

28 MR. LYASH: Burns & McDonnell is an independent

1 contractor reporting directly to the Darlington
2 Refurbishment Committee of the board. They do not report
3 through management --

4 MR. MONDROW: Right.

5 MR. LYASH: -- and so their report is not filtered or
6 any way incorporated into management's report. It's
7 provided independently directly to the Darlington
8 Refurbishment Committee of the board.

9 MR. MONDROW: The Darlington Refurbishment Committee
10 of the board, next week, will receive, among other things,
11 two documents. One the report that you've undertaken to
12 provide subject to your disclosure concerns and
13 confidentiality perhaps -- disclosure concerns, I suppose,
14 and the other is a Burns & McDonnell report?

15 MR. LYASH: Yes.

16 MR. MONDROW: Okay. So could we get that undertaking
17 which we've been given, which is J2.10, if I'm not
18 mistaken, to cover both of those documents?

19 MR. KEIZER: I look to the Chair's ruling, and Madam
20 Chair has indicated that you deem it to be relevant, so
21 subject to their availability and subject to
22 confidentiality aspects, obviously, and subject to timing
23 for it being disclosed to the committee itself and the
24 committee's reviewing and report to the board, if that's --

25 MS. LONG: Yeah. I think you understand what we want,
26 Mr. Keizer. I think I will leave it to you to figure out
27 timing --

28 MR. KEIZER: Yes.

1 MS. LONG: -- based on when the DRC receives it and
2 has time to digest it, and you can deal with
3 confidentiality and security issues, and you'll raise that
4 with us next week if those pose any problems.

5 MR. KEIZER: Yes, Madam Chair.

6 MS. LONG: Okay.

7 MR. MONDROW: And, again, Madam Chair and gentlemen,
8 thank you very much. I'm done.

9 MS. LONG: Okay. Thank you.

10 Mr. McLeod.

11 **CROSS-EXAMINATION BY MR. MCLEOD:**

12 MR. MCLEOD: Thank you, Madam Chair.

13 Panel, I represent the Quinte Manufacturers'
14 Association, which is a group of manufacturers and
15 processors in eastern Ontario. And one of the things that
16 we're particularly concerned about is -- many manufacturers
17 are -- are cost control and business processes and policies
18 and procedures.

19 Your testimony over the last day and a half now has
20 been really helpful in particular. What we were just
21 talking about with respect to the DRC is of concern to us,
22 so, actually, I'm going to take you through just now is the
23 Charter, so that's at Staff IR 222, which is Exhibit L, tab
24 10.4, schedule 1.

25 And the dialogue we had just now has been helpful, but
26 I would like to just go through a few more things which I
27 think might help just clarify things for us. If we look at
28 the Charter -- I'm looking at page 1 of the Charter right

1 now -- it talks -- and I'm looking at item 1, or paragraph
2 1, section 1, I guess, external independent oversight. And
3 (a) talks about:

4 "The committee reviews and approves the retention
5 and compensation of qualified advisers."

6 Et cetera.

7 The next paragraph in (b) talks about:

8 "In carrying out its responsibilities for
9 oversight of external experts and/or independent
10 oversight, the committee reviews --"

11 And then it talks about:

12 " -- results and/or major findings from external
13 assessments of the Darlington refurbishment
14 project and management's proposed remediation
15 programs and plans."

16 It reviews it. Then what does it do? That's my
17 question. What happens? Where does it go?

18 MR. LYASH: So the refurbishment committee reviews a
19 wide range of activities, so, in this paragraph, for
20 example, the feedback from Burns & McDonnell, as we have
21 discussed, the Darlington Construction Review Board, which
22 generally reports its findings to myself and Mr. Reiner,
23 also has the opportunity to present periodically those
24 results directly to the Darlington Review Committee.

25 The Nuclear Safety Review Board that looks at impacts
26 on operating units, the World Association of Nuclear
27 Operators, who does independent assessments, each of these
28 independent assessments are provided to the board so they

1 can consider and be cognizant of them, as are project -- as
2 are internal audits in the company and audits done under
3 our quality assurance program by the nuclear oversight
4 organization.

5 So each of these streams of oversight activities has
6 visibility to the Darlington Refurbishment Committee of the
7 board. Likewise, the expectation is that management
8 provides full and accurate information on project
9 performance to the DRC, with an emphasis on any gaps or
10 performance deficiencies, that we make those visible. It's
11 actually part of the Burns & McDonnell mission to verify
12 that management is providing complete and accurate
13 information on performance, especially gaps.

14 That's put before the board, and the expectation of
15 the board is that the management team identify for any gap
16 what mitigation, what recovery, what remediation plans are
17 necessary, either specific or programmatic in nature, to
18 close that gap.

19 MR. MCLEOD: Okay. So when they've completed the
20 review, what triggers it then to go forward? Because it
21 sort of stops there. It says, "Okay. They review it." Is
22 there an obligation then to bring it forward? Is there a
23 determination by them whether or not they bring it forward?

24 MR. LYASH: Bringing it forward to the board --

25 MR. MCLEOD: To the full board?

26 MR. LYASH: Full board? Yeah. That determination is
27 made by the Chair and the committee members.

28 MR. MCLEOD: Okay. Great.

1 MR. LYASH: But the general expectation from the board
2 is that any material issue with respect to refurb
3 identified or discussed in the Darlington Refurbishment
4 Committee is reported out at the full board.

5 MR. MCLEOD: Okay. Perfect. Thank you.

6 Now, paragraph 3, or item 3, talking about the
7 execution phase, again, the committee reviews and makes
8 recommendations. I see that. And then, under (b), where
9 it's talking about execution phase, progress, and safety
10 scope, budget, and performance, is the DRC the first group
11 to flag where there's problems for the board?

12 MR. LYASH: No. There is -- without going into a long
13 description, there is a substantial and layered set of
14 performance reporting, gap identification, and corrective
15 action that rolls from the individual projects to the
16 bundle to the project management team to the executive
17 committee of the company, with myself as the Chair of that.
18 And it's the obligation of the management team, if there is
19 a material issue, regardless of when it occurs, that that
20 be raised to the board of directors, and I would do that
21 directly with subsequent review by the DRC.

22 MR. MCLEOD: And that would -- to me, that would make
23 sense as an operational thing moving up to the governance
24 level, so we're just trying to figure out: There's so much
25 information, enormous amounts of information. How do you
26 kind of manage this and make sure the board is properly
27 informed of what's going on in the entire project.

28 So now I'm going to take you to the back part of the

1 Charter, and I'm just looking at authorities, because the
2 authorities for us sometimes becomes kind of critical. And
3 in the delegation of authority it says a couple of
4 interesting things:

5 "The committee may not delegate its oversight
6 responsibilities."

7 Okay. It may or may not.

8 "The committee may delegate to a sub-committee."

9 Which could be yourself, Mr. Lyash, or -- and then
10 here is where the concern comes in:

11 "Any employee of OPG."

12 Can you just explain what that means, if you wouldn't
13 mind?

14 MR. LYASH: Let me take a second to read the
15 statement.

16 MR. MCLEOD: Sure.

17 MR. LYASH: Okay. So I would comment that the way not
18 to read that is in sort of the literal sense, any employee,
19 meaning any engineer, any accountant, any lawyer. But
20 there may be occasions where the committee wants to
21 delegate some activity to the chief executive officer.
22 There may be a situation where it's more appropriate to
23 delegate an activity to the chief audit officer directly
24 from the board, task the chief audit officer independent of
25 the CEO to undertake some effort and report on some issue.
26 My sense of what's meaning here is that the -- of this is
27 that the committee should not delegate its oversight
28 responsibilities generally. It should retain those, but it

1 might delegate particular and specific sets of activities
2 to be undertaken by individuals in the organization.

3 MR. MCLEOD: Okay. This is really helpful. The
4 reason I'm looking at this, not that it matters
5 specifically for this, but outside my role here as being
6 president of a corporation, these things become very
7 important, especially when the committee a is committee of
8 the board. This wording sometimes gets us a little bit
9 concerned, because you don't know how -- if something goes
10 sideways on us.

11 It kind of goes back to what I think Mr. Mondrow was
12 getting at and what the Modus reports do in reporting
13 directly to the board. That's where these kind of things
14 would get captured, I think. Is that correct?

15 MR. LYASH: Yes.

16 MR. MCLEOD: Perfect. I guess the other circumstance
17 I want to clarify: Under what circumstance can you think
18 of -- and I am not holding you to these, but just as an
19 example -- where that delegated authority may go? You
20 mentioned audit, for example.

21 But if we're looking at -- let's suppose one of the
22 project packages starts going sideways or something, and
23 the board is advised of it and there's concerns raised at
24 the board, how does this -- I'm trying to figure out the
25 process for how it works so that it's managed and
26 controlled.

27 MR. LYASH: It's difficult to think of a hypothetical,
28 because I don't have a practical example here. The DRC

1 hasn't moved to delegate activities of this nature. They
2 have tasked out independent and outside consultants to do
3 reviews, as in Burns & McDonnell.

4 A hypothetical might be, if there is action or
5 decision that needs to be taken in the flow of the
6 refurbishment that's very timely in nature, where a
7 decision has to be made, a contract written, an allocation
8 of resources above what is otherwise my delegation limit of
9 authority has to be made between meetings, it may require
10 that the DRC to consider that in a special call and
11 delegate the authority to move forward to me because of the
12 urgency of the timing. That's a hypothetical.

13 MR. MCLEOD: Fair enough. That's fine; I'm happy with
14 that.

15 Now, the Infrastructure Ontario rep who sits on here,
16 would he or she see that?

17 MR. LYASH: Yes, the shareholder has contracted
18 Infrastructure Ontario and put an independent
19 representative who reports to the shareholder on the DRC.
20 That member functions as any other DRC member, except for
21 engagement in voting on a decision. Otherwise, they have
22 full and open access to all the information and attend any
23 activity scheduled for the DRC.

24 MR. MCLEOD: I may be confused on this, but I think
25 when I read in here that the board -- and correct me if I'm
26 wrong -- does see the Infrastructure Ontario person's
27 report, maybe not necessarily in the briefing of the
28 Minister.

1 MR. LYASH: Not necessarily. The Infrastructure
2 Ontario individual reports directly to the Minister, so we
3 may or may not see any written report that is shared with
4 the Minister of Energy from Infrastructure Ontario.

5 The practice is that -- to date is that, if there are
6 concerns from that representative, he voices them in the
7 DRC meeting, and they're addressed as any other concern or
8 issue that might rise to the committee. Also, following
9 the board of directors meeting, the chair of the DRC and
10 the Infrastructure Ontario representative hold a briefing
11 of the Minister of Energy to share the results of the DRC
12 meeting, at which point they talk about their independent
13 assessment.

14 But directly to your question, we may or may not see
15 what goes between the Minister and Infrastructure Ontario.

16 MR. MCLEOD: Would it be fair for me to say, then, the
17 discussion that goes on is reasonably transparent?

18 MR. LYASH: Yes. I have no reason to believe that the
19 IO representative has concerns we don't know about. The
20 practice is to be very transparent.

21 MR. MCLEOD: Thank you, that's helpful. Those are my
22 questions.

23 MS. LONG: Thank you.

24 Mr. DeRose?

25 MR. DEROSE: Thank you very much.

26 **CROSS-EXAMINATION BY MR. DEROSE:**

27 MR. DEROSE: Panel, my name is Vince DeRose, and I'm
28 here on behalf of Canadian Manufacturers & Exporters. The

1 benefit of coming to the end of the group is I've narrowed
2 my questions down to one area, and I'm going to remove us
3 out of the weeds where we have been for most of the morning
4 and take us to the 10,000-foot level again, because one of
5 the concerns CME has is actually not with the Darlington
6 refurbishment.

7 CME has publicly stated since 2010 that it supports
8 Darlington refurbishment. CME's concern is with
9 maintaining Energy Board oversight of the project as it
10 proceeds and just trying to understand exactly when and
11 where the Board will be reviewing what has occurred.

12 If I could pull up -- I've given -- so Exhibit D2, tab
13 2, schedule 8, this is a chart that Mr. Mondrow took you to
14 this morning, and I think I'm going to use it as an aid to
15 try and walk through some scenarios so we can understand
16 exactly when and if the Board would have any further
17 approval or scrutiny of the costs in the future.

18 First of all, panel, am I right this is your current
19 breakdown of the unit 2 costs?

20 MR. REINER: Yes, that is correct.

21 MR. DEROSE: And I appreciate this was filed before
22 there were updates. So, for instance, the contingency
23 shows 694, and I believe it's now 677.

24 MR. REINER: Yes. Let me go back. I believe this is
25 the release quality estimate breakdown. There was a unit 2
26 execution estimate breakdown provided as well, and that is
27 the most current.

28 MR. DEROSE: Okay. For today's purpose, I think we

1 can use this one, and if you feel the other is more
2 appropriate, we can turn to it. But I don't think we'll
3 have to.

4 First of all, in terms of this chart, am I right that,
5 if we take the scenario that unit 2 proceeds perfectly on
6 time and perfectly on estimate right down to the cent,
7 that, in 2020, if you were to reproduce this chart for the
8 Board, there would be either no contingency line or zero
9 contingency and that -- we'll say 694, since that is on the
10 chart now -- that 694 would be allocated to the various
11 lines above it? Simple approach?

12 MR. REINER: Yes.

13 MR. DEROSE: And if that were to occur -- again, if
14 the Board gives you the approvals that you're asking for
15 and approves the entire 4.8, if that were to occur, while
16 you may provide that chart as some form of reporting, there
17 would be no Board review of the line-by-line costs that
18 occurred at that time?

19 MR. LYASH: Yes. Our fundamental position is that the
20 \$4.8 billion estimate is reasonable when resting on the
21 basis that we've established and that, if we deliver the
22 project for that price on that schedule, that withstanding
23 indications of fraud or misinformation or a number of other
24 things, that the Board would accept that as prudently
25 incurred cost.

26 MR. DEROSE: Again, just to make sure, not that the
27 Board would in the future accept it as prudently. What
28 you're asking is that they accept it right now as prudently

1 incurred; correct?

2 MR. LYASH: No. And I think this is an issue we took
3 offline yesterday in response to some of Mr. Poch's
4 questions. All we're asking is the Board conclude, since
5 this is forward looking, that the \$4.8 billion and what it
6 rests on is reasonable and that that would be used as the
7 standard or the measurement in determining prudence.

8 MR. DEROSE: So, for instance, five years from now, if
9 you came in at 4.8, would the Board, from your perspective,
10 be entitled to look at that 4.8 and say, "It should have
11 cost you 4.6," if you get the approves you're asking for in
12 this case?

13 MR. LYASH: Hopefully, it won't be five years from
14 now. It will be first quarter of 2020.

15 MR. DEROSE: Okay.

16 MR. LYASH: So I'm not sure I understand your
17 question, but I think we believe what we've done in terms
18 of building a detailed cost, a detailed schedule, a
19 detailed risk register, and the foundation we put this on
20 demonstrates that the company has taken every reasonable
21 action to deliver the project for 4.8, and that if we
22 deliver it at 4.8, that should be a primary measure of
23 prudence.

24 If you get below that in a project of this nature and
25 start parsing, because we've acknowledged that risks don't
26 materialize in small pieces; they materialize in large
27 pieces, and one project here if the risks materialize may
28 be higher than the number that's on the sheet. Another

1 project may be lower than the number that's on the sheet.

2 And these offset, and we manage it under the 4.8.

3 Conceivably, you could continue to raise that bar
4 until you lowered this test to the task level, but the
5 farther down you go, the more you're moving toward
6 perfection as a standard.

7 And so just -- I say this just illustratively. So
8 what we're suggesting is the ten years' worth of planning
9 and the substantial amount of evidence we've given form a
10 basis to conclude that \$4.8 billion and our processes are
11 reasonable and that, if we implement them as we've planned
12 and achieve that result, that that would be a substantial
13 measure against which to judge prudence.

14 MR. DEROSE: And I don't disagree with anything you've
15 said other than the fact I'm just trying to understand the
16 timing of the board's approval. And you're asking for the
17 approval of 4.8 billion from this Panel in this case, and
18 my question is: In the first quarter of 2020, or when you
19 bring your next application, the first moment after it goes
20 into service, will the next Energy Board Panel also have to
21 make a decision on that 4.8, or will that decision have
22 come and gone, and this Panel has made it, and it is not
23 available for scrutiny anymore?

24 MR. LYASH: I think you're asking a legal question
25 that perhaps I'm not the best person to answer.

26 MR. DEROSE: I'm actually happy to have Mr. Keizer
27 answer. Well, I didn't think that this would be a tough
28 question. I actually thought the answer would be, yes,

1 this Panel is going to make the decision on 4.8, and no
2 other Panel can look at that 4.8.

3 MR. KEIZER: Well, our position is that that -- you
4 know, if it's added to rate base and brought into service
5 at 4.8 and forms part of rate base, when we return, you
6 know, our rate base is restated to reflect former test year
7 rate base at the time we return to reflect, you know, on
8 our forward test year rate base at the time we return for
9 whatever -- let's say it's another five years. I don't
10 know. Then it would -- the rate base would include the 4.8
11 billion as approved by this Panel, and if there is some
12 different number, 4.6 or 4 whatever, it's a CRVA issue.
13 That's effectively our position.

14 MR. DEROSE: Okay. Thank you.

15 And if it is 4.6, I believe you said yesterday that
16 the board would not have a review of that 200 million, but
17 it would be through the CRV returned to ratepayers?

18 MR. KEIZER: Well, ultimately the board -- I don't
19 want to give evidence here, but our understanding is that,
20 with respect to any disposition of a deferral or variance
21 account, the board ultimately reviews the entry in the
22 account and makes the decision as to how that amount gets
23 disposed of and whether the appropriate amount is reflected
24 in the account.

25 MR. DEROSE: Okay. Well, let me turn to the situation
26 where the CRVA -- where more -- a greater amount than the
27 694 million contingency is incurred, and so,
28 hypothetically, instead of it being 694, you actually spend

1 894, so that the result is that the CRV has an additional
2 \$200 million that you would be looking to collect.

3 MR. LYASH: So I assume in that example -- let me
4 focus on the total instead of just the contingency, because
5 there may be flows in and out. So you're asking if the
6 project is delivered but delivered for more than \$4.8
7 billion.

8 MR. DEROSE: Let's say five for the hypothetical.

9 MR. LYASH: Say five.

10 MR. DEROSE: Just so that we walk through, and the
11 Board -- again, I want to understand what a future Panel
12 would be looking at. So you --

13 MR. LYASH: Then I would expect that to show up in the
14 CVRA (sic), and I would expect the OEB to question whether
15 that additional \$200 million was prudently incurred and
16 examine that, and in doing so, they may have to work up
17 from a base, but I would expect that they would look at
18 that \$200 million and determine whether it was prudent or
19 not.

20 MR. DEROSE: Okay. And, again, if we look at the
21 chart, I'm picturing that, if the number at the bottom,
22 instead of it saying 4.799 billion, said 5 billion, and we
23 would have all the numbers above -- let's assume retube was
24 the only number that changed -- and it went -- or,
25 actually, let's take two numbers -- that retube was the 1.8
26 billion plus 694 million, and the turbine generator had
27 another 200 million added to it. How would the board
28 determine which of the -- what construction element is

1 above the 4.8 or below the 4.8, or what's the driver of the
2 increase?

3 MR. KEIZER: I think that's only fair, though, I mean,
4 to be able to evaluate that at the time that the
5 consideration is brought before the board, and the board
6 would then, through its own discretion, decide how to
7 inquire into the 200, if it's the \$200 million overage, as
8 to the nature of it, where it came about, why it came
9 about, and what effects or measures were the implication of
10 that. I mean, I don't know how helpful it can be today to
11 pick a line number and say, "Well, this one goes up, and
12 that one goes up. What would the board do?" I think he
13 can only look at the facts at the time when the application
14 is made, and, you know, obviously through that process, it
15 would be evaluated and considered. So I don't think it's a
16 fair question to pick a line and say, "What would happen if
17 this is the case?"

18 MR. DEROSE: I guess what I'm trying to understand is
19 that there is a contingency built in that the board would
20 be approving now, and if you approve it, you would be
21 approving an amount of money that you do not know what it
22 will be spent on. And if the CRV captures money in
23 addition to that, my question right now is: How do you, as
24 the board, post facto determine what is the contingency
25 that you've approved and what is the -- what's driving the
26 additional amount? I mean, it's --

27 MR. KEIZER: Well, but I think, as Mr. Lyash just
28 said, that it's beyond just looking at the contingency,

1 because there may be circumstances where no contingency was
2 used and certain projects are below an amount of money. So
3 I don't know if we're only talking about the evaluation of
4 any contingency at the time that the \$200 million
5 theoretical overage actually occurred, and that's where I
6 don't think you can tie -- I raise the fairness of the
7 question as to the overage to the contingency itself. It's
8 in respect of the total project cost, of which contingency
9 is a part of it, only because certain risks have
10 materialized, and so you understand what risks have or
11 haven't materialized and how they were mitigated. I don't
12 know if you can really evaluate it in this proceeding.
13 It's really the proceeding to come.

14 MR. LYASH: Yes. And I would add that let's remember
15 that you're not making that future assessment from a blank
16 sheet of paper. It's precisely why we have developed a
17 unit 2 execution estimate. It is a very detailed baseline
18 budget and schedule, and the \$694 million contingency has a
19 very granular basis to it. And so that gives you a clear
20 picture of how we intend to execute the project that allows
21 you then to -- I can't predict how it will be evaluated,
22 but it gives you a basis upon which to evaluate the actual
23 performance when the project is concluded and assess what
24 cost drivers were relevant to any amount of money over the
25 \$4.8 billion.

26 So while it's not entirely precise, because it can't
27 be predicting the future, in our views, it gives a good
28 solid basis for the OEB to start from in reviewing those

1 expenditures.

2 MR. DEROSE: Okay.

3 MS. LONG: Sorry, Mr. DeRose, can I take you back to
4 your question? I'm just not clear. When you talk about
5 the next time the OEB will see OPG, are you talking about
6 the next fees case --

7 MR. DEROSE: Well --

8 MS. LONG: -- are you talking about the midterm
9 review, or --

10 MR. DEROSE: -- I was actually just about to ask on
11 both the midterm review and the --

12 MS. LONG: Okay.

13 MR. DEROSE: -- rates case, so you've --

14 MS. LONG: Okay. I just wasn't clear, so --

15 MR. DEROSE: Yeah.

16 MS. LONG: -- perhaps you can ask your question.

17 MR. DEROSE: I'll actually -- and let me ask one
18 question between, and then I'll get right to that.

19 Now, when you mentioned granularity, are you able or
20 -- not are you able, but have you actually taken the 694
21 and broken it down or assigned it to the granular level of
22 each of these line items? So, for instance, could you tell
23 us how much of the 694 has been allocated to contract
24 management or engineering or to planning and controls?

25 MR. REINER: Yes. There is an allocation of that
26 contingency across the projects. There is also an
27 allocation, as we talked earlier, and panel 1B will get
28 into more detail on this. There is some that's held at

1 general contingency that goes across all projects. But
2 there is a breakdown of that contingency.

3 MR. DEROSE: And is it possible -- and I'll ask this
4 in advance of 1B, I guess. But what would be very helpful
5 for us is if this chart could be reproduced with one
6 additional column that shows the allocated contingency for
7 each of the line items, if it has been allocated to those
8 line items?

9 MR. KEIZER: I think there was a chart or table this
10 morning we looked at, which had project level contingency
11 and program level contingency.

12 MR. DEROSE: It did have it at the project level. My
13 question is: Do you have it at the level we're looking at
14 in this chart? If you don't, that's fine. But if you do,
15 we would like to be able to say, for instance, retube
16 feeder replacement, 1.8 billion. There would be a column
17 that says contingency -- I'm throwing out numbers -- 100
18 million, turbine generator, et cetera.

19 If you don't have it at that level, that's fine. But
20 if you do, it would be helpful to have it in a single
21 place, in a single chart, where the Board can see what the
22 costs are and the attributed contingency.

23 MS. LONG: Mr. DeRose, you're talking about the first
24 five lines that you would like the contingency value?

25 MR. DEROSE: If contingency has been allocated to the
26 other subtotal functions or the bundles -- I don't think it
27 has, but if it has, we would like to just see --

28 MS. LONG: Do you know, Mr. Reiner, is there a

1 contingency for work control, as an example?

2 MR. KEIZER: Sorry, I don't want -- but maybe this is
3 helpful. Staff is showing me Exhibit D2, tab 2, schedule
4 7, page 8, a breakdown of contingency amounts.

5 Page 8 of 10 is now on the screen, Mr. Reiner.

6 MR. DEROSE: Thank you very much. I apologize; I had
7 missed that.

8 MR. KEIZER: Is that --

9 MS. LONG: I think that meets your purposes.

10 MR. DEROSE: That's exactly what I needed. Thank you
11 very much.

12 If we can go back to chart 4, please. Now, I would
13 like to talk about a scenario that again -- and I
14 appreciate that you would not like this to happen, but if
15 the Board were to approve in this case only the 4.1, the
16 subtotal before contingency, to go into rate base at this
17 time, am I right that any money that would be spent between
18 now and 2020 that would normally be part of the contingency
19 would automatically flow into the CRV?

20 MR. LYASH: You're proposing a construct that's not
21 the one we submitted, so I'm not sure how that would
22 work. I would say that if you -- if you took contingency
23 out of the project, fundamentally you're under funding the
24 project.

25 MR. DEROSE: Let me rephrase. The Board is free to
26 approve into rate base whatever amount they want. First of
27 all, we can agree on that?

28 MR. LYASH: Yes.

1 MR. DEROSE: And whatever amount the Board approves to
2 go into rate base in this hearing does not prevent you from
3 spending more money than that on the project. Can we agree
4 on that?

5 MR. LYASH: Correct.

6 MR. DEROSE: And any money that you spend in excess of
7 what the Board approves, I understand, will be put in the
8 CRV?

9 MR. LYASH: That's the way I understand it, yes.

10 MR. DEROSE: What I'm suggesting to you is that, if
11 the Board -- if this Panel were to approve 4.1 billion
12 instead of 4.8 billion to go into rate base, so they simply
13 do not approve the contingency, am I correct, at the
14 midterm review, when you clear the CRV, any incremental
15 funds would be cleared at that time?

16 MR. KEIZER: I think the treatment of the midterm
17 review in the CRVA is probably better for panel 2, which is
18 midterm review, as to what's expected and what would happen
19 at that point.

20 MR. DEROSE: Okay. And whether it happens at the
21 midterm review or not, I take it you would agree with me --
22 actually that's fine. I'll just leave it there.

23 MS. LONG: I thought I heard this morning, Mr. Keizer,
24 that the CRVA would be handled at the midterm review. Are
25 you saying that's an issue better dealt with by another
26 panel, and it can be flushed out then?

27 MR. KEIZER: Just to clarify, my understanding is the
28 CRVA consideration at the midterm review is in respect of

1 2018 balances, but any monies associated with this project
2 wouldn't -- although registered in the CRVA, the project
3 wouldn't be in-service by the time of the midterm review,
4 so wouldn't be eligible for consideration in any event in
5 respect of unit 2 DRP.

6 MR. DEROSE: I can ask to panel 1B when the CRV would
7 happen for this project.

8 MS. LONG: Okay.

9 MR. DEROSE: Those are all my questions. I'll move to
10 panel 1B afterwards.

11 MS. LONG: Thank you, Mr. DeRose. I think we will
12 take our lunch break now for an hour and be back. And it
13 will be you, Mr. Janigan, that will be up?

14 MR. JANIGAN: That's correct, Madam Chair.

15 --- Luncheon recess taken at 12:49 p.m.

16 --- On resuming at 1:58 p.m.

17 MS. LONG: Mr. Janigan, I see a compendium in front of
18 me here.

19 MR. JANIGAN: Yes, it is, Madam Chair.

20 MS. LONG: Is that K1.5?

21 MR. RICHLER: It's K2.1.

22 MS. LONG: Oh, 2 -- okay. Sorry.

23 **EXHIBIT NO. K2.1: VECC COMPENDIUM**

24 MS. LONG: Are you ready?

25 **CROSS-EXAMINATION BY MR. JANIGAN:**

26 MR. JANIGAN: I am. Thank you, Madam Chair.

27 Good afternoon, panel. My name is Michael Janigan
28 with the Vulnerable Energy Consumers Coalition, and I

1 believe you have a copy of my compendium. I would like to
2 start, actually, at the tail end of that, principally
3 because you dealt with a lot of the oversight matters that
4 I was going to deal with later, and I have just a few
5 clean-up questions on that.

6 I wonder if you can turn up page 63 of my compendium.
7 And it deals with the internal audit group and the
8 refurbishment construction review board. And I was
9 wondering: Does one inform the other, or are they entirely
10 separate in terms of their functions?

11 MR. LYASH: They are entirely separate in terms of
12 their functions. The internal audit organization is a
13 classic standards-based audit organization, compliance and
14 performance, and it reports to our senior vice-president
15 and chief financial officer. And it reports directly out
16 to the audit committee of the board.

17 The Refurbishment Construction Review Board is a set
18 of industry experts that we retained on a periodic basis to
19 evaluate performance and report out to Mr. Reiner and
20 myself. They also report their results out directly to the
21 Darlington Refurbishment Committee, although I must say
22 that each of those organizations has access to the others'
23 products.

24 MR. JANIGAN: Okay. So the internal audit group's
25 information might inform that committee?

26 MR. LYASH: Correct.

27 MR. JANIGAN: Okay. On page 64, it deals with the
28 Darlington Refurbishment Committee, and as you've

1 indicated, the Ontario Government or Ontario --
2 Infrastructure Ontario has a member of that committee, a
3 non-voting member, as I understand.

4 MR. LYASH: That's correct.

5 MR. JANIGAN: Now, did I read somewhere that the
6 Infrastructure Ontario member is actually a consultant that
7 has been appointed by Infrastructure Ontario and is paid by
8 OPG?

9 MR. LYASH: Yes. The Minister of Energy selected
10 Infrastructure Ontario to be their independent adviser,
11 and, as I understand it, Infrastructure Ontario recognized
12 that they needed a breadth of experience that they didn't
13 possess internally, so they went out for a contract, and
14 they independently decided who to hire, and that's the
15 individual. The budget for that, we don't set, but OPG is
16 responsible for funding it.

17 MR. JANIGAN: Okay. And that individual is not
18 connected with any of the contracting parties of OPG?

19 MR. LYASH: No, they are not.

20 MR. JANIGAN: Okay. In the same area, just before
21 that, on pages 55 and 56, I was wondering how the change
22 management process works in with things like the Darlington
23 Refurbishment Committee, or is this operating on a much
24 lower level?

25 MR. REINER: The change management process operates at
26 a much lower level than the Darlington Refurbishment
27 Committee. It's a day-to-day process that tracks all
28 changes. It has a review board associated with it. So

1 based on the magnitude of the change, the change review
2 board will get called in to assess and review and approve,
3 and then it could make its way, depending on the nature of
4 the change and the size of the change, it does -- all of
5 this does roll up in terms of tracking performance for the
6 project. And if there is a material change that requires
7 an approval authority in accordance with our OPG authority
8 register, it could make its way up right up to the
9 Darlington Refurbishment Committee.

10 MR. LYASH: So just to add, there is a division of
11 responsibilities and delegation limits of authority and a
12 process lying overtop of this working change management
13 process that would drive escalation of issues at certain --
14 certain types of issues or levels of materiality up through
15 the DRC and the board of directors.

16 MR. JANIGAN: Was the D20 heavy water project that --
17 change that took place, was that part of this process?

18 MR. REINER: You'd have to tell me which particular --
19 so the recent change to remove it from this proceeding?

20 MR. JANIGAN: That's correct. Was that part of the
21 change management process, or did it take place in another
22 process altogether?

23 MR. REINER: That change did not go through this --
24 the diagram that you have here. That decision to remove it
25 from this rate application did not go through this process.
26 However, the analysis that we are going through to assess
27 schedule and cost for that project, that does follow this
28 kind of a change control process.

1 MR. JANIGAN: Is this a process that is frequently
2 resorted to, or is it something unusual?

3 MR. REINER: It is part of our project controls. It's
4 a day-to-day process. It's a mechanism that allows us to
5 clearly document and identify anything that creates a
6 deviation or a variance on schedule or on budget.

7 MR. JANIGAN: Okay. I would like to go back to the
8 front of my compendium now, and the first thing that I
9 wanted to look at is a conversation you had yesterday with
10 Mr. Buonaguro and, in particular, on pages 2 and 3 of that
11 compendium.

12 And Mr. Buonaguro was discussing with you matters
13 associated with the prudence of your capital estimates and
14 whether or not overexpenditures might be imprudent and
15 matters such as that, and he is quoting from the transcript
16 from the Technical Conference of Mr. Rose. And at the
17 bottom of page 2 he indicates -- he reads from that
18 transcript:

19 "Now, this answer talks about the program or
20 project level. That begs for me the question:
21 Is there some other level that is missing from
22 the answer? If there is some other level that
23 was considered, whether it would be program costs
24 that OPG would have anticipated as a risk that
25 may be manifest, are you going to have to absorb
26 rather than collect through the CRVA?"

27 And, in this case, Mr. Rose, who, I believe, was on
28 panel 2, answered, and he said:

1 "No, I can't think of anything. So we manage
2 refurbishment as a program."

3 And goes on further down the page:

4 "The correlation to projects in excess of 12.8
5 billion, that's our internal motivation to be
6 able to deliver the four units at 12.8 billion."

7 And further down the page he indicates, quoting from
8 the Technical Conference again, then I said:

9 "Then, in fact, your answer here is that you
10 can't conceive of a world where it wasn't
11 prudent?"

12 And on the following page Mr. Rose indicates:

13 "That's correct."

14 It would appear, at least from Mr. Rose's standpoint,
15 that, given the degree of planning and planned execution,
16 that even though you may be expending monies that exceeded
17 your estimates, that nothing that you did or expended would
18 be imprudent. Is that the sense you got from this
19 exchange?

20 MR. LYASH: No, it wasn't.

21 MR. JANIGAN: Okay. And certainly you come in with
22 the -- at the bottom of page 4:

23 "Certainly, there's certainly risk associated with the
24 project, and the risks may or may not have materialized, so
25 OPG's obligation is to prudently -- reasonably and
26 prudently manage this.

27 So the fact that the project, if there is a series of
28 events that cause the project to run over, wouldn't

1 necessarily mean OPG is imprudent. So, in effect, what
2 you've indicated is that, I believe, if there is an
3 overexpenditure and the money is in the CRVA, there would
4 be a prudence review of whether or not there is an
5 overexpenditure, and that would determine whether or not
6 OPG could collect on that amount.

7 MR. LYASH: Yes, I agree. And if I may, as I look at
8 Mr. Rose's exchange -- and I wasn't there for this
9 exchange, but as I read it over, Mr. Rose is projecting
10 risk prospectively and identifying in the risk register
11 risks that we can conceive may occur and that we then would
12 have to manage. And you wouldn't put a risk in the risk
13 register of imprudence, right, that I would mismanage and,
14 therefore, put it in the register, because then I'm pricing
15 imprudence into the contingency.

16 I think what he was referring to is I can't imagine an
17 imprudence-related risk that I would put in my risk
18 register as a prospective matter. But I think I agree
19 with, if I heard you correctly, your characterization that,
20 if the project costs us more than \$4.8 billion and that is
21 landed in the CRVA, then I would expect the OEB would
22 closely evaluate that to determine whether imprudence was a
23 factor in that cost overrun. And it may or may not be
24 imprudent, depending on the facts.

25 MR. JANIGAN: Let's take this scenario where there is
26 a cost overrun. If I take you to page 38 of my compendium,
27 which is the report from Concentrix, it has in numeral III
28 the standard of review about halfway down the page.

1 Specifically, Concentrix defined the prudent standard as:

2 "Examining the range of actions a reasonable
3 manager would take given the facts or
4 circumstances that were known or knowable at the
5 time of the decision or action. The decision
6 rejects the use of hindsight as a basis for
7 determining the prudence of a decision or
8 action."

9 Would you agree with me that is the standard that the
10 Board would apply in looking it at whether or not the
11 overexpenditure was prudent or not prudent?

12 MR. LYASH: I'm sorry. I had trouble getting to the
13 spot.

14 MR. JANIGAN: That's okay.

15 MR. KEIZER: Isn't that a legal question, Madam Chair,
16 and one of argument as to whether that does or does not
17 apply?

18 MR. JANIGAN: No. I would ask if he agrees with that
19 in terms of what the standard was that OPG would meet.

20 MR. KEIZER: Again, I say -- he can give you what the
21 position of the company is, how they intend to seek it and
22 what the application says. But whether that is the
23 definition in law as put forward by Concentrix, making
24 reference to various cases and case law, I think is a point
25 of argument.

26 MR. JANIGAN: Let me rephrase the question. Do you
27 agree that OPG has acted as a reasonable manager in putting
28 forward this application and has taken into consideration

1 the facts and circumstances that were known or knowable at
2 the time of putting forward this application?

3 MR. LYASH: To the best of my knowledge, yes.

4 MR. JANIGAN: Okay. If I can turn you to page 7 of my
5 compendium, you've outlined some of the steps that you've
6 taken to try to be a reasonable manager, I would assume.
7 And that includes, down at the bottom of the page, that
8 you've also engaged independent experts to review and
9 verify key aspects of the program, and you list all of the
10 independent expert reviews that were provided in support of
11 the evidence.

12 Would you agree that that was in pursuit of your
13 responsibilities as a reasonable manager?

14 MR. LYASH: Yes.

15 MR. JANIGAN: Okay. And I want to look at what each
16 of these reports included. First of all, the KPMG report
17 on pages 11 and 12 and on page 10 of my compendium notes
18 that:

19 "KPMG was engaged by Ontario Power Generation to
20 provide an independent review of the risk
21 management and contingency development process
22 for the released quality estimate for the
23 Darlington Nuclear Refurbishment Program, DNRP."

24 On the following page, page 11, it indicates at the
25 top that:

26 "Overall, OPG's governance, methodology, and
27 approach aligns with AECC guidelines and industry
28 practice in terms of identifying and classifying

1 risk and utilizing an integrated Monte Carlo-
2 based risk analysis."

3 Do you see that?

4 MR. LYASH: I see it.

5 MR. JANIGAN: And on the following page, at the top of
6 the page:

7 "It is KPMG's view the risk register
8 implementation by OPG in the RMO tool is of
9 quality and integrity. It is also in alignment
10 with industry guidelines and best practices. The
11 RMO risk register adequately encompasses the
12 risks identified by project managers and the
13 broader OPG team through ongoing risk workshops
14 and team meetings conducted by the OPG DNRP
15 team."

16 So, effectively, this methodology was given some sort
17 of seal of approval by KPMG. Do you agree with me?

18 MR. REINER: Yes.

19 MR. JANIGAN: Moving ahead, on page 17:

20 "KPMG also was engaged by OPG to provide an
21 independent review of their governance and
22 process to develop a reasonable risk quality
23 estimate."

24 And on page 17, midway down the page, it says that:

25 "OPG has demonstrated knowledge of the AACE
26 guidelines and generally interpreted and
27 correctly applied them to the DNRP program, and
28 we also note that aspects of OPG's estimating

1 governance and processes for the DNRP are
2 strong."

3 In a number of areas that they list, and also gives,
4 on the next page, that:

5 "In fact, there are no critical gaps in the A
6 category."

7 Agree with that?

8 MR. REINER: Yes.

9 MR. JANIGAN: That's another way in which your
10 process or approach has been deemed reasonable by an
11 outside expert; correct?

12 MR. LYASH: Yes.

13 MR. JANIGAN: Okay. I'm not buttressing your evidence
14 here. I'm going to get to a point eventually.

15 On page 21, this is a report from Modus Burns
16 McDonnell, and they were looking at -- they assessed at the
17 top of the page the DR team's process for developing the
18 release quality estimate which OPG and the DR team have
19 been developing since 2009. And on page 27, it's noted
20 that:

21 "While risk management contingency development
22 have many subjective aspects, the DR process has
23 been relatively well constructed and executed.
24 It is perhaps in the upper percentile of
25 comparable project practices."

26 Once again, a clean bill of health from this company?
27 Would you agree with that?

28 MR. REINER: Yes.

1 MR. JANIGAN: Further in that same report:

2 "In summary, Modus found that OPG has
3 substantially conformed to the governance it put
4 in place for RQE and the guidance from AACE
5 International on which governance was based."

6 Going ahead, we have an expert panel review, and the
7 expert panel review dealt with matters associated with the
8 RFR project and indicates on page 32:

9 "One of the definitions of phase deliverables of
10 the joint venture is an AACE Class 2 estimate to
11 perform the execution phase of the RFR project.
12 As OPG prepares to accept, this estimate from the
13 JV as part of the determination of the execution
14 phase target price that ultimately the release
15 quality estimate for the Darlington refurbishment
16 projects due diligence requires an independent
17 review of the Class 2 estimate."

18 And, on the next page, on page 33, that
19 notwithstanding some of the things that they noted might be
20 -- could be addressed, nevertheless the panel was able to
21 conclude that the risk management processes, taken in
22 context of all of the risk, recognizes that all the risk-
23 related information provided is sufficiently mature to
24 support the Class 2 estimate.

25 So your Class 2 estimate was also reviewed by
26 independent sources and found to be sound; correct?

27 MR. REINER: Yes.

28 MR. JANIGAN: All right. Now, on page 38 of the

1 Concentric report, I earlier referred to notes that:

2 "As discussed below, Concentric has concluded
3 that, based on the Ontario Power Generation's
4 activities regard to amending and finalizing the
5 retube and feeder replacement contracts since our
6 last report, the terms of the retube and feeder
7 replacement contract, including the target price
8 and the allocation of risk, are both reasonable
9 to meet the regulatory standard of prudence as
10 we've defined the concept in the September 2013
11 report and repeat herein for convenience."

12 And that is that section that I read to you earlier.

13 So, once again, your activities in relation to
14 amending and finalizing the retube and feeder replacement
15 contract were also found to be sound; correct?

16 MR. REINER: Yes.

17 MR. JANIGAN: And, on page 45, the report -- the
18 testimony of Dr. Galloway looks at the Darlington
19 refurbishment program and finds on the top of page 45 that:

20 "OPG is using a strong matrix organization
21 comprised of full-time project managers with
22 considerable authority and full-time functional
23 support stuff, and the content and scope of OPG's
24 program and project management plans is
25 consistent with industry best practices and other
26 megaprojects and megaprograms that we've
27 reviewed."

28 And finds that they have the most qualified

1 individuals, efficient oversight in place, and the program
2 management organizational staff decisions are reasonable in
3 accordance with good utility practice. Do you see that?

4 MR. REINER: Yes.

5 MR. JANIGAN: So it would appear that, at least in
6 terms of your planning and the reports that you've
7 obtained, that you've acted as a reasonable manager in
8 attempting to bring forward this application?

9 MR. REINER: Yes.

10 MR. JANIGAN: Can you tell me, in the event that you
11 have an overexpenditure of your estimate, what information
12 would be brought before the Board that would suggest that
13 whatever you've done in accordance with your planning, and
14 application would be imprudent?

15 We have seven reports here that set out that you have
16 followed the appropriate procedures of a manager, and what
17 happens if there is an overexpenditure based on what you
18 have planned and what you have approved? What chance would
19 you think that the Board would find your actions imprudent
20 and associated with an overexpenditure?

21 MR. LYASH: That's a very difficult hypothetical
22 question to ask. In the event that there was an overage on
23 the project, whatever amount, we think we've taken all the
24 reasonable actions that management can to establish the 4.8
25 and to be prepared to execute on it. But we still must
26 execute the project.

27 And, as we said, these are complicated projects.
28 There will be discovery. There will be unexpected

1 conditions occur. There may be performance issues that
2 arise with one or more contractors. And it's the company's
3 obligation to take those eventualities and manage them
4 prudently and to defend that prudence if we run over the
5 \$4.8 billion estimate.

6 So, if we're over that estimate, I would expect, to
7 the extent that that delta exists, that the OEB would want
8 to examine that for prudence and that the burden to prove
9 we were prudent would be on the company.

10 MR. JANIGAN: That could well be the case, but won't
11 you be pointing to all of these reports and processes that
12 you have instituted to show prudence in the execution of
13 your application?

14 MR. LYASH: As we should, because they form a basis
15 for reasonableness and prudence. Now, our performance in
16 consistently executing in concert with these is another
17 matter.

18 MR. JANIGAN: Okay. Now, let's wind it back a little
19 bit. All of these reports and all of the planning and
20 extensive planning that you've done has been part of a very
21 detailed planning process that's all been paid for by
22 ratepayers. Wouldn't you agree?

23 MR. LYASH: Well, the asset is not in-service, so I'm
24 not sure of your question, but...

25 MR. JANIGAN: Well, if this goes forward --

26 MR. LYASH: As we sit here today, we've invested \$2.8
27 billion in planning, preparation, and definition, and what
28 we're proposing is to bring the portion associated with

1 unit 2 into service in 2020.

2 MR. JANIGAN: Given the fact that ratepayers have paid
3 for all this, isn't there some expectation that they should
4 be given a little more assurance about whether or not cost
5 overruns are going to be mitigated in the event they occur?

6 MR. LYASH: I'm not -- first of all, as I said, the
7 asset is not in-service. We're proposing to bring it into
8 service. So, to this point, the ratepayer hasn't
9 shouldered these costs, but if our proposal is approved,
10 they will at a date in the future.

11 MR. JANIGAN: Understood.

12 MR. LYASH: With your regard to assurance, I'm not
13 sure what assurance you have in mind other than the
14 thousands of pages of testimony we've put here, the
15 reporting we've committed to the OEB, the layered oversight
16 process we put in place, running from the project level
17 through executive management, the board of directors, and
18 through the shareholders' independent adviser. And my
19 sense is those provide a robust set of assurances that the
20 project will be managed prudently to deliver the results
21 and that, if we manage the project imprudently, then the
22 OEB will be in a position to disallow that.

23 MR. JANIGAN: Well, given what you have spent in terms
24 of the planning process and given the fact that you've set
25 up things like your contracting process to ensure that
26 there are appropriate off-ramps and appropriate target
27 pricing, given that you've built in contingencies, why
28 shouldn't you have to bear at least some of the

1 consequences if you are -- or, for example, some of the
2 benefits if you exceed the budget or come in below budget?

3 MR. LYASH: I think the shareholder does bear the
4 consequences if we don't manage the project prudently.
5 That's the role of the OEB. And there is the basic
6 regulatory compact and the process we have before us that
7 defines that.

8 MR. JANIGAN: But you are the one that is executing
9 this project. You are the ones that have set up and done
10 the planning associated with this. And couldn't you stand
11 behind this project and say, "Look it, this is the amount
12 that we're going to meet. If we don't meet it, we will
13 take some of the consequences, but if we come under we
14 should have the benefits too"? What's wrong with that?

15 MR. LYASH: That's not the process as it exists today.

16 MR. JANIGAN: I know that's not the process, and
17 you've indicated that the reason that that process has not
18 been resorted to is that you believe that cost does not
19 necessarily -- attention to cost does not necessarily
20 reflect attention to performance, if I can paraphrase your
21 answer.

22 MR. LYASH: I did provide an answer of that nature,
23 yes.

24 MR. JANIGAN: And the reason that you say that is that
25 you feel that, in the event that you were motivated by
26 financial incentives, you think the performance of OPG
27 would suffer?

28 MR. LYASH: I did not make that leap in my answer.

1 Our determination would not be to allow it to suffer, not
2 to allow it to suffer. My point was that putting a --
3 putting a capital incentive on a project whose value is
4 delivered over 30 years and that value is so dependent on
5 the safety, the reliability, and the cost-effectiveness of
6 the unit post-refurbishment would not be an incentive that
7 would necessarily be in the customer's long-term best
8 interests.

9 MR. JANIGAN: Well, I think I'm going to try to square
10 those two aspects of your answer. First, you said that
11 performance of OPG would not be affected by financial
12 incentive, and I think what you've told us before this is
13 that it's a destiny project, that you have an obligation --
14 as an Ontario business corporation, you have an obligation
15 to the taxpayers of Ontario also personally invested in it.
16 None of that performance would suffer. Do you agree?

17 MR. LYASH: I'm sorry. What I'm saying is we have
18 plenty of incentives to deliver the project on or ahead of
19 schedule, on or ahead of budget, and I think I've outlined
20 those several times.

21 What I was referring to -- and, again, if you had a
22 specific incentive in mind or disincentive, perhaps I could
23 answer the question better.

24 MR. JANIGAN: Effectively, the kind of incentive
25 that's associated with meeting a budget, that, in fact, if
26 you come under the budget that you've set, that you get
27 some financial benefits from it, and if you exceed that
28 budget, that you have to absorb at least some of those

1 costs.

2 MR. LYASH: If we come under the budget, then we will
3 have delivered the project under budget. It will reduce
4 risk of the additional Darlington refurb and provide us an
5 opportunity to earn income on those assets, and it will
6 serve to help expand our ability to make other capital
7 investments. And so we do benefit from that.

8 If we come in over the budget, and that is examined by
9 the OEB and deemed to be imprudent and disallowed, then
10 that disallowance comes directly off a net income and
11 return on equity, and that is a penalty for that
12 performance.

13 MR. JANIGAN: But I would suggest the possibility of a
14 disallowance, given the symmetries of information that
15 exist between OPG and other stakeholder interests are so
16 substantial that the likelihood of a prudence review
17 resulting in some kind of penalty to OPG is pretty slim.

18 MR. LYASH: I don't agree.

19 MR. JANIGAN: You've gone over with my friends the
20 previous experience of other megaprojects. Given that
21 experience, don't you think the ratepayers might require
22 additional assurance of your ability to meet the estimated
23 budget?

24 MR. LYASH: We've tried to provide that assurance in
25 the testimony that's on the docket, and in the way we have
26 constructed the costs, the schedule, the risks and the
27 contingency. I'm not sure what additional assurance you're
28 referring to.

1 MR. JANIGAN: You've indicated, notwithstanding how
2 prudent you've been in terms of planning this project,
3 there is the possibility that the execution might go awry.

4 MR. LYASH: I think, in a project of this nature, not
5 all will go perfectly. That is the only thing with a
6 certainty of 100 percent. The challenge for OPG will be to
7 identify those issues early, characterize them completely,
8 and take every reasonable and prudent action to mitigate
9 them.

10 MR. JANIGAN: What would be your response if the Board
11 elected to put in the kind of financial incentive
12 associated with meeting the budget you put forward in this
13 application?

14 MR. LYASH: The OEB has broad discretion. They're a
15 regularity, and we would certainly respond constructively,
16 as constructively as we could to that.

17 MR. JANIGAN: To circle back to your previous answer,
18 this may induce greater attention to cost possibly. Would
19 that attention negate from OPG's performance?

20 MR. LYASH: Again, it's a hypothetical question. I
21 don't think such an incentive would have an effect to drive
22 OPG in some way to delivering the project at a lower cost.
23 That's already our objective. We would have to guard
24 against that introducing inappropriate behaviours or
25 objectives into the project.

26 MR. JANIGAN: Finally, I wonder if you could turn to
27 page 49 of my compendium. This is something that came up
28 from a footnote in Dr. Galloway's report and was followed

1 up by AMPCO, and it involves a memorandum of understanding
2 between Bruce Power and Ontario Power Generation Inc. and
3 issued under the authority of both yourself and
4 Mr. Hawthorne of Bruce Power. What's been the fallout of
5 this?

6 MR. LYASH: I'm sorry. Your question is?

7 MR. JANIGAN: What has been done in relation to the
8 memorandum of understanding since the understanding was
9 entered into?

10 MR. LYASH: This formed the opening of what has become
11 a rather extensive collaboration program. I could spend
12 some time detailing it. I'll try to summarize it for you.
13 We have established teams in each organization who work on
14 an ongoing basis on a set of collaboration opportunities,
15 opportunities that can either shorten schedule, reduce
16 cost, improve safety, reduce radiation exposure, or
17 eliminate risk. Those teams talk on an ongoing basis and
18 work towards those ends.

19 There is also an executive steering team that is
20 chaired by myself and Duncan Hawthorne's replacement,
21 Dr. Renchek. We review status every two weeks in a
22 telephone call. We meet quarterly to look at results over
23 the last quarter and projected activities we want to
24 complete in the next quarter, and that has produced a range
25 of activities.

26 Mr. Reiner may want to add some other examples, but
27 one I would give you is, as an example, we have seconded
28 some experience -- some Bruce Power individuals with

1 experience with their prior refurbishment directly into the
2 OPG refurbishment team so they can bring that experience
3 with them and so they can take experience from our project
4 and return that firsthand to Bruce for their execution.

5 MR. JANIGAN: I note on page 52, there is an annual
6 summary report that's been prepared. Has one been
7 prepared?

8 MR. LYASH: Yes. It was issued and it's publicly
9 available. I can't recall the date; it's maybe 60 days
10 ago.

11 MR. JANIGAN: When you say "publicly available," is it
12 on your website or something like that?

13 MR. LYASH: I'm sure it is. We can get you a
14 reference to where that is.

15 MR. JANIGAN: Okay. Thanks very much.

16 Finally, just a question I forgot to ask initially:
17 The annual status reports, the annual status public reports
18 and your report to the OEB, is that one and the same?

19 MR. LYASH: Which?

20 MR. JANIGAN: If you go to the oversight section,
21 there's a mention that you're going to be preparing annual
22 reports - sorry, just before the oversight section. And on
23 the bottom of the page 61:

24 "OPG plans to issue annual status reports to the
25 public for the duration of the program through
26 its website. This reporting will include a range
27 of measures."

28 Et cetera, et cetera.

1 Is that the same -- that public reporting, is that the
2 same as your report to the OEB?

3 MR. LYASH: The one referred to here in the table at
4 the top of page 62, that particular reference is to the OEB
5 report.

6 MR. JANIGAN: Okay. But is that also the report to
7 the public, or is that different?

8 MR. LYASH: We have established a practice of
9 quarterly summary reports to the public posted on our
10 website. Perhaps that's what you're referring to.

11 MR. JANIGAN: Okay.

12 MR. LYASH: We do a monthly update, and then we do a
13 quarterly more extensive report on the website.

14 MR. JANIGAN: This is an annual report that's referred
15 to here.

16 MR. LYASH: This is the OEB report.

17 MR. JANIGAN: And that's going to be available to the
18 public as well?

19 MR. LYASH: Correct.

20 MR. JANIGAN: Okay.

21 MR. LYASH: I should say, let me say -- I'm assuming
22 submitting it through the OEB process makes it a public
23 report. Perhaps my language is a little loose there.

24 MR. JANIGAN: Would the OEB release it, or would you
25 release it?

26 MS. LONG: I'm assuming it's going to be filed
27 publicly. Is that what you're contemplating? And,
28 therefore, it would be public filed on the record?

1 MR. JANIGAN: Okay. Thank you very much, panel, for
2 your patience. Those are all my questions.

3 MS. LONG: Thank you, Mr. Janigan.

4 Mr. Tolmie?

5 MR. TOLMIE: Is it working?

6 MS. LONG: I can hear you, yes.

7 **CROSS-EXAMINATION BY MR. TOLMIE:**

8 MR. TOLMIE: Thank you. You're both engineers by
9 background, I think, so you can put on your engineering
10 hats for what I'm going to talk about. Maybe they should
11 be hard hats, though.

12 What I want to talk about is energy storage, which is
13 the field I work in. I work in the field of R&D for energy
14 storage in Sustainability Journal, and OPG presently uses
15 energy storage on a very large scale. People don't talk
16 about it very much, but you have nuclear power sources that
17 are providing power at a costed output. You have this band
18 that's fluctuating over a tremendously wide range, and the
19 thing that matches those two is, in fact, the storage of
20 the ponding of the hydro facilities.

21 You also have some generation involved, because
22 there's peak generators run by natural gas, but a very
23 large part of it is, in fact, a storage issue, and I think
24 storage should be considered one of the risk factors in
25 doing the engineering for this type of system, that if
26 you're using storage appropriately, you can, in fact,
27 reduce the costs of this kind of system very substantially,
28 by billions of dollars, in fact.

1 Now, you've already gone through a definition phase
2 for the NDRP project, and that phase is based on the 2013
3 long-term energy plan plus various regulations and
4 directives that have flowed out of that plan. The planning
5 is subject, though, to off-ramp decisions that may be made
6 to government approvals on the various components of the
7 system, to potential changes in the LETP itself that are
8 currently underway, and intervening events have been
9 happening that are changing government policy in quite
10 fundamental ways. So we need to go back to basics to see
11 if there is a possibility that energy storage could, in
12 fact, help at this stage in the game to make the systems
13 work better or cheaper or more reliably, and the basic
14 number that we're dealing with in all energy systems is how
15 many megawatt hours of electrical energy you're using per
16 year.

17 In Ontario, that amounts to about 150 terawatt hours,
18 150.4, to be exact, for last year, and if you go back for
19 about a decade, it was approximately the same, a little
20 higher some years, lower other years, and the projections
21 from the IESO are that it will either remain constant by
22 one scenario or may increase quite substantially by some
23 other scenarios. It might increase by 50 percent up to the
24 year 2035. But, basically, we know we have to deal with
25 that kind of output from the power system.

26 Are those numbers sort of reasonable to you? I don't
27 want to go off on a tangent here. If the source of power,
28 whatever it is -- we need 150 terawatt hours per year. If

1 you have a supply source of load following -- ACR 1000, for
2 example, was supposed to have been load-following a reactor
3 -- a load-following system can handle the demand changes as
4 they occur, so a load-following system only needs 17,000
5 megawatts of power, capacity. That's 150,000 -- 150
6 terawatt hours divided by the one year's worth of hours.
7 There is no need to generate more power than that if your
8 system is load following.

9 MS. LONG: Mr. Tolmie, I don't mean to interject here,
10 but are you going to frame these questions --

11 MR. TOLMIE: Yes, sorry.

12 MS. LONG: -- in the context of Darlington?
13 Because --

14 MR. TOLMIE: I go on for --

15 MS. LONG: -- this is the Darlington --

16 MR. TOLMIE: -- prologue the whole thing, and that
17 leads to questions. Is that okay?

18 MS. LONG: Okay. Well, can you get to the questions
19 quickly? I'm trying to follow your line of thought. Is
20 this with respect to off-ramps that you're discussing
21 energy storage? You need to bring this within the context
22 of what this panel can talk about, which is an overview
23 generally of the DRP project. I know you have questions
24 for many of the other panels, but this panel specifically
25 is talking about overview of Darlington, so you can frame
26 your questions in that context --

27 MR. TOLMIE: That's what I'm trying to do --

28 MS. LONG: -- it would be helpful --

1 MR. TOLMIE: -- but unfortunately the question
2 requires that I explain what the rationale for the question
3 is before I pose the question itself.

4 MS. LONG: Okay. Well, I hope you get to the question
5 soon.

6 MR. TOLMIE: Okay. I won't be very long. I'll be
7 well within the --

8 MS. LONG: Okay.

9 MR. TOLMIE: -- 20-minute time scale, so I'm not going
10 to keep you too long. And if there's any questions that
11 you have, by all means, bring them up.

12 There is no need to generate more than 17,200 megawatt
13 hours and -- megawatts, I should say, and it's possible
14 that we might not need to produce even that amount.

15 I mentioned that we are going through periods of
16 change in energy supply. One of those changes is going to
17 be the adoption of procedures that adapt to the Paris
18 Climate Change, very tough thing to meet. And that is
19 going to mean that we have to look at all of the energy
20 sources or none -- they all have to be looked at, at the
21 same time. If you're going to reduce the consumption of --
22 reduce the production of greenhouse gases, then you have to
23 think about all the greenhouse gases that are being
24 produced by heating your homes, and when you heat your
25 home, one of the options is use energy storage. You can
26 store summer heat, heat the home with that.

27 One of the options, one of the opportunities that's
28 available, is that you can use that process to also store

1 electricity. You're, in effect, using the electricity to
2 -- the technical word is to increase the exergy of the
3 stored energy, so you're actually storing both heat and
4 electricity concurrently, and that is what we're driving
5 at.

6 Have you considered the potential of using that type
7 of storage to reduce the overall load to the order of
8 11,000 megawatts of power, which implies that we wouldn't
9 need to use natural gas to heat our homes or natural gas to
10 provide peak power for generation or nuclear power to some
11 extent?

12 MR. LYASH: So, Mr. Tolmie, as you know, you and I
13 have had long discussions about exergy, so I understand the
14 technology, basically, and I and OPG are supporters of
15 storage as a part of the system mix here that you
16 mentioned. We just refurbished the Sir Adam Beck pump
17 hydro storage facility. It's the largest storage facility
18 in Canada.

19 So, in concept, I think, in the long-term, the
20 development application of storage is important. Whether
21 that technology is exergy or others, I think, remains to be
22 seen, and using storage can enhance the effectiveness of
23 the rest of the generation fleet we have around climate
24 change objectives, et cetera.

25 To the extent it's relevant to Darlington, you know,
26 the IESO has thought about whether, in the future resource
27 mix, Darlington plays a vital long-term role, and OPG has
28 looked at that very carefully in making decisions about

1 whether to proceed with the Darlington refurbishment, and
2 our judgment -- and I think it's backed by the IESO -- is
3 that, in any of those future scenarios, the Darlington
4 units will be very valuable low-carbon resources paired
5 with storage or otherwise.

6 MR. TOLMIE: Can you give me an estimate of how much
7 storage already exists in the system?

8 MR. LYASH: I didn't come prepared to cover this
9 material today, so I'm not in a position to do that for you
10 right now.

11 MR. TOLMIE: Okay. Well, I'll throw out a number just
12 so people have a concept for what we're talking about.
13 There's about 8,000 megawatts of capacity in the hydro
14 ponding system plus pump storage, which is not widely used
15 in Ontario. Can you compare pump storage here vis-à-vis
16 pump storage in other countries like China, for example?

17 MS. LONG: Mr. Tolmie, this does not relate to
18 Darlington.

19 MR. TOLMIE: Yes, it does.

20 MS. LONG: Pump storage?

21 MR. TOLMIE: Yeah. In order to make the Darlington --

22 MS. LONG: In other countries? In other countries?

23 MR. TOLMIE: -- to make the nuclear system pump --

24 MS. LONG: I don't think so. So --

25 MR. TOLMIE: Sorry.

26 MS. LONG: You have to let me speak, and then you --

27 MR. TOLMIE: Sorry, I'm sorry.

28 MS. LONG: -- can speak.

1 What we're interested in, this Panel is hearing the
2 evidence of these two witnesses.

3 MR. TOLMIE: Yes.

4 MS. LONG: So we can't accept anything that you are
5 saying as evidence. You're not giving evidence here. You
6 are asking questions, so you need to set the context and
7 ask these two witnesses the questions, because we can only
8 rely on the evidence that these two witnesses give us. So
9 I'm asking you to direct your questions to them squarely on
10 the issue of Darlington.

11 MR. TOLMIE: That's exactly what I'm trying to do.

12 MS. LONG: I'll ask you to rephrase your question so
13 that you do that, please.

14 MR. TOLMIE: The objective of the Darlington project
15 is to meet Ontario's requirement for power; right?

16 MR. LYASH: Yes.

17 MR. TOLMIE: And there's a confusion over whether
18 power should be expressed in megawatts or megawatt hours or
19 terawatt hours. If you set megawatts as your objective,
20 then the ISO says we need 36,000 of them. If you set
21 terawatt hours, we only need 11,000. Do you agree?

22 MR. LYASH: I agree that the concept of capacity
23 megawatts and energy megawatt hours are two different
24 concepts and have to be treated differently in planning a
25 system.

26 MR. TOLMIE: Which one do you use, though?

27 MR. LYASH: You must use both.

28 MR. TOLMIE: Do you need to know the power demand if,

1 in fact, you're drawing your power from the storage system?

2 MR. LYASH: Yes. Because you're designing and
3 operating a system that includes a wide range of generating
4 resources, storage resources, transmission, distribution,
5 loads with different real and reactive power profiles,
6 voltage and frequency requirements.

7 So I don't disagree that you need to understand and
8 utilize storage, but you asked me whether you could pick
9 megawatts or megawatt hours, and I said you need to
10 consider both.

11 MR. TOLMIE: I can't disagree with you. There are
12 elements of power factor and that kind of thing involved.
13 But from a straight physics point of view, I think I would
14 question the need for paying too much attention to power
15 capacity, because the real issue is energy capacity.
16 However, we're not here to debate. We are here to consider
17 the dollar value.

18 So the plan is to complete four Darlington reactors
19 that will cost \$12.8 billion. Could we possibly do that
20 cheaper if, in fact, we pay close attention to storage as
21 the means of matching supply and demand?

22 MR. LYASH: I think that was a question that was
23 evaluated by the IESO and the Province in making a decision
24 to proceed with the Darlington refurbishment. But under
25 any scenario, the Darlington refurbishment was a critical
26 element of that solution.

27 MR. TOLMIE: Has the OPG itself carried out any cost
28 benefit analysis of the potential of using storage

1 explicitly?

2 MR. LYASH: We operate storage, and we operate in the
3 market, so in a real sense, we evaluate alternative
4 technologies on an ongoing basis.

5 MR. TOLMIE: And you feel that the options that you
6 have presented are absolutely the best to minimize the
7 customer price, to quote you from yesterday, or to meet
8 your fiduciary obligations?

9 MR. LYASH: There's certainly a range of options and
10 system planning. The government considered them in LTEP.
11 The ISO considers them in their deliberations, and OPG
12 considers them in evaluating what solutions we think are
13 best and we want to advocate. And all that was considered
14 in reaching the decision to undertake the refurbishment at
15 Darlington.

16 MR. TOLMIE: When were those decisions arrived at?

17 MR. LYASH: If you look at the Darlington timeline,
18 certainly there was there was a feasibility study embarked
19 on in 2009, a definition phase in 2010, a number of
20 checkpoints all the way along the line up to and including
21 board of directors and Cabinet approval at the point we put
22 the RQE forward. So it's he been ongoing decision-making
23 process as we moved through the project beginning ten years
24 ago.

25 MR. TOLMIE: At what date did the Paris agreement on
26 climate change come into effect?

27 MR. LYASH: I don't have that reference available
28 here.

1 MR. TOLMIE: Would you agree it's quite recent, like
2 November of last year?

3 MR. LYASH: Yes.

4 MR. TOLMIE: So since the decision was made, there has
5 been a fundamental change in the direction of government
6 planning on energy?

7 MR. LYASH: The Government of Canada has certainly
8 focused on carbon and put out materials on 2050 goals and
9 action plans, and to the extent I reviewed them -- and I
10 don't claim to have reviewed them in detail -- they all
11 show an ongoing and growing element of the mix as nuclear
12 for almost every scenario.

13 MR. TOLMIE: Would you agree there is a potential for
14 very large changes in how the system works? I referred
15 previously to the potential to store heat for thermal
16 applications and, as a free consequence, you get a large
17 amount of electricity storage via the exergy storage
18 process. So, in effect, you get terawatt hours of
19 energy coming free out of the system once you have adopted
20 the concept of using storage for thermal applications.

21 I'm trying to help you. There is --

22 MR. LYASH: I have no way of predicting that. I know
23 what the system planning outputs are. I understand what
24 OPG and the Province's positions have been. OPG is an
25 advocate of technology and supportive of storage, but I
26 have no way of validating the conclusion that it will be
27 plentiful and free as a result at this point. I hope it
28 is, but I can't say that's the case as I sit here.

1 MR. TOLMIE: Can anyone say what the case will be? We
2 presently don't have the new LDPE; presumably that will
3 come later this year. We do not have the federal plan for
4 energy; presumably that will come soon. We don't yet have
5 a provincial plan for energy. So it's perfectly correct to
6 say that there are no plans in place, but there are
7 potentially opportunities in place.

8 My question is: Are you examining those opportunities
9 as assiduously as you can?

10 MR. KEIZER: Madam Chair, as you know, the Regulation
11 5305 prescribes that the need for the project has been
12 determined by the government and determined by way of
13 regulation. So I'm not sure we need to go into what the
14 various scenarios could be in the future or other issues,
15 given that we're here today to consider the Darlington
16 refurbishment project as it is and as it's planned and as
17 it is intended to go forward in satisfaction of that need.

18 MR. TOLMIE: Is it your position, then, that it
19 doesn't matter that it might cost \$12.8 billion more than
20 we really need to spend?

21 MR. LYASH: I wouldn't characterize that as my
22 position. But what I would say is that the Darlington
23 units which provide a low-cost source of power, zero
24 greenhouse gas emissions, or near zero, and 20 percent of
25 the province's energy have a lifetime, and we are facing
26 the end of that lifetime. And based on that, and ten
27 years' worth of efforts examined by the IESO, examined by
28 the Province, decisions have been made that at least one of

1 the central elements of the Province's energy plan going
2 forward is to refurbish Darlington. We face that decision
3 now. We can't wait ten years to see whether something else
4 materializes, because if we do that, then the decision is
5 not to refurbish Darlington and to retire it. That wasn't
6 the decision that was taken after all that analysis.

7 So, in my view, the review was done; the decision was
8 made that, regardless of what other technology or scenario
9 might develop in the future, the correct course of action
10 in this time is to refurbish the Darlington refurbishment,
11 and that's the path that we are on and what we're here to
12 talk about today.

13 MR. TOLMIE: Do you recognize that there are potential
14 drawbacks to building the Darlington reactor from the point
15 of view of achieving the greenhouse gas objectives? For
16 example, if you're going to use a constant energy source
17 like a nuclear facility, you've got to cope with the load
18 variations, and there's only a limited capacity in our
19 hydro facilities, so the balance is made up by generation
20 with gas-fired generators, and there's a potential to get
21 rid of those gas-fired generators if you employ storage
22 appropriately. And you appear to be saying we're stuck
23 with that. We're going to have to continue using the gas-
24 fired generators, because we need them for coping with the
25 nuclear mismatch against the power demand.

26 MS. LONG: Mr. Tolmie, do you have some final
27 questions for this panel, because you have reached your 20-
28 minute time period, and while I know engineers love to talk

1 about these different concepts, it's really nothing that we
2 can consider? As Mr. Keizer has stated, the need for
3 Darlington is established in the regulation, and what we're
4 here to do is discuss payment amounts.

5 So I'm going to give you one final question for
6 Mr. Lyash and for Mr. Reiner, but then we need to move on.

7 MR. TOLMIE: My final question is: May I have the
8 opportunity to present a report to show that we could, in
9 fact, save billions, many billions of dollars, if we make
10 better use of storage?

11 MS. LONG: Are you thinking that you're going to put
12 it in front of these witnesses and have them comment on it?

13 MR. TOLMIE: No. I'm just, well, suggesting it as a
14 report that would go to the Board for their consideration
15 in coming to a conclusion on this issue.

16 MS. LONG: Well, that's not before us, certainly not
17 before us in this Panel. We are discussing an overview of
18 the Darlington project.

19 MR. TOLMIE: I'm trying to do that too.

20 MS. LONG: Well, I know you are. But I don't see how
21 the report would assist us in what we need to determine
22 here, so my answer is no.

23 MR. TOLMIE: Okay. Fine. Thank you.

24 MS. LONG: Thank you.

25 Mr. Elson?

26 MR. RICHLER: Pardon me, Madam Chair, if I might just
27 add one thing. I note that Mr. Tolmie circulated a hard
28 copy of a two-page document. I'm not sure if he wishes to

1 add that document to the record, but if that is his
2 intention and if the Panel wishes to admit it, we should
3 probably give it an exhibit number.

4 MS. LONG: I haven't seen it. Do I have it?

5 Mr. Keizer, do you have an objection for this going on
6 the record?

7 MR. KEIZER: I don't have an objection. I don't
8 particularly know its use. It's not something that's been
9 put to our witnesses, so otherwise it would just be sitting
10 on the record. And I'm assuming that -- so my view is it
11 does say at the top "Compendium for February/March
12 Hearing," so I'm assuming, if Mr. Tolmie is going to use it
13 for a subsequent panel, that he would bring it forward at
14 that time and have it marked then. Otherwise it wasn't put
15 to the witnesses or --

16 MS. LONG: Are you planning, Mr. Tolmie, to put this
17 before other witness panels?

18 MR. TOLMIE: No, I wasn't.

19 MS. LONG: So what is the purpose of this? You didn't
20 put it to these witnesses, so --

21 MR. TOLMIE: It was intended to provide a means for
22 anyone interested to track back on what I had said.

23 MR. KEIZER: Well, I think we have a transcript with
24 respect to that, so -- which is -- you know, everybody has
25 a record of, so, in my view, I mean, we don't need to mark
26 it as an exhibit.

27 MR. TOLMIE: Okay with me.

28 MR. KEIZER: We have the transcript of Mr. Tolmie's

1 examination.

2 MS. LONG: Thank you.

3 Thank you, Mr. Richler.

4 Mr. Elson, do you have a compendium, do you?

5 MR. ELSON: I do, yes. Thank you, Madam Chair.

6 MS. LONG: You're going to put it to these witnesses?

7 MR. ELSON: I am, yes.

8 MS. LONG: Okay. Let's mark that, please.

9 MR. RICHLER: So this one will be K2.2.

10 **EXHIBIT NO. K2.2: ENVIRONMENT DEFENCE COMPENDIUM**

11 MS. LONG: Can you give us a time estimate, Mr. Elson?

12 MR. ELSON: I should be below my estimate, max 20
13 minutes --

14 MS. LONG: Okay. And Mr. --

15 MR. ELSON: -- probably even 15.

16 MS. LONG: Mr. DeRose, do I understand that you plan
17 on going in camera this afternoon?

18 MR. DEROSE: Yes, that's correct.

19 MS. LONG: Okay. Then, I think the way we're going to
20 structure the rest of the afternoon is I would like to have
21 Mr. Elson ask his questions. The Panel would like to ask
22 our questions. Then, Mr. Keizer, if you have any redirect,
23 you can deal with that, and then I think we'll take the
24 break so we can go in camera for the next panel.

25 **CROSS-EXAMINATION BY MR. ELSON:**

26 MR. ELSON: Thank you, Madam Chair.

27 Thank you, panel. My name is Kent Elson. I represent
28 Environmental Defence. And I have just a small number of

1 questions, and I would like to start with some questions
2 about reporting on the DRP.

3 And if the compendium could be turned up on the
4 screen, and if we could turn to page 1 of the compendium.
5 And where this is all going is we're looking for an
6 additional figure to be reported along with your quarterly
7 reporting, and I'm going to take you through some
8 references before getting to the specific metric that we
9 are looking for, so bear with me for a moment.

10 Page 1 here of the compendium is ED interrogatory
11 number 6, and you'll see here that we asked for the
12 forecast of the cumulative capital expenditures for unit 2.
13 Do you see that there?

14 MR. REINER: Yes.

15 MR. ELSON: And turning over the page to page 2, this
16 is JT1.17, and by way of undertaking, we asked that the
17 full response be provided, breaking out by quarters for
18 2019 and 2020 as well, so this is the complete data here in
19 JT1.17. Do you see that there?

20 MR. REINER: Yes, I see that.

21 MR. ELSON: So if we turn to page 4, this is a
22 Technical Conference transcript, and, on page 5, which is
23 page 97 of the transcript, I had asked if the numbers that
24 would be reported on a quarterly basis would be comparable
25 with the cumulative capital expenditure figures that we
26 received in IR 6. Do you see that there?

27 MR. REINER: Yes.

28 MR. ELSON: And I'm turning over one page -- sorry for

1 the long preamble -- page 6. It said that they will not be
2 comparable because there's some differences. And so all of
3 this is the lead-up for a very simple question, which is
4 whether OPG is willing to report on the unit 2 actual
5 cumulative total capital costs versus the forecast
6 cumulative total capital costs as set out in JT1.17C,
7 including a breakout of the contingency amounts.

8 MR. LYASH: So how often -- can you clarify? How
9 often are you looking for this reporting and for what
10 purpose?

11 MR. ELSON: Because they're quarterly figures, the
12 reporting would be quarterly.

13 MR. KEIZER: Can I just understand Mr. Elson's
14 question? Are you asking that the numbers that are
15 forecast in JT1.17 be frozen in time and that that be the
16 comparison from this day forward? Is that kind of what
17 you're contemplating?

18 MR. ELSON: I struggle with the terminology "frozen in
19 time." What we're seeking is reporting of the actual costs
20 versus the forecast as of today, actual versus forecast.

21 MR. LYASH: So before I go directly to this, one of --
22 some of the metrics that we had included in the OEB report
23 that we proposed were cost performance index and schedule
24 performance index. And I just would -- for the sake of
25 understanding what your objective is, I want to contrast
26 those to these cash flows.

27 These cash flows exist at a point in time and are
28 based on a schedule and a cash flow. As we talked about

1 many times, it's a dynamic set of activities, and so, as an
2 example, in defuelling, schedule pull forward, cash
3 expenditures pull forward with the execution of that
4 schedule.

5 So the cash expenditures for the quarter go up, but,
6 in fact, you're gaining schedule provided you're
7 accomplishing - you're earning value for the cash you
8 spent. Likewise, there may be cases where resequencing
9 occurs and expenditures move out. And looking at cash flow
10 may show an underrun against the cash flow. That isn't
11 necessarily a project underrun, because the work hasn't
12 been executed, so the cash associated with it hasn't
13 exited.

14 So our reporting approach here, which focuses on
15 earned value and on -- through the MD&A on total
16 expenditures life to date and whether there is any material
17 change in the forecast give you, I think, a good picture of
18 the status of the project.

19 My concern is that picking a point in time and a set
20 of cash flows could, without all the in-depth project
21 knowledge underneath that, could be, in fact, just plain
22 misleading.

23 MR. ELSON: Mr. Lyash, you actually hit on the precise
24 issue which is why we're looking for this, which is a
25 number where the baseline isn't changing. The challenge
26 with the CPI and SPI, the cost variance and the schedule
27 variance, is that it's a single number, and under that
28 single number, there is large amount of calculations,

1 including a baseline which sometimes changes. So that is
2 the purpose for seeking something very simple, which is
3 your quarterly capital expenditures, forecast versus
4 actual, on a quarterly basis.

5 MR. LYASH: And I think that is likely not to give you
6 what you're looking for is my point. And I think panel 1B
7 can go into this in detail, but CPI and SPI are measured
8 against a budget and a schedule that doesn't have a lot of
9 fluidity to it. It's measured against a firm baseline and
10 change control against that.

11 So there may be some other way to get to what you're
12 looking for. I'm not optimistic that cash flow is going to
13 give that to you. And perhaps -- and we can discuss it
14 more, but perhaps Mr. Rose and panel 1B may be a place to
15 explore that.

16 MR. ELSON: Let me ask you this question: My
17 understanding is that, when certain changes are made to the
18 project, such as changing directions to contractors, you
19 change the baseline for the CPI.

20 MR. REINER: No. The baselines do not change. In
21 project control's space -- and as Mr. Lyash said, we can
22 get into this in more detail in 1B. In project control's
23 space, we maintain a baseline budget and baseline schedule
24 that always links back to the approvals that were provided.
25 So it links back to the funds released by the Board in 2016
26 as part of the U2 execution estimate and links back to the
27 execution schedule that we've presented in evidence. That
28 baseline is locked in. And so, when we do a program level

1 report of cost and schedule performance, it is always
2 relative to that baseline.

3 Now, recognizing that -- and we spoke about a change
4 control mechanism, The change control mechanism is in
5 place because it recognizes that, as you execute the
6 project, things are not going to unfold exactly as planned.
7 And there needs to be an ability to understand what has
8 changed and then measure performance against those changes.

9 So, for example, if something were behind schedule on
10 a project, we would expect to see a recovery plan. That
11 recovery plan would then essentially provide another basis
12 to track performance against. The way we do this is
13 through control budgets. But they're always linked to the
14 baseline budget and baseline schedule and in our program.
15 Reporting, it always rolls up to that baseline.

16 If you're looking at cash flows alone, I think the
17 shortcoming there, which is why in our proposal we talked
18 about cost performance and schedule performance, cost
19 performance and schedule performance give you an indicator
20 of how you're doing relative to the work that you planned
21 to execute. It tells you whether you're adhering to your
22 schedule, whether you're ahead of your schedule or behind
23 your schedule. It also tells you, in terms of the costs
24 you're expending, how that is doing relative to what you
25 budgeted. Are you spending more? Are you spending less?

26 If you looked at just cash flows, you would actually
27 not get the visibility into the performance that you need
28 to get on a project like this.

1 MR. ELSON: Could you turn to page 8, just further to
2 your comment about the baseline not changing, paragraph 2,
3 page 8 of Exhibit 2.2, which is our compendium.

4 The second paragraph says:

5 "If we are making a strategic change where we are
6 directing the vendor to take on a new component
7 or we are moving them on a schedule and it's an
8 agreed-to change, in certain cases we would
9 adjust the baseline for which we are measuring
10 CPI."

11 MR. REINER: I think this is -- and, again, we will
12 have Mr. Rose on panel 1B and come back at this. But this
13 is specifically in reference to a project bundle, and that
14 would be done through that control budget that I talked
15 about. We do establish control budgets, and those control
16 budgets move up and down based on what the change review
17 board has authorized and approved. And then performance
18 gets measured at the bundle level relative to this control
19 budget. But the ultimate base line that we put forth in
20 evidence, which is unit 2 execution estimate and the
21 execution schedule, that is the baseline that we will
22 always continue to measure our performance against.

23 MR. ELSON: I'm not suggesting that you're changing
24 the 4.8, but it appears the baseline on which CPI is
25 measured might change between the work bundles.

26 MR. REINER: On a bundle level, it will always be
27 reflective of the control budgets, but that gets rolled up
28 into the program level where the reference is the common

1 baseline that we put forward.

2 MR. ELSON: And you're not providing reporting of the
3 CPI on the work package level; correct?

4 MR. REINER: We did not propose to provide it on the
5 work package level; that we would do it at the rolled up
6 program level.

7 The success of the project is really measured not just
8 by the success of one bundle. The entire program needs to
9 execute to completion within the parameters that we've
10 identified in order to be successful. We certainly do, in
11 the project management that we've implemented internally,
12 we look at this in granular level of detail, because we're
13 interested in ensuring everything moves along in concert to
14 get to that complete outcome.

15 MR. ELSON: I won't, I guess, continue to engage in a
16 debate about why Environmental Defence wants to look under
17 the hood of the CPI or the cost variance, and so I'll move
18 on. But before I do that, I would like to get a clear
19 answer. I think I know what the answer is, but is OPG
20 willing to report on the unit 2 actual cumulative total
21 costs versus the forecast cumulative total capital cost as
22 set out in JT 1.17 C, including a breakout of contingency
23 amounts, including -- because intervenors such as ourselves
24 would like such a thing and would find it helpful?

25 MR. LYASH: No, we're not prepared to commit to that
26 at this time.

27 MR. ELSON: I'll leave that for now and move on to
28 another area. Just a quick confirmation: OPG has agreed

1 to report the CPI cost variance, SPI, and schedule variance
2 on a quarterly basis. Fair?

3 MR. LYASH: Just to be clear, we've laid out an annual
4 report to the OEB that on cost includes CPI, life to date,
5 forecast to complete, estimated completion, and a similar
6 suite of metrics around the schedule. And we've committed
7 to provide that reporting to the OEB on an annual basis.
8 Of course, if the Panel deems that more often is necessary,
9 that's certainly the OEB's prerogative to ask us to do
10 that.

11 Separately from that -- that's for the purposes of the
12 OEB's role. Separately from that, we will be reporting
13 information in our management disclosure and analysis
14 around costs, schedule, performance, and any material
15 development.

16 We've also committed to provide quarterly public
17 reports, which we will make available on our website, and
18 those will focus around safety, quality, cost, and
19 schedule, including how we are doing on a broad sense on
20 CPI, on SPI, and then we've committed to provide a monthly
21 update on our website around that information as well.

22 That's designed more for public awareness and
23 understanding, distinctly different from the kind of
24 materials we would provide to the OEB to help it discharge
25 its responsibility.

26 MR. ELSON: I had asked this question to Mr. Reiner,
27 and you provided an undertaking, and in the answer to
28 Undertaking JT1.18, my understanding is that OPG had

1 committed to quarterly reporting of the CPI, SPI, cost
2 variance, and schedule variance. That's in the materials
3 at page 10.

4 It seems clear to me, and I just wanted confirmation
5 on the record in this hearing that that's what OPG is
6 agreeing to do.

7 MR. REINER: So what I -- I believe at the Technical
8 Conference what we had committed to, we had discussed the
9 semi-annual public reporting, again, distinctly different
10 from what we proposed for the Ontario Energy Board. We
11 talked about public reports that we previously, up to this
12 point in time, have issued on a semi-annual basis, the most
13 recent of which is posted on our website, and it's the
14 August report.

15 We had committed to providing that on a quarterly
16 basis. That does -- that provides indicators. It does not
17 provide precise numbers. The indicators tend to be
18 qualitative in nature. I mean, you can -- I can't recall
19 if that was actually submitted in evidence, that --

20 MR. KEIZER: It was part of CC's compendium, or
21 provided to us, I think, excerpts from OPG's website.

22 MR. REINER: So it is that August report that's posted
23 on our website, so that report looks at safety, quality,
24 schedule, cost, and provides an indication in terms of
25 status on a bar that ranges from red to green, obviously
26 red being bad, green being good, and shows you where we are
27 on an overall level. It then also breaks that down into
28 project bundles, giving more of a qualitative indicator,

1 and we have committed to providing that report on a
2 quarterly basis.

3 MR. ELSON: Well, I'm very glad I asked that question.

4 Could you look up on the screen, JT1.18, and, at line
5 5, you'll see a description of the undertaking, which is to
6 provide the OPG position on monthly and quarterly reporting
7 of those figures, those figures being the SPI, CPI, cost
8 and schedule variance. And then at the second paragraph,
9 it says:

10 "OPG has considered the request and will issue
11 public reporting on the status of the DRP and
12 specifically on unit 2 safety, quality, cost
13 performance, and schedule performance on a
14 quarterly basis."

15 But this answer is actually saying no. You're saying,
16 "No. We're not agreeing to publish the SPI and CPI on a
17 quarterly basis"? Looks like yes to me, but if your answer
18 is no, that's important for me to know.

19 MR. REINER: That says:

20 "Cost performance and schedule performance and
21 safety and quality."

22 And if you look at that semi-annual report, it does
23 provide an indication of cost and schedule performance. It
24 does not provide a CPI, which is a specific metric, or an
25 SPI, which is a specific metric, and I believe this
26 response also doesn't reference SPI or CPI as a specific
27 metric. It talks about cost performance and schedule
28 performance.

1 MR. ELSON: So, just to clarify, in response to
2 Environmental Defence's request for quarterly reporting of
3 the CPI, SPI, cost variance, and schedule variance, OPG is
4 saying, "No, we do not agree to that"?

5 MR. REINER: Well, we would ask you to look at the
6 August report, which is the one that we have proposed to
7 provide quarterly, and see if that suffices, if that meets
8 your request.

9 MR. ELSON: It doesn't. What we're looking for is the
10 CPI, SPI, cost variance, and schedule variance, which are
11 the specific figures.

12 MR. REINER: We had not -- I mean, we had not
13 contemplated doing that on a quarterly basis. Our proposal
14 still remains as submitted in evidence that we would
15 provide that on an annual basis. As Mr. Lyash said, you
16 know, the Board can choose to do something different in
17 this regard, but our proposal remains with what we have
18 submitted.

19 MR. ELSON: So the answer is to our request no, and
20 I'm asking because I'll have to take up time in submissions
21 to request that the Board address this as part of their
22 order, and I want to be clear that OPG is saying that, no,
23 it does not agree to do this.

24 MR. REINER: That's correct. At this stage, we're not
25 agreeing to provide that level of granularity on a
26 quarterly basis.

27 MR. ELSON: Can you confirm that the SPI and the CPI
28 are calculated internally on a monthly basis?

1 MR. REINER: They are. SPI and CPI are calculated
2 internally on a monthly basis, yes.

3 MR. ELSON: So you'll have the figures, but you don't
4 want to release them?

5 MR. REINER: The question of what is useful to the
6 public for public reporting versus what gets used
7 internally for managing a project -- I mean, SPI and CPI
8 indicators are critical metrics for project managers to see
9 so that they can take appropriate action in managing the
10 project. That's why they exist on an internal basis. They
11 are a project management tool.

12 The question on what the public extracts from that and
13 what sorts of conclusions it draws is a separate question.
14 We do not see that as being a useful metric to provide on a
15 more granular basis than what we've committed to.

16 MR. ELSON: What's the difference between cost
17 performance and the cost performance index?

18 MR. REINER: So cost performance here, in the way
19 we've identified it, is it's more of a qualitative measure,
20 how are we doing overall on budget with the program. A
21 cost performance index is a fairly precise mathematical
22 calculation, and there is a prescribed formula for deriving
23 that, and we can get into details on panel 1B on how that's
24 established and how it's calculated.

25 MR. LYASH: There may be additions that we might be
26 willing to make to the quarterly report if they're really
27 valuable to the public and can be understood. Many of
28 these metrics, SPI and CPIs, these are metrics created for

1 us to manage the project, not the best communication tools
2 for the broad public. They're also useful to the OEB
3 because of the depth of understanding of the Staff and the
4 Panel that can be developed.

5 I just give you an example. A high-level SPI might,
6 without any underlying knowledge from a project management
7 point of view, might indicate that the project is well on
8 track, but if the critical path is behind schedule, the end
9 date may be in jeopardy.

10 Likewise, the SPI might show a value less than one,
11 but until you drill down and understand precisely what it's
12 telling you, you may not realize that it is being driven by
13 non-critical path activities that are behind schedule where
14 a recovery plan exists to return it to one at a future
15 point in time.

16 So what we try -- what we're attempting to do with the
17 public reporting is be transparent and inform the public of
18 the status of the project, but do it in a way that the
19 public can understand.

20 MR. ELSON: Mr. Reiner, is the difference between the
21 schedule performance, as referred to in JT1.17, and the
22 schedule performance index the same as the difference
23 between cost performance and cost performance index, in
24 that cost performance and schedule performance are
25 qualitative, and schedule performance index is a specific
26 quantitative measure with calculations behind it?

27 MR. REINER: Yes, the same holds true for that. It is
28 not -- so, in this August report, the indicator there is

1 not the precise mathematical calculation, because it takes
2 into consideration if there is a variance from plan in
3 something like a cost performance index what has been done
4 to address that and what do we foresee the outcome of that
5 being.

6 So it looks at more than just the precise mathematical
7 calculation. So, yes, the same holds true for the
8 scheduled performance and the cost performance.

9 MR. ELSON: Thank you.

10 A few more questions on a different topic, and I
11 apologize, Madam Chair. I'm going beyond my re-estimated
12 time. I've had some unexpected answers, specifically about
13 the decision to proceed with unit 3 and potential off
14 ramps.

15 I understand that OPG would be seeking approval to
16 proceed with unit 3 from its own board of directors roughly
17 three to six months before starting with that unit?

18 MR. LYASH: Nominally, that's accurate, yes.

19 MR. ELSON: But you haven't put forward -- OPG hasn't
20 put forward a process or timeline to seek approval from the
21 government before proceeding with Unit 3; right?

22 MR. LYASH: The government's expectation, I think
23 that's for the government to set. But my understanding is
24 that we would, in the same time frame, at that three- to
25 six-month period, we would proceed to our board to gain
26 approval to proceed, and that would be precedent to going
27 to the Province and requesting confirmation from the
28 Province that they have no issue with proceeding.

1 MR. ELSON: First, you'd go to the Board roughly three
2 to six months before, and, after that, you'll seek approval
3 from the Province?

4 MR. LYASH: That's the process we used for unit 2, and
5 I would expect to follow the same process for the
6 subsequent units.

7 MR. ELSON: But Energy Board approval is not required
8 before proceeding with unit 3, because that would be the
9 next test period for the next application; right?

10 MR. LYASH: Correct.

11 MR. ELSON: And you're seeking approval in this case
12 for rates up to December 31, 2021?

13 MR. LYASH: Yes.

14 MR. ELSON: And the plan is to start the unit 3
15 refurbishment roughly in February 2020?

16 MR. LYASH: Correct.

17 MR. ELSON: If it's ahead of schedule for unit 2, you
18 might start early, or if it's behind schedule, you might
19 start a bit later?

20 MR. LYASH: Correct.

21 MR. ELSON: So in your next payment amount
22 application, you'll be roughly two years into the unit 3
23 refurbishment?

24 MR. LYASH: Depending on when unit 2 concludes and
25 unit 3 begins.

26 MR. ELSON: But it's roughly about two years in. Is
27 OPG willing to commit to seek energy approval for the
28 budget for unit 3 before proceeding with unit 3, in the

1 event that unit 2 is going over budget?

2 MR. KEIZER: Madam Chair, I don't know what this has
3 to do with the application that's currently before you. My
4 friend's questions all relate to unit 3, which is not
5 something for consideration nor part of the application.
6 This application relates only to unit 2.

7 MS. LONG: Mr. Elson?

8 MR. ELSON: It relates to off-ramps in the event that
9 there is a situation of there being -- unit 2 being over
10 budget and whether, as part of that process, there will be
11 any Board involvement or OPG would agree to Board
12 involvement to look at those costs.

13 I also think it's relevant that unit 3 costs, by
14 virtue of this application, will be largely spent before
15 the next application, and that might be something that the
16 Board is interested to hear something about.

17 MS. LONG: Do you think this is the right panel to
18 answer that question?

19 MR. ELSON: It seemed to be to be a high-level
20 question relating to off-ramps and relating to the position
21 of a company on whether it will be coming to the Board to
22 confirm that it's on the right track in the event it's off
23 the rails with unit 2 before it proceeds with Unit 3.

24 MS. LONG: I can understand why you might want to ask
25 Mr. Lyash this question from a general oversight viewpoint,
26 but I'm wondering if the whole regulatory panel dealing
27 with applications and considerations is perhaps the better
28 panel. I know Mr. Keizer may say he objects to the

1 question even at that point, but I'm not sure that this is
2 the right panel to be talking about those issues.

3 MR. ELSON: Perhaps --

4 MS. LONG: Maybe conceptually you can ask the
5 question. But with respect to next fees case applications,
6 I'm not sure that this is the right panel for it.

7 MR. ELSON: I don't have a technical question about
8 the regulatory framework. I think everyone is in agreement
9 and understands that, in this proceeding, there is not
10 being sought approval for unit 3 costs; that won't happen
11 until the next proceeding. My question is whether OPG
12 would be willing to come back to the Board, if unit 2 is
13 off the rails, before proceeding with unit 3 to see if the
14 Board has something to say about how it does unit 3 or how
15 it will approve costs for unit 3, seeing as unit 2 is off
16 the rails.

17 Perhaps it could be --

18 MS. LONG: So you're saying off the rails, though. Is
19 that off-ramp exercised? Is that over budget by X? I
20 don't know how they can answer that question.

21 MR. ELSON: The question is just over budget, so
22 beyond the P90. And if this panel wants to take away,
23 think about it, and provide an undertaking, that may be the
24 best way. But these are the high-level witnesses, and I
25 think they'd be the best place to answer that question as
26 to whether --

27 MR. KEIZER: My view, Madam Chair, is that it's a
28 hypothetical question for which I think today the OPG can't

1 necessarily give an answer to. It's been clear on the
2 record OPG has said in the event there is some kind of an
3 off-ramp, there is an entire process that gets affected
4 through the Province, through itself, and ultimately what
5 would be the next stages with respect to that, and that is
6 only going to play out relative to the circumstances that
7 arise at that time.

8 And with respect to a degree of cost changes or
9 implications and how it could affect unit 3 or not, there
10 could be a myriad of issues that could require OPG to take
11 certain actions which I think are predicted today, nor can
12 you state, based on that potentiality, which hasn't really
13 been accessed or evaluated in evidence here as to what OPG
14 would or wouldn't do. Notwithstanding that, it is
15 something that's outside the test period with respect to
16 any kind of rate impact for rate consumers, and certainly
17 OPG bears the risk of cost until such time as there is
18 otherwise a determination.

19 I just don't see how it's relevant to unit 2 or the
20 request that's currently before the Board.

21 MR. ELSON: I don't have anything to add in terms of
22 the relevance. I think it's relevant both to the off-
23 ramps, and I also think that this Board will want to know
24 about the regulatory process for multi-billions of dollars
25 that will be spent in the test period. It's not coming in-
26 service, but it's going to happen, and we're not going to
27 be able to turn back the clock on that.

28 MS. LONG: I have both your positions, and I'm not

1 going to order them to answer it. And I think to the
2 extent the panel has any questions, we will ask them of
3 another panel.

4 MR. ELSON: Thank you. I will just ask one more
5 question for confirmation, which is that unit 3 costs, if
6 incurred, will be either recovered through rates or the
7 responsibility of the shareholder, which is the taxpayers.
8 Is that fair to say?

9 MR. LYASH: Yes.

10 MR. ELSON: Thank you. I have no further questions.

11 MS. LONG: Thank you, Mr. Elson.

12 I have changed my mind, and we are going to take a
13 break now for 15 minutes. We will come back. The Panel
14 will ask our questions. Mr. Keizer, if you have any
15 redirect, you can do it then. And then we'll take a five-
16 minute break to switch out the panel. Thank you.

17 --- Recess taken at 3:37 p.m.

18 --- On resuming at 3:55 p.m.

19 MS. LONG: Panel, the Panel has some questions, and
20 we're going to start with Member Fry.

21 **QUESTIONS BY THE BOARD:**

22 MS. FRY: Good afternoon, gentlemen. Can you hear me
23 okay?

24 MR. LYASH: Yes.

25 MR. REINER: Yes.

26 MS. FRY: All right. Okay. So I want to ask a few
27 questions to get a better feel for how your management
28 oversight processes are working. You have, obviously, a

1 number of different processes, and I just want to get a bit
2 of a better feel for how they work on the ground.

3 So starting with you, Mr. Lyash, so obviously you
4 have, obviously, overall responsibility for oversight of
5 the project, and you have a management team to assist you,
6 but I'm just wondering, in terms of all these oversight
7 mechanisms, which are the ones that you would generally get
8 involved in personally.

9 MR. LYASH: Yes. So if I kind of start at the highest
10 level and work my way down, of course, the shareholder has
11 some oversight, and we meet with the shareholder monthly,
12 discuss the progress of the project, and answer questions
13 for the shareholder.

14 Their representative, Milt Kaplan, who sits on the DRC
15 on their behalf, spends time not only with the DRC but over
16 the course of the -- between DRC meetings and looking
17 independently at issues, and I interface with him when he
18 has questions and answers as well to make sure he is
19 getting full access.

20 If I roll to the board, of course, I'm at each DRC
21 meeting, on-site, off-site, and of the full board meeting,
22 as -- serving as both an executive and as a director of the
23 company in that regard.

24 If I move down a step now from the board into the
25 executive team's oversight, I have a role in oversight, so
26 I -- and to discharge that, I've set up the RCRB, which
27 we've talked about. I talk to them when they're on-site.
28 I attend their debriefings. It's not uncommon for me to

1 discuss particular issues with them between reviews,
2 because they're reviewing materials when they're not on-
3 site, and so I have direct contact with the RCRB.

4 I also have very direct contact with the Nuclear
5 Safety Review Board, which is similar to the RCRB, but
6 their focus rather than just on unit 2 is on to what extent
7 is the unit 2 evolution affecting the operating units and
8 nuclear safety. And I deal with them similar to the RCRB.

9 Internal audit. Internal audit lays out an audit
10 plan. I have an opportunity to comment on that audit plan.
11 If I think there are particular areas that should be on the
12 audit plan with respect to refurb to be probed, I have the
13 opportunity to provide that input, and I'm debriefed on
14 each of the internal audit results on refurbishment, and I
15 would typically review the corrective action plans with Mr.
16 Reiner to close any gaps identified by the audit.

17 MS. FRY: Okay. I was going to ask you about those,
18 because I do remember reading several internal audit
19 reports with a number of recommendations, so you personally
20 follow up on those?

21 MR. LYASH: Yes, I do.

22 MS. FRY: Okay.

23 MR. LYASH: I do. And I follow up on those personally
24 as part of my management responsibility, and then I'm
25 engaged in discussion with the audit and risk committee of
26 the board, to whom audit has a direct line of reporting.

27 Okay? Moving down into engagement, on a day-to-day
28 basis, I chair a quarterly senior leadership team review of

1 the project, at which time Mr. Reiner and his team go
2 through the last quarter's worth of performance, the next
3 quarter's worth of plan, and we go over any gaps in that.
4 That's on a quarterly basis.

5 I also attend the quarterly meetings that we hold with
6 each of the major contractors, where I sit with their CEOs
7 and their leadership team and our project leadership team
8 and review their execution of their scope of work and where
9 their issues are, if they have recovery plans in place, how
10 they're proceeding on the plans, so another level of direct
11 contact with the CEOs of the major contracting firms.

12 There are also a series of -- when we go to Mr. Reiner
13 -- that his management system implements, whether they are
14 individual project reviews, weekly or monthly schedule
15 reviews, cost performance reviews, quality or safety
16 reviews, and I attend a sample of those, and my purpose for
17 attending those is to judge whether the process is working
18 effectively: Is this the right standard? Are they asking
19 the right questions? Do I see the right level of follow-
20 up? So, to do that, I generally spend about one day a week
21 on-site at Darlington exercising that sort of oversight
22 activity.

23 MS. FRY: Thank you. That's helpful.

24 Mr. Reiner, from your perspective.

25 MR. REINER: Yes. And I'll just add to Mr. Lyash, so
26 Mr. Lyash and I are in regular contact, so --

27 MS. FRY: I'm sure you are.

28 MR. REINER: -- we talk probably on a daily basis, and

1 we also have a weekly executive leadership team meeting
2 where, at that meeting, the entire executive leadership
3 team reports out on the significant issues or strategic
4 issues for the team, so that's another area where I have an
5 opportunity to report on status, some particular issue if
6 there's a concern, if we're seeing something in terms of
7 either a contractor's performance or safety performance or
8 something of that nature.

9 If you go down into the project level, so I have a set
10 of direct reports that are per the organization chart that
11 we've shown. I have a direct reports meeting. That tends
12 to deal with the more strategic issues that cut across all
13 of the project work. And then we also have in place
14 essentially a standing calendar, and it's important on a
15 project to have that so everybody knows what gets reviewed
16 on what day, and it's the same each week.

17 There are meetings with contractors specifically on
18 their projects. There are roll-up meetings at project
19 bundle level that include contractor and OPG performance
20 rolled up at the bundle level. There are project status
21 meetings where weekly we go through the performance
22 metrics, any issues.

23 We run a risk oversight committee, and that risk
24 oversight committee does a forward look on what's ahead of
25 us in terms of significant risks, given where we're at in
26 execution, and have we got mitigation plans in place. And
27 that's a formal process and a subset of that risk oversight
28 committee. If there is a significant item that we

1 identify, then we will get into our calendars a specific
2 discussion around how that issue gets dealt with.

3 In regards to some of the oversight agencies, the
4 Minister's oversight adviser has free and unfettered access
5 to the site, so he will attend meetings and can attend any
6 meetings that he chooses, also has access to information,
7 so there is a physical presence on-site.

8 Same goes for, obviously, the Refurbishment
9 Construction Review Board. They are on-site physically
10 looking at work being executed in the field, looking at
11 metrics packages, and just sort of aligning what the
12 reporting is telling us with what they're seeing in
13 performance and in general sort of behaviours.

14 I also have in my organization a separate project
15 assurance group, and that project assurance group is really
16 that first level of defence where we look at our -- is the
17 execution of the work being done in accordance with the
18 processes and systems that we have put in place, and it's
19 important to have some separation between an execution
20 organization and that kind of assurance group.

21 So we take a look and see are the contracts being
22 executed in accordance to what the provisions tell us. Are
23 any contractual events logged and properly dispositioned?
24 So all of that is run through a separate assurance group.

25 And as part of the project controls function, which is
26 also separate, there are a variety of regular reports, and
27 they range from updates that are done each shift that we
28 work to each day to weekly to monthly. So it's a very

1 granular set of updates that work sort of up the
2 organization.

3 MS. FRY: Thank you. Those are my questions.

4 MS. LONG: I just want to go back to a discussion that
5 you had with Mr. Mondrow today where you stated that the
6 P90 factor was based on the four units. But I guess that
7 leaves me with the unit 2 that we're being asked to
8 consider, and I understand the contingency being about 40
9 percent of what you've budgeted.

10 But does that have a P factor as well? It's not a P90
11 factor. That's for the four units. But where does that
12 leave us for unit 2 which we're considering?

13 MR. LYASH: Perhaps Mr. Reiner can amplify this. In
14 establishing the contingency and the risk metrics for the
15 project, you really need to consider the nature of the
16 project. For that reason, because this is a program
17 spanning four units, the units overlap; at least three of
18 the units overlap. Unit 2 contains common systems and work
19 that affects all four units.

20 The way that the contingency was established, the risk
21 assessment and contingency when we talk about P90 level and
22 all this Monte Carlo, that was done for the program, for
23 the whole four units.

24 MS. LONG: Understood. Is it fair, Mr. Lyash, to say
25 you can break it up per unit?

26 MR. LYASH: We didn't do that. We did not do that --

27 MS. LONG: Okay.

28 MR. LYASH: -- because of the interrelationships, but

1 what we did then was take a look at the four-unit
2 contingency and look at the scopes that were being executed
3 on each of the units which are slightly different and
4 allocate the contingency among the four. We also looked at
5 unit 2 and allocated additional contingency to it because
6 it is the first time through.

7 So the first execution, no matter how well we've
8 planned, will identify issues that will need to be dealt
9 with, with respect to contingency cost and schedule
10 contingency. But my expectation, then, would be we take
11 that emergent issue and mitigate it for the subsequent
12 three units, and by doing that, we need a lower level of
13 contingency as you work through the project.

14 That allocation among the units wasn't driven by unit-
15 specific Monte Carlo analysis. It took the program
16 problematic analysis and then applied our knowledge of
17 scope and first-of-a-kind factor in weighting how much
18 contingency we would need on unit 2.

19 MR. LYASH: And I think that's exactly right. In the
20 simplest way, you could have just divided by four. So
21 rather than dividing by four, it is these kinds of
22 adjustments where we look at -- there are some scope
23 differences, and they've been factored into the allocation
24 of contingency and the fact that unit 2 is the first unit
25 through and, therefore, would carry a higher level of risk
26 associated with our ability to mitigate issues as they
27 arise, we put a heavier weighting on the allocation of
28 contingency on the first unit.

1 But the second unit has a new element of scope that we
2 spoke of earlier related to the turbine generator, that all
3 the experience and industry suggests that return-to-service
4 time can be significantly extended as a result of bringing
5 that system online. We factored that into the second unit,
6 so it carries heavier weighting and contingency, and then
7 you see sort of a following in the allocation.

8 MS. LONG: Thank you.

9 Mr. Janigan took you through a number of expert --
10 well, reports that you filed to demonstrate reasonableness,
11 and those reports deal with governance. They deal with
12 methodology. They deal with process. But is there
13 anywhere in the evidence where you filed a report or
14 commentary on any independent assessment of the actual
15 costs of this project, be it the 12.8 or the 4.8 billion?
16 Is there anybody who took a sober second thought at that
17 and said, "Yes, 4.8 is reasonable; 12.8 is reasonable"?
18 Not how you did it, not the methodology, not the risks that
19 you identified, but the actual numbers?

20 MR. REINER: What we did not embark on in this -- if
21 you look at just the time it took to plan this project, to
22 get from when we -- from the start of definition phase, so
23 January 2010 to being ready to begin execution on the first
24 unit, the complexity and effort associated with building up
25 the estimates, we deemed it virtually impossible for an
26 independent body to derive an estimate completely separate.

27 So the approach we took -- now, in the previous
28 hearing, I believe we may have filed a report that

1 specifically looked at scope of the turbine generator
2 project. That's a fairly standard type of an overhaul that
3 we're doing, and we did get a technical agency to just have
4 a look at the scope associated with the work that we're
5 executing in line with what others do in that. And we got
6 a technical report on that which informed our estimate.

7 But the process we took internally to ensure we have
8 the right checks and balances in place, estimating was done
9 by people independent from projects, for example. We
10 brought in expertise to help us with estimating that have
11 the ability to look at a scope of work and quantify an
12 estimate. And because of the complexity, it took us over a
13 year to get the Class 2 estimate compiled for just the RFR
14 project, and the effort that went into the option we took
15 is bring in experts to have a look at the approach we took,
16 the method we used, do some sampling to see if that
17 methodology was followed. Would it result in a reasonable
18 outcome in terms of the project estimate? That's what we
19 opted to do.

20 We just did not see it feasible to have somebody
21 completely independent come back to us with an estimate for
22 executing the refurbishment and then trying to do a side-
23 by-side comparison.

24 MR. LYASH: The other body of information that the
25 team used to help make sure the estimate is reasonable --
26 there's a lot of history. So, in other words, if you begin
27 to parse this into its pieces, there are activities that
28 are going to be executed in the station in refurb that have

1 been executed before. So there are historical actuals on
2 how long it takes to rebuild a valve, how long it takes to
3 open a turbine generator. So in building up the estimate,
4 the estimators relied on also looking at actual durations
5 historically at the station or in industry and making sure
6 their estimate was reasonable.

7 If you look at the RFR, the heart of that is the
8 removal of the feeders, the pressure tubes, the Calandria
9 tubes, and their reinstallation. And in building the full-
10 scale mock-up and testing and proving out the tools, that
11 helps form the basis for what are the productivity numbers
12 we can reasonably expect out of that tooling and that
13 environment.

14 So you start with an estimate, but then rationalize it
15 to what you have seen on the mock-up with the individuals
16 running the processes and the tools to benchmark the
17 productivity that's applied to that very large job.

18 MS. LONG: Thank you. My final question is one of the
19 things that you talked about. I think, Mr. Lyash, you
20 talked about, in us setting the revenue requirement, we
21 would implicitly be agreeing with the reasonableness of the
22 contracts that you have in place. I just want to clarify
23 that you're taking that position with respect to what we
24 are being asked to consider in this time period. So, for
25 unit 2, because, as I understand it in my read of the
26 contracts, you have the ability to terminate the contracts
27 if, let's say, lessons learned tell you that you should be
28 doing something else via contracting. I just want to be

1 sure that you're not taking the position that by us
2 implicitly agreeing, if we do, that the contract is
3 reasonable for what you should be doing with unit 2, that
4 we would be binding a future panel by saying we thought the
5 contracting strategy for all units was reasonable.

6 I just want to make sure we're clear on that. What
7 we're being asked is for this five years for this unit 2.
8 That's what you're deeming we should be looking at with
9 respect to reasonableness.

10 MR. LYASH: Yes, I agree. I didn't mean to imply that
11 you were endorsing a contracting strategy, nor that you
12 were endorsing our plan for future units. What we're
13 putting before you now is unit 2 and \$4.8 billion, and the
14 process we've taken to establish that as the set of
15 objectives. Nothing more.

16 MS. LONG: Thank you. Those are the Panel's
17 questions. Mr. Lyash, thank you very much for your
18 evidence.

19 MR. KEIZER: Just for the record, we have no redirect.

20 MS. LONG: No redirect. Mr. Reiner, you'll be on the
21 next panel, so I won't thank you now. Shall we --

22 MR. DEROSE: Madam Chair, I do realize and I
23 appreciate that Board Staff has tried to accommodate me
24 today. I'm more than happy to go today, if your timing
25 still works. But I just want to throw it out there that if
26 -- I don't want to put the Panel out just to try and fit me
27 in today. I can have one of my colleagues here on Thursday
28 to ask my questions, or I can go right now. I just -- I'm

1 in your hands.

2 MS. LONG: I appreciate that. How long do you think
3 your direct is going to be, Mr. Keizer?

4 MR. KEIZER: I would think it's probably no more than
5 five minutes.

6 MS. LONG: I mean, I think, given that, you know,
7 you're here and we would like you to continue, we'll go
8 ahead.

9 MR. DEROSE: It will be in camera. I believe --

10 MS. LONG: Yeah.

11 MR. DEROSE: -- Board staff has told you that, so --

12 MS. LONG: Yes, they have.

13 So, Mr. Keizer, if you can get your next panel up.

14 MR. KEIZER: I would ask Mr. Gary Rose and Mr. Leo
15 Saagi come forward to be affirmed.

16 Madam Chair, the two new members have joined the
17 panel, and just by way of introduction before they are
18 affirmed, closest to me is Mr. Leo Saagi. Next to him is
19 Mr. Reiner, obviously, who has been affirmed and is
20 continuing to testify, and next to Mr. Reiner is Mr. Gary
21 Rose. If they could be affirmed.

22 MS. LONG: Thank you.

23 **ONTARIO POWER GENERATION - PANEL 1B**

24 **Mr. L. Saagi,**

25 **Mr. G. Rose, Affirmed;**

26 **Mr. D. Reiner; Previously Affirmed.**

27 **EXAMINATION-IN-CHIEF BY MR. KEIZER:**

28 MR. KEIZER: Starting first with you, Mr. Rose, you

1 are vice-president, planning and project controls, nuclear
2 projects?

3 MR. ROSE: That's correct.

4 MR. KEIZER: You've held various positions at Ontario
5 Power Generation and, prior to that, Ontario Hydro?

6 MR. ROSE: That is correct.

7 MR. KEIZER: And could you very briefly describe your
8 role in the Darlington refurbishment program?

9 MR. ROSE: Certainly. I've been involved in
10 Darlington refurbishment program since 2008. I was
11 involved in the original development of the feasibility
12 business case and the planning that has happened through
13 the definition phase and ultimately the release quality
14 estimate.

15 Specifically, my role is project planning and project
16 controls, so I ultimately own the procedures for cost
17 management, scheduling, risk management, issues management,
18 et cetera. I lead and manage the preparation of the
19 release quality estimate on behalf of the team, and I was
20 the leader. It involved many hundreds of people in it over
21 the years, but that is my responsibility.

22 MR. KEIZER: And, Mr. Saagi, you are director,
23 controllership, nuclear projects. Is that correct?

24 MR. SAAGI: That's correct.

25 MR. KEIZER: And over your career, you've held various
26 positions at both Ontario Power Generation and, prior to
27 that, Ontario Hydro?

28 MR. SAAGI: Correct.

1 MR. KEIZER: And could you briefly describe your role
2 in the Darlington refurbishment program?

3 MR. SAAGI: Okay. I've been with the project since
4 the end of 2009. I'm currently the director of
5 controllership for nuclear projects. I oversee a team, a
6 dedicated controllership team, for the Darlington nuclear
7 refurbishment project where we help facilitate and maintain
8 the general ledger of the project and ensuring there's
9 financial controls in place as well as overall framework of
10 financial controls.

11 MR. KEIZER: Thank you.

12 And, Mr. Rose, do you adopt the evidence that has been
13 assigned to panel 1B as detailed in Exhibit A1, tab 9,
14 schedule 1, which is the exhibit establishing the panel
15 responsibility that OPG has filed in this proceeding?

16 MR. ROSE: Yes, I do.

17 MR. KEIZER: And you, Mr. Saagi, do you adopt the
18 evidence that's been assigned to panel 1B as detailed in
19 Exhibit A1, tab 9, Schedule 1, which is the exhibit that
20 has been filed with panel responsibilities by OPG in this
21 proceeding?

22 MR. SAAGI: Yes, I do.

23 MR. KEIZER: And I just have one other question in
24 direct, Madam Chair, and that relates to something that
25 arose in discussions with panel 1A, and it relates
26 particularly to, if I can have it brought up on the screen,
27 Exhibit L6.6, SEC 003, attachment 4, and it's before you
28 now, and I believe this is probably a question for you, Mr.

1 Reiner.

2 And so, during the hearing related to the examination
3 of panel 1A, we heard various questions and answers about
4 executive compensation incentives relative to the
5 Darlington refurbishment program, and it's my understanding
6 that information relating to that is found within this
7 exhibit that's on the screen here.

8 And could I ask you, given the current scheduling,
9 just to very briefly highlight some of the elements within
10 the schedule to show the nature of the incentives and how
11 they relate to the Darlington refurbishment program?

12 MR. REINER: Yes. So this is the OPG 2016 corporate
13 scorecard and weighs directly into incentive compensation.
14 And there are -- there are four measures in total, but I'll
15 start with three specific measures that touch on
16 refurbishment. And they show up right underneath the green
17 line that has the 40 percent in it on the left-hand side.

18 So the first is refurbishment project cost, and what
19 that looks at is the budget that has been established for
20 the project. In 2016, we were operating under a budget
21 that was not yet for execution of unit 2. That was what we
22 called the mobilization phase and was an annual budget that
23 was released by our board.

24 So to achieve threshold, that 100 percent aligns with
25 what we've called a 90 percent confidence budget, so that
26 budget had some contingency associated with it. So we have
27 to at least achieve at least P90. If we are outside of
28 P90, there would be a zero for this particular measure.

1 And then it looks at -- it's then a graded approach. If we
2 can execute the work at a 5 percent cost reduction relative
3 to what was budgeted, we would achieve the maximum on this.
4 Where we landed in 2016 was at around target for this
5 particular measure.

6 The second measure on here relates to defuelling of
7 the reactors. Towards the end of 2016, we were already in
8 the defuelling phase. And the metrics that you see on here
9 for threshold -- so this takes a look at, on December 31st,
10 where is the project on critical path. Defuelling was the
11 critical-path activity, and to achieve threshold in
12 accordance with the P90 schedule, we would have achieved
13 212 fuel channels defuelled in accordance with the working
14 schedule. That doesn't have any of the contingency
15 allocated to it. We would have achieved 311 channels
16 defuelled. In this particular case, we did actually
17 achieve the stretch target because we were running well
18 ahead on defuelled. Defuelled performance was quite good.

19 The third measure relates to the safety improvement
20 projects and the D20 storage project, and what is in there
21 are milestone dates, again, that were selected in
22 accordance with the in-service dates that were in place for
23 those projects. For this particular measure, all three of
24 the projects needed to meet their in-service dates in order
25 for this to be recognized. We did not -- we achieved a
26 zero on this. We did not achieve the in-service targets,
27 and that was primarily related to two of the projects, EPG3
28 and containment filter venting, going beyond their in-

1 service date.

2 There is also an element of refurbishment in the very
3 first measure on safety performance, so that is a corporate
4 safety indicator. And the refurbishment performance gets
5 rolled up into that corporate safety indicator.

6 MR. KEIZER: Thank you, Mr. Reiner.

7 Madam Chair, those are the questions I have in direct,
8 so the panel is available for cross-examination.

9 MS. LONG: Thank you.

10 MR. KEIZER: If I may, just before we go to CME, just,
11 at the end of the proceeding, if I have a moment just to
12 deal with one preliminary matter, just to advise you on an
13 undertaking, just...

14 MS. LONG: Okay. We are going to go in camera now, so
15 if you have not signed the declaration and undertaking and
16 if you are not an employee of OPG and if you are not Board
17 Staff and you are not the panel, then you need to leave the
18 room. And we are going to go off air.

19 --- On commencing in camera at 4:27 p.m.

20 MS. LONG: Mr. DeRose?

21 **CROSS-EXAMINATION BY MR. DEROSE:**

22 MR. DeROSE: Thank you, Madam Chair. I would like to
23 start by pulling up J1.3 and for the Panel's benefit. I'm
24 only going to be referring to a few documents. I've given
25 my friends the references, so they should be prepared for
26 them.

27 Attachment number 1, please. You will see that this
28 is the RCRB report dated November 29 through December 2.

1 If I can start, panel, am I right to assume that the
2 members of this panel, or at least one of you, would either
3 be given a copy of this report, or otherwise be made aware
4 of the findings and recommendations out of this report?

5 MR. REINER: Yes. There is -- as part of the
6 Refurbishment Construction Review Board process, there is
7 an exit meeting that occurs, and the subject of what is in
8 this report gets discussed with the refurbishment team. So
9 Mr. Rose and myself would normally take part in that, and
10 I've been a participant in each of these. I'm not sure if
11 Mr. Rose was, because if there isn't a project controls
12 element that gets discussed, he may not be involved. And
13 then the report is issued shortly after the exit meeting.

14 MR. DeROSE: Okay. And I take it from the
15 conversation the last couple days that these reports are
16 seen as important documents. These are documents that you
17 internally would take the recommendations quite seriously?

18 MR. REINER: We would look at every recommendation.
19 Now, we might not implement every recommendation. I want
20 to be clear that we would not necessarily implement
21 everything that the review board would tell us. And that's
22 the purpose of having an exit meeting, because it gives an
23 opportunity for the Refurbishment Construction Review Board
24 to articulate what they observed and gives management an
25 opportunity to either put context around it or identify why
26 certain things are being done by management. And, in that
27 dialogue, we would agree on what actions are appropriate to
28 take. And if we disagree with a particular recommendation,

1 we would also disposition them.

2 We also -- just to add to this, we also take every
3 observation and recommendation, and we log it internally.
4 We have a register where all of these are kept, and this
5 goes for every piece of oversight and audit that gets
6 executed, and there are actions associated with each.

7 In the case, for example, as I gave you where we would
8 say we're not going to change anything as a result of this,
9 we recognize the observation, but no change. That is all
10 logged, and there are dates and timelines associated with
11 actions being implemented.

12 MR. DeROSE: Thank you. Let's focus on the reports at
13 the moment, and we won't go into the complete data logs.

14 If I can have you turn to page 10 of 11, and I'm
15 starting at the back of the document because, at this page,
16 there is an appendix which summarizes -- first of all, do
17 you agree with me this is a summary of recommendations from
18 an earlier report, from the July 18 to 22 report?

19 MR. REINER: Yes, that's correct.

20 MR. DeROSE: Okay. If I can take you down to
21 recommendation number 3, you'll see in, the first two
22 sentences, it says:

23 "While the project does have a large number of
24 metrics, they do not consistently provide an
25 integrated picture of project health. The
26 metrics identify project performance, but do not
27 adequately portray the integrated project
28 execution status."

1 Stopping there, did you agree with that finding?

2 MR. ROSE: We did agree with the finding, but let me
3 elaborate on the discussions that were held. It refers to
4 a pyramidal system of metric, so the opinion of the RCRB,
5 we had a very good reporting for our board of directors, as
6 an example. We had a very good reporting of a program as a
7 whole. But what they wanted to see is how the engineering
8 department, as an example, fit into the reporting that was
9 taken to our board. So that's where they were going from a
10 pyramidal perspective: How does the lowest-level metrics,
11 from a day-to-day perspective, roll up to the top level
12 metrics?

13 They do state they have lots of metrics, and it wasn't
14 with a matter of needing more metrics. It was just a
15 matter, sure, that you could drill from the top right down
16 to the bottom or from the bottom right to the top and see
17 that flow of information.

18 MR. DeROSE: Thank you for that. And the pyramidal
19 system, do you now have that in place?

20 MR. ROSE: We do not. We have a plan in place that
21 was reviewed with the RCRB at their most recent meeting; we
22 left that plan with them. We're in the process of working
23 on that.

24 Our focus over the past three months was on making
25 sure we had the appropriate project metrics in place to
26 measure, on a weekly basis, the performance of our vendors
27 who were executing work in the field. We felt that was the
28 most important focus for the project team at this point in

1 time.

2 The RCRB members, in their February report, commented
3 on how things -- on some of the improvements we've done in
4 that area positively. We committed to them that we were
5 working on the pyramidal metrics, and it was something that
6 we will be completing over the next quarter.

7 MR. DeROSE: Thank you for that.

8 And the very last sentence in that recommendation
9 number 3 says:

10 "In this report, the recommendation specifically
11 targets a particular focus area for the project
12 to address."

13 I have to tell you I didn't understand what that
14 sentence meant. Was there a particular focus area that was
15 discussed, or can you give us any explanation of what's
16 being referenced there?

17 MR. ROSE: My recollection, as I've already said, is
18 how does a department level metrics flow from the lowest
19 level right through so there's visibility at the highest
20 level. The other thing I would say, recollecting back on
21 this exit meeting, was they wanted to make sure that the
22 folks in the field understood clearly where the project was
23 at in plain language. So we actually put in daily metrics
24 and issued a daily report on where the status was, where
25 the project was at so everybody across the project had a
26 clearly understanding of that.

27 Those were a couple of specific discussions at those
28 meetings.

1 MR. DeROSE: Okay. If I can now take you to page 3 of
2 11, so now we're moving from July to the November 29 to
3 December 2 period.

4 Under the heading "Work Execution," first of all, the
5 RCRB recognized the ability to execute the baseline
6 schedule is a key issue that the project must address.
7 Stopping there, I take it that the panel agrees that is a
8 key issue?

9 MR. REINER: Yes.

10 MR. DeROSE: Okay. And then in the -- the RCRB then
11 identifies a number of metrics which, to put it the way
12 they do, show the required volume of work is not getting
13 executed. So the first bullet:

14 "Work week T-0 activity schedule completions are
15 approximately 53 percent with a downward trend
16 since breaker open."

17 Am I right that 53 percent is not a good metric in
18 that particular circumstance; that's not something that you
19 want to see?

20 MR. REINER: That's correct. So this is clearly an
21 area of concern, and we recognize this and have taken a
22 number of actions now.

23 And what this really sort of speaks to is -- T0 would
24 be the day of execution, and then where there is a
25 reference to T minus 2, that is from two weeks ahead of
26 execution, getting to the day of execution how much work
27 actually stays on the schedule to be ready for execution.
28 So this is an indicator of the readiness to get work

1 executed in the field, so clearly not where it needs to be.

2 MR. DEROSE: So does that mean that, in the second
3 bullet where it says the activity work survival between T
4 minus 2, T minus 0 is approximately 50 percent, that --

5 MR. REINER: Yes.

6 MR. DEROSE: -- that you're literally hitting about 50
7 percent of what you're --

8 MR. REINER: Yes, yes.

9 MR. DEROSE: -- aiming to achieve?

10 MR. REINER: Exactly. That's what they observed here.

11 Now, what I will tell you, there is -- so that has the
12 potential of having a productivity impact and a schedule
13 impact. This includes all work, not just critical path,
14 but everything that is happening in parallel with critical
15 path and with work related to prerequisites for unit 2, so
16 it's all work that is taking place at the site.

17 When you -- the compensating action that sort of
18 management takes to address this issue is to ensure that
19 there is other work available for resources to execute to
20 maintain productivity levels at a high rate, but the
21 schedule adherence is a concern, and that's -- and is
22 clearly an area that we are focused on correcting.

23 MR. DEROSE: And, again, I'm sorry if I simplify
24 things, because I'm a lawyer, not an engineer, but when I
25 look at the 50 percent or 50 to 55 percent, does that mean
26 -- I mean, does it mean that, if you don't fix it, that
27 you're going to take -- basically your timeline is going to
28 be double?

1 MR. REINER: No, it doesn't equate exactly --

2 MR. DEROSE: Okay.

3 MR. REINER: -- exactly that way, but what it does say
4 is, if you don't fix this, this does have the potential to
5 impact critical path --

6 MR. DEROSE: Okay.

7 MR. REINER: -- and then impact your schedule. So it
8 is one of the indicators that we use to ensure that
9 schedule performance is where it needs to be.

10 MR. DEROSE: Okay. And then, below, if we go into the
11 paragraph, the second sentence, the RCRB observed again,
12 quote, that:

13 "Little effort is devoted to determining why
14 schedule adherence is low, for example, why the
15 work was not ready to execute."

16 Did you agree with that observation?

17 MR. REINER: Not entirely, and that's where we would
18 have a potential difference of opinion, but in terms of the
19 significance of the finding, it isn't really relevant,
20 because we recognize the issue here.

21 MR. DEROSE: Okay.

22 MR. REINER: There is a significant amount of effort,
23 and this was an area that we asked the RCRB in their
24 February visit to come back and have a look, and we
25 identified for them specific actions that we're taking to
26 address this, and we asked them, "Have a look and see if
27 you're seeing an improvement as a result of these actions
28 and give us your finding."

1 MR. DEROSE: I'll take you there in a moment because I
2 -- we'll get to there in just one second.

3 And the last question on work execution is right at
4 the bottom of that paragraph. The RCRB states as follows,
5 that:

6 "Both schedule and metric review meetings --"
7 Or, sorry:

8 "At both schedule and metric review meetings, the
9 RCRB observed that the majority of the discussion
10 was focused in making schedule changes to support
11 execution shortfalls versus what steps are being
12 taken to adhere to the schedule."

13 And that:

14 "In addition, project management is not
15 consistently holding the vendors to account for
16 not adhering to the committed schedule."

17 Did you and your team agree with both of those
18 observations, or did you disagree with those?

19 MR. ROSE: We agreed to those observations, and we
20 reacted to those observations and have made a number of
21 changes to the way we have our -- to the way our product
22 managers review weekly metrics with our vendors and hold
23 them accountable to those weekly metrics.

24 I just wanted to also state another -- just for a
25 clarification perspective, when we're talking about
26 compliance here to 50 percent -- and I'm not by any means
27 suggesting this -- significant -- this is an important
28 metric -- not all tasks are created equal. Within a

1 nuclear operating plant, there are one-hour tasks, two-hour
2 tasks, four-hour tasks, and then thousand-hour tasks, so a
3 lot of these tasks that are being referred to are tasks
4 that are performed by our maintenance or operations
5 organizations to help ready projects. So when a project
6 doesn't have a scaffold setup or permitry (sic) tag on,
7 they're not ready to go.

8 So, from a project perspective, they go and look for
9 other work that is ready to go, and they move things in or
10 out of the schedule to maximize their efficiency in that
11 period of time. So a task lost one week may be picked up
12 in a following week and vice versa. Overall --

13 MR. DEROSE: Fair enough. But am I correct that when
14 you're talking about completion rates in the range of 50
15 percent to 53 percent, this is beyond just a small task
16 like scaffolding?

17 MR. REINER: No, no. This would include very small
18 tasks, like erect scaffold. That would be a task that
19 gets --

20 MR. DEROSE: So let me rephrase it. When you're
21 talking 53 percent, you're talking 53 percent of all of the
22 tasks that should be accomplished that week, which would --

23 MR. REINER: Yes.

24 MR. DEROSE: -- include the big tasks, the little
25 tasks. It includes everything.

26 MR. REINER: It includes everything, yeah, and I
27 believe Mr. Rose's point was they're not all equal, so in
28 the phase that we are currently in, in the project and that

1 we were in for this report, much of this was setup work to
2 begin execution, so it is things like putting tags on
3 equipment to get them positioned in a certain
4 configuration, getting scaffolding erected, getting things
5 ready to execute work. But this doesn't -- this is an all-
6 in look at what was planned two weeks ahead for that period
7 of time and how much of what was on the plan actually got
8 executed.

9 MR. DEROSE: Thank you.

10 Can I now pull up J1.3, attachment 2?

11 MS. SPOEL: Can I just ask a question while we have it
12 picked up on the screen?

13 MR. DEROSE: Absolutely.

14 MS. SPOEL: When it says vendors are pulling non-
15 scheduled work into the work week as opposed to adhering to
16 the T-0 schedule, does that mean that, let's say, instead
17 of erecting the scaffolding over here, they're erecting the
18 scaffolding over there instead, even though that's not the
19 one that's on the schedule, so they're kind of doing their
20 own thing?

21 MR. REINER: So they wouldn't do their own thing. It
22 would all be in dialogue with project management, but
23 that's exactly the kind of decision that gets made; right?
24 If a scaffolding isn't ready to erect in a certain area
25 because something is in the way, we would say, "Okay.
26 Let's advance something in future that's to be done next
27 week and bring it into this week," and then you would make
28 a decision like start erecting a scaffolding here. It's

1 not scheduled for this week, but resources are available,
2 and let's make use of the resources.

3 MS. LONG: Mr. Reiner, can I ask: The Refurbishment
4 Construction Review Board, where are they getting their
5 information to come up with these recommendations?

6 MR. REINER: So they attend the project meetings.
7 They look at the metrics that are produced by the project,
8 and then they will also do field walk-downs just to
9 validate, and they will draw their conclusions from the
10 information that is provided to them by the project.

11 MS. LONG: So let's say, for example, how would they
12 come to the conclusion that equipment wasn't being tagged?
13 Are they walking around looking to see that that happens?
14 Is that the level at which they are --

15 MR. REINER: They are at a very detailed level in some
16 cases. Now, we don't have them look at every specific item
17 that gets executed at that level. They will take -- so,
18 for example, when they're in, they will say, "Let's take a
19 look at one of your projects, one specific set of
20 activities, and we'll go in the field and we'll just watch
21 and see what happens." And what they will do is they'll
22 take with them a schedule that they will receive from us on
23 what was planned. They will go out in the field. They'll
24 have a look, and they'll talk to the contractors, the OPG
25 project managers. They will watch and observe. They'll
26 get the report at the end of the shift to see what was
27 actually performed, so they do an eyes-on validation just
28 for that specific slice, and they will draw a conclusion

1 out of that.

2 They don't do that for every single activity that gets
3 executed. It would be impossible to do that. So they will
4 then take our reports, where we -- so that essentially is a
5 validation that we're tracking things appropriately, and
6 they will then look at our reports and our metrics, and so
7 this conclusion, about a 50 percent adherence to tasks,
8 actually gets extracted from the project reports.

9 MS. LONG: Thank you.

10 MS. FRY: So looking at the scheduling issue there, so
11 are you saying that the main cause of that was perhaps the
12 sequencing of the scheduling wasn't quite right; something
13 was in the way so they couldn't build the scaffolding, or
14 are we talking about work overload; there was too much
15 work; couldn't be done on time?

16 MR. REINER: In general, it would not be work
17 overload, because the scheduled activities do align with
18 resources that are available to perform the work. It is
19 more about readiness of work. Now --

20 MS. FRY: So, basically, the sequencing of the work in
21 the schedule wasn't quite right?

22 MR. REINER: Yes. Now, I will also say there are --
23 so this is a very easy finding to take out of context,
24 because a construction project typically does not get
25 managed at a task level like this. And you will see other
26 observations and findings from the refurbishment review
27 board that says you're trying to manage this project like
28 an outage. You would manage an outage this way, where

1 every single task gets itemized down to a level of hang a
2 tag, close a valve, open a valve. And when we execute a
3 planned outage in the station, that's a 30- to 60-day time
4 period, a very condensed period with a lot of resources
5 that have been synchronized very closely.

6 In the refurbishment, there are some activities like
7 that, so this is a relevant thing. Like, defuelling
8 follows this type of a process. A return to service of the
9 plant would follow this type of a process. But when we're
10 in execution of work, when the unit is islanded from when
11 we bring it back, there is an observation in the reports as
12 well that says you need to allow contractors more leeway to
13 be able to manage this sort of thing, and you need to clear
14 barriers for them so they can manage this.

15 So this task level reporting, although it's very
16 important for us, and it is an indicator of performance in
17 the field, it isn't -- there are many other things that go
18 into this to tell us what the actual performance is and how
19 to fix this problem.

20 MS. FRY: Thanks.

21 MR. DeROSE: Thank you. If we can turn to page 4 of
22 11 of that same document, and go to sub B, schedule
23 stability, second paragraph, the second sentence says:

24 "It is strongly recommended that only OPG be
25 authorized to make changes to the schedule."

26 Who was making changes to the schedule unilaterally
27 without OPG's authority?

28 MR. ROSE: This was at the beginning of the project in

1 a time where --their basis was comparison to September 15th
2 baseline of ours. Since September 15th, our vendors had
3 added hours in the schedule based on approved work
4 packages, so our vendors are managing our level 3
5 schedules. They add hours to those level 3 schedules, and
6 we oversee those schedules, and we actually report out on
7 the hours that were being added.

8 So we control our schedule at level 2, and the hours
9 at level 2, we compare to what the vendor added at level 3,
10 assess it, and, in some cases, the vendor made an error,
11 and we get it corrected. In some cases, the vendor was
12 adding hours for work that was approved, but not yet added
13 to the schedule. The hours weren't yet in the schedule;
14 the tasks may have been there, and that type of thing.

15 MR. DeROSE: And have you accepted that
16 recommendation? Are your vendors still permitted to add
17 hours without pre-approval?

18 MR. ROSE: We do want our vendors managing their
19 schedules, and we continue to have our vendors manage their
20 schedules, because we want them forecasting. They are the
21 best persons to indicate what a forecast of an actual --
22 the total number of hours for specific piece of work is
23 going to be.

24 But we don't accept that as the total hours without
25 challenging it. Let's just take you through a very simple
26 scenario. If a vendor's task is 5,000, and this week they
27 forecast it to be 6,000, our project managers, our product
28 controls leads are asking questions as to why it went up

1 1,000 hours, and that may trigger a change control.

2 So the later report, when you go to attachment 2, the
3 RCRB concludes we've actually now done a good job of
4 reconciling those hours, resolving those hours, and
5 managing those hours.

6 MR. DeROSE: We'll go there in just one moment. One
7 last question on this particular attachment: If we can go
8 to page 7 of 11, and it's under the heading "Other
9 Observations," number 2. [REDACTED]

10 [REDACTED]
11 [REDACTED]
12 [REDACTED]
13 [REDACTED]
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16 [REDACTED]
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[REDACTED]

8 MR. REINER: There are financial consequences. And so
9 all of this gets looked at in accordance with the contracts
10 that we have, and there are provisions in the contracts
11 that do impose disincentives and would result in a
12 financial penalty.

13 MR. DeROSE: Have you triggered those or put them on
14 notice that you either intend to or may trigger those?

15 MR. REINER: Yes. And that actually happens on an
16 ongoing basis, so there is a very active contract
17 management process that works in concert with execution of
18 work. So if a piece of work, for example, needs to get
19 executed that is above and beyond what the contractual
20 requirement called for due to a performance issue, there is
21 a financial penalty that gets imposed. They don't earn
22 their fee on that work. And so that's tracked on an
23 ongoing basis as the work gets executed, and there's a
24 ledger that is essentially run that manages that.

25 MR. DeROSE: Thank you.

26 I have one last short area, if I can take you to J
27 1.3, attachment 2, page 2 of 3. This is now the RCRB
28 report from February 6-7th, so we're talking a couple of

1 weeks back now. And if I can take you to page 2 of 3 under
2 the recommendation status. First of all, it says, in the
3 second sentence, under number 1:

4 "As it currently exists today, the project is
5 starting to build a bow wave of work."

6 I have to tell you -- and I'm sorry if it makes it
7 sound like I'm ignorant -- I have no idea what a bow wave
8 of work is. Can you explain into me what is meant?

9 MR. REINER: I think a bow wave or a --

10 MR. DeROSE: Or a bow wave?

11 MR. REINER: -- that way.

12 MR. DeROSE: I mean, does it mean that the work is
13 ramping up, or does it mean that it's backlogged?

14 MR. REINER: It means -- I guess the analogy is to a
15 marine thing, a boat going through water that has a wave in
16 front of its bow that it eventually has to cross over.
17 That is what a bow wave is here. So there is an amount of
18 work that is accumulating that needs to get completed.

19 MR. DeROSE: Fair enough.

20 And it then underneath says:

21 "Your T minus zero task completion as planned for
22 the last ten weeks is under 60 percent."

23 So, if you recall, it was 53 percent in November.
24 It's now under 60. So is it fair -- and, again, as a
25 layperson, I see there is some improvement, but there's
26 still a lot of room for improvement?

27 MR. REINER: Yes, there is still room for improvement
28 here. It -- so we are focused on continuing to get this

1 up. It will -- so this metric, there is what we call sort
2 of a live zero. It will never be 100 percent.

3 MR. DeROSE: Fair enough. And this was actually going
4 to be my very last question of the day: What is the
5 percentage that -- and I appreciate it's never 100. What
6 is the percentage, from a project management perspective,
7 that you want to achieve?

8 MR. REINER: And so our -- the target that we are
9 setting is 90 percent. The optics that we have from
10 previous refurbishments is they got to 60 percent, so our
11 objective is not to settle there and to get this to 90
12 percent.

13 MR. DeROSE: And the previous projects that were at 60
14 percent, were they all delayed?

15 MR. REINER: And those are the ones that we've got the
16 optics on cost and schedule performance --

17 MR. DeROSE: Okay. Fair enough. So we don't want 60
18 percent; you want 90 percent.

19 MR. REINER: Want 90 percent.

20 MR. DeROSE: And am I also right to assume that the
21 longer you stay at 60 percent, the harder it becomes to hit
22 90?

23 MR. REINER: Yes. There are potential consequential
24 impacts, because you can have a critical-path impact, for
25 example, and not have the opportunity to get the work
26 completed. We do have in our schedule -- and we talked
27 about this in panel 1A. A methodology we adopted is to
28 front-end load all of what we call the non-critical-path

1 work, and if you look at the schedule, you'll see that, in
2 the first 60 percent of execution, most of the work lies in
3 that window.

4 If we don't get the schedule adherence up to the level
5 that we are targeting, we run a risk of starting to push
6 some of that work past that 60 percent line, and if it
7 pushes further, it does have the potential to impact
8 critical path. And, in some cases, it also has the
9 potential to impact some of those lines that we looked at
10 that tie into the critical path on the schedule. So it's
11 definitely something we're focused on and that we need to
12 achieve improvements on.

13 MR. DeROSE: Thank you very much. Those are all my
14 questions. I do appreciate you sitting a little bit late
15 today.

16 MS. LONG: Thank you, Mr. DeRose.

17 --- On resuming public session at 4:59 p.m.

18 **PROCEDURAL MATTERS:**

19 MS. LONG: Mr. Keizer, you had an issue you wanted to
20 deal with?

21 MR. KEIZER: It's actually not really an issue. It's
22 more of an update on one of the undertakings --

23 MS. LONG: Okay.

24 MR. KEIZER: -- and maybe it's so people are preparing
25 tomorrow.

26 With respect to the undertaking that was given on
27 J2.3, I believe, today, which is the undertaking, what is
28 the revenue-requirement impact, based on Unit 2, of moving

1 from P90 to P50 confidence level? First part of the
2 undertaking. Second question is: Does the 40 percent
3 allocation of contingency to Unit 2 still hold?

4 I can report that the answer to that undertaking is
5 actually set out in an interrogatory response, which is
6 Exhibit L 4.3-5 CCC 18.

7 MS. LONG: Okay. Thank you for that update.

8 Are there any other issues that we need to deal with
9 before the end of the day? No? Then we're adjourned, and
10 we will see everyone Thursday at 9:30. Thank you.

11 --- Whereupon the hearing adjourned at 5:00 p.m.

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