

Page 1	Page 3
<p>1 CHAIRMAN: 2 Q. So, there are no preliminary matters? I think 3 I am correct, am I? 4 MS. GLYNN: 5 Q. Yes, you are, Mr. Chair. 6 CHAIRMAN: 7 Q. So, we're back to the same panel and we're 8 over to you, Mr. Coxworthy, sir. 9 MR. COXWORTHY: 10 Q. Thank you, Mr. Chair. Good morning, 11 gentlemen. 12 DARREN MOORE, PAUL HUMPHRIES, ROBERT HENDERSON, TERANCE 13 LEDREW - PREVIOUSLY SWORN - RESUMES THE STAND 14 CROSS-EXAMINATION BY MR. PAUL COXWORTHY 15 MR. COXWORTHY: 16 Q. I wanted to return to a topic we were talking 17 about on Friday and that's the work that was 18 being done in August 2015 that made it not 19 possible to do the black start testing for the 20 100 mega watt CT to test whether it could 21 black start the Holyrood generation station 22 proper. I'm referring to page 153 of your 23 evidence on Friday, October 30, Mr. Henderson, 24 starting at Line 11. There were three, and 25 perhaps others, but there were three aspects</p>	<p>1 was work going on in other stations on the 2 Avalon Peninsula which would affect the lines 3 coming in and out of Holyrood as well. So, 4 all of those elements would have made it 5 challenging and introduce risks by switching 6 out more breakers in Holyrood. 7 MR. COXWORTHY: 8 Q. The other work, the work that wasn't being 9 done in the Holyrood switch yard, was it work 10 that had to be done in August of 2015 in terms 11 of timing? Could it have been done at other 12 times? 13 MR. HENDERSON: 14 A. The entire work plan for the year was laid out 15 early and it is quite a co-ordinated effort 16 when you have so much work going on and 17 replacing equipment to get it timed right 18 equipment deliveries, with crews and those 19 types of things. So, there is a large element 20 of planning for all of those equipment 21 outages. 22 MR. COXWORTHY: 23 Q. So, did the work plan originally include 24 testing the 100 mega watt CT in August 2015? 25 MR. HENDERSON:</p>
<p>Page 2</p> <p>1 of work that you spoke about there which took 2 resources away from what otherwise would have 3 been available to do that work in August. And 4 one of them was that there was a "large amount 5 of work being done in our Holyrood switch 6 yard". Was the 100 megawatt CT generator, 7 during that August period when the three 8 Holyrood turbines were down, the turbines 9 proper, was that available to provide power to 10 the system, if needed? Could it have been - 11 MR. HENDERSON: 12 A. It was operated during that time. 13 MR. COXWORTHY: 14 Q. Okay, so the switch yard wasn't completely 15 shut down during August to do that switch yard 16 work? 17 MR. HENDERSON: 18 A. No, it wasn't. 19 MR. COXWORTHY: 20 Q. Would any switch yard work had been done in 21 August of 2015? 22 MR. HENDERSON: 23 A. We were doing breaker replacements down in 24 Holyrood and so that would mean elements of 25 the switch yard were out of service. There</p>	<p>Page 4</p> <p>1 A. The plan was to do it at some point during the 2 summer before the plant came back into 3 service, late in the summer. So, that was 4 part of the original plan, was to do that. A 5 lot of the details for that got developed 6 during the year and it depended on the timing 7 of getting all the pieces ready in the 8 combustion turbine as well. 9 MR. COXWORTHY: 10 Q. So, is it fair to say that some of the other 11 pieces of the work plan must have moved around 12 to make it not possible to proceed in August 13 2015? 14 MR. HENDERSON: 15 A. So, there were a number of things that were 16 moving around in terms of affecting schedule 17 and that sort of thing. 18 MR. COXWORTHY: 19 Q. I'd like to move back to the 2011 capital 20 budget and if I could ask Mr. Gray to bring up 21 Information No. 32 which is the response to 22 the Industrial Customer RFI-26 in that Capital 23 Budget Application. The work and the steps 24 that were outlined in the response to IC-NLH- 25 26 that were going to be done by Hydro, that</p>

Page 5

1 Hydro is telling the Board were going to be
 2 done, apart from obtaining the Level 2
 3 condition assessment, was any of that other
 4 work done that's described in--and I can take
 5 you through it and I guess I'm conscious of
 6 time. So, if necessary, we can go through it
 7 paragraph by paragraph or perhaps you could
 8 review it and advise me if anything was done
 9 as outlined in IC-NLH-26.

10 MR. LEDREW:
 11 A. We had made attempts previous to that to
 12 replace exhaust gas leaks and the oil leaks as
 13 I suggested to you in the main gearbox and we
 14 could not totally eliminate them. So, those
 15 problems remain.

16 MR. COXWORTHY:
 17 Q. Was that the issue that resulted in a stop
 18 work order?

19 MR. LEDREW:
 20 A. Yes, it was.

21 MR. COXWORTHY:
 22 Q. Was it the issue that was intended to be
 23 addressed by the capital budget project in the
 24 2011 Capital Budget that was deferred and
 25 withdrawn?

Page 6

1 MR. LEDREW:
 2 A. No, the capital budget was the actual jet
 3 engine itself was going to be overhauled. So,
 4 this was a gearbox; this was new learning -

5 MR. COXWORTHY:
 6 Q. I understood it was different work, I just
 7 want to confirm that.

8 MR. LEDREW:
 9 A. Yes, different work.

10 MR. COXWORTHY:
 11 Q. Apart from that, apart from trying to rectify
 12 the issue that resulted in the stop work
 13 order, was there any other work or steps
 14 outlined in IC-NLH-26 that was done, other
 15 than a request to level 2 condition
 16 assessment?

17 MR. LEDREW:
 18 A. No, I don't believe, we didn't resolve any of
 19 those issues.

20 MR. COXWORTHY:
 21 Q. So, when it came back on in February 2011 when
 22 the Province allowed it to be used for
 23 emergency purposes, I should say, the gas
 24 turning with the black start, that's the only
 25 work that had been done, is the attempt to

Page 7

1 address the stop work order issues, which was
 2 not successful.

3 MR. LEDREW:
 4 A. Correct, several attempts actually. We had
 5 different agencies involved to reduce it
 6 without tearing about the whole machine.

7 MR. COXWORTHY:
 8 Q. So, I mean, we can go to it, but in the 2011
 9 capital budget, there was a report filed and
 10 it's part of the material that was filed as IC
 11 -- or as Information 31. There were outage
 12 statistics given for the Holyrood gas turbine,
 13 in terms of justification for why major work
 14 had to be done in relation to that turbine.
 15 None of that, none of the work that had been
 16 envisioned to address those issues was done?

17 MR. LEDREW:
 18 A. Correct, yeah.

19 MR. COXWORTHY:
 20 Q. If we could turn to the La Capra report, the
 21 August -- or the one that's attached to the
 22 August 2015 Hydro reply evidence, page six?
 23 And if we could move down to the last bullet,
 24 yes. "After the 2010 repairs", this is La
 25 Capra, "Hydro determined that a more

Page 8

1 comprehensive condition assessment of the
 2 Holyrood GT was needed." These are the
 3 attempted 2010 repairs that are being referred
 4 to by -

5 MR. LEDREW:
 6 A. Correct, yeah.

7 MR. COXWORTHY:
 8 Q. The unsuccessful ones. If we can move on then
 9 to the next page, page -- and I'm sorry, when
 10 I'm referring to page six, I'm referring to
 11 the top page number in Appendix B, as opposed
 12 to the bottom page number. So it's actually
 13 page five of this report. But Ms. Gray has
 14 anticipated that, thank you.

15 So on page 7 of 39 of Appendix B or page
 16 five of the La Capra report, at the bottom
 17 half, he talks about events that he dates from
 18 March of 2010 and the second bullet there,
 19 decision. "Due to the stop work order" which
 20 of course was issued in March 2010 "Hydro
 21 decided to withdraw the overhaul proposal and
 22 the CBA." But of course, that wasn't
 23 withdrawn until later in the year? Would you
 24 -- is that correct?

25 MR. LEDREW:

Page 9	Page 11
<p>1 A. That's correct. It was a while.</p> <p>2 MR. COXWORTHY:</p> <p>3 Q. So it wasn't just because of the stop work</p> <p>4 order that the -</p> <p>5 MR. LEDREW:</p> <p>6 A. No, it was condition assessment process was</p> <p>7 happening as well, yeah.</p> <p>8 MR. COXWORTHY:</p> <p>9 Q. Sure. On page 8 of 39 of Appendix B or page</p> <p>10 six of the La Capra report, February 2011,</p> <p>11 date February 2011, what he discusses with</p> <p>12 respect to that date. And the second bullet</p> <p>13 again then "Decision: the stop work order was</p> <p>14 lifted due to Hydro addressing the OHS</p> <p>15 concerns and determining new generation" --</p> <p>16 and determined, I'm sorry, "new generation</p> <p>17 options. Hydro reported this update to the</p> <p>18 Board" and then referred to, and I don't know</p> <p>19 if it's necessary to go to it, PR-PUB-NLH-003,</p> <p>20 Attachment 1, page 70 of 101. When you go to</p> <p>21 that, it doesn't actually have a document</p> <p>22 that's dated from February of 2011 or for that</p> <p>23 matter any time in 2011 updating the Board.</p> <p>24 Mr. LeDrew, or perhaps Mr. Henderson or Mr.</p> <p>25 Humphries might be aware, are you aware of how</p>	<p>1 email from Mr. Banfield to Mr. Haynes, if</p> <p>2 there's any indication internal to that email</p> <p>3 that there was an email that Mr. Banfield,</p> <p>4 prior to that or after that, I'd like to</p> <p>5 include that in the record in the undertaking</p> <p>6 request.</p> <p>7 MS. GLYNN:</p> <p>8 Q. Noted on the record.</p> <p>9 MR. COXWORTHY:</p> <p>10 Q. Thank you. If we could move on then to PR-</p> <p>11 PUB-NLH-002, Attachment 1, and this is the</p> <p>12 AMEC report, the level two condition</p> <p>13 assessment, and if we could go to page three</p> <p>14 of 371 of Attachment 1? Now we know from IC-</p> <p>15 NLH-026 that that was the response in the 2011</p> <p>16 capital budget that the level one condition</p> <p>17 assessment was expected at the end of October</p> <p>18 of 2010. There's an undertaking outstanding,</p> <p>19 undertaking for production of that document.</p> <p>20 Did anyone on the panel review that level one</p> <p>21 condition assessment in 2015 in preparation</p> <p>22 for these proceedings or otherwise? Has</p> <p>23 anyone recently looked at it?</p> <p>24 MR. LEDREW:</p> <p>25 A. I hadn't.</p>
<p>1 the Board was updated of that information in</p> <p>2 February of 2011?</p> <p>3 MR. HENDERSON:</p> <p>4 A. There were some emails at least. I did see an</p> <p>5 email from Sam Banfield to Jim Haynes, so I</p> <p>6 think via that route the Board was informed.</p> <p>7 I'm not sure if there was anything that Mr.</p> <p>8 Young may have written as well, but at least I</p> <p>9 know that Mr. Banfield had been in touch with</p> <p>10 Mr. Haynes.</p> <p>11 MR. COXWORTHY:</p> <p>12 Q. I don't think there's anything on the record,</p> <p>13 certainly Mr. La Capra doesn't refer to it and</p> <p>14 it's not in PUB -- PR-PUB-NLH-003 and I would</p> <p>15 have expected if there was something that</p> <p>16 would have been put on the record. You've</p> <p>17 seen an email, is it? Would it be possible to</p> <p>18 get an undertaking to get a copy of that</p> <p>19 email?</p> <p>20 MR. HENDERSON:</p> <p>21 A. Sure.</p> <p>22 MS. GLYNN:</p> <p>23 Q. Noted on the record.</p> <p>24 MR. COXWORTHY:</p> <p>25 Q. And if it indicates -- obviously if there's an</p>	<p>1 MR. COXWORTHY:</p> <p>2 Q. Mr. Henderson?</p> <p>3 MR. HENDERSON:</p> <p>4 A. No.</p> <p>5 MR. COXWORTHY:</p> <p>6 Q. Mr. Humphries?</p> <p>7 MR. HUMPHRIES:</p> <p>8 A. No.</p> <p>9 MR. COXWORTHY:</p> <p>10 Q. Do you have any recollection, Mr. LeDrew, of</p> <p>11 what was in that condition assessment, in</p> <p>12 terms of it's ultimate conclusion, the level</p> <p>13 one?</p> <p>14 (9:15 a.m.)</p> <p>15 MR. LEDREW:</p> <p>16 A. Well, level one would have been a desktop</p> <p>17 review by outside set of cold eyes competence</p> <p>18 in that type of equipment. So we gathered up</p> <p>19 all the inspection reports and all the</p> <p>20 repairs, so we shared all that with AMEC and</p> <p>21 that's what level one became, and I would have</p> <p>22 suggested they were recommending to do a more</p> <p>23 in-depth analysis.</p> <p>24 MR. COXWORTHY:</p> <p>25 Q. But you don't have any specific recollection?</p>

Page 13	Page 15
<p>1 MR. LEDREW: 2 A. I don't, not at this point, no. 3 MR. COXWORTHY: 4 Q. No, fair enough, fair enough. It was expected 5 at the end of October 2010. Can you tell me 6 whether it was received within the timeframe 7 that was expected? 8 MR. LEDREW: 9 A. I would expect, yeah. 10 MR. COXWORTHY: 11 Q. So the level two wasn't completed until 12 December of 2011? 13 MR. LEDREW: 14 A. Correct. 15 MR. COXWORTHY: 16 Q. Almost 14 months later? 17 MR. LEDREW: 18 A. Correct. 19 MR. COXWORTHY: 20 Q. And so if we could, at page 3 of 371, if we 21 could scroll down just a little bit. I tried 22 reviewing this document to see if there was 23 any information in terms of timelines, in 24 terms of when the level two condition 25 assessment was requested, et cetera, and the</p>	<p>1 on the front end. 2 MR. COXWORTHY: 3 Q. Again, could I have an undertaking for that 4 document? 5 MR. LEDREW: 6 A. Yeah. 7 MR. COXWORTHY: 8 Q. Thank you. 9 MS. GLYNN: 10 Q. Noted on the record. 11 MR. COXWORTHY: 12 Q. If we could turn then to page 25 of 371 in 13 Attachment 1? And you'll recall, and I 14 believe it was Mr. Henderson's evidence, but 15 Mr. LeDrew you may also have commented on 16 this, that Hydro's scope for this report was 17 narrow, and that's a word that Mr. Henderson 18 used, in terms of it was only intended to look 19 at what were the options for refurbishing or 20 replacing the local, if I can call it that, 21 black start capability at Holyrood, as opposed 22 to whether Holyrood needed local black start 23 capability at all. 24 MR. LEDREW: 25 A. That's correct.</p>
<p>Page 14</p> <p>1 best I could arrive at in terms of timelines 2 was the information that's on this page, which 3 indicates a draft report was prepared but no 4 date provided. Then a version of the final 5 report or a draft of the final report was 6 ready apparently on the 30th of August 2011 7 and then a final report was not ready then 8 until December 9, 2011. Mr. LeDrew, do you 9 have any recollection of why it may have taken 10 from -- well, first of all, from October 2010 11 to August 30th, 2011 to get to a version of 12 the final report and second of all, why there 13 was a delay then from August 30th to December 14 19th to getting to the, I guess, final final 15 report? 16 MR. LEDREW: 17 A. I can't recall. 18 MR. COXWORTHY: 19 Q. Was AMEC advised or told that there was any 20 urgency in getting this level two condition 21 assessment to Hydro? 22 MR. LEDREW: 23 A. We would have outlined a schedule, a proposed 24 schedule to consolidate that would normally be 25 in an RFP document that we would have sent out</p>	<p>Page 16</p> <p>1 MR. COXWORTHY: 2 Q. And the wider question of whether having black 3 start out of Hardwoods, would be a reasonable 4 alternative. This study basis, on page 1.3, 5 "the basis for this study is as follows: in- 6 service summer 2013." Did Hydro specify that 7 it was looking for a solution that would be in 8 service in summer of 2013? 9 MR. LEDREW: 10 A. I think Rob, Mr. Henderson mentioned earlier 11 that any of these options had a date that 12 wasn't going to see it in - 13 MR. COXWORTHY: 14 Q. Absolutely, that was their conclusion. 15 MR. LEDREW: 16 A. Correct. 17 MR. COXWORTHY: 18 Q. That was their conclusion. But this is their 19 study basis. This is what they're asking -- 20 they're being asked to look at these issues, 21 but the study basis states an in service of 22 summer 2013. I would presume, you know, if 23 this proceeds, they're coming to their 24 conclusion as opposed to their retroactively 25 arriving at a study basis after they've come</p>

Page 17

1 to a conclusion. Is that fair?
 2 MR. LEDREW:
 3 A. Yeah, you would like to -- it to have read as
 4 soon as possible, I guess is what you're -
 5 MR. COXWORTHY:
 6 Q. Isn't it fair that IC-NLH-026 indicated that
 7 that's what Hydro, at least at that point, was
 8 intending to do, to do things as soon as
 9 possible?
 10 MR. LEDREW:
 11 A. Yeah, that would -
 12 MR. COXWORTHY:
 13 Q. To address this issue. If we could turn to --
 14 this is in the 100 megawatt CT application.
 15 That's one of the related applications in the
 16 prudence review section on the PUB website. I
 17 guess this is for Ms. Gray's assistance. So
 18 if we go to the actual application for the 100
 19 megawatt CT, and if we could go -- there's a
 20 report that's attached immediately following
 21 the application proper and page 32 of that
 22 report.
 23 MS. GRAY:
 24 Q. Sorry, it's just taking a moment to load.
 25 MR. COXWORTHY:

Page 18

1 Q. Sorry?
 2 MS. GRAY:
 3 Q. It's just taking a moment to load.
 4 MR. COXWORTHY:
 5 Q. Oh no, no, no problem. No problem.
 6 MS. GRAY:
 7 Q. It's a large document.
 8 MR. COXWORTHY:
 9 Q. Yes, it's a large document. It takes a while
 10 to load.
 11 MS. GRAY:
 12 Q. Mr. Coxworthy, what page?
 13 MR. COXWORTHY:
 14 Q. Page -- there's a report immediately after the
 15 application document proper, page 32 of that
 16 report. So, yes, that's the report, so page
 17 32 of that document. It's the combustion
 18 turbines options. Yes, you've just passed it
 19 there. That's the page, thank you.
 20 So the second full paragraph on that
 21 page, the one that starts "the cost estimates
 22 and schedules for the 60 megawatt nominal unit
 23 were developed and adjusted as additional
 24 information was acquired. The current 60
 25 megawatt alternative is estimated at a certain

Page 19

1 cost." There's been previous evidence, Mr.
 2 Henderson, that by 2012, it had been
 3 identified that the need to add 50 or 60
 4 megawatts to the Island Isolated system before
 5 the in-feed, that had been identified by 2012
 6 as something that would be necessary by late
 7 2015 at the latest. But it also had been
 8 identified -- and this was in November 2012
 9 planning report, that regardless, regardless
 10 of whether the Labrador in-feed and the
 11 Muskrat Falls sanction came down and that was
 12 going to be the future of generation for the
 13 Island or going -- continuing down the
 14 Isolated Island route, either way, the
 15 preferred solution was to get a 50 or 60
 16 megawatt gas turbine to meet the anticipated
 17 load forecast for 2015. We could go to the
 18 references, but would you agree that that's
 19 where things stood in 2012?
 20 MR. HENDERSON:
 21 A. Subject to check, yes. Mr. Humphries might be
 22 able to better speak to that.
 23 MR. COXWORTHY:
 24 Q. Sure, absolutely.
 25 MR. HUMPHRIES:

Page 20

1 A. Yes. At the end of 2012, the generation
 2 planning issues report that I think you're
 3 speaking of, indicated a requirement and at
 4 that time we were looking at 50 megawatts.
 5 MR. COXWORTHY:
 6 Q. And was this something that just in November
 7 2012 came down as a thunder clap or was it
 8 fair to say that earlier 2012 that the world
 9 was orienting itself in such a way that the
 10 need to obtain a gas turbine at Holyrood, 50
 11 or 60 megawatts, was becoming clear?
 12 MR. HUMPHRIES:
 13 A. Yes, I think as we moved through 2012, the
 14 requirement was becoming more.
 15 MR. COXWORTHY:
 16 Q. And so still then on page 32 of the report
 17 that's attached to the 100 megawatt
 18 application, it goes on to say that "through
 19 discussion and consideration of other
 20 modifications to aid system integration of
 21 future development, the possibility of adding
 22 a larger generator to aid integration with the
 23 HVDC link was reviewed. As well, given the
 24 possibility of the larger generator, it was
 25 natural to consider provision for future

Page 21	Page 23
<p>1 expansion adding a second turbine at some 2 point in the future could increase the plant 3 output to 120 megawatts." So it was always an 4 option to start at 50 or 60 megawatts in 5 Holyrood and then if more was needed, a 6 configuration could have been put in place to 7 make that possible?</p> <p>8 MR. HUMPHRIES: 9 A. Well, within step sizes, yes. You know, if we 10 went with initially it was a 50, it would 11 probably -- the expansion would be another 50 12 or 60 on top of that. The situation we were 13 looking at here was a larger generator left 14 the opportunity open to be able to add a 15 second engine at some point in the future to 16 get full capacity, yes.</p> <p>17 MR. COXWORTHY: 18 Q. In 2012 or prior to 2012, did Hydro take any 19 steps to determine the availability of a 50 or 20 60 megawatt gas turbine on the gray market, I 21 think is the term that's been used, not one to 22 be completely built for you from scratch but 23 like was found with the 100 megawatt one that 24 had been built but was not used?</p> <p>25 MR. HUMPHRIES:</p>	<p>1 100 megawatt, and correct me if I'm wrong, 2 that's a search that would have started in 3 2014?</p> <p>4 MR. HUMPHRIES: 5 A. Well, we had -</p> <p>6 MR. COXWORTHY: 7 Q. After the January 2014 events?</p> <p>8 MR. HUMPHRIES: 9 A. No, well, we had done some research after the 10 2013 event. So we did have some knowledge of 11 what was available size wise and feature wise, 12 I would say, and no, we -- at that time, we 13 did not find a unit that had all the 14 characteristics that you would look for 15 ideally.</p> <p>16 MR. COXWORTHY: 17 Q. But that search wouldn't have started before 18 January of 2013 or thereafter?</p> <p>19 MR. HUMPHRIES: 20 A. It would have started after January 2013.</p> <p>21 MR. COXWORTHY: 22 Q. Mr. Henderson, in terms of the decision in 23 early 2012 to go with the Hardwoods as the 24 black start solution, an interim black start 25 solution for Holyrood, you've said that part</p>
<p>Page 22</p> <p>1 A. Prior to 2012? I don't think there was a 2 whole lot of research done at that time.</p> <p>3 MR. COXWORTHY: 4 Q. Why not?</p> <p>5 MR. HUMPHRIES: 6 A. Well, A, I guess we were looking at a 7 requirement for a 50 megawatt unit to -- we 8 were also looking at the possibility of 9 incorporating some of these forward looking 10 enhancements. That probably would not have 11 been available in a gray market situation.</p> <p>12 MR. COXWORTHY: 13 Q. What wouldn't have been available in a gray 14 market?</p> <p>15 MR. HUMPHRIES: 16 A. A unit with a double size generator, half size 17 engine, synchronous condenser capability, all 18 of these additional features.</p> <p>19 MR. COXWORTHY: 20 Q. You didn't look for them?</p> <p>21 MR. HUMPHRIES: 22 A. No, we didn't look for one.</p> <p>23 MR. COXWORTHY: 24 Q. When you went looking for -- later on, the 25 search that resulted in the locating of the</p>	<p>Page 24</p> <p>1 of the rationale within Hydro was that it was 2 anticipated that there would be the need to 3 obtain another -- some solution in terms of 4 load growth by 2015. That was January 2012. 5 So is it fair to say you were anticipating or 6 Hydro was anticipating in January 2012 that it 7 was going to be the 50 megawatt or 60 megawatt 8 gas turbine installed at Holyrood that was 9 going to be the long term black start 10 solution?</p> <p>11 MR. HENDERSON: 12 A. The generation planning expansion analysis was 13 identifying a combustion turbine, a 50 14 megawatt combustion turbine that we adjusted 15 to 60 megawatts at that time and so the 16 analysis that was done that winter in terms of 17 siting of that possible new CT was for 18 Holyrood.</p> <p>19 MR. COXWORTHY: 20 Q. Sure. So why wouldn't the search for a 50 21 megawatt or 60 megawatt CT, combustion 22 turbine, why wouldn't that have started in 23 January of 2012? Of course, it wouldn't have 24 committed you to actually proceeding with it, 25 but to see what the options were out there.</p>

Page 25

1 MR. HENDERSON:
 2 A. Well, during that time, there was work being
 3 done by the technical services group of the
 4 project execution technical services division
 5 looking at options and they would have been
 6 accumulating information, information from
 7 vendors, looking at site, all of those things
 8 would have been part of the consideration. I
 9 don't know specifically -- as Mr. Humphries
 10 said, it's not likely that they were looking
 11 at gray market solution there, giving the
 12 specifics of what Mr. Humphries was saying we
 13 were looking for in particular, which would
 14 have been a unit that would be being able to
 15 be expanded to a two-turbine configuration at
 16 some point down the road.
 17 MR. COXWORTHY:
 18 Q. So you're saying a two-turbine solution had
 19 been one that was considered, that would have
 20 made it not possible or appropriate to use a
 21 used -- when I say used, similar to the 100
 22 megawatt situation, a gray market machine?
 23 MR. HENDERSON:
 24 A. I'm not saying that the -- I think, as Mr.
 25 Humphries just said, it's possible there was

Page 26

1 something, but we -- there was nothing brought
 2 to our attention that it was there and the
 3 focus was getting -- making sure that we had
 4 all of the engineering good estimates,
 5 scheduling and everything required to put
 6 forward an application to the Board for that
 7 2015 in-service date.
 8 MR. COXWORTHY:
 9 Q. Was the same effort put into looking for what
 10 was out there, what was available on the
 11 market in 2012 as was put into it after
 12 January 2013?
 13 MR. HENDERSON:
 14 A. In January 2013, with the -
 15 MR. COXWORTHY:
 16 Q. Or after January 2013, sorry.
 17 MR. HENDERSON:
 18 A. - with the turbine on unit one damaged and
 19 knowing that we didn't have that capacity that
 20 winter, that did cause us to have considerable
 21 urgency of looking at something, because we
 22 were in a situation where we were down a 170
 23 megawatt unit. So there was a considerable
 24 amount of effort there to look to see if there
 25 was anything that we could bring in quickly,

Page 27

1 if need be. So at that time, there was -- it
 2 was the situation was not looking at a future
 3 need so much as that there was a pressing
 4 immediate need.
 5 (9:30 a.m.)
 6 MR. COXWORTHY:
 7 Q. If we could turn to -- and this is in PR-PUB-
 8 NLH-002, Attachment 1, so in the same
 9 document, page 6 of 371, and if we could
 10 scroll down. And this is the AMEC report, the
 11 level two report, and one of the things they
 12 looked at there in the section is the system
 13 failure cost of each of the options that they
 14 were asked to look at during the period to the
 15 end of 2020. This is a function of the
 16 expected or predicted difference in
 17 reliability between the options and the cost
 18 per hour of the electric system blackout
 19 disruption situation assumed to occur would be
 20 similar to 1986 island blackout which lasted
 21 about 30 hours. So they look then in the
 22 table below or they summarize below the
 23 impacts, as I understand it, of proceeding
 24 with one of the options that they have
 25 recommended.

Page 28

1 So they don't give us there what would
 2 have been the impact of doing nothing, from
 3 the point of view of doing nothing, of not
 4 refurbishing the local Holyrood CT, nor of
 5 purchasing a new Holyrood hard -- I'm sorry, a
 6 black start option. So they've given there
 7 values in terms of even if the unit had been
 8 refurbished in accordance with their
 9 recommendations, there was still a 10 percent
 10 probability of an outage event of failure over
 11 that 2013-2020 period and they give costs in
 12 the millions of dollars, as I would understand
 13 it, of that type of incident occurring.
 14 Is it fair to say that the situation that
 15 Holyrood was in, starting certainly from
 16 January 2012 when the decision was made that
 17 it could no longer be utilized, even the gas
 18 turbine could no longer be utilized even in an
 19 emergency basis, the scenario that Holyrood
 20 was in, in terms of this table, was even worse
 21 than what this table portrays, that it would
 22 have to have been? Because it wasn't
 23 refurbished. There was no used or new or used
 24 diesels brought in or new or used gas turbines
 25 brought in, none of those options were

Page 29

1 pursued. So does it stand to reason that the
 2 situation that Holyrood was in, in terms of if
 3 AMEC had been asked to analyze it in the same
 4 way they've been asked to analyze this, would
 5 have had to have been worse?
 6 MR. HENDERSON:
 7 A. I would say that AMEC did not look at the
 8 picture including Hardwoods. So, you'd have
 9 to consider that Hardwoods was an additional
 10 option for a similar situation that occurred
 11 in the past, and that -
 12 MR. COXWORTHY:
 13 Q. But they would have been aware that power was
 14 available from the grid to Holyrood. I mean,
 15 I know you're saying that they weren't asked
 16 to look at that option, but surely you would
 17 acknowledge that they would have been aware of
 18 that when they did this economic analysis
 19 here?
 20 MR. HENDERSON:
 21 A. I don't know what they were aware. I can say
 22 that they did not -- if they were presented
 23 with looking at -- I think the terms of
 24 reference are there. So they're looking at
 25 narrowly, as I previously stated, at the

Page 30

1 Holyrood facility. They did not look at the
 2 entire Avalon area and what other generation
 3 was available that could be brought into bear
 4 if the situation -- I just don't think that
 5 they looked at that.
 6 MR. COXWORTHY:
 7 Q. So you're saying when they did this analysis,
 8 economic values failure to operate
 9 assumptions, that they wouldn't have taken
 10 into account at all the rest of the grid?
 11 MR. HENDERSON:
 12 A. No, I don't think they did. I think they were
 13 looking at just that plant.
 14 MR. COXWORTHY:
 15 Q. And we're going -- we have an undertaking for
 16 the request for proposal, so presumably that
 17 will provide us some more information, in
 18 terms of the terms of reference.
 19 MR. HENDERSON:
 20 A. Sure.
 21 MR. COXWORTHY:
 22 Q. Thank you, gentlemen. I have no further
 23 questions.
 24 CHAIRMAN:
 25 Q. Mr. Fleming, sir.

Page 31

1 CROSS-EXAMINATION BY MR. DENIS FLEMING
 2 MR. FLEMING:
 3 Q. Thank you, Mr. Chair. Nature of going last
 4 and having most of the issues dealt with in
 5 great detail by those who came before me is I
 6 will jump around a little bit, but the good
 7 news is my questions should be fairly brief.
 8 The first issue I'd like to discuss is
 9 the five-year recovery of 1.2 million dollars
 10 in catch-up preventative maintenance on
 11 breakers and transformers in 2015. And if we
 12 could pull up V-NLH-089, Revision 1, from the
 13 GRA? We didn't ask nearly that many RFIs in
 14 the prudence review.
 15 MS. GLYNN:
 16 Q. We're having a hard time hearing you. If
 17 you'd just -
 18 CHAIRMAN:
 19 Q. Yeah, try to -
 20 MR. FLEMING:
 21 Q. That's not a complaint I hear very much.
 22 CHAIRMAN:
 23 Q. Speak more directly into the mic. I think
 24 there's a -
 25 MS. GRAY:

Page 32

1 Q. V-89?
 2 MR. FLEMING:
 3 Q. It is, yeah. So the request was for 1.2
 4 million dollars would be recovered over five
 5 years and if we look through the answer to
 6 this RFI, Table 1 shows that expected costs in
 7 2015 for transformers is \$411,000 and change.
 8 If you go to Table 2, it shows breakers at 351
 9 and change and if you go down to page three,
 10 the current estimate is \$763,000 with a few
 11 omissions, travel costs, that don't add up to
 12 that much I understand. I also understand
 13 from the RFI that it's still expected that all
 14 the catch-up maintenance will be completed in
 15 2015. Is that correct?
 16 MR. MOORE:
 17 A. Yes, that's correct. It will be completed in
 18 2015.
 19 MR. FLEMING:
 20 Q. So the difference is just that it's costing
 21 less than budgeted or estimated?
 22 MR. MOORE:
 23 A. Yeah, the -- what was included in the 2015
 24 test year would have been based on the
 25 estimate that was prepared and documented in

Page 33	Page 35
<p>1 the June 2nd, 2014 reports.</p> <p>2 MR. FLEMING:</p> <p>3 Q. Right. And I have some questions on whether</p> <p>4 this changes the deferral and recovery but I</p> <p>5 guess that should probably be for the next</p> <p>6 panel. Would that be better for the finance</p> <p>7 panel?</p> <p>8 MR. HENDERSON:</p> <p>9 A. Yes, it would be.</p> <p>10 MR. FLEMING:</p> <p>11 Q. I'd like to turn to the failure of the DC</p> <p>12 motor at Holyrood on January 11th, 2013. And</p> <p>13 my understanding is that there was two factors</p> <p>14 that led to that motor not reaching the</p> <p>15 required speed on that date and one of those</p> <p>16 involved the maintenance contractor failing to</p> <p>17 properly align the motor during maintenance in</p> <p>18 2009, correct?</p> <p>19 MR. LEDREW:</p> <p>20 A. Actually two aspects there, a neutral plane</p> <p>21 adjustment and the carbon brushes were</p> <p>22 misaligned in the brush box assemblies.</p> <p>23 MR. FLEMING:</p> <p>24 Q. Okay. So two mistakes during the contractor's</p> <p>25 work?</p>	<p>1 yes.</p> <p>2 MR. FLEMING:</p> <p>3 Q. Okay. And I also understand that Hydro's</p> <p>4 position is that that test was done or at</p> <p>5 least, the evidence doesn't show that it was</p> <p>6 not done?</p> <p>7 MR. LEDREW:</p> <p>8 A. That's correct. I got asked earlier. I have</p> <p>9 no reason to believe that it was not done.</p> <p>10 MR. FLEMING:</p> <p>11 Q. Okay. And Ms. Greene asked you some questions</p> <p>12 about if it was done, shouldn't the contractor</p> <p>13 have found it to hit the right speed during</p> <p>14 testing?</p> <p>15 MR. LEDREW:</p> <p>16 A. Well, there's a difference between AC motors</p> <p>17 and DC motors. AC motors will generally, once</p> <p>18 repaired, reach speed. DC motors you can</p> <p>19 change speed by these adjustments that were</p> <p>20 discovered here through this investigation.</p> <p>21 MR. FLEMING:</p> <p>22 Q. Okay. So when -- but when the maintenance was</p> <p>23 done and they complete the test at the end of</p> <p>24 the maintenance, shouldn't they have seen that</p> <p>25 it wasn't hitting the required speed if it was</p>
Page 34	Page 36
<p>1 MR. LEDREW:</p> <p>2 A. Correct.</p> <p>3 MR. FLEMING:</p> <p>4 Q. Okay. And Hydro views that as a major</p> <p>5 contributor to the causes of the failure on</p> <p>6 January 11th, 2013?</p> <p>7 MR. LEDREW:</p> <p>8 A. The motor was turning at a slower speed</p> <p>9 unbeknownst to us and that was the main</p> <p>10 failure, yes.</p> <p>11 MR. FLEMING:</p> <p>12 Q. And I also understand that your contract with</p> <p>13 the service provider required that service</p> <p>14 provider to conduct testing on the motor</p> <p>15 before it was placed back in service.</p> <p>16 MR. LEDREW:</p> <p>17 A. Yes, they would do as found and as left</p> <p>18 testing, as the motor comes in and when it</p> <p>19 gets shipped out. That would be a normal</p> <p>20 procedure for a service centre.</p> <p>21 MR. FLEMING:</p> <p>22 Q. And that testing would have tested whether it</p> <p>23 hit the required speed?</p> <p>24 MR. LEDREW:</p> <p>25 A. They would test it dynamically and at speed,</p>	<p>1 misaligned?</p> <p>2 MR. LEDREW:</p> <p>3 A. Yes, through their inspection procedure, if</p> <p>4 the motor wasn't reaching rated speed, you</p> <p>5 would have expected that would have gotten</p> <p>6 picked up and corrected before it got returned</p> <p>7 to us.</p> <p>8 MR. FLEMING:</p> <p>9 Q. And it didn't?</p> <p>10 MR. LEDREW:</p> <p>11 A. As we come to understand now, yes, the motor</p> <p>12 was shipped to us running at a lower speed.</p> <p>13 MR. FLEMING:</p> <p>14 Q. Right. So on the invoice when it says that it</p> <p>15 completed testing and passed okay, either they</p> <p>16 didn't do the test or they did the test</p> <p>17 incorrectly, because if it was misaligned it</p> <p>18 should have never passed?</p> <p>19 MR. LEDREW:</p> <p>20 A. Yeah, you know, there are many factors in a</p> <p>21 motor service centre. They have much</p> <p>22 equipment and calibration equipment, so there</p> <p>23 can be numerous things that could have</p> <p>24 occurred at that time that would give you an</p> <p>25 indication of a passed test, but in fact, it</p>

Page 37

1 was off its speed setting.
 2 MR. FLEMING:
 3 Q. So they could get a false positive test?
 4 MR. LEDREW:
 5 A. Yes. They have a number of equipment there,
 6 would take measurements and adjustments. All
 7 of that equipment has to be calibrated to
 8 validate the repair is meeting the
 9 expectation.
 10 MR. FLEMING:
 11 Q. So if they got it tested, said it was reaching
 12 speed, but it wasn't, you're saying it could
 13 have been because their equipment wasn't
 14 calibrated correctly that was doing the test?
 15 MR. LEDREW:
 16 A. Yeah, many factors that they would be
 17 providing to us that we would not have
 18 capability to execute ourselves, yes.
 19 MR. FLEMING:
 20 Q. But again, that would be a problem with their
 21 testing procedure that they don't have the
 22 testing procedure calibrated correctly?
 23 MR. LEDREW:
 24 A. Yeah, that would be in their end of the deal,
 25 that would be, yeah.

Page 38

1 MR. FLEMING:
 2 Q. So if the test was done by the contractor, it
 3 was done incorrectly?
 4 MR. LEDREW:
 5 A. Well, again, I can't project what -- how we
 6 ended up with a wrong speed reading. I really
 7 don't know. I know there can be many theories
 8 on it, but I don't have an answer for you at
 9 this point in time.
 10 MR. FLEMING:
 11 Q. So do you see any scenario in which the
 12 contractor acted -- met every standard you
 13 would expect? Their equipment is properly
 14 calibrated. They've done everything
 15 correctly. They've run the test, but it still
 16 fails to meet speed, despite the fact its
 17 misaligned?
 18 MR. LEDREW:
 19 A. I think I gave evidence earlier in the process
 20 that we have -- this contractor is providing
 21 services to all the major industrial clients
 22 in the province and we have had many years of
 23 engagement with this one and others in the
 24 local marketplace and we have never, in my
 25 recollection, been sent back a repaired motor

Page 39

1 that did not operate as intended. So, it
 2 wasn't something that we were anticipating, to
 3 be quite honest and sincere.
 4 MR. FLEMING:
 5 Q. Fair enough. They may have a good track
 6 record, but what I'm getting at is it seems on
 7 this motor they didn't complete the test
 8 correctly. They misaligned it and the test
 9 couldn't have been conducted correctly,
 10 because had it been, the issue would have
 11 shown up before it left their shop.
 12 MR. LEDREW:
 13 A. Right. So what you've said there is that the
 14 test must have been done incorrectly. So the
 15 point that was asked, whether they had done a
 16 test or not, and I believe or had no reason to
 17 believe that they did not execute a test, but
 18 the readings that were recorded or observed or
 19 measured at the time were incorrect, and it
 20 got shipped out and sent to us and we put it
 21 into our plant.
 22 MR. FLEMING:
 23 Q. And to be clear, this line of questioning, I'm
 24 not trying to get at whether Hydro should have
 25 doubted whether the test was done or whether

Page 40

1 it was done correctly, but I'm just -- my
 2 suggestion is that the evidence shows that the
 3 test clearly was done incorrectly or not done,
 4 one of those two. There's no other -- there's
 5 no option in which they did it completely
 6 correctly, they had everything calibrated
 7 correctly and they still got a number that was
 8 false, but -
 9 MR. LEDREW:
 10 A. Something about the testing process at the
 11 facility went awry. That's a fair statement.
 12 I believe that.
 13 MR. FLEMING:
 14 Q. Okay. If I could turn to the contract with
 15 the contractor? It's at PR-PUB-NLH-182,
 16 Section 1.11 and I believe it's on page 7 of
 17 31 of the RFI. Just up one, I think. So this
 18 section -- down a little bit more -- required
 19 the vendor to carry a commercial general
 20 liability policy in the amount of one million
 21 dollars and they had to show proof that they
 22 had that insurance before they were awarded
 23 the contract. As I read the contract, I would
 24 think one of the purposes in having this
 25 requirement is to ensure that should something

Page 41	Page 43
<p>1 go wrong with the vendor where they cause a 2 problem that there's funds available in the 3 event that Hydro has to start a legal action 4 against them to recover damages suffered as a 5 result of the vendor's negligence or breach of 6 contract. I guess not breach of contract 7 probably wouldn't be covered by that policy, 8 but certainly negligence. Would you agree 9 that that would be one of the purposes in 10 including that insurance clause in the 11 contract? 12 (9:45 a.m.) 13 MR. LEDREW: 14 A. Yeah, many of our contracts would have the 15 standard set of wording in our clauses and 16 general conditions. 17 MR. FLEMING: 18 Q. So in this case, was any claim made against 19 the contractors, based on the fact that they 20 sent the motor back as testing okay when it 21 couldn't have properly tested as okay? 22 MR. LEDREW: 23 A. To my knowledge there was no claim put back 24 towards the service provider. 25 MR. FLEMING:</p>	<p>1 MR. HENDERSON: 2 A. No, I don't think so. 3 MR. LEDREW: 4 A. No. 5 MR. MOORE: 6 A. No. 7 MR. HUMPHRIES: 8 A. No. 9 MR. FLEMING: 10 Q. Okay. Do you know if there was a report 11 generated after the review? 12 MR. LEDREW: 13 A. Oh yes, we would have done a report. It would 14 have been change that all happened inside our 15 long term asset planning role. That would be 16 a fundamental role of that group. 17 MR. FLEMING: 18 Q. I'd like an undertaking to get a copy of that. 19 I don't think it's on the record. 20 MR. HENDERSON: 21 A. Can you just be specific and make sure that we 22 give you - 23 MR. FLEMING: 24 Q. It's in PR-PUB-NLH-179. There's an indication 25 -- it states that Hydro completed a complete</p>
Page 42	Page 44
<p>1 Q. Do you know why not? 2 MR. LEDREW: 3 A. No, I wasn't party to those conversations. 4 MR. FLEMING: 5 Q. Do you know if there's any litigation 6 outstanding from the events of January 2013 or 7 2014, either by Hydro or against? 8 MR. LEDREW: 9 A. Not that I'm aware of. 10 MR. HENDERSON: 11 A. No, there's none that I'm aware of. I would 12 say that there isn't any. 13 MR. FLEMING: 14 Q. Okay. At various times during the testimony 15 over last week, there was discussion about 16 changes in testing and documentation methods 17 that Hydro has implemented since the events of 18 January 2013 and 2014. I also note in 19 response to one of the RFIs, and we don't need 20 to pull it up, but it's PR-PUB-NLH-179, it's 21 indicated that Hydro completed a review of its 22 asset management practices in 2011 and that 23 included an analysis of practices across North 24 America. Was anyone on the panel involved in 25 that review?</p>	<p>1 review of its asset management practices in 2 2011, including an analysis of the practices 3 of other utilities across North America. I 4 don't think I have the number messed up, 179. 5 MR. HENDERSON: 6 A. So this would be specific -- I'm just trying 7 to make sure I got the right scope here. 8 Because there would have been reviews done at 9 different -- many different locations of 10 Hydro's facilities, so it's specifically to 11 Holyrood, I assume? 12 MR. FLEMING: 13 Q. Yeah, I took it as probably one report 14 generated at the end of this review, but if 15 it's area specific - 16 MR. HENDERSON: 17 A. There were reviews done for many aspects of 18 the operation in a number of different areas. 19 So the - 20 MR. FLEMING: 21 Q. Well, I'd like to see the one for Holyrood for 22 sure. I don't know if that would have covered 23 preventative maintenance programs in general. 24 MR. HENDERSON: 25 A. I think it would have.</p>

Page 45	Page 47
<p>1 MR. LEDREW: 2 A. Yes, it would have. 3 MR. FLEMING: 4 Q. Then I'd like to see that as well. And I'm 5 just going down through here. Yeah, I think 6 if I got those two areas, that would cover 7 what I'm looking for. 8 MS. GLYNN: 9 Q. The undertaking is accepted? 10 MR. HENDERSON: 11 A. Yes. 12 MS. GLYNN: 13 Q. Noted on the record. 14 MR. FLEMING: 15 Q. I'd just like to go briefly through a few of 16 the changes that have been made. One of the 17 changes involved testing of the DC motor we 18 just discussed at Holyrood, and I understand 19 that before these events, the motor would be 20 tested weekly, but it would be tested just to 21 see if it would turn on when required. It 22 wasn't tested to see if it would work as 23 required. But now you test for both as part of 24 your weekly procedure? 25 MR. LEDREW:</p>	<p>1 Q. Yeah, but I believe you just said you never 2 spoke to other utilities after the event. So 3 do you have a knowledge that that's what other 4 utilities are doing or are you surmising that 5 they would have been following the same? 6 MR. LEDREW: 7 A. In my previous career, I worked with Ontario 8 Power and they had a fleet of thermal plants 9 as well, so I was familiar with that process, 10 but no, I didn't do an exhaustive - 11 MR. FLEMING: 12 Q. And they were testing these motors in the same 13 way you were testing them before the events of 14 January 2013? 15 MR. LEDREW: 16 A. The weekly online test was to validate that on 17 falling pressure that the standby and the 18 emergency pumps would start on falling 19 pressure and falling pressure could be -- 20 could happen as a result of loss of power, 21 loss of flow, lots of factors would pick up 22 that failure mode. 23 MR. FLEMING: 24 Q. You named the person who developed the new 25 test. The name is eluding me right now.</p>
Page 46	Page 48
<p>1 A. The weekly, yes, is looking at that. 2 MR. FLEMING: 3 Q. When you were developing the new test, did you 4 have an opportunity to canvas other utilities 5 across North America to see what the standard 6 was at the time for testing these type of 7 motors? 8 MR. LEDREW: 9 A. I would have anticipated the people involved 10 may have done that, but I didn't ask or 11 inquire or read any correspondence to that 12 effect. 13 MR. FLEMING: 14 Q. So you're not able to say what the industry 15 standard was in January 2013 for testing these 16 type of motors? 17 MR. LEDREW: 18 A. I think the tests that we were doing prior to 19 this event would have been the industry 20 standard. That was the OEM recommendations 21 and would suggest to you, most folks were 22 doing what we were doing, were executing the 23 weekly test in the manner in which the OEM had 24 described to execute it. 25 MR. FLEMING:</p>	<p>1 MR. LEDREW: 2 A. Yeah. Well, the weekly test would be 3 primarily driven by the operations group, so 4 the individual that would have been at the 5 centre of it was the operations manager, a 6 fellow by the name of Evan Cabot. 7 MR. FLEMING: 8 Q. I'd like to get an undertaking for any 9 correspondence, any documentation surrounding 10 the development of the new test that relates 11 to what the industry standard was at the time, 12 what other utilities were doing in North 13 America. 14 MR. LEDREW: 15 A. Yeah, and I think I mentioned to you, at the 16 time it would have been a joint effort of the 17 operations manager plus the lead investigator 18 who was involved in this process out of our 19 technical service side of our engineering 20 group in corporate. So there was a couple of 21 participants here that would have been in a 22 consultative process developing the new 23 process. 24 MR. FLEMING: 25 Q. And I'm not concerned with who developed the</p>

Page 49	Page 51
<p>1 test. Just I'd like to know whether there was</p> <p>2 any inquiries made, any documentation that</p> <p>3 shows in 2012 other jurisdictions were already</p> <p>4 doing these tests.</p> <p>5 MR. LEDREW:</p> <p>6 A. Okay.</p> <p>7 MS. GLYNN:</p> <p>8 Q. The undertaking is noted on the record.</p> <p>9 MR. FLEMING:</p> <p>10 Q. One of the other changes that's been discussed</p> <p>11 is changes to how you document preventative</p> <p>12 maintenance deferrals, and I understand that</p> <p>13 now you say the same decision making criteria</p> <p>14 goes into a decision to defer preventative</p> <p>15 maintenance, but the reporting structure and</p> <p>16 the documentation is more rigorous, correct?</p> <p>17 MR. HENDERSON:</p> <p>18 A. Yes.</p> <p>19 MR. FLEMING:</p> <p>20 Q. Do you know if what Hydro was doing for</p> <p>21 tracking backlog of preventative maintenance</p> <p>22 was consistent with what other utilities in</p> <p>23 North America were doing back in 2013?</p> <p>24 MR. HENDERSON:</p> <p>25 A. I don't know what other utilities were doing</p>	<p>1 able to identify the work to be done through</p> <p>2 corrective maintenance and tracking that</p> <p>3 performance.</p> <p>4 MR. FLEMING:</p> <p>5 Q. You do the same things now, you just have -</p> <p>6 would you consider it a better process now</p> <p>7 than you had before 20103?</p> <p>8 MR. HENDERSON:</p> <p>9 A. I would say, yes, we do have a better process</p> <p>10 now.</p> <p>11 MR. FLEMING:</p> <p>12 Q. If that process had been in place prior to</p> <p>13 2013, do you think that the preventative</p> <p>14 maintenance backlog would have been addressed</p> <p>15 earlier?</p> <p>16 MR. HENDERSON:</p> <p>17 A. I can't say - what was happening prior to 2013</p> <p>18 was a concerted effort to get the backlog -</p> <p>19 the preventative maintenance that had been</p> <p>20 deferred, and I probably should try to stay</p> <p>21 away from the backlog because the backlog</p> <p>22 includes corrective maintenance, there's a lot</p> <p>23 of things in the backlog that would normally</p> <p>24 for any business that has facilities like</p> <p>25 ours, they would have backlogs that basically</p>
<p>1 with respect to tracking backlog other than</p> <p>2 they do track them. They would have their own</p> <p>3 tools that they would use for tracking that.</p> <p>4 MR. FLEMING:</p> <p>5 Q. Do you know if after these events when you</p> <p>6 were developing the new procedure whether</p> <p>7 other utilities were canvassed to find out</p> <p>8 what the industry practice was?</p> <p>9 MR. HENDERSON:</p> <p>10 A. I don't recall that there was anything. We</p> <p>11 were looking at the tools that we had. We</p> <p>12 were already tracking our backlogs, and so</p> <p>13 what we had done is that we said that we would</p> <p>14 in terms of tracking the PM, preventative</p> <p>15 maintenance work, is that we would put</p> <p>16 specific emphasis on that so any deferred</p> <p>17 preventative maintenance would be documented</p> <p>18 and there would be clear documentation on the</p> <p>19 decisions made. With respect to tracking</p> <p>20 backlogs, I think there's different practices</p> <p>21 and there's established practices on how</p> <p>22 different areas, you know, regardless of</p> <p>23 industry of tracking the backlogs, and we did</p> <p>24 ours. We do know and look at our backlogs</p> <p>25 regularly to understand what's there to be</p>	<p>1 is a list of work to be done, but the</p> <p>2 preventative maintenance was under a working</p> <p>3 through a process to get that deferred</p> <p>4 maintenance and preventative maintenance</p> <p>5 completed, and in 2013, I think as Mr. Moore</p> <p>6 has described, there was a lot work that came</p> <p>7 into play that became a higher priority that</p> <p>8 resulted in it being deferred.</p> <p>9 MR. FLEMING:</p> <p>10 Q. And I understand there's evidence on the</p> <p>11 reasons it was deferred. What I'm getting at,</p> <p>12 though, is do you think if you had that same</p> <p>13 reporting structure, written reports weekly,</p> <p>14 the documentation was different, do you feel</p> <p>15 that there might have been in 2013 with this</p> <p>16 reporting, someone might have said we have to</p> <p>17 address this earlier than -</p> <p>18 MR. HENDERSON:</p> <p>19 A. I would suggest it would have been much more,</p> <p>20 I'll say, proactively dealt with in the sense</p> <p>21 it would have been a clear view to address it,</p> <p>22 and that's why we made the change that we did.</p> <p>23 MR. FLEMING:</p> <p>24 Q. The same undertaking I asked for the last</p> <p>25 change, I don't know if there would be any</p>

Page 53

1 documentation that anyone canvassed utilities
 2 across North America after these events to
 3 find out what they were doing with
 4 preventative maintenance and whether there was
 5 a better procedure or an industry standard
 6 procedure that Hydro wasn't following,
 7 recognizing from your answer there may be
 8 nothing, but if there is anything, I'd like to
 9 see it.

10 MR. HENDERSON:
 11 A. We can look into that, but I'm pretty
 12 confident that this was just a method to be
 13 able to keep track and report every week what
 14 preventative maintenance was done each week,
 15 and that's all being tracked in our
 16 maintenance management system which is a
 17 computerized system which keeps track of all
 18 the maintenance work done, when it's due, that
 19 sort of thing.

20 MR. FLEMING:
 21 Q. If there was any canvassing of other utilities
 22 to see what they were doing, I'd like to see
 23 the results of that inquiry.

24 MS. GLYNN:
 25 Q. Noted on the record.

Page 54

1 MR. FLEMING:
 2 Q. Another change you discussed involved breaker
 3 maintenance such that now before a breaker is
 4 placed back in service, new drains were
 5 installed, and the drain will be open to make
 6 sure there's no moisture in the breaker before
 7 it's put back in service. Do you know if
 8 industry standard in 2014 or 2013 with other
 9 utilities were doing that?

10 MR. MOORE:
 11 A. We don't have any information to indicate
 12 that, but again we're going to, as part of the
 13 undertaking, supply the 2011 asset maintenance
 14 review that was done, but there was nothing to
 15 indicate that we needed to change our process
 16 at that time to include that drain. That was
 17 a change that we made as a result of our root
 18 cause failure investigation of that breaker.

19 MR. FLEMING:
 20 Q. And I put it to you, it could be in 2011 or it
 21 could have been something you found out after
 22 the events of 2013 and 2014 when you were
 23 looking at new tests, you could have canvassed
 24 other utilities and found out that this is
 25 what other people are doing, so you installed

Page 55

1 the mechanism yourself to catch up to what was
 2 the industry standard?

3 MR. MOORE:
 4 A. It's quite possible, but I do know when we did
 5 the asset maintenance review that we just
 6 talked about, you know, talking to other
 7 utilities would have been part of that review
 8 as well at that time, and we've already
 9 agreed, I guess, to supply that report as an
 10 undertaking.

11 MR. FLEMING:
 12 Q. You did. Who developed the procedure to put
 13 the new valves in the bottom of each phase of
 14 the breaker and to open them before they went
 15 back into service?

16 MR. MOORE:
 17 A. That typically would be done by our long term
 18 asset planning group.

19 MR. FLEMING:
 20 Q. Do you know who did it in this case? I know
 21 typically, but do you know did they do that in
 22 this instance?

23 MR. MOORE:
 24 A. It was an action that was recommended as part
 25 of the root cause failure analysis that we did

Page 56

1 on the breaker. I'd have to check to get an -
 2 are you looking for the name of who actually
 3 made the recommendation?

4 MR. FLEMING:
 5 Q. I'm not looking for the name necessarily, but
 6 it's the same kind of undertaking, and I
 7 didn't expect to ask for this many
 8 undertakings, whether in the process of
 9 developing this new test, whether you
 10 canvassed other jurisdictions and found that
 11 this is something other people are doing and
 12 Hydro is just -

13 MR. MOORE:
 14 A. It would have been out long term asset
 15 planning manager who would have made that
 16 decision and ultimately the change to the
 17 preventative maintenance tactic, and I do know
 18 at the time there was a discussion with other
 19 utilities with respect to the frequency of
 20 preventative maintenance on those types of
 21 equipment, so he may have talked to the
 22 utilities about that particular specific item
 23 to check the drain valve.

24 MR. FLEMING:
 25 Q. Okay.

<p style="text-align: right;">Page 57</p> <p>1 MR. MOORE: 2 A. I do know he did talk to other utilities with 3 respect to our six year frequency and did a 4 bit of a comparison there. 5 MR. FLEMING: 6 Q. I'd like the undertaking for that 7 documentation as well that relates to changes 8 to the test on the breakers and what his 9 canvassing of other utilities to see what they 10 were doing. 11 MR. MOORE: 12 A. Okay. I know the new procedure that we use is 13 part of an existing RFI. 14 MR. FLEMING: 15 Q. The new procedure - I'm not concerned what the 16 new procedure is, I'm concerned about whether 17 other utilities were already doing that 18 procedure prior to the events of January 2013 19 and 2014. 20 MR. MOORE: 21 A. Yeah, we can take that away and find out if we 22 did consult with other utilities and what 23 discussion may have been had with respect to 24 the drain valve. 25 (10:00 a.m.)</p>	<p style="text-align: right;">Page 59</p> <p>1 the weather event. It may not necessarily be 2 just Holyrood. 3 MR. FLEMING: 4 Q. Fair enough. 5 MR. MOORE: 6 A. But any of our infrastructure, any of our 7 facilities where the weather forecast is 8 coming, we will look at key locations to 9 station people that can respond if any events 10 do come up. 11 MR. FLEMING: 12 Q. Again the same question, do you know if other 13 utilities were already doing that in 2013? 14 MR. MOORE: 15 A. I'm not sure if other utilities were doing 16 that or not. 17 MR. FLEMING: 18 Q. Not aware of any conversations with other 19 utilities or any canvassing of other utilities 20 to see if that was a standard procedure to put 21 technicians in semi-remote locations when bad 22 weather was called for? 23 MR. MOORE: 24 A. No specific conversations that I can recall or 25 aware of.</p>
<p style="text-align: right;">Page 58</p> <p>1 MS. GLYNN: 2 Q. Noted on the record. 3 MR. FLEMING: 4 Q. The last such change - unfortunately, not my 5 last question, but the last such change is the 6 January 2013 issues at Holyrood, I understand 7 that they were exacerbated a little bit by bad 8 weather and personnel not being able to get to 9 the Holyrood station, so some changes were 10 made that now when you're calling for 11 inclement weather, certain key personnel will 12 be stationed at Holyrood throughout the event 13 to make sure that access doesn't cause a 14 problem in the future, is that correct? 15 MR. LEDREW: 16 A. Placed on standby, right. 17 MR. MOORE: 18 A. Well, I will say that we look at each - there 19 is a protocol in place now where we do 20 planning for each weather event that's 21 forecasted and depending on where the weather 22 system may be heading, or where the worst 23 forecast may be, we will look at stationing 24 key people in any location that would be 25 helpful, I guess, for response depending on</p>	<p style="text-align: right;">Page 60</p> <p>1 MR. FLEMING: 2 Q. I guess, to be consistent, I'll ask for an 3 undertaking whether there was any inquiry from 4 other utilities as to whether that was 5 standard practice in other jurisdictions? 6 MR. MOORE: 7 A. Like, I do know that, for example, storm 8 response and storm preparation is obviously a 9 big issue with all utilities, and every 10 utility, I'm sure, as we do as well, have 11 protocols in place to make sure that they are 12 prepared for storm events. I mean, I've heard 13 presentations maybe at conferences and those 14 type things about what other utilities do, but 15 to say we went out and specifically canvassed 16 other utilities to get copies of their 17 protocols to compare against ours - we were 18 well aware of what Newfoundland Power had in 19 place and we also talk with Newfoundland Power 20 regularly with respect to joint response to 21 storms so that, you know, we can help each 22 other out depending on the nature of the 23 event. 24 MR. FLEMING: 25 Q. And I'm not asking you to conduct such an</p>

Page 61	Page 63
<p>1 analysis now. I'm just saying if the 2 information is there, if it was done when you 3 were redeveloping these tests, I'd like to see 4 what the results were.</p> <p>5 MR. MOORE:</p> <p>6 A. Yeah, we can provide that because I do know 7 part of it as well is the - like, when you 8 look at the North American Electrical 9 Reliability Council type standards, NERC 10 standards, we did look at the NERC standard 11 for preparation and response to storms and 12 compare against what we were doing, so I would 13 say that NERC would certainly be a compilation 14 of what most of the North American utilities 15 are doing. We did compare against that 16 standard and I can provide you with some 17 detail on that.</p> <p>18 MR. FLEMING:</p> <p>19 Q. And did NERC require personnel to be placed at 20 a station if bad weather is being called for?</p> <p>21 MR. MOORE:</p> <p>22 A. I don't think it got down to those specifics.</p> <p>23 MR. FLEMING:</p> <p>24 Q. Okay.</p> <p>25 MS. GLYNN:</p>	<p>1 Q. Right, when you got the September 2013 2 readings at Sunnyside of 11, was there a 3 conversation with the manufacturer at that 4 point about going in and doing a test to 5 confirm that it's coming from the tap changer?</p> <p>6 MR. MOORE:</p> <p>7 A. I got to go back, and I think we've already 8 listed this as an undertaking, go back and 9 validate when we actually consulted with the 10 manufacturer when we got that reading first, 11 and I will find that out.</p> <p>12 MR. FLEMING:</p> <p>13 Q. I actually don't recall either. One of my 14 questions was when did you have conversations 15 with the manufacturer, and I understood you 16 had conversations throughout time in the 90s 17 while these levels were -</p> <p>18 MR. MOORE:</p> <p>19 A. There is an undertaking actually on the record 20 to provide all communication and consultation 21 we had with ABB on this transformer before and 22 after the failure.</p> <p>23 MR. FLEMING:</p> <p>24 Q. I must have missed that somehow.</p> <p>25 MR. MOORE:</p>
<p>1 Q. We'll note the undertaking on the record.</p> <p>2 MR. FLEMING:</p> <p>3 Q. The failure of T1 at Sunnyside, most of the 4 questions I had were asked by other counsel, 5 but I just want to turn to the October 29th 6 transcript and it's the very last page, page 7 208. Mr. Moore was asked a question. There 8 was a question about how far the acetylene gas 9 numbers had gone up, and on the very last 10 answer it says, "We can look at the exact 11 data. I do remember one year it was 10, and 12 like I mentioned, our equipment manufacturer 13 indicated that these levels are, in their 14 opinion, is coming from the tap changer 15 compartment and the monitoring that we've been 16 doing was the recommended course of action, 17 and at some planned opportunity we could go in 18 and do a test to validate that this is 19 actually happening". I understand that test 20 was subsequently done at Stony Brook?</p> <p>21 MR. MOORE:</p> <p>22 A. That's correct, it was done on a transformer 23 at Stony Brook, which was the same design, 24 age, and rating.</p> <p>25 MR. FLEMING:</p>	<p>1 A. We've agreed to dig that out.</p> <p>2 MR. FLEMING:</p> <p>3 Q. That should answer the questions I have. In 4 any event, though, that test was not done on 5 the Sunnyside transformer between September 6 2013 and when it failed?</p> <p>7 MR. MOORE:</p> <p>8 A. No, because, I think as we explained too as 9 well, like, at the time we were in the process 10 of having - we've already talked about how we 11 were in the process of having to defer some of 12 our preventative maintenance due to the higher 13 priority break in work, so the ability to 14 dismantle and do an internal inspection on 15 that transformer between September and the end 16 of the year was just not possible with the 17 resources we have before us. It would have 18 had to have been something that we would have 19 planned into the next maintenance season, but, 20 of course, we didn't get the opportunity in 21 the next maintenance season because the 22 transformer failed in January.</p> <p>23 MR. FLEMING:</p> <p>24 Q. That's the same thing that happened with the 25 retesting of the gas level, you said it would</p>

Page 65	Page 67
<p>1 have been pushed off to 2014?</p> <p>2 MR. MOORE:</p> <p>3 A. It would have been done. Once our equipment</p> <p>4 engineer done the analysis and looked at the</p> <p>5 recommendation, you know, would have scheduled</p> <p>6 a retest, which we didn't get the opportunity</p> <p>7 to do.</p> <p>8 MR. FLEMING:</p> <p>9 Q. The same transformer, there was a discussion</p> <p>10 about the power factor test that would have</p> <p>11 been done as part of the preventative</p> <p>12 maintenance program had that been done on the</p> <p>13 six year cycle for that transformer, and you</p> <p>14 were asked by Ms. Greene if that test would</p> <p>15 have shown problems with the bushings, the</p> <p>16 response was, and we can go to the transcript</p> <p>17 if you want, but the response was it's not a</p> <p>18 pass/fail test, but what I didn't get is had</p> <p>19 the test - had the power factor test been</p> <p>20 done, would it have given you a numerical</p> <p>21 reading somewhere on a spectrum as to what's</p> <p>22 happening with the bushings?</p> <p>23 MR. MOORE:</p> <p>24 A. Yeah, it would. Like I mentioned, the actual</p> <p>25 test does measure the condition of the</p>	<p>1 would have been and what decision we could</p> <p>2 have made at the time, but we do go back to</p> <p>3 Doble Engineering to look at our past readings</p> <p>4 and they did indicate from their review of the</p> <p>5 data that the bushings did look good. We've</p> <p>6 already talked about 2007 when the last test</p> <p>7 was done. We didn't have a 2013 test for the</p> <p>8 reasons we talked about, I guess, to reference</p> <p>9 as well.</p> <p>10 MR. FLEMING:</p> <p>11 Q. Given that it failed in January 2014, are they</p> <p>12 able to deduce what the test likely would have</p> <p>13 shown in September 2013 had it been completed?</p> <p>14 MR. MOORE:</p> <p>15 A. No, they weren't able to do that.</p> <p>16 MR. FLEMING:</p> <p>17 Q. Okay, you would expect to me that if you're on</p> <p>18 a spectrum and something is about to fail or</p> <p>19 it fails three months later, the test would</p> <p>20 show that it's a very poor reading, but I</p> <p>21 don't understand these tests maybe.</p> <p>22 MR. HENDERSON:</p> <p>23 A. Yeah, maybe - it is a test that shows the</p> <p>24 power factor of the insulation. It basically</p> <p>25 gives you an indication of whether the</p>
<p>1 bushings and you monitor the readings over</p> <p>2 time, and typically in consultation with Doble</p> <p>3 Engineering to determine, you know, how well</p> <p>4 the bushings are performing over time and if</p> <p>5 there is degradation showing over time such</p> <p>6 that you could plan for the appropriate</p> <p>7 replacement in your long term plan, but it</p> <p>8 normally doesn't give a value that's sort of,</p> <p>9 like we mentioned, pass/fail, it's a longer</p> <p>10 term condition monitoring reading.</p> <p>11 MR. FLEMING:</p> <p>12 Q. But to me, that almost sounds more specific</p> <p>13 than pass/fail. Pass/fail is 50/50.</p> <p>14 MR. MOORE:</p> <p>15 A. Right.</p> <p>16 MR. FLEMING:</p> <p>17 Q. Whereas what you're getting is more of on a</p> <p>18 spectrum, so if something it about to fail, it</p> <p>19 almost sounds like you're expected to get a</p> <p>20 very low rating?</p> <p>21 MR. MOORE:</p> <p>22 A. Yeah, like, if we had gotten - if we were able</p> <p>23 to actually complete that piece of maintenance</p> <p>24 in September 2013, I mean, it's purely</p> <p>25 speculation, I guess, to say what that reading</p>	<p>1 condition of the insulator has changed</p> <p>2 relative to the previous measurement of that,</p> <p>3 and so it's something that you trend over</p> <p>4 time, but you can have a sudden change and a</p> <p>5 failure. It doesn't - the insulators can</p> <p>6 break down suddenly rather than just gradually</p> <p>7 deteriorate. It's quite possible that the</p> <p>8 test wouldn't have shown it, and it's possible</p> <p>9 it may have shown a trend that may have said</p> <p>10 let's do another test earlier than the six</p> <p>11 year PM, or may have said, well, what you</p> <p>12 should do is plan for a replacement of those</p> <p>13 bushings down the road, but it's not - as</p> <p>14 Darren said, it's not a pass/fail, it does</p> <p>15 show a trending, but it doesn't necessarily</p> <p>16 always all the insulators trend in a</p> <p>17 particular way that would say, well, if it</p> <p>18 failed, you extrapolate back and get another</p> <p>19 reading. It can take a sudden shift.</p> <p>20 MR. FLEMING:</p> <p>21 Q. And you give two options there as to what it</p> <p>22 could have shown. It could have shown that</p> <p>23 everything was okay, but then it failed</p> <p>24 suddenly, catastrophic failure, anyway. It</p> <p>25 could have shown that there's a trend and it's</p>

Page 69

1 something to look into. Is there a third
 2 option that it could have shown that the
 3 insulation is severely degraded and it should
 4 be replaced now?
 5 MR. HENDERSON:
 6 A. It's possible that it could result in an
 7 immediate replacement. Our experience has
 8 generally been we schedule the replacement at
 9 a later point.
 10 MR. FLEMING:
 11 Q. But we don't know what the test would have
 12 shown because the test would not have -
 13 MR. HENDERSON:
 14 A. That's correct.
 15 MR. FLEMING:
 16 Q. The six year maintenance plan, in general, I
 17 understand in 2009 a decision was made to
 18 adopt a six year maintenance plan, a
 19 preventative maintenance plan. Does a six
 20 year preventative maintenance plan require
 21 that a transformer or breaker be maintained
 22 within six years, like, is six years the
 23 maximum you should go under that type of plan?
 24 MR. MOORE:
 25 A. Normally the way it's done is what we would

Page 70

1 look at is any breakers or transformers that
 2 are coming due in that six year cycle would be
 3 scheduled into the annual work plan for that
 4 year, so it doesn't necessarily mean that, you
 5 know, if the six years was up at, say, March,
 6 that we would have to do it in March. It
 7 would just be done in that annual work
 8 planning year.
 9 MR. FLEMING:
 10 Q. Give or take, it's within a year?
 11 MR. MOORE:
 12 A. Right.
 13 MR. FLEMING:
 14 Q. Within a calendar year, okay. Is there a
 15 defined maximum in that plan as to a
 16 transformer or breaker cannot go above seven
 17 years, eight years, whatever the number is?
 18 MR. MOORE:
 19 A. We don't have that number actually documented,
 20 no, as a maximum. What we try to do and what
 21 we like to do is comply with our schedule that
 22 we set forward.
 23 MR. FLEMING:
 24 Q. But as we've seen, that doesn't always happen,
 25 so there are times when six years turns into

Page 71

1 eight?
 2 MR. MOORE:
 3 A. That's right, we've talked about how that can
 4 happen if unknown higher priority work for out
 5 customers comes up in a given year and we end
 6 up having to re-prioritize our maintenance
 7 because of that, so, yes, it can happen, as
 8 we've talked about.
 9 MR. FLEMING:
 10 Q. And there's no documented red flag number
 11 where if it hits seven years, eight years, it
 12 has to be done that year, no questions asked?
 13 MR. MOORE:
 14 A. No, there's no drop dead number documented.
 15 MR. FLEMING:
 16 Q. You also discussed at length the reasons that
 17 the plan wasn't followed in 2010, 2011, 2012,
 18 2013, it got behind for some reasons that
 19 you've explained in detail. Do you know if
 20 there was vacancies in the maintenance
 21 departments between 2010 and 2013 that
 22 contributed to the inability to meet the
 23 preventative maintenance schedule?
 24 MR. MOORE:
 25 A. We don't have anything documented to indicate

Page 72

1 that there would have been an exceptionally
 2 high number of vacancies that may have driven
 3 us to cause deferrals of maintenance, but, I
 4 guess, what got us into a situation of re-
 5 prioritizing and deferring some of our
 6 maintenance would have been the unknown break
 7 in work that came into our annual work plan
 8 that was of a high priority, but I can't say
 9 that an exceptional number of vacancies was
 10 one of the root causes.
 11 MR. FLEMING:
 12 Q. Would vacancies be tracked for the four crews
 13 across the island that do this maintenance?
 14 MR. MOORE:
 15 A. Yes, that's an ongoing item that we do track
 16 and an ongoing recruitment effort when
 17 vacancies do come up.
 18 MR. FLEMING:
 19 Q. There is a lot of information on the record
 20 about vacancies, but I'm not familiar whether
 21 there's any breakdown of what the vacancies
 22 were in each of these maintenance crews
 23 between 2009 and 2014. If it is on the
 24 record, then that's fine. If you could point
 25 me to it that would be great; if not, I'd like

Page 73	Page 75
<p>1 to get an undertaking to see what the vacancy 2 rate was for - 3 MR. MOORE: 4 A. I'm not sure if it's on the record there for 5 detailed vacancy rates in those particular 6 departments for those years. I do know we 7 documented in RFIs the FTEs per shop, but I 8 don't know if we documented per shop vacancy 9 rates for those years. I'm not sure off the 10 top of my head. 11 MR. FLEMING: 12 Q. Can I get an undertaking to have those? 13 MR. MOORE: 14 A. Yes, we certainly can. 15 MS. GLYNN: 16 Q. Noted on the record. 17 (10:15 a.m.) 18 MR. FLEMING: 19 Q. During testimony there was also some questions 20 about - some of the answers, we can go to the 21 record, I'm trying not to, to save some time, 22 about it was 2014 when you finally got enough 23 evidence to put together an application to the 24 Board - Hydro's position was to put together 25 an application to the Board to catch up on the</p>	<p>1 needed, but as I think through it, there would 2 have been no application needed, I think you 3 just said, had you hired outside contractors 4 in 2010 and 2011 to make sure you're on 5 schedule? 6 MR. HENDERSON: 7 A. The only application we would make is if it 8 was extraordinary, which would be a 9 significant dollar amount. 10 MR. FLEMING: 11 Q. \$500,000.00 or so is the number - 12 MR. HENDERSON: 13 A. I think that's the threshold. 14 MR. FLEMING: 15 Q. The last few questions I have involve 16 operating temperatures of breakers and the 17 suggestion that low temperatures may have led 18 to some of the undiagnosed failures that are 19 under consideration. If I could turn to PUB- 20 NLH-004. I understand from the answer that 21 the manufacturer rates the acceptable 22 operating temperature of between -40 and -50, 23 but several utilities in Canada have found 24 that the acceptable operating temperature is 25 actually somewhat lower than -40, and you list</p>
<p>1 maintenance in 2014 and 2015. Would there 2 have been any reason between 2010 and 2013 3 that you would have needed to go to the Board 4 for approval to hire an outside contractor to 5 make sure that you were staying on the 6 preventative maintenance schedule? 7 MR. HENDERSON: 8 A. There wouldn't be any reason to go to the 9 Board. It's an operating expense that the 10 company had. If it was an extraordinary 11 expense, then we have made application to the 12 Board for extraordinary expenses, but we were, 13 as Darren has said, throughout that period 14 within the operating budgets that we had, it 15 was expected that we would be completing and 16 making progress on getting all the PMs done in 17 accordance with that recovery plan. 18 MR. FLEMING: 19 Q. It was expected, but it wasn't happening in 20 the first couple of years of the plan? 21 MR. HENDERSON: 22 A. That's right. 23 MR. FLEMING: 24 Q. When I read the transcript, I got the 25 impression that maybe an application was</p>	<p>1 two utilities there that have put restrictions 2 on those breakers when the temperatures are 3 lower. One uses -10 as a threshold, one uses 4 -20. Who uses -10, do you know? 5 MR. MOORE: 6 A. What I will say is when we consulted with the 7 other utilities and talked about some of the 8 operating temperatures for those breakers 9 through our utility contacts, they were very 10 free to share the information, but they did 11 ask that we not document the actual names of 12 the utilities on the record. 13 MR. FLEMING: 14 Q. Okay. 15 MR. MOORE: 16 A. I don't know if that's the right way to put 17 it, but they were very free to share the 18 information, but they were hesitant to - 19 MR. FLEMING: 20 Q. They didn't want to put their name on the 21 record. Not a lot turns on it, so that's 22 okay. Does the manufacturer stand by -40, 23 despite the fact that some utilities are 24 putting restrictions on them and as low as - 25 10?</p>

Page 77

1 MR. MOORE:
 2 A. We don't have anything from the manufacturer
 3 to indicate otherwise, other than when we did
 4 bring in ABB to help us with the failure
 5 investigation on the breaker in Sunnyside,
 6 B1L03, they did make some comments that were
 7 included in the root cause failure analysis
 8 report of March, 2014, and I can read out one
 9 of their quotes if that'll help, the opinion
 10 they gave us.
 11 MR. FLEMING:
 12 Q. Sure.
 13 MR. MOORE:
 14 A. They said, "The testing showed indications
 15 that the mechanism could be affected by colder
 16 temperatures in the condition they were found.
 17 How much is difficult to determine. The exact
 18 field condition of the pole boxes during the
 19 event could not be replicated". That's one
 20 opinion that they offered on that breaker.
 21 MR. FLEMING:
 22 Q. Okay.
 23 MR. MOORE:
 24 A. And the second quote that they put in the
 25 report was, "I believe that the three pole

Page 78

1 control boxes on the B1L03 breakers did not
 2 unlatch when the trip command was sent during
 3 the event. I believe that the cold
 4 temperatures that the breaker was experiencing
 5 for days up to the event and the condition of
 6 the pole control boxes are factors affecting
 7 the breaker operation. The pole control boxes
 8 should have operated under these conditions,
 9 but maybe slow". That was an opinion that the
 10 manufacturer had at the time, so I guess
 11 they're not saying that they're not standing
 12 by, I guess, their operating temperature
 13 range, but in the same breath they're saying
 14 that the colder temperatures may affect
 15 operation of the breakers, so it's just a may,
 16 it's not conclusive -
 17 MR. FLEMING:
 18 Q. They're standing by it, but not very strongly.
 19 They don't seem to be very strong in their
 20 opinion any more that it's good to -40.
 21 MR. MOORE:
 22 A. It's an opinion, right, it's an opinion.
 23 MR. FLEMING:
 24 Q. Did you first become aware of this issue with
 25 breakers not operating at these colder

Page 79

1 temperatures after the failure of B1L03?
 2 MR. MOORE:
 3 A. That's when we would have dug into it, yes, as
 4 the root cause failure analysis report
 5 indicated.
 6 MR. FLEMING:
 7 Q. There was a little bit of discussion there
 8 about what actually happens when its cold,
 9 what mechanism of the breaker fails, and could
 10 you repeat that? Sorry, what do they say
 11 happens when it's cold to the breaker?
 12 MR. MOORE:
 13 A. What they're saying, they're talking about the
 14 - like, a breaker has three poles, I guess,
 15 three phases, A, B, and C, and they're talking
 16 about the actual pole control boxes that may
 17 be impacted by cold temperatures. They kind
 18 of indicate that it could be slow operation.
 19 MR. FLEMING:
 20 Q. Do you know if there's any link between a slow
 21 operation and cold temperatures and a breaker
 22 being behind on its preventative maintenance?
 23 MR. MOORE:
 24 A. No, not that I'm aware of that we could draw
 25 the conclusion that maintenance schedules

Page 80

1 would have any impact on what they found here.
 2 MR. FLEMING:
 3 Q. No discussion, and I can't remember the -
 4 there's no discussion from them that if a
 5 properly maintained breaker is going to
 6 operate better on a cold temperature than one
 7 that's behind its maintenance?
 8 MR. MOORE:
 9 A. No, that wasn't even documented as a -
 10 MR. FLEMING:
 11 Q. Based on the mechanism of failure, do you
 12 think that preventative maintenance would have
 13 had any effect on that type of failure?
 14 MR. MOORE:
 15 A. Not from the investigation that we did. We
 16 didn't find anything conclusive to indicate
 17 that if we had have completed the maintenance
 18 in the fall of 2013, that that would have
 19 definitely resulted in that breaker operating
 20 properly. That breaker did operate properly
 21 in 2013 on two occasions when we checked back
 22 through our records. It opened and closed as
 23 it should have in 2013. Like I indicated in
 24 PUB-NLH-174, there's a long list of
 25 preventative maintenance that's carried out in

Page 81	Page 83
<p>1 a terminal station, everything from monthly to</p> <p>2 quarterly to annual checks, and the six year</p> <p>3 PM is basically one portion of the maintenance</p> <p>4 that we do on these items, and it was the six</p> <p>5 year that was due in 2013 that we had to defer</p> <p>6 into 2014.</p> <p>7 MR. FLEMING:</p> <p>8 Q. I understand. I'm just wondering whether</p> <p>9 there's anything in that preventative</p> <p>10 maintenance that would have increased the</p> <p>11 ability of the breaker to work in a cold</p> <p>12 temperature?</p> <p>13 MR. MOORE:</p> <p>14 A. No.</p> <p>15 MR. FLEMING:</p> <p>16 Q. Did the manufacturer recommend any actions</p> <p>17 that you take now that you know that this -40</p> <p>18 rating isn't - it's not a rating that says</p> <p>19 this will work perfectly up to -40, and then</p> <p>20 start to break down. It seems to me to be</p> <p>21 something that says it'll operate in -40, but</p> <p>22 it'll start to break down - its ability to</p> <p>23 operate will break down at much higher</p> <p>24 temperatures than that?</p> <p>25 MR. MOORE:</p>	<p>1 from six years to four years may be very few</p> <p>2 because of the replacement program that's</p> <p>3 happening in parallel.</p> <p>4 MR. FLEMING:</p> <p>5 Q. Okay, any restrictions put on the breakers</p> <p>6 like the other unnamed jurisdictions?</p> <p>7 MR. MOORE:</p> <p>8 A. No, none that we're aware of other than what</p> <p>9 we documented.</p> <p>10 MR. FLEMING:</p> <p>11 Q. Nothing Hydro has - you haven't put any</p> <p>12 restrictions on the breakers like the other</p> <p>13 two jurisdictions.</p> <p>14 MR. MOORE:</p> <p>15 A. No, we haven't, no.</p> <p>16 MR. FLEMING:</p> <p>17 Q. Thank you. Those are all my questions.</p> <p>18 CHAIRMAN:</p> <p>19 Q. Okay, I think I'm going to - where am I going?</p> <p>20 I'm confused.</p> <p>21 MS. GLYNN:</p> <p>22 Q. If there's any questions from the</p> <p>23 Commissioners.</p> <p>24 CHAIRMAN:</p> <p>25 Q. Commissioners, yes.</p>
<p>1 A. No, there was nothing that they recommended</p> <p>2 with respect to a change in our maintenance</p> <p>3 tactic. Now we have made some changes to</p> <p>4 maintenance on air blast circuit breakers,</p> <p>5 such that we've changed it to a four year</p> <p>6 cycle from a six year cycle, but they didn't</p> <p>7 recommend anything specific from a change in</p> <p>8 our maintenance tactic because of the</p> <p>9 investigation that they completed on that</p> <p>10 breaker.</p> <p>11 MR. FLEMING:</p> <p>12 Q. Do you think that change from six years to</p> <p>13 four years will have any effect on the</p> <p>14 breakers ability to operate in low</p> <p>15 temperatures?</p> <p>16 MR. MOORE:</p> <p>17 A. I don't think it will other than the reason</p> <p>18 we're doing it is because the breakers are</p> <p>19 aging and we feel that, you know, it's</p> <p>20 diligent, I guess, to increase our maintenance</p> <p>21 cycle on this aging asset. We probably won't</p> <p>22 see that much change when it comes to actually</p> <p>23 doing the maintenance because we're also into</p> <p>24 an accelerated replacement program, so the</p> <p>25 number of breakers that will actually change</p>	<p>1 MS. GLYNN:</p> <p>2 Q. We're finished, and then there is some re-</p> <p>3 direct from Hydro once the Commissioners are</p> <p>4 finished.</p> <p>5 CHAIRMAN:</p> <p>6 Q. Yes. Do you have any questions?</p> <p>7 CROSS-EXAMINATION BY VICE-CHAIR WHALEN:</p> <p>8 Q. I have a question that's probably just for</p> <p>9 clarification, I think. Do I understand that</p> <p>10 you've moved from a six year maintenance plan</p> <p>11 to a four year maintenance plan for your</p> <p>12 breakers and your transformer?</p> <p>13 MR. MOORE:</p> <p>14 A. No, just for air blast circuit breakers.</p> <p>15 VICE-CHAIR WHALEN:</p> <p>16 Q. Just for your breakers, okay. That was a</p> <p>17 misunderstanding then, and how many breakers</p> <p>18 do you have?</p> <p>19 MR. MOORE:</p> <p>20 A. Originally we had - back in early 2014, there</p> <p>21 would have been 63 air blast circuit breakers.</p> <p>22 That number is somewhat reduced and is being</p> <p>23 reduced as we speak because we're in the</p> <p>24 middle of a replacement program, so we may be</p> <p>25 down to somewhere around 55 air blast circuit</p>

<p style="text-align: right;">Page 85</p> <p>1 breakers now at this point.</p> <p>2 VICE-CHAIR WHALEN:</p> <p>3 Q. So there's some actually being taken out,</p> <p>4 removed or -</p> <p>5 MR. MOORE:</p> <p>6 A. Yeah, being replaced with the SF6 technology.</p> <p>7 VICE-CHAIR WHALEN:</p> <p>8 Q. Okay.</p> <p>9 MR. MOORE:</p> <p>10 A. So as we speak, there's one being done in</p> <p>11 Holyrood today, right.</p> <p>12 VICE-CHAIR WHALEN:</p> <p>13 Q. Will those breakers also, though, kick into a</p> <p>14 four year maintenance -</p> <p>15 MR. MOORE:</p> <p>16 A. No, they'll be a six year cycle.</p> <p>17 VICE-CHAIR WHALEN:</p> <p>18 Q. They'll be on a six year cycle. So the four</p> <p>19 years for your existing breakers.</p> <p>20 MR. MOORE:</p> <p>21 A. Existing air blast circuit breakers.</p> <p>22 VICE-CHAIR WHALEN:</p> <p>23 Q. And the new ones that are going in will be on</p> <p>24 a six year?</p> <p>25 MR. MOORE:</p>	<p style="text-align: right;">Page 87</p> <p>1 existing breakers completed?</p> <p>2 MR. MOORE:</p> <p>3 A. That's correct.</p> <p>4 VICE-CHAIR WHALEN:</p> <p>5 Q. For 2014/2015?</p> <p>6 MR. MOORE:</p> <p>7 A. And power transformers.</p> <p>8 VICE-CHAIR WHALEN:</p> <p>9 Q. And the transformers. Is that done? Are you</p> <p>10 fully recovered on the six year -</p> <p>11 MR. MOORE:</p> <p>12 A. Yeah.</p> <p>13 VICE-CHAIR WHALEN:</p> <p>14 Q. This will be the six year cycle backlog,</p> <p>15 right?</p> <p>16 MR. MOORE:</p> <p>17 A. By December 1st, which is quickly approaching,</p> <p>18 we will be completed on air blast circuit</p> <p>19 breakers and power transformers.</p> <p>20 VICE-CHAIR WHALEN:</p> <p>21 Q. And could you just take me through very</p> <p>22 briefly what actions did Hydro have to take to</p> <p>23 get that done, because, I guess, you're doing</p> <p>24 that recovery in addition to doing your</p> <p>25 ongoing scheduled maintenance?</p>
<p style="text-align: right;">Page 86</p> <p>1 A. That's correct.</p> <p>2 VICE-CHAIR WHALEN:</p> <p>3 Q. Okay.</p> <p>4 MR. LEDREW:</p> <p>5 A. And they use a different gas extinguishing</p> <p>6 mechanism than air. They use SF6, an inert</p> <p>7 gas, so it's a complete new design.</p> <p>8 VICE-CHAIR WHALEN:</p> <p>9 Q. So the plan is to replace all 63 air blast</p> <p>10 circuit breakers with these new -</p> <p>11 MR. MOORE:</p> <p>12 A. That's correct, yes.</p> <p>13 VICE-CHAIR WHALEN:</p> <p>14 Q. And what's the time frame for that?</p> <p>15 MR. MOORE:</p> <p>16 A. The schedule right now is to have it all</p> <p>17 complete by the end of 2020.</p> <p>18 VICE-CHAIR WHALEN:</p> <p>19 Q. 2020, okay. I understand that you had an</p> <p>20 accelerated maintenance program in place since</p> <p>21 early last spring, 2014, I'm assuming.</p> <p>22 MR. MOORE:</p> <p>23 A. Yes.</p> <p>24 VICE-CHAIR WHALEN:</p> <p>25 Q. To get the backlogged maintenance on the</p>	<p style="text-align: right;">Page 88</p> <p>1 MR. MOORE:</p> <p>2 A. Right.</p> <p>3 VICE-CHAIR WHALEN:</p> <p>4 Q. So you're running - what did you have to do?</p> <p>5 MR. MOORE:</p> <p>6 A. In 2014, we used several different tactics.</p> <p>7 We hired some additional temporary employees</p> <p>8 and if I speak to just the air blast circuit</p> <p>9 breakers, what we did for the air blast</p> <p>10 circuit breakers, we brought in the</p> <p>11 manufacturer to work with our crews and put in</p> <p>12 an accelerated schedule to go around and</p> <p>13 complete the maintenance on air blast circuit</p> <p>14 breakers through 2014/2015. In 2014, for</p> <p>15 power transformers, we brought in a contractor</p> <p>16 to actually go out and work in some of our</p> <p>17 stations under the supervision of one of our</p> <p>18 employees to do additional preventative</p> <p>19 maintenance on power transformers. Now into</p> <p>20 2015, we actually just focused on - because we</p> <p>21 accomplished so much, I guess, with the</p> <p>22 contractor in 2014, that for the remainder of</p> <p>23 the work in 2015, we're able to do it with</p> <p>24 hiring temporary employees to assist with - to</p> <p>25 enhance our workforce to get it done.</p>

Page 89

1 VICE-CHAIR WHALEN:
 2 Q. So is it Hydro's plan to continue to use
 3 contractors for backlogs that may occur in the
 4 future?
 5 MR. MOORE:
 6 A. Only if required, but at the end of 2015,
 7 we'll be back to, I guess, square one might be
 8 the right way to put it. In our planning
 9 moving forward, we wouldn't be bringing in
 10 contractors for maintenance unless it was
 11 absolutely necessary.
 12 VICE-CHAIR WHALEN:
 13 Q. So your plan going forward is to have no
 14 backlog preventative maintenance?
 15 MR. MOORE:
 16 A. That's correct, to meet our schedule, and our
 17 annual work planning and the 2014/2015 test
 18 year reflects, I guess, a workforce that will
 19 accomplish - will allow us to complete that
 20 going forward. That's assuming that no
 21 unplanned work comes that we're not aware of
 22 that may take us off plan because that can
 23 happen in any year, but we won't be using
 24 contactors unless the need arises, shall we
 25 say, right, for maintenance.

Page 90

1 VICE-CHAIR WHALEN:
 2 Q. And just listening to - certainly Mr. Fleming
 3 brought you through a number of the things
 4 that have changed since January 2014.
 5 MR. MOORE:
 6 A. Yes.
 7 VICE-CHAIR WHALEN:
 8 Q. I was just jotting them down. There's testing
 9 documentation, you've actually taken specific
 10 action to do your catch up work, you're doing
 11 replacement program, you've moved to the four
 12 year cycle on the new - 100 percent target
 13 completion. I mean, there was a whole bunch
 14 of things. If we hadn't had the outages,
 15 would any of these changes have gone into
 16 place?
 17 MR. MOORE:
 18 A. I would - my understanding is that we would
 19 because we're always trying to improve our
 20 asset management program, and the tools that
 21 we're using now to track on a weekly basis of
 22 our annual work plan, and some of the changes,
 23 like I say, we've made to our maintenance
 24 cycles, and we've been very much committed to
 25 completing the remainder of our recovery

Page 91

1 program by the end of 2015, so I can say that
 2 we would have implemented these changes.
 3 Would they have been all implemented as
 4 quickly as they were without the January 2014
 5 outages; maybe not as quickly, but as a
 6 continual improvement of our program, we
 7 definitely would have been looking at the
 8 changes that we put forward, but maybe not on
 9 such an accelerated schedule, might be a fair
 10 way to put it.
 11 VICE-CHAIR WHALEN:
 12 Q. Mr. Henderson, I just have one question for
 13 you. In your role as Vice President, do you
 14 think that the preventative maintenance issues
 15 that have been discussed over the last number
 16 of days had any impact on Hydro's operations?
 17 MR. HENDERSON:
 18 A. I'm not sure exactly what you mean by "had any
 19 impact". In terms of the deferral of
 20 maintenance, is that - you just said. Maybe
 21 you could repeat the question, and I'll just
 22 see if I can -
 23 VICE-CHAIR WHALEN:
 24 Q. The issues that have been discussed in respect
 25 of the specific assets at Sunnyside, Holyrood,

Page 92

1 Western Avalon, in particular, and also the
 2 whole overriding issue, I guess, of the
 3 backlog of maintenance and the deferral of and
 4 what I've classified as re-prioritizing what
 5 you've already told us is priority work,
 6 because other work comes along, all those
 7 things, did that have any impact on Hydro's
 8 operations, vis-a-vis, I thinking in
 9 particular of the outages?
 10 (10:30 a.m.)
 11 MR. HENDERSON:
 12 A. So the - we were not able to see any
 13 connection with what happened in January 2014
 14 specifically with respect to the Sunnyside
 15 transformer failure or the breaker
 16 misoperations that were the result of deferred
 17 maintenance. We've certainly through that
 18 review identified that there was this
 19 accumulated deferred maintenance that had to
 20 be addressed, and was being addressed, had a
 21 plan in place, but there was nothing at all
 22 that we were able to find - we did a very
 23 extensive investigation to find out because we
 24 were obviously very concerned about what
 25 happened and wanted to understand what

Page 93

1 happened to make sure that it didn't happen
 2 again, and the investigation did not identify
 3 anything that said there was this piece of
 4 maintenance that hadn't been done, and as a
 5 result that's what caused the failure, and we
 6 brought in independent people to be able to do
 7 that to ensure that there was no internal bias
 8 and make sure that we had some external eyes
 9 on this to ensure it, and there was nothing
 10 that came out of the investigation that tied
 11 those failures in Sunnyside to the deferred
 12 maintenance. Similarly, with the breaker in
 13 Western Avalon, which we identified after some
 14 analysis what was happening there that
 15 resulted in the tap changer compartment damage
 16 on the Western Avalon transformer, that
 17 breaker worked fine before and worked fine
 18 after, so there was nothing identified through
 19 the review of the work on it that it was a
 20 maintenance issue. That day it obviously did
 21 not work, but we weren't able to replicate it
 22 to tie it back to a particular maintenance
 23 activity. That was what our whole objective
 24 was to find out what was the issue here and
 25 why did this happen, and there was nothing

Page 94

1 identified there. So that's where our
 2 investigation landed. Of course, we wanted to
 3 get the maintenance back on schedule. That
 4 was identified by our own team to say, listen,
 5 you know, we need to make a priority of
 6 getting this back on track which we did in
 7 2014 and 2015, but that's the nub of it for
 8 us. There was nothing there that was
 9 specifically identified. The breaker, B1L17,
 10 that one we reviewed how down in Holyrood we
 11 had - how we went about the maintenance on
 12 that, and we identified that there was a
 13 weakness in that program where we introduced
 14 now putting the drain valve on to ensure that
 15 we get the water - if there is any water that
 16 gets in while the breaker is dismantled, that
 17 it's identified and drained. So that was one
 18 thing that did change our maintenance
 19 activities or practices, not so much of the
 20 routine, it was an enhancement to it that we
 21 identified.
 22 VICE-CHAIR WHALEN:
 23 Q. That's all I have. Thank you very much,
 24 panel.
 25 CROSS-EXAMINATION BY COMMISSIONER OXFORD:

Page 95

1 COMMISSIONER OXFORD:
 2 Q. I do have one question for Mr. LeDrew with
 3 regards to the infamous pump and the new
 4 testing procedures that you've put in place
 5 since that time, and I think, okay, your
 6 testimony indicates that the secondary pump is
 7 tested on a regular basis now for the PSI
 8 that's happening, okay, with that pump, you're
 9 doing that on a regular basis. These pumps, I
 10 understand, are in place to provide both
 11 lubrication to the system and for cooling. So
 12 in testing for PSI, that's one aspect of it,
 13 however, that doesn't guarantee the volume of
 14 flow for the cooling aspect of it.
 15 MR. LEDREW:
 16 A. Right.
 17 COMMISSIONER OXFORD:
 18 Q. So are we also testing - in addition to the
 19 PSI, are we testing for the level and volume
 20 of flow in that system?
 21 MR. LEDREW:
 22 A. Some good points there. Yes, with the varying
 23 temperatures on that machine near 1000
 24 degrees, you have to provide adequate
 25 lubrication so that the rotating parts and the

Page 96

1 stationary parts are lubricated, and there's
 2 also heat that has to be dealt with and that
 3 lubricating oil provides the lubrication plus
 4 it removes the heat out of the bearing. That
 5 comes back to a tank and we have a temperature
 6 control system in the oil tank itself that
 7 actually cools and hits the target temperature
 8 on the upside, so that's part of it as well is
 9 that there's temperature alarms on that tank
 10 that will give you positive confirmation that
 11 you're returning oil at target temperature
 12 back up to remove heat.
 13 COMMISSIONER OXFORD:
 14 Q. That's all the questions I have.
 15 CROSS-EXAMINATION BY CHAIRMAN WELLS:
 16 CHAIRMAN:
 17 Q. I've got a quick question respecting January
 18 2013. Did you lose complete snowclearing to
 19 the plant, were the plows taken off the main
 20 road and nobody could get down to the plant as
 21 well to plow around the plant?
 22 MR. LEDREW:
 23 A. On that day, we have a contract at the station
 24 that when incoming snow storms are coming
 25 because we have employees there 24/7, we have

<p style="text-align: right;">Page 97</p> <p>1 a requirement to keep the roads clear in the 2 event you have a medical emergency or 3 anything, so we had our own contractor in 4 there with two large pieces of equipment that 5 was constantly plowing through the storm 6 event. When the outages happened, we directed 7 that contractor to plow the province's road 8 from the generating plant up to Route 60, 9 which is about three kilometres of road that 10 had drifted in solid. So we had done that 11 piece and then the Department of Highways 12 later on late that morning or early afternoon 13 finally had enough of Route 60 cleared that we 14 could actually get people up to the top of the 15 access road and then down to the terminal 16 station itself. So a really rare event that 17 you physically couldn't get a vehicle through 18 a stretch of -</p> <p>19 CHAIRMAN: 20 Q. There was nobody, like, trapped in the 21 building because of a lack of snow clearing?</p> <p>22 MR. LEDREW: 23 A. No, we had a contractor there the whole period 24 of time trying to maintain and keep those 25 routes open around the facility.</p>	<p style="text-align: right;">Page 99</p> <p>1 A. I was trying to follow you along, and I 2 couldn't see where - I'm sorry, I was looking 3 at the wrong side.</p> <p>4 MR. LEDREW: 5 A. Over here, left hand side.</p> <p>6 MR. HENDERSON: 7 A. Left hand side.</p> <p>8 MR. MACDOUGALL: 9 Q. So the discussion from lines 11 to 15 was all 10 around March of 2012.</p> <p>11 MR. HENDERSON: 12 A. Yes.</p> <p>13 MR. MACDOUGALL: 14 Q. But then, I think, Mr. O'Brien in putting his 15 question forward referred to April of 2010, 16 and you just simply said that would be right. 17 My understanding was that that discussion of - 18 that the question posed was likely to have 19 referred to April of 2012, just to clarify the 20 record?</p> <p>21 MR. HENDERSON: 22 A. That's right.</p> <p>23 MR. MACDOUGALL: 24 Q. Thank you. Could we now pull up PUB-013 in 25 the black start application, and Ms. Greene</p>
<p style="text-align: right;">Page 98</p> <p>1 CHAIRMAN: 2 Q. All right, thank you very much. Is there any 3 re-direct?</p> <p>4 MR. MACDOUGALL: 5 Q. Yes, Mr. Chair, just a few questions. Thank 6 you.</p> <p>7 RE-DIRECT EXAMINATION BY MR. MACDOUGALL: 8 MR. MACDOUGALL: 9 Q. Ms. Gray, if we could pull up the transcript 10 for October 28th, and if we could go to the 11 bottom of page 224. Here, Mr. Henderson, you 12 were being asked some questions about the 13 siting for the new CT at Holyrood, and Mr. 14 O'Brien at line 17 asked, "Okay, and Ms. 15 Greene had taken you through some emails as 16 well, one of which, I think, was from Mr. 17 Haynes to you, Mr. Henderson, that really 18 seemed to - around April of 2010 that you were 19 focused on Holyrood as the site, does that 20 sound about right". Now the discussion up to 21 then was around 2012, and I believe Mr. 22 O'Brien put to you that date and you said that 23 would be right, but was that the date that 24 that occurred or was it April of 2012?</p> <p>25 MR. HENDERSON:</p>	<p style="text-align: right;">Page 100</p> <p>1 referred to this, and if we could go to 2 Attachment 6, page 1 of 2. Mr. Henderson, if 3 you could look at the first paragraph there, 4 Ms. Greene read the second sentence to you and 5 she said, "As it says there, we are 6 discounting reliability for cost". However, 7 at the time she didn't read in the second 8 sentence which continued, "However, I think 9 the cost differential is probably not worth 10 the reliability benefits". I was wondering if 11 you could maybe explain the statement there, 12 the second part indicating the view that the 13 cost differential was probably not worth the 14 reliability benefits?</p> <p>15 MR. HENDERSON: 16 A. What I would have been saying - the analysis 17 that I was presented indicated that there was 18 a significant additional cost to go into what 19 would be referred to as a green field site, 20 and, therefore, that would have brought - 21 going to the east end of St. John's would have 22 brought some level of reliability improvements 23 for, I would suggest, customers in the east 24 end of St. John's, which would then be closer 25 to a generating source. The primary reason</p>

Page 101	Page 103
<p>1 for the CT was system capacity requirements 2 and when you look at the incremental cost for 3 that benefit, I would say that you'd have to 4 weigh all of that out and say, okay, well, the 5 incremental cost for that reliability benefit 6 of having that in the east end of St. John's 7 was probably not worth the cost that you'd 8 incur for that, which the incremental cost 9 relative to having it at the Holyrood site.</p> <p>10 MR. MACDOUGALL: 11 Q. Thank you. If we could now pull up PR-PUB- 12 NLH-200, and if we could go to Table 1 and 13 here, Mr. LeDrew, I'm going to ask you a 14 question or two with respect to Table 1 in 15 this response. We've had a lot of discussion 16 about the DC portion of the overall lube oil 17 system, which we've discussed has two 18 potential AC redundant systems and the DC 19 component. With respect to the overall lube 20 oil system, can you explain to the Board what 21 this data shows with respect to the 22 availability of that system prior to the 23 January 2013 events and its operating 24 experience? 25 MR. LEDREW:</p>	<p>1 in a little greater detail the similarities 2 between Stony Brook T2 and Sunnyside T1? 3 MR. MOORE: 4 A. Yes, I can. The transformer in Stony Brook was 5 of the same age and design and rating as the 6 transformer that's in Sunnyside, and we've 7 been tracking gas levels in that transformer 8 since the early 1990s in the same manner as we 9 have been tracking gas levels in the 10 transformer in Sunnyside, so when we were 11 speaking with the manufacturer of that 12 transformer and they were explaining and 13 giving us their opinion as to typically where 14 we would see those levels of gassing coming 15 from the tap changer compartment, they 16 suggested that we should go in and actually do 17 a test in a transformer to definitely validate 18 that that phenomena does happen and can 19 happen. So our opportunity, I guess, to look 20 at a transformer that's exactly the same as 21 the transformer in Sunnyside and physically 22 verify that those levels of gas can get from 23 one compartment into the other and that it's a 24 normal operation of that transformer was on 25 the Sunnyside unit. The transformer - I</p>
<p>Page 102</p> <p>1 A. Can we just go up one page just to read. Okay, 2 so this is showing successful transfers. 3 Going back down now, this is showing 4 successful transfers going from the primary 5 lube oil system to the standby when the unit 6 would come out of production and you'd go to 7 your standby system on both units.</p> <p>8 MR. MACDOUGALL: 9 Q. And what was the operating experience from 10 1990 until January 2013 with respect to the 11 overall system in that regard? 12 MR. LEDREW: 13 A. That worked as designed.</p> <p>14 MR. MACDOUGALL: 15 Q. And was there any time prior to January, 2013, 16 that it did not? 17 MR. LEDREW: 18 A. No.</p> <p>19 MR. MACDOUGALL: 20 Q. Thank you. Mr. Moore, I'm just going to ask 21 you a couple of questions. Board counsel 22 appeared through her questioning to continue 23 to have concerns about why one would use Stony 24 Brook T2 to validate gas and issues at 25 Sunnyside T1, and could you just maybe explain</p>	<p>Page 104</p> <p>1 should say Stony Brook. The transformer in 2 Sunnyside had failed, so we actually couldn't 3 go in and do that, so our opportunity to go in 4 and look at an exactly the same transformer in 5 Stony Brook presented itself in our 6 maintenance plan, so that we could validate 7 that that was actually happening.</p> <p>8 MR. MACDOUGALL: 9 Q. Thank you very much, Mr. Moore. I couldn't 10 find a re-direct question for Mr. Humphries, 11 Mr. Chair, so that's all of my re-direct.</p> <p>12 CHAIRMAN: 13 Q. You're a failed lawyer if you can't find 14 another question.</p> <p>15 MR. MACDOUGALL: 16 Q. I am, Mr. Chair. 17 (10:45 a.m.)</p> <p>18 CHAIRMAN: 19 Q. Given the hour, I would suggest, but, I mean, 20 if there's a storm of disapproval, I'll 21 chicken out, but I think we should take our 22 half hour break now. Is that acceptable? 23 MR. MACDOUGALL: 24 Q. Yes, Mr. Chair, absolutely. 25 (RECESS)</p>

Page 105

1 (11:25 a.m.)
 2 CHAIRMAN:
 3 Q. I think we're over to you, Mr. MacDougall, to
 4 introduce your next panel.
 5 MR. MACDOUGALL:
 6 Q. Thank you very much, Mr. Chair. Mr. Chair,
 7 our next panel is two gentlemen. Closest to
 8 the Board is Mr. Phil DiDomenico, and next to
 9 him is his colleague, Mr. John Athas. The two
 10 gentlemen work for La Capra Associates Inc.
 11 I'm just going to very briefly discuss their
 12 background and have them qualified. Before we
 13 do that, maybe we could have both of the
 14 gentlemen sworn, Mr. Chair.
 15 MR. PHILLIP DIDOMENICO (SWORN)
 16 MR. JOHN ATHAS (SWORN)
 17 DIRECT-EXAMINATION BY MR. MACDOUGALL:
 18 MR. MACDOUGALL:
 19 Q. Thank you, Mr. Chair. Mr. Chair, on August
 20 7th, Hydro filed its reply evidence and
 21 Appendix "B" to that document is the reply
 22 evidence of La Capra. Hydro's reply evidence
 23 was revised on September 23rd, but there were
 24 no revisions made to the La Capra portion of
 25 that evidence, so Ms. Gray has pulled up page

Page 106

1 24 of 39 of Appendix "B" of that reply
 2 evidence, which contains in Appendix "A" to
 3 Appendix "B", the resumes of Mr. DiDomenico
 4 and Mr. Athas. Again these have been prefiled
 5 and their extensive resumes have been with the
 6 Board and parties for some time. I'm not
 7 going to go through them in any detail, but
 8 just to briefly introduce their experience to
 9 the Board, I would like to turn first to page
 10 31 of 39 with respect to Mr. DiDomenico, and
 11 if we could go down to the bottom of that, Ms.
 12 Gray, and Mr. DiDomenico, my understanding
 13 from your CV, here we see at the bottom, and
 14 maybe we can go over to the top of the next
 15 page, your education includes an MBA in
 16 Management from Loyola College, and also a
 17 Bachelor of Science and Electrical Engineering
 18 Power Systems from Northeastern University,
 19 correct?
 20 MR. DIDOMENICO:
 21 A. Correct.
 22 MR. MACDOUGALL:
 23 Q. And maybe if we could go back up a little bit,
 24 Ms. Gray, thank you very much, and maybe you
 25 can just briefly describe your employment

Page 107

1 history to the Board with respect to both your
 2 specific experience with electric utilities
 3 and your consulting experience?
 4 MR. DIDOMENICO:
 5 A. Certainly. I've been in the utility industry
 6 now for just about 40 years. The first 20
 7 years of my career were exclusively working in
 8 the utility industry, working for both
 9 Baltimore Gas and Electric and Boston Edison.
 10 The second half of my career has been in
 11 consulting to that very same electric utility
 12 industry. My areas of expertise, or the
 13 positions that I've held rather that are
 14 directly related to what we're doing here
 15 today is at one point I had the role of
 16 Performance and Reliability Coordinator for
 17 Boston Edison, which was a fleet of 3000
 18 megawatts worth of fossil generating units.
 19 My responsibilities there were basically to
 20 track the performance of those units and
 21 report to the Department of Public Utilities
 22 at the time on their performance and issues
 23 that arose, how were they addressed, basically
 24 defend the operation as being a prudent
 25 operation. I did that for a period of three

Page 108

1 years. Subsequent to that, I've been involved
 2 in advising utilities relative to their
 3 generating fleet, their operations, the
 4 management of the generating fleet, how they
 5 should address various issues, whether it be
 6 investment and capital spending, or operations
 7 and maintenance.
 8 MR. MACDOUGALL:
 9 Q. Thank you very much, Mr. DiDomenico. Now
 10 maybe if we could have Mr. Athas do the same,
 11 so Ms. Gray, if we could go to page 38 of 39,
 12 and if we could stop there. Mr. Athas, I
 13 understand that you have a Bachelor's Degree
 14 in Mechanical Engineering, Masters of Science
 15 and Mechanical Engineering, and a Masters of
 16 Business Administration, is that correct?
 17 MR. ATHAS:
 18 A. That's correct.
 19 MR. MACDOUGALL:
 20 Q. And could you also briefly describe your
 21 specific electric utility experience and your
 22 consulting experience?
 23 (11:30 a.m.)
 24 MR. ATHAS:
 25 A. With a strikingly similar time table to my

Page 109	Page 111
<p>1 colleague, Mr. DiDomenico, I've been involved 2 with the electric power and utility industry 3 for almost 40 years, and about half of that 4 for Northeast Utilities, 19 years to be exact, 5 and since that time I've been with two 6 research - two consulting firms, research 7 firms, Cambridge Energy Research Associates, 8 and La Capra Associates since 2006, but my 9 time at Northeast Utilities, which is a 10 foundation for a lot of my La Capra work as 11 well had various positions in planning, from 12 resource planning to strategic planning, to 13 issues around rates and rate setting and 14 revenue requirements. Generally, you know, 15 all the things that kind of get into the 16 effectiveness of resource management, 17 including I spent a couple of years on the 18 Capital Budgeting Committee for the 19 transmission and distribution aspects of 20 Northeast Utilities, which at the time was a 21 three state, about a 6000 megawatt utility at 22 that time.</p> <p>23 MR. MACDOUGALL: 24 Q. Thank you very much, Mr. Athas. Mr. Chair, 25 with that brief summary and with the more</p>	<p>1 MR. DIDOMENICO: 2 A. They are.</p> <p>3 MR. ATHAS: 4 A. Yes, they are.</p> <p>5 MR. MACDOUGALL: 6 Q. And do you adopt them as your evidence in this 7 proceeding? 8 MR. DIDOMENICO: 9 A. I do.</p> <p>10 MR. ATHAS: 11 A. I do.</p> <p>12 MR. MACDOUGALL: 13 Q. Mr. Chair, with that, again because all of the 14 information has been prefiled, we do not 15 propose to do an opening statement or take the 16 gentlemen through their evidence. They are now 17 available for cross-examination.</p> <p>18 CHAIRMAN: 19 Q. Over to you, Madam Greene.</p> <p>20 CROSS-EXAMINATION BY GREENE, Q.C.: 21 GREENE, Q.C.: 22 Q. Thank you, Mr. Chair. Good morning, 23 gentlemen.</p> <p>24 MR. DIDOMENICO: 25 A. Good morning.</p>
Page 110	Page 112
<p>1 extensive resumes that have been prefiled, we 2 would ask that Mr. DiDomenico and Mr. Athas be 3 qualified to provide expert evidence in 4 electric utility management planning and 5 operations.</p> <p>6 CHAIRMAN: 7 Q. Okay. So you have nothing further? 8 MR. MACDOUGALL: 9 Q. We have no - because we filed both the reply 10 and the surrebuttal, I will simply ask the two 11 gentlemen if they could confirm that with 12 respect to Appendix "B" of Hydro's reply 13 evidence of August 7th, and Appendix "B" of 14 Hydro's surrebuttal of October 14th, which are 15 the two La Capra Reports, and with respect to 16 a few of the RFIs that were specifically 17 addressed to La Capra, were those provided 18 under your direction and control, gentlemen?</p> <p>19 MR. DIDOMENICO: 20 A. They were.</p> <p>21 MR. ATHAS: 22 A. Yes, they were.</p> <p>23 MR. MACDOUGALL: 24 Q. And are they true to the best of your 25 knowledge and belief?</p>	<p>1 MR. ATHAS: 2 A. Good morning.</p> <p>3 GREENE, Q.C.: 4 Q. As I will be talking about your report, I 5 wonder, Ms. Gray, if we could bring up La 6 Capra's August 7th report, which, of course, 7 was Appendix "B" to Hydro's reply. Could you 8 please tell us, and I'm not sure who would 9 like to answer this question, when La Capra 10 was retained by Hydro for this proceeding, I 11 understand it was after Liberty filed its 12 prudence review report on July 6th, is that 13 correct?</p> <p>14 MR. DIDOMENICO: 15 A. That's correct.</p> <p>16 MR. ATHAS: 17 A. That's correct.</p> <p>18 GREENE, Q.C.: 19 Q. Can you please tell us the specific date that 20 you were retained by Hydro? 21 MR. ATHAS: 22 A. It was - I don't know the exact date. I'm 23 sure it was the middle of July. It must have 24 been about a week after the filing by Liberty. 25 We had a very limited amount of time of about</p>

Page 113	Page 115
<p>1 two to three weeks, I think, from the time we 2 started chatting to the time that there was a 3 target date for filing. 4 GREENE, Q.C.: 5 Q. And at the time of your retention, could you 6 please tell us what was the scope of your 7 retention, that is what was it Hydro asked you 8 to do? 9 MR. ATHAS: 10 A. They mentioned that there was a Liberty report 11 that had significant amounts of findings and 12 they told us they wanted us to address two 13 particular findings; the issues around the 14 black start, and the lube oil, and 9:26) wharf 15 area, and they mentioned that they were - in 16 their report, there was a question of whether 17 the company was prudent, and they asked us if 18 we would have some expertise in that matter, 19 and whether we would be willing to look at it 20 as an independent look to see what we would 21 think about the practices that went into 22 Hydro's planning and decision making for the 23 issues in question. We told them that we 24 definitely had the expertise, and our approach 25 as an independent is well documented in many</p>	<p>1 MR. DIDOMENICO: 2 A. Fundamentally, we received a copy of all the 3 relevant transcripts - not the transcripts, 4 but the record information that was on file 5 relative to the two incidents, in particular. 6 We reviewed that material, only that material, 7 and we also set up conference calls to meet 8 with Hydro staff to review our interpretation 9 of what they were sending us, and to go over 10 to make sure there wasn't any misunderstanding 11 of how we were interpreting things. 12 GREENE, Q.C.: 13 Q. I took from your answer that Hydro provided 14 you with selected documentation about the two 15 issues; black start at the Holyrood plant and 16 Unit 1 failure at the Holyrood plant, is that 17 correct? 18 MR. DIDOMENICO: 19 A. To my knowledge, it was all the information 20 related to those two incidents. 21 GREENE, Q.C.: 22 Q. And when you say all the information, what 23 type of information was it? 24 MR. DIDOMENICO: 25 A. Information requests, reports, things that had</p>
<p>Page 114</p> <p>1 of the other works that we do, and the fact is 2 that we would - we told them, obviously, we 3 had no idea at the time that we started 4 discussions what we would agree with and what 5 we would not about the practices that Hydro 6 had taken place a few years ago. 7 MR. DIDOMENICO: 8 A. If I could add, our scope was essentially 9 limited to having several interviews with the 10 Hydro staff, in addition to reviewing the 11 record of the events leading up to the January 12 event. 13 GREENE, Q.C.: 14 Q. And was this your first experience with the 15 island interconnected electrical system in 16 Newfoundland? 17 MR. ATHAS: 18 A. Mine, yes. 19 MR. DIDOMENICO: 20 A. Yes. 21 GREENE, Q.C.: 22 Q. And how did you go about doing the work after 23 you were retained? You mentioned you had a 24 short period of time in which to do it, so can 25 you tell us how you went about doing it?</p>	<p>Page 116</p> <p>1 been filed relative to the case. The two 2 binders that are sitting on my desk are 3 testament to the information. 4 GREENE, Q.C.: 5 Q. Those two binders there, is it, that's the 6 documentation? 7 MR. DIDOMENICO: 8 A. That's a good portion of it. 9 GREENE, Q.C.: 10 Q. Okay, and after you received the written 11 documentation from Hydro, you mentioned you 12 set up conference calls with individuals? 13 MR. DIDOMENICO: 14 A. It wasn't so much individuals as teams of 15 individuals, depending upon what the topic 16 was. 17 GREENE, Q.C.: 18 Q. Okay, and can you tell us who the team of 19 individuals were for the black start matter? 20 MR. DIDOMENICO: 21 A. I'm not sure I can give you the exact record, 22 if you will, of exactly who was on the call. 23 I know Mr. Henderson was part of the calls for 24 the most part, but I don't know the whole team 25 that was on the calls.</p>

Page 117	Page 119
<p>1 GREENE, Q.C.:</p> <p>2 Q. Okay, and what about the team for Unit 1?</p> <p>3 MR. DIDOMENICO:</p> <p>4 A. The same situation, I don't have that readily</p> <p>5 available.</p> <p>6 GREENE, Q.C.:</p> <p>7 Q. Mr. Henderson was on both teams, is that how I</p> <p>8 understood your answer?</p> <p>9 MR. DIDOMENICO:</p> <p>10 A. That's my understanding.</p> <p>11 GREENE, Q.C.:</p> <p>12 Q. How many conference calls did you have with</p> <p>13 the Hydro personnel?</p> <p>14 MR. DIDOMENICO:</p> <p>15 A. I'm estimating now, again I don't know the</p> <p>16 precise number, but I believe we probably had</p> <p>17 either four or five calls.</p> <p>18 MR. ATHAS:</p> <p>19 A. That's my recollection.</p> <p>20 GREENE, Q.C.:</p> <p>21 Q. Did you visit Newfoundland prior to your</p> <p>22 coming here for evidence - to give evidence?</p> <p>23 MR. DIDOMENICO:</p> <p>24 A. I did not.</p> <p>25 GREENE, Q.C.:</p>	<p>1 between the need for additional capacity on</p> <p>2 the island and how it related to the</p> <p>3 requirement for black start at Holyrood?</p> <p>4 MR. DIDOMENICO:</p> <p>5 A. At this point I'm more familiar with it than I</p> <p>6 was at the time this report was written</p> <p>7 because I've reviewed the transcripts.</p> <p>8 GREENE, Q.C.:</p> <p>9 Q. Okay. I'd like first to go to page 13 of 39</p> <p>10 of your report. If we could go back to</p> <p>11 Section 2.3, "Review and Conclusions", and in</p> <p>12 the first sentence there, "Hydro's principal</p> <p>13 shortcoming regarding its decision on black</p> <p>14 start is at most not doing more to keep the</p> <p>15 Board informed of its decision making process,</p> <p>16 and its ultimate decision to accept the loss</p> <p>17 of on-site black start on an interim basis</p> <p>18 until a new CT could be placed in service at</p> <p>19 Holyrood as the permanent solution". I wanted</p> <p>20 to talk to you first about this issue of</p> <p>21 communications. I take from your report that</p> <p>22 you do agree that there was a lack of</p> <p>23 communication between Hydro and the</p> <p>24 stakeholders with respect to the status of</p> <p>25 black start at the Holyrood plant, is that</p>
Page 118	Page 120
<p>1 Q. At the time you were provided with the</p> <p>2 information, you mentioned that you were given</p> <p>3 the information related to the two specific</p> <p>4 issues you had been asked to look at; black</p> <p>5 start and Unit 1. Do I take from that, that</p> <p>6 you weren't given any documentation or</p> <p>7 information with respect to other issues</p> <p>8 before the Board, such as the new 100 megawatt</p> <p>9 CT?</p> <p>10 MR. DIDOMENICO:</p> <p>11 A. It's generally correct. I want to qualify the</p> <p>12 answer a little bit in the sense that in the</p> <p>13 documentation that we had, there were</p> <p>14 certainly references to that 100 megawatt CT,</p> <p>15 but in terms of any specific record related</p> <p>16 exclusively to that CT, I don't think we have</p> <p>17 all that information.</p> <p>18 GREENE, Q.C.:</p> <p>19 Q. Were you familiar at the time of your review</p> <p>20 with respect to Hydro's generation expansion</p> <p>21 plans for the island interconnected system?</p> <p>22 MR. DIDOMENICO:</p> <p>23 A. I was not.</p> <p>24 GREENE, Q.C.:</p> <p>25 Q. So you're not familiar with the connection</p>	<p>1 correct?</p> <p>2 MR. DIDOMENICO:</p> <p>3 A. With respect to this specific element, yes.</p> <p>4 GREENE, Q.C.:</p> <p>5 Q. In your opinion, what would have been more</p> <p>6 appropriate timely communication?</p> <p>7 MR. DIDOMENICO:</p> <p>8 A. I think based on the information that we</p> <p>9 reviewed, it was obvious that this was an</p> <p>10 issue that was kind of paramount in the</p> <p>11 public's eye, so to speak, so people were very</p> <p>12 well aware of it, there had been communication</p> <p>13 about black start issues. I guess, from my</p> <p>14 perspective, it would have followed that once</p> <p>15 an ultimate decision was made, it would have</p> <p>16 been a good idea to run that by the Board</p> <p>17 rather than wait for them to find out about it</p> <p>18 after the fact.</p> <p>19 GREENE, Q.C.:</p> <p>20 Q. And if we go back through your chronology of</p> <p>21 the events that happened, I noticed that you</p> <p>22 did record that Hydro advised the Board in</p> <p>23 February of 2011 that the stop work order had</p> <p>24 been lifted, is that correct?</p> <p>25 MR. DIDOMENICO:</p>

Page 121	Page 123
<p>1 A. That's correct.</p> <p>2 GREENE, Q.C.:</p> <p>3 Q. And the next communication noted from Hydro to</p> <p>4 the Board with respect to the status of black</p> <p>5 start at the Holyrood plant was not until</p> <p>6 August of 2013, which was in response to a</p> <p>7 request from the Board following the January</p> <p>8 2013 outages, is that correct?</p> <p>9 MR. DIDOMENICO:</p> <p>10 A. That's my understanding.</p> <p>11 GREENE, Q.C.:</p> <p>12 Q. Now your view with respect to communications,</p> <p>13 would you agree that it's the same as what</p> <p>14 Liberty expressed in its report?</p> <p>15 MR. DIDOMENICO:</p> <p>16 A. I would say substantially, yes.</p> <p>17 GREENE, Q.C.:</p> <p>18 Q. So there's no dispute between you and Liberty</p> <p>19 that there was improper or inadequate</p> <p>20 communication?</p> <p>21 MR. DIDOMENICO:</p> <p>22 A. Communications could have been better.</p> <p>23 GREENE, Q.C.:</p> <p>24 Q. And I take it, you would also agree that</p> <p>25 Liberty did not use the inappropriate or the</p>	<p>1 made the decision to tolerate the risk</p> <p>2 associated with not having black start</p> <p>3 capability at Holyrood on an interim basis</p> <p>4 until a permanent long term solution could be</p> <p>5 implemented, thereby relying solely on the</p> <p>6 Hardwoods gas turbine or Hardwoods to black</p> <p>7 start the Avalon Peninsula in the event it</p> <p>8 became separated from the rest of the system".</p> <p>9 So the first thing I wanted to ask you about</p> <p>10 is one of the principal basis for your opinion</p> <p>11 is that the use of the Hardwoods gas turbine</p> <p>12 was only to be an interim option or an interim</p> <p>13 solution, is that correct?</p> <p>14 MR. DIDOMENICO:</p> <p>15 A. Interim in the sense that at this time it</p> <p>16 would have been the only solution as opposed</p> <p>17 to the fact that it's always been part of the</p> <p>18 solution.</p> <p>19 GREENE, Q.C.:</p> <p>20 Q. But if we go back, first of all, you would</p> <p>21 agree that Hydro's planning had always been to</p> <p>22 have on site black start capability at the</p> <p>23 Holyrood plant, is that correct?</p> <p>24 MR. DIDOMENICO:</p> <p>25 A. Certainly.</p>
<p>Page 122</p> <p>1 lack of communication as one of the factors</p> <p>2 contributing to its imprudence finding, is</p> <p>3 that correct?</p> <p>4 MR. DIDOMENICO:</p> <p>5 A. I believe that's correct.</p> <p>6 GREENE, Q.C.:</p> <p>7 Q. The next thing, if we go back to your review</p> <p>8 and your conclusions, starting on page 14, and</p> <p>9 I want to take you to the top of page 14, and</p> <p>10 I believe it's the last sentence in the</p> <p>11 paragraph that carried over from the previous</p> <p>12 page, and you'll see that we're going to spend</p> <p>13 some time around this one sentence because it</p> <p>14 seems to summarize your opinion. If you could</p> <p>15 scroll down, Ms. Gray, to page 14 of 39, the</p> <p>16 end of the first paragraph, the paragraph that</p> <p>17 carried over. I'm sorry, you were on the</p> <p>18 previous page. I'm looking at the top of page</p> <p>19 14 of 39. I'd like to read a quote from the</p> <p>20 last sentence in the paragraph at the top of</p> <p>21 the page that carried over from the previous</p> <p>22 page, and as I said, I believe this sentence</p> <p>23 seems to summarize your opinion with respect</p> <p>24 to black start. You're saying, "What is not</p> <p>25 debatable is that Hydro management consciously</p>	<p>Page 124</p> <p>1 11:45 a.m.)</p> <p>2 MR. ATHAS:</p> <p>3 A. Just to add to that, I mean, our understanding</p> <p>4 is that Hydro's planning for black start, you</p> <p>5 know, first centres around black start from</p> <p>6 power from the grid, and I just wanted to</p> <p>7 clarify that the reliance on Hardwoods is not</p> <p>8 the first step, and most of the time that</p> <p>9 there's been a black start, there's been power</p> <p>10 available from the grid, was our</p> <p>11 understanding, and deployed to black start the</p> <p>12 Holyrood facility.</p> <p>13 GREENE, Q.C.:</p> <p>14 Q. I'm not sure what your answer actually meant</p> <p>15 in the context of my question. The evidence</p> <p>16 to date on the record is that Hydro's plan and</p> <p>17 its preferred solution, even when it found</p> <p>18 itself in the situation in January, 2012, is</p> <p>19 that because Holyrood was critical, that black</p> <p>20 start at the Holyrood plant was their</p> <p>21 preferred position. Do you agree with what I</p> <p>22 just said was Hydro's position?</p> <p>23 MR. DIDOMENICO:</p> <p>24 A. I do.</p> <p>25 MR. ATHAS:</p>

Page 125	Page 127
<p>1 A. Yes.</p> <p>2 GREENE, Q.C.:</p> <p>3 Q. Okay, so it was because they found themselves,</p> <p>4 as I understand your opinion, in 2012 that</p> <p>5 they could not use the on site gas turbine</p> <p>6 after receipt of the AMEC Report, so they</p> <p>7 couldn't rely on what they had used in their</p> <p>8 planning since the plant went in operation.</p> <p>9 The plan had always been to have an on site CT</p> <p>10 at Holyrood, and now, in fact, when we came to</p> <p>11 use of Hardwoods, it was only an interim step.</p> <p>12 They were still going to go back and put black</p> <p>13 start at the Holyrood plant.</p> <p>14 MR. DIDOMENICO:</p> <p>15 A. I think some context is necessary, if I may.</p> <p>16 GREENE, Q.C.:</p> <p>17 Q. Sure.</p> <p>18 MR. DIDOMENICO:</p> <p>19 A. The issue here seems to be muddled between</p> <p>20 black start, area restoration. We go back and</p> <p>21 forth between what we're talking about here.</p> <p>22 The black start of the Holyrood plant is a</p> <p>23 portion of the plant providing energy to the</p> <p>24 Avalon Peninsula. It's only a portion of it,</p> <p>25 it's not the plan, it's a part of the plan. So</p>	<p>1 GREENE, Q.C.:</p> <p>2 Q. Okay, why is it normal for utilities in</p> <p>3 planning the system to provide for black start</p> <p>4 for the Holyrood plant? Let's use Holyrood as</p> <p>5 an example.</p> <p>6 MR. DIDOMENICO:</p> <p>7 A. Like, I don't want to speak to Holyrood</p> <p>8 exclusively because, in general, the purpose</p> <p>9 of black start is to facilitate restoring the</p> <p>10 system when the major supply is interrupted.</p> <p>11 GREENE, Q.C.:</p> <p>12 Q. And the idea of doing black start is to be</p> <p>13 able to start the plant when there is no</p> <p>14 supply available from the grid, isn't that why</p> <p>15 it's called a black start?</p> <p>16 MR. DIDOMENICO:</p> <p>17 A. For the plant, yes.</p> <p>18 GREENE, Q.C.:</p> <p>19 Q. Okay.</p> <p>20 MR. DIDOMENICO:</p> <p>21 A. But be aware that black starting the plant, in</p> <p>22 and of itself, is not an end. In order to</p> <p>23 restore power to the customers, you have to</p> <p>24 have generation, you have to have</p> <p>25 transmission, you have to have distribution.</p>
<p>Page 126</p> <p>1 we're talking about an element of the plan</p> <p>2 when we say this. So in addition, as John was</p> <p>3 pointing out a minute ago, when the worst</p> <p>4 occurs, if Holyrood trips offline, the first</p> <p>5 recourse is to restart the unit based on power</p> <p>6 from the grid. If that is not there, then it</p> <p>7 would go to Hardwoods.</p> <p>8 GREENE, Q.C.:</p> <p>9 Q. It would go to where?</p> <p>10 MR. DIDOMENICO:</p> <p>11 A. It would go to Hardwoods as secondary -</p> <p>12 GREENE, Q.C.:</p> <p>13 Q. If there's no power from the grid, it goes to</p> <p>14 Hardwoods?</p> <p>15 MR. DIDOMENICO:</p> <p>16 A. If there's no power from the grid to restart</p> <p>17 Holyrood, it would use Hardwoods to do that.</p> <p>18 MR. ATHAS:</p> <p>19 A. And from there, we mean off peninsula power.</p> <p>20 GREENE, Q.C.:</p> <p>21 Q. So let's talk about black start capability</p> <p>22 then. Black start capability for the Holyrood</p> <p>23 plant.</p> <p>24 MR. DIDOMENICO:</p> <p>25 A. Holyrood plant.</p>	<p>Page 128</p> <p>1 All of that has to work before the lights come</p> <p>2 on.</p> <p>3 GREENE, Q.C.:</p> <p>4 Q. Oh, yes.</p> <p>5 MR. DIDOMENICO:</p> <p>6 A. That's all I'm trying to clarify.</p> <p>7 GREENE, Q.C.:</p> <p>8 Q. And in Hydro's situation, which is what the</p> <p>9 issue the Commissioners have to deal with, in</p> <p>10 looking at the Holyrood plant from the time</p> <p>11 the plant went in, Hydro's planning had been</p> <p>12 to have on site black start capability at the</p> <p>13 Holyrood plant.</p> <p>14 MR. DIDOMENICO:</p> <p>15 A. Correct.</p> <p>16 GREENE, Q.C.:</p> <p>17 Q. And, in fact, even in 2012 when Hardwoods</p> <p>18 became an option, it had always been Hydro's</p> <p>19 plan to return to have black start capability</p> <p>20 at the Holyrood site, is that correct?</p> <p>21 MR. DIDOMENICO:</p> <p>22 A. That is correct, with just one amplification,</p> <p>23 Hardwoods was always part of the area</p> <p>24 restoration plan.</p> <p>25 GREENE, Q.C.:</p>

Page 129	Page 131
<p>1 Q. Now why do we need black start capability at 2 the Holyrood plant, what additional benefit 3 does it give us over having it available from 4 Hardwoods? 5 MR. DIDOMENICO: 6 A. In general, the more sources of supply - the 7 more sources of supply that can be started 8 with black start the better, so whether we 9 have two, three, four, five, the more the 10 better. That's essentially the benefit of it. 11 GREENE, Q.C.: 12 Q. So one benefit of having the black start at 13 Holyrood was to be able to keep units warm, is 14 that correct? 15 MR. DIDOMENICO: 16 A. Absolutely. 17 GREENE, Q.C.: 18 Q. Even if there was no source of power from the 19 grid? 20 MR. DIDOMENICO: 21 A. Absolutely. 22 GREENE, Q.C.: 23 Q. Okay, and for the Holyrood plant for the 24 Newfoundland electrical system, that up until 25 2012 that had been Hydro's plan, is that</p>	<p>1 start plan for Holyrood would primarily rely 2 on energy available from the grid supplied by 3 Hardwoods if it became electrically isolated 4 from the remainder of the system", and you 5 just helped explain a little bit of what you 6 were talking about there. When you go up to 7 your first line, you say at the very first 8 paragraph, "Here is one of various examples 9 where Liberty implies that Hydro did not have 10 a black start plan. Hydro had a black start 11 plan for the Avalon Peninsula", and I just 12 wanted to confirm, as I thought we just did, 13 that that plan for use of Hardwoods did not 14 provide the same level of additional backup as 15 Hydro's previous plan up to 2012. So it 16 wasn't the same black start backup plan, is 17 that correct? 18 MR. DIDOMENICO: 19 A. It was not the same plan, but we're talking 20 matters of degree, but it was not the same 21 plan. 22 GREENE, Q.C.: 23 Q. Okay. So you're saying that Hydro did have 24 black start capability, and that black start 25 capability was only as long as they could get</p>
<p>1 correct? They would have black start at 2 Holyrood to keep the units warm, even in the 3 event all of the lines were down, they would 4 be able to have the plant up and running as 5 soon as the lines were connected? 6 MR. DIDOMENICO: 7 A. True enough. 8 GREENE, Q.C.: 9 Q. So when I come back to your sentence, the fact 10 that in 2012, Hardwoods became available, 11 while it didn't provide the same level of 12 reliability or backup, whatever word we agree 13 upon, had existed previously when they had 14 black start at Holyrood and the Hardwoods 15 option, would you agree with that? 16 MR. DIDOMENICO: 17 A. I would, again as an interim solution. 18 GREENE, Q.C.: 19 Q. Now I'd like to go to your surrebuttal of 20 October 14th, page 4 of 9, Hydro's 21 surrebuttal, which in your report is attached 22 again as Appendix "B", I believe, and page 4. 23 Looking at this, your first sentence in the 24 very first paragraph on page 18, "La Capra 25 Associates understanding is that the black</p>	<p>1 power over the grid to the Holyrood plant, and 2 that's what we see with the Hardwoods option? 3 MR. DIDOMENICO: 4 A. I'm not sure I - would you please repeat that? 5 GREENE, Q.C.: 6 Q. You're saying that they could use Hardwoods 7 and get power from the grid, and you're saying 8 that that is Hydro's black start plan? 9 MR. DIDOMENICO: 10 A. For the peninsula, yes. 11 GREENE, Q.C.: 12 Q. Right, and I'm saying that that plan was only 13 as good as the ability to get power in from 14 Hardwoods into the plant, which you've just 15 agreed with me? 16 MR. DIDOMENICO: 17 A. Agree. 18 GREENE, Q.C.: 19 Q. And, therefore, that black start plan was not 20 the same as, and, in fact, I would use the 21 words "not as good as" the previous plan. Now 22 you can take exception to "not as good as", 23 but not as reliable - 24 MR. DIDOMENICO: 25 A. And I would take exception to that, but again,</p>

<p style="text-align: right;">Page 133</p> <p>1 as I think we've said more than once, Hydro 2 made the conscious decision to accept a lower 3 level of reliability on an interim basis until 4 they could produce the other new CT. 5 GREENE, Q.C.: 6 Q. So you're - 7 MR. DIDOMENICO: 8 A. Specifically around all the issues that go 9 into that decision - recall again, I'm just 10 trying to amplify here a little bit that when 11 you're making a decision like this, you're not 12 looking at this in a vacuum. You're not 13 looking at it from a reliability only 14 perspective. You're looking at the 15 reliability benefit, you're looking at the 16 cost, and you're looking at the probability of 17 that benefit actually accruing to the 18 customers that are paying for this. 19 GREENE, Q.C.: 20 Q. Okay. 21 MR. DIDOMENICO: 22 A. Of those three elements, only one is certain 23 and that's the cost you're going to incur. 24 Whether or not that reliability benefit ever 25 actually accrues, it may, it may not. In this</p>	<p style="text-align: right;">Page 135</p> <p>1 MR. DIDOMENICO: 2 A. Yes. 3 GREENE, Q.C.: 4 Q. And we're going to come back to that as well. 5 Now the next thing and you just brought me 6 there, was the fact that it was, "What is not 7 debatable is that Hydro management consciously 8 made the decision to tolerate the risk". So 9 when we look at that, I wanted to know the 10 basis for your statement that management 11 consciously made the decision to tolerate a 12 risk. First, what did you rely on to come to 13 your conclusion that it was a conscious 14 decision? 15 MR. DIDOMENICO: 16 A. It was a combination. It was a combination of 17 the information that we read that was 18 available via information requests, what have 19 you, and the interviews that we had with the 20 Hydro team, the conference calls that I 21 alluded to earlier. 22 GREENE, Q.C.: 23 Q. And you can't recall who you had those 24 conference calls with other than Mr. 25 Henderson?</p>
<p style="text-align: right;">Page 134</p> <p>1 specific instance, we're dealing with an issue 2 that had extremely low level of likelihood of 3 occurring, and they made the call to accept 4 some risk on an interim period until they 5 could get the permanent long term solution. I 6 mean, I think that embodies everything that 7 we're saying. 8 GREENE, Q.C.: 9 Q. And we're going to come to each one of these 10 step by step. The first one I was talking 11 about was the fact that it was interim and 12 that you're saying that they did have a black 13 start plan, and I think you've agreed with me 14 that that black start plan they had after they 15 were only relying on Hardwoods wasn't - did 16 not provide the same level of reliability or 17 backup as the previous plan? 18 MR. DIDOMENICO: 19 A. Agree. 20 GREENE, Q.C.: 21 Q. Okay. Now if we could go back to your report 22 where we were just talking about the - here we 23 go, your last sentence. We talked about one 24 of the important factors in your opinion is 25 that it was an interim decision?</p>	<p style="text-align: right;">Page 136</p> <p>1 MR. DIDOMENICO: 2 A. Certainly Mr. Henderson was part of it. I do 3 not remember the whole staff, but it would 4 have been anyone that was directly related to 5 those two issues, and we can go back and get 6 you that information. 7 GREENE, Q.C.: 8 Q. Do you know if you talked to the people who 9 are involved in making the decision at the 10 time back in 2012, and we've heard evidence 11 that it was a Mr. Haynes was the Vice 12 President who was primarily responsible? 13 MR. DIDOMENICO: 14 A. I don't know. 15 GREENE, Q.C.: 16 Q. So this is talking to individuals after the 17 event. Did you see any analysis that Hydro 18 had done at the time, not when you were 19 talking to them in 2015, did Hydro provide you 20 with any internal reports or analysis with 21 respect to the factors they considered in 22 making the decision? 23 MR. DIDOMENICO: 24 A. If you're referring to a specific document or 25 report, the answer to that would be "no".</p>

Page 137	Page 139
<p>1 GREENE, Q.C.:</p> <p>2 Q. And you are aware that Hydro was asked to</p> <p>3 provide a copy of any documentation, including</p> <p>4 analysis, reports, memos, and none were -</p> <p>5 Hydro was not able to provide any?</p> <p>6 MR. DIDOMENICO:</p> <p>7 A. That's my understanding as well.</p> <p>8 GREENE, Q.C.:</p> <p>9 Q. So again you relied upon your review of the</p> <p>10 evidence that we've all seen, and discussions</p> <p>11 in 2015 with individuals, some of whom may or</p> <p>12 may not have been involved in the decision</p> <p>13 making process back in 2012, is that correct?</p> <p>14 MR. DIDOMENICO:</p> <p>15 A. That is correct.</p> <p>16 GREENE, Q.C.:</p> <p>17 Q. Now the next part of this, as I said, is one</p> <p>18 sentence that really summarizes your opinion</p> <p>19 so we will spend some time on it. You said</p> <p>20 they made the decision to tolerate the risk.</p> <p>21 What risk was it they made the decision to</p> <p>22 tolerate?</p> <p>23 MR. DIDOMENICO:</p> <p>24 A. The lack of on site black start capability at</p> <p>25 Holyrood.</p>	<p>1 January 11, 2013, event, a black start</p> <p>2 scenario had occurred only three times".</p> <p>3 MR. DIDOMENICO:</p> <p>4 A. That's correct.</p> <p>5 GREENE, Q.C.:</p> <p>6 Q. And I wondered what was the basis for that</p> <p>7 statement?</p> <p>8 MR. DIDOMENICO:</p> <p>9 A. It was based on information we received from</p> <p>10 Hydro.</p> <p>11 (12:00 p.m.)</p> <p>12 GREENE, Q.C.:</p> <p>13 Q. Can you point to any specific piece of</p> <p>14 information that you relied on for the fact</p> <p>15 that it was three times before?</p> <p>16 MR. DIDOMENICO:</p> <p>17 A. That was based on conversations that we had</p> <p>18 with the Hydro staff.</p> <p>19 GREENE, Q.C.:</p> <p>20 Q. The response to PR-PUB-NLH-003 indicates that</p> <p>21 it was two times, including 2013. We can go to</p> <p>22 PUB-NLH-003, if you like, Attachment 1.</p> <p>23 Anyway, nothing turns on it. I just wondered</p> <p>24 - so it was based on oral information you were</p> <p>25 given in your conference calls?</p>
Page 138	Page 140
<p>1 GREENE, Q.C.:</p> <p>2 Q. Okay, and in your mind, what is the</p> <p>3 quantification of that risk?</p> <p>4 MR. DIDOMENICO:</p> <p>5 A. I think the quantification would vary</p> <p>6 depending upon circumstances. In the</p> <p>7 particular instance that we're talking about,</p> <p>8 we go back to that 11 hours that we've been</p> <p>9 discussing over and over again, the pre-</p> <p>10 warming time, if you will, the ability to keep</p> <p>11 the units warm while the rest of the system</p> <p>12 was unavailable.</p> <p>13 GREENE, Q.C.:</p> <p>14 Q. So that was one risk, they lost the use of</p> <p>15 warming. You also mentioned in here one of</p> <p>16 the other factors that I thought related to</p> <p>17 their assessment of the risk was the limited</p> <p>18 exposure, given the limited number of times</p> <p>19 that it happened before, is that correct?</p> <p>20 MR. DIDOMENICO:</p> <p>21 A. That's correct.</p> <p>22 GREENE, Q.C.:</p> <p>23 Q. And if we go down to the next paragraph, you</p> <p>24 say in the second sentence, "It is our</p> <p>25 understanding that since 1990, and prior to</p>	<p>1 MR. DIDOMENICO:</p> <p>2 A. Yes, and again I'm going to keep repeating</p> <p>3 myself, forgive me, but we need to be careful</p> <p>4 about what we're categorizing as black start.</p> <p>5 That term is thrown around a lot, and it's</p> <p>6 thrown around in different contexts, and I</p> <p>7 want to make sure that we're using it in the</p> <p>8 same manner. When we were talking about black</p> <p>9 start there, we were talking about the fact</p> <p>10 that the system was isolated.</p> <p>11 GREENE, Q.C.:</p> <p>12 Q. Yes.</p> <p>13 MR. DIDOMENICO:</p> <p>14 A. As opposed to -</p> <p>15 GREENE, Q.C.:</p> <p>16 Q. And when you say isolated, and you say -</p> <p>17 MR. DIDOMENICO:</p> <p>18 A. Electrically isolated.</p> <p>19 GREENE, Q.C.:</p> <p>20 Q. Are you talking about the Holyrood plant or</p> <p>21 are you talking about the Avalon Peninsula?</p> <p>22 MR. DIDOMENICO:</p> <p>23 A. I'm talking about the Avalon Peninsula.</p> <p>24 GREENE, Q.C.:</p> <p>25 Q. Okay, so the risk of not having the black</p>

Page 141	Page 143
<p>1 start at the Holyrood plant, I think that you 2 have agreed that one thing that was lost by 3 not having it is the ability to keep the units 4 warm so that they would be ready to go when 5 power is connected? 6 MR. DIDOMENICO: 7 A. Certainly. 8 GREENE, Q.C.: 9 Q. Okay, and in your discussion with respect to 10 the low risk that the event would occur, the 11 fact that it didn't happen very often, I'm 12 trying to put that in the context of - you 13 are also, as I understand it, agreeing with 14 the Hydro position that it is better to have 15 black start at Holyrood and that is their 16 preferred option, and that's what they had 17 always intended to do. 18 MR. DIDOMENICO: 19 A. Yes, on a long term basis, yes. 20 GREENE, Q.C.: 21 Q. So the fact that it might be a rare event or 22 only happened a few times, so the risk was 23 low, and that is one of the factors you use 24 for saying it was a low risk. Isn't that what 25 utilities are supposed to do when they're</p>	<p>1 to spend money, right. The easiest thing any 2 engineering staff can do is buy a new one, buy 3 a new power plant, buy a new transmission, 4 sure, why not, let me go buy it. If that's 5 the only concern, if you're only concerned 6 about reliability and not balancing 7 reliability and cost, which is the job of 8 every utility manager, that's the dilemma, 9 that was the question, that's what they were 10 faced with, that's what they were trying to 11 justify. 12 GREENE, Q.C.: 13 Q. And of course, there's also legislative 14 requirement here is to provide reliable, least 15 cost power. So I take it from even that 16 answer then, you're not saying that because 17 the risk was low, the fact that it could 18 occur, it didn't -- wasn't foreseeable it 19 would occur very often, that is not a basis 20 for saying that black start at the Holyrood 21 site was not a good decision by Hydro at the 22 time it made the decision and in fact, it 23 continued to be its position that even though 24 it was a rare event, it was prudent and 25 essential as part of the reliable Island</p>
<p>Page 142</p> <p>1 planning? We don't say it hasn't happened 2 very often, so don't worry about it. I was 3 confused by - you seem to rely so much on the 4 fact that it was rare. 5 MR. DIDOMENICO: 6 A. Well, I think when we're looking at making 7 investments, millions of dollars worth of 8 investments, large investments in assets, we 9 don't do that on a whim relative to something 10 that may occur some time that hasn't occurred 11 or has happened very infrequently. The 12 exposure period here was, as we were just 13 talking about, three times in the last 25 14 years. Now we're exposed for another two 15 years or two and a half years or whatever it 16 was. The likelihood of that event occurring in 17 that time frame is very, very low, I mean, 18 very, very low. We're talking less than a 19 percent type of a low. So again cost benefit. 20 GREENE, Q.C.: 21 Q. Okay. 22 MR. DIDOMENICO: 23 A. Do we want - I do want to mention because it 24 strikes me when I go through the testimony 25 here, the easiest solution for any utility is</p>	<p>Page 144</p> <p>1 Interconnected system to have black start at 2 the Holyrood plant? 3 MR. DIDOMENICO: 4 A. It is beneficial, yes. But again, remember 5 the context. 6 GREENE, Q.C.: 7 Q. Oh yeah. 8 MR. DIDOMENICO: 9 A. The longer we go, the longer the period of 10 time, the more likely the event is to occur. 11 Short term, very unlikely. We go 10 years, 20 12 years, 30 years, it's more likely. It's in 13 that context that we say that. 14 GREENE, Q.C.: 15 Q. Okay. 16 MR. ATHAS: 17 A. And I'd like to just add one thing too. Our 18 understanding during the decision process was 19 -- and as we mentioned on page five of nine on 20 the item number three in Appendix B of the 21 surrebuttal was that the -- a limited decrease 22 in reliability was consciously known by the 23 management at Hydro, the people making that 24 decision, not the specific issue of an 11-hour 25 outage for the warming and the like.</p>

Page 145

1 Predominantly on their experience that most of
 2 the -- that the black start incidences have
 3 been from the grid and from -- and very short
 4 durations. So that that level of reliability,
 5 some reliability degradation was what was
 6 traded off in the issue of cost and exposure
 7 for the interim period, not a specific event.
 8 That specific event was of an additional 11
 9 hours, as unfortunate as it was, is an outcome
 10 of the -- and not a specific input to the
 11 decision process.

12 GREENE, Q.C.:
 13 Q. But the fact that the units would not be able
 14 to quickly generate power, the warning thing,
 15 that was a foreseeable thing, not just an
 16 outcome I assume?

17 MR. ATHAS:
 18 A. It was foreseeable in the context of having a
 19 -- if you could foresee a weather event that
 20 would take all five lines down to the facility
 21 at Holyrood.

22 GREENE, Q.C.:
 23 Q. Which of course is, as we said even though
 24 it's rare, is what Hydro had been planning on.
 25 It's why they have black start at the plant to

Page 146

1 begin with. So if we come back to your last
 2 sentence, we've talked about some of the
 3 factors. We've talked about the conscious
 4 decision and we've talked about what the risk
 5 was for the tolerance. Part of it, as Mr.
 6 DiDomenico just said in one of his previous
 7 answers, was the length of time. Do you know
 8 what Hydro was anticipating in 2012 as the
 9 period that this interim solution would be in
 10 effect?

11 MR. DIDOMENICO:
 12 A. It was my understanding that by early '15
 13 there would be a more permanent solution in
 14 place.

15 GREENE, Q.C.:
 16 Q. And in your opinion, that three-year period
 17 was acceptable?

18 MR. DIDOMENICO:
 19 A. Yes.

20 GREENE, Q.C.:
 21 Q. And in your opinion, would it have been
 22 incumbent on Hydro to do everything possible
 23 to ensure that that period of time that that -
 24 - the higher risk that we've just acknowledged
 25 existed?

Page 147

1 MR. DIDOMENICO:
 2 A. Within reason, yes.

3 GREENE, Q.C.:
 4 Q. Okay. And coming back again to that one last
 5 -- to this sentence on the top of page 14,
 6 that Hydro's reliance on an alternate, which
 7 was the Hardwoods gas turbine, which you've
 8 acknowledged didn't provide the same level of
 9 black start capability for the plant, in that
 10 situation, in your opinion, the -- how
 11 important is the functionality or the
 12 alternative that was being proposed if you
 13 look at how important a factor was it whether
 14 the alternative being proposed was a good
 15 option?

16 MR. DIDOMENICO:
 17 A. You're going to have to help me again because
 18 I'm not sure I understand.

19 GREENE, Q.C.:
 20 Q. Hydro was looking at the Hardwoods gas
 21 turbine.

22 MR. DIDOMENICO:
 23 A. Yes.

24 GREENE, Q.C.:
 25 Q. In your opinion, in making that -- looking at

Page 148

1 that, was it a factor that what they were
 2 going to rely on was going to work?

3 MR. DIDOMENICO:
 4 A. Yes.

5 MR. ATHAS:
 6 A. May I add again, Hardwoods has always been
 7 part of the restoration plan for the Avalon
 8 Peninsula. It's never not been. The
 9 difference is that it was being solely relied
 10 upon, just to clarify.

11 GREENE, Q.C.:
 12 Q. And I guess I accept that and we'll go back
 13 again that the black start capability at the
 14 plant provides additional benefit?

15 MR. DIDOMENICO:
 16 A. Agreed.

17 GREENE, Q.C.:
 18 Q. And in fact, if you go to the black start
 19 definition of being able to black start
 20 without power from the grid, you need a CT at
 21 the Holyrood plant to be able to achieve that.
 22 Is that correct?

23 MR. DIDOMENICO:
 24 A. That's correct.

25 GREENE, Q.C.:

<p style="text-align: right;">Page 149</p> <p>1 Q. So now we're looking at where Hydro was in 2 2012 and you're saying that they relied on 3 Hardwoods and my question was, in looking at 4 and seeing whether Hydro was a suitable backup 5 plan, how important, in your opinion, was the 6 ability of Hardwoods to actually function when 7 called upon? 8 MR. DIDOMENICO: 9 A. Certainly was important. 10 GREENE, Q.C.: 11 Q. Okay. If you can go to Liberty's report of 12 July 6th at page 44, page 54, and if you 13 scroll down. And here if you look at the 14 third bullet where Liberty states "Hardwoods 15 is particularly unreliable and hence 16 inappropriate for a source of black start 17 capability. It did not exhibit the high 18 probability of starting that a black start 19 resource requires. Utilization forced outage 20 probability, UFOP, measures the probability 21 that a generator will not be available when 22 required. Hardwoods UFOP average over 26 23 percent from 2008 to 2012" and of course that 24 means it's not available about 25 percent of 25 the time when it was needed?</p>	<p style="text-align: right;">Page 151</p> <p>1 A. Yes. 2 GREENE, Q.C.: 3 Q. Okay. 4 MR. DIDOMENICO: 5 A. I think the answer was yes to that question. 6 MR. ATHAS: 7 A. Yeah, that 26 percent is not necessarily the 8 time when there was unavailability of one of 9 the units to be able to provide black start 10 capability from Hardwoods. 11 GREENE, Q.C.: 12 Q. So you have no difficulty with Hydro's 13 experience with that Hardwoods gas turbine in 14 giving your opinion that that was a reliable 15 unit that could be relied upon for black start 16 capability? 17 MR. DIDOMENICO: 18 A. In the context of the fact that they were 19 investing significant effort into improving 20 the reliability of that unit over that same 21 timeframe. I mean, there are life extension 22 efforts that were ongoing. The expectation 23 was that the availability would improve. But 24 again, that 26 percent is not indicative of 25 how much of that unit is actually available</p>
<p style="text-align: right;">Page 150</p> <p>1 MR. DIDOMENICO: 2 A. Agreed. 3 GREENE, Q.C.: 4 Q. So would you -- with that information, which 5 is on the record, would you have felt that 6 Hydro -- that Hardwoods was a reliable option 7 to be able to be used? 8 MR. DIDOMENICO: 9 A. A reasonable option for it to be used? 10 GREENE, Q.C.: 11 Q. Yes. 12 MR. DIDOMENICO: 13 A. The answer would be yes. 14 GREENE, Q.C.: 15 Q. And is that because it was the only one they 16 had at that point? 17 MR. DIDOMENICO: 18 A. Well, the only one is one thing. But that 19 statistic talks -- speaks to the entire unit's 20 availability. In order to be used and useful 21 as a black start unit, only half of the unit 22 needs to be available. 23 GREENE, Q.C.: 24 Q. And is that what you interpret that to mean? 25 MR. DIDOMENICO:</p>	<p style="text-align: right;">Page 152</p> <p>1 for black start. It's a number less than 2 that. I don't have the exact number. 3 GREENE, Q.C.: 4 Q. So again, even with the record for Hardwoods, 5 it doesn't give you any pause for concern 6 about why Hardwoods would be an acceptable 7 interim solution? 8 MR. DIDOMENICO: 9 A. Not given the fact that they had a plan in 10 place to improve the reliability of that 11 facility. 12 GREENE, Q.C.: 13 Q. And would it give you any pause for concern to 14 know that even though investment was spent, we 15 still don't see a significant improvement in 16 the reliability of Hardwoods? 17 MR. DIDOMENICO: 18 A. That's a concern. 19 GREENE, Q.C.: 20 Q. So if we go back again to that one sentence 21 which August 7th, Appendix B, page 14 -- 22 actually, I'm sorry, it's not that sentence. 23 It's you refer later on the page that it was 24 to minimize cost. The second full paragraph 25 actually. Yes, "Hydro's management revisited</p>

Page 153

1 the issue on a number of occasions and in each
 2 case decisions were made taking account of
 3 minimizing the cost to its customers." And
 4 here you're emphasizing, as you have earlier
 5 in your testimony, that it was the least cost
 6 and we've talked a little bit about how you
 7 balance reliability and how you balance cost
 8 because there's no blank cheque book for any
 9 utility. And in your view, how do, in this
 10 particular circumstances, the importance of
 11 reliability for black start at the Holyrood
 12 plant, what weight should have been given to
 13 that reliability versus the cost?
 14 (12:15 p.m.)
 15 MR. DIDOMENICO:
 16 A. When you use the word "weight" to me it
 17 implies having some numerical value and in
 18 decisions of this type, you're often left with
 19 the experience of the managers that are
 20 involved in making those decisions, not a
 21 weight per se. I think that the people that
 22 are best positioned to make that judgment are
 23 the folks that have been living and breathing
 24 the operation of the system and the unit in
 25 particular for a number of years, and I rely

Page 154

1 on that.
 2 GREENE, Q.C.:
 3 Q. So your opinion, you relied on Hydro's
 4 assessment with respect to all of this? Isn't
 5 that correct? Not just the minimization of
 6 cost.
 7 MR. DIDOMENICO:
 8 A. No, not at all. Not all of it, no. What I'm
 9 saying is that if you -- you asked me what
 10 particular weight we should put on reliability
 11 and I'm saying that it's not a numerical value
 12 and that the best source of how to value the
 13 ability are the people that are running the
 14 unit. No consultant can come in and tell you
 15 how to run your system without knowing the
 16 information that the people that are working
 17 there know.
 18 GREENE, Q.C.:
 19 Q. And there is another step as well, isn't
 20 there? While the utility has the information
 21 on cost, as well they always must establish to
 22 the regulator that they are making the right
 23 balance of the cost versus reliability?
 24 MR. DIDOMENICO:
 25 A. Absolutely.

Page 155

1 GREENE, Q.C.:
 2 Q. So it's not just the utility who has input
 3 into -- customers, of course, also are
 4 concerned, aren't they, in terms of they want
 5 their lights on at a reasonable cost?
 6 MR. DIDOMENICO:
 7 A. Certainly.
 8 GREENE, Q.C.:
 9 Q. And that's the tension you always see. Now
 10 the black start diesels went into service in
 11 April of 2014 and at that time, the plan was
 12 that they would remain in service until mid
 13 2015, so just a little over a year. That was
 14 the plan. Now you have mentioned you've read
 15 the transcript, so you do know that there is
 16 some uncertainty with respect to Hydro's plans
 17 for the existing black start diesels at this
 18 point in time, as to whether they will be
 19 applying for approval to keep them in service
 20 as black start.
 21 MR. DIDOMENICO:
 22 A. Generally. I'd say generally aware, yes.
 23 GREENE, Q.C.:
 24 Q. Okay. But at the time Hydro applied and got
 25 approval, the black start diesels were to

Page 156

1 remain in service for just over a year, and we
 2 still don't know what's going to happen with
 3 them at this point. So if we could go to
 4 Liberty's reply of September 17th, page 21,
 5 and can you keep scrolling down? And here,
 6 this goes to Liberty's recommendation that
 7 Hydro not be allowed to recover the cost for
 8 the black start system because of its
 9 imprudence. And here, Liberty is saying
 10 "Hydro first lost its capability for black
 11 start at the Holyrood plant in 2010. At that
 12 point, Hydro became deficient in meeting a
 13 very critical system need. Hydro allowed that
 14 deficiency to continue until mid-2014, a
 15 period of 52 months. Hydro finally
 16 established black start capability at the
 17 Holyrood plant with a temporary solution that
 18 filled its need for 12 months. In summary,
 19 Hydro had an obligation to provide a critical
 20 system need for 64 months, yet met its
 21 obligation for only 12 months. Hydro claims
 22 it is due compensation for that 12 months, but
 23 what about the 52 months of failure?"
 24 So that's Liberty's position with respect
 25 to f the Board does find that Hydro acted

Page 157

1 imprudently with respect to the black start
 2 project, what the disallowance should be. And
 3 what I wanted to ask you, if the Board reaches
 4 a contrary decision, in fact they find that
 5 the black start project was indeed imprudent,
 6 what would your opinion be with respect to
 7 what the disallowance should be?
 8 MR. DIDOMENICO:
 9 A. That's an area that I'm not sure I can comment
 10 on right now. It wasn't something we've been
 11 asked to look at.
 12 GREENE, Q.C.:
 13 Q. Okay. You would agree that if Hydro is
 14 allowed to recover the full cost of the black
 15 start diesel and if the Board does find
 16 imprudence, there would be no penalty sanction
 17 or negative for Hydro?
 18 MR. DIDOMENICO:
 19 A. I guess I would disagree with that.
 20 MR. ATHAS:
 21 A. I think we disagree with that because one part
 22 of that omelet that you didn't say is if they
 23 find imprudence and they don't -- and they
 24 implement some other penalty, that's something
 25 that could happen. What we've spent -- what

Page 158

1 we've highlighted a little bit in our report
 2 is that the nature of that decision to put in
 3 the diesels as a response to a Board Order and
 4 to the Board communicating the importance of
 5 the diesels. Besides the order it was the
 6 very fact that their conclusion was it was
 7 very important to have that coverage. That is
 8 a used and useful investment.
 9 The association of a penalty with the
 10 cost of the diesels by Liberty is, at best, a
 11 convenience of saying that's the best place --
 12 that could be an easy place to take the money
 13 and it's really -- and we're just trying to
 14 highlight that the -- we've tried to highlight
 15 that the decision to put in the diesels and
 16 get recovery -- and expect recovery of that
 17 money is something that we would think that
 18 every utility would be expecting, that upon a
 19 Board order to put an investment in place,
 20 they would get recovery of that.
 21 Whether or not there is a separate ruling
 22 of imprudence by the Board and a penalty to be
 23 imposed that even could be the exact amount of
 24 dollars of that, it's important to break up
 25 that decision of any imprudence or penalty

Page 159

1 from an apparent placing that the decision to
 2 follow the Board order and put in the diesels
 3 that have been deemed very critical was a bad
 4 decision and that that should be allowed on
 5 its face -- disallowed on its face.
 6 GREENE, Q.C.:
 7 Q. So you're relying on a Board order. But the
 8 Board order that approved the black start
 9 diesel specifically said that the recovery of
 10 the cost was a separate issue.
 11 MR. ATHAS:
 12 A. No, that's right, and there's many utility
 13 practices that we've been involved with where
 14 there's been deferred recovery which is not
 15 guaranteed, and I didn't imply that it was
 16 guaranteed. I implied that it would get -- I
 17 would expect that at some time it would get,
 18 you know, some degree of review for whether
 19 the manner of which they acquired the diesels
 20 and the practicum of projects of putting them
 21 in place were all done prudently and the fact
 22 that those diesels did prove used and useful
 23 are the standards that we are more closely
 24 experiencing with a recovery of investment.
 25 So that, but associating recovery of the

Page 160

1 investment with an inaction at some other time
 2 is misleading, in my frame of mind.
 3 GREENE, Q.C.:
 4 Q. So if there is a finding of imprudence by the
 5 Board, I'm still not sure -- you do
 6 acknowledge that if there is no negative
 7 consequence for Hydro, what would be the
 8 incentive for the utility to act prudently in
 9 the future? Is there normal -- should there
 10 be an attachment of a negative consequence
 11 when we have the very serious finding by a
 12 regulator that there has been imprudence?
 13 MR. DIDOMENICO:
 14 A. I think the concept or the notion that unless
 15 a utility is financially penalized they won't
 16 take action to correct past deficiencies is
 17 unfortunate. I think this very proceeding has
 18 shown that a great many changes have already
 19 taken place and are continuing to take place
 20 without any finding one way or the other on
 21 the level of imprudence. So, I don't see the
 22 connection between performance improvement --
 23 and this is fundamental to our position
 24 relative to Liberty's. On many fronts, we
 25 agree with many of the suggestions that

Page 161

1 Liberty has put forward. Where we disagree is
 2 at that level of imprudence. Performance
 3 improvement versus level of improvement.
 4 Hindsight versus progressively looking
 5 forward. We disagree on those elements, but
 6 we don't disagree that a number of actions can
 7 be taken and are in fact being taken by Hydro
 8 to improve their situation going forward.
 9 MR. ATHAS:
 10 A. I also would just add that to infer -- maybe
 11 if I misinterpreted your question -- to infer
 12 that there would be no reaction stigma
 13 associated with a finding of imprudence
 14 without a financial penalty, I think is
 15 mistaken. I would think -- I can't imagine a
 16 utility management that would seriously think
 17 about its business even more so than just is
 18 going on in this proceeding if they were
 19 labelled with the "P" word of questioning
 20 their prudence and so that I think is, in
 21 itself, prior to -- as my colleague mentioned,
 22 prior to monetary penalties itself is a
 23 profound statement to be made by the Board.
 24 GREENE, Q.C.:
 25 Q. Yes, and I guess that's what we're all

Page 162

1 struggling with here. It's to assist the
 2 Commissioners when they're looking at this
 3 when they go to their offices and have to look
 4 at all of the information, and if they do make
 5 a determination that in their finding that
 6 Hydro was imprudent, again to give additional
 7 opinions to assist the Board with the next
 8 step. So I take from your response that the
 9 finding of imprudence itself is very
 10 significant. No utility likes the regulator
 11 to say that they have acted imprudently. And
 12 you believe that the performance improvement
 13 that was identified as a result of this work
 14 is that will ensure or lessen the risk of
 15 repeats and that no financial penalty or
 16 consequence to Hydro in addition is required.
 17 In your opinion, is it ever required by a
 18 regulator for imprudence?
 19 MR. ATHAS:
 20 A. I'd prefer not to speculate with is it ever
 21 required.
 22 GREENE, Q.C.:
 23 Q. Are you aware of situations where it has been
 24 awarded?
 25 MR. ATHAS:

Page 163

1 A. Certainly.
 2 GREENE, Q.C.:
 3 Q. If we could move to unit one and here your
 4 August 7th report, your reply, page 21 of 39.
 5 And again, on the very first sentence under
 6 your review and conclusions. "The issue here
 7 is not whether Hydro's existing processes and
 8 procedures relative to the lube oil system
 9 could be improved upon. There is no
 10 disagreement on that point." So again, you're
 11 not taking issue with the fact that Hydro
 12 needed to change its process and its
 13 procedures. The question is whether those
 14 that were in place at the time rose to the
 15 level of imprudence. Is that what you're
 16 saying?
 17 MR. DIDOMENICO:
 18 A. That's correct.
 19 GREENE, Q.C.:
 20 Q. When I read your report, this first report,
 21 you dealt only with the issue of the lack of
 22 testing for the adequate lube oil flow for the
 23 DC system. Is that correct? The couple of
 24 pages that deal with it here didn't get into
 25 any of the inadequacies that existed with the

Page 164

1 motor. That's correct, isn't it? You only
 2 dealt, in your initial report, with respect to
 3 the lack of testing of adequate flow for the
 4 DC system?
 5 MR. DIDOMENICO:
 6 A. That's correct.
 7 GREENE, Q.C.:
 8 Q. Okay. And essentially, I summarized when I
 9 read it, and again we've read it more than
 10 once in preparing for cross, I was struck by
 11 the fact that your primary reason for saying
 12 that Hydro had not been imprudent with respect
 13 to the failure to test for adequate lube oil
 14 is that they relied on an opinion of the
 15 original equipment supplier some 40 years ago
 16 or 40 odd years ago. So the principal defence
 17 was nobody told Hydro that they should do it.
 18 MR. DIDOMENICO:
 19 A. I'm just thinking about how I should answer
 20 that.
 21 GREENE, Q.C.:
 22 Q. And the -
 23 MR. DIDOMENICO:
 24 A. The issue here is that in an operating
 25 environment at a power plant, there are lots

<p style="text-align: right;">Page 165</p> <p>1 of issues coming up on a daily basis for any 2 facility, not specific to Hydro. Lots of 3 things going on. To expect an entity to be 4 investigating things that have never been a 5 problem in 90 years worth of operating 6 history, never has come up, never has been a 7 problem, to expect them to be sitting around 8 looking for things like that that have never 9 happened, while it would be admirable, it 10 doesn't usually work that way. There are too 11 many issues that have to be addressed in the 12 short term to expect them to do that. That's 13 why we talk about reasonable versus imprudent. 14 (12:30 p.m.) 15 GREENE, Q.C.: 16 Q. And actually, that answer is what I had 17 expected you to say and I was struck in 18 reading your report, and also in some of the 19 evidence that Hydro has given, that has been a 20 typical response of Hydro in some of these 21 cases, "look, we never had a problem. So why 22 should we foresee it? Why should we have 23 taken action?" and you sort of repeated that 24 again. 25 MR. DIDOMENICO:</p>	<p style="text-align: right;">Page 167</p> <p>1 appropriate. 2 GREENE, Q.C.: 3 Q. And under number 11 on page eight, what I 4 wanted to bring you -- you just expressed your 5 first sentence, which is you disagree with the 6 statement, but the second sentence, "La Capra 7 Associates agrees that a functional test of 8 the system must verify that the system works 9 as intended." 10 MR. DIDOMENICO: 11 A. I'd agree. 12 GREENE, Q.C.: 13 Q. So we know that in order for the motor to 14 work, the motor had to work and had to provide 15 adequate lube oil and in order for Hydro to 16 have verified that the DC lube oil system 17 worked, wouldn't it have been that there was 18 adequate flow to keep the motor going? 19 MR. DIDOMENICO: 20 A. Again, this speaks to Hydro's reliance on OEM 21 specification and direction from their on-site 22 experts that they have on site on a regular 23 basis. They rely on that expertise. None of 24 that expertise flagged this as an issue and 25 I'm betting that largely because it had never</p>
<p style="text-align: right;">Page 166</p> <p>1 A. I did. 2 GREENE, Q.C.: 3 Q. So let's start with I guess you would agree 4 that the lube oil system was a critical system 5 at the Holyrood plant? 6 MR. DIDOMENICO: 7 A. Certainly. 8 GREENE, Q.C.: 9 Q. You would agree that the failure of the lube 10 oil system could cause catastrophe damage to 11 the unit and in fact there was a potential for 12 personal safety issues? 13 MR. DIDOMENICO: 14 A. I would agree. 15 GREENE, Q.C.: 16 Q. Liberty has said in its report that it's 17 common sense to test a system. Would you 18 agree with that? And in fact, here I'd like 19 to take you to your surrebuttal, page eight. 20 MR. DIDOMENICO: 21 A. I would object to the term "common sense". I 22 think that undervalues the individuals that 23 are responsible for this kind of work on a 24 daily basis. It trivializes what they do on a 25 daily basis and I don't think that's</p>	<p style="text-align: right;">Page 168</p> <p>1 come up as an issue. But it's not just Hydro. 2 Hydro had hired people to be on site, both the 3 turbine experts, boiler experts, what have 4 you, to oversee their operation because they 5 realize that they need assistance technically 6 on these systems. None of those people 7 identified this as an issue. 8 GREENE, Q.C.: 9 Q. So reliance absolves the owner of the plant? 10 MR. DIDOMENICO: 11 A. Using the term "absolves", as if it means they 12 don't care and they don't have any problem. 13 That's not the case, that's not the case, it 14 does not absolve anybody, but it puts a 15 context around why things happen. Nothing is 16 bullet proof. 17 GREENE, Q.C.: 18 Q. Okay, so in this particular case, they're 19 saying that the original equipment supplier 20 didn't tell them to test the adequate lube oil 21 flow that it actually did flow, you have 22 acknowledged that that was important. It 23 wasn't enough the motor started, it had to 24 actually get appropriate oil and the next 25 part, I guess of your opinion was, that well,</p>

<p style="text-align: right;">Page 169</p> <p>1 and here we can go to page 21 of 39 of your 2 original one. It had been in place for a 3 number of years, there had been no incident. 4 MR. DIDOMENICO: 5 A. And again, I need to add that it wasn't just 6 the OEM specification. They had experts on 7 site that they were relying on, in addition to 8 that specification to oversee their operation 9 and they didn't flag this as an issue. 10 GREENE, Q.C.: 11 Q. And one of the reasons for both is that they 12 didn't have a problem in the past. 13 MR. DIDOMENICO: 14 A. That's correct. 15 GREENE, Q.C.: 16 Q. And I guess in looking at this, I was trying 17 to determine how did we know they never had a 18 problem in the past and in fact, Hydro was 19 asked that question. Can we go to first PR- 20 PUB-NLH-201. So we were talking about a 21 failure of the DC system to work because it 22 couldn't provide the adequate flow of oil, and 23 here the question was, "Please tell us, 24 provide the dates in which the Holyrood unit 25 one and DC lube oil pumps were called on to</p>	<p style="text-align: right;">Page 171</p> <p>1 GREENE, Q.C.: 2 Q. That the lube oil system functioned, yes, but 3 we don't know if - 4 MR. DIDOMENICO: 5 A. The specific elements, yes. 6 GREENE, Q.C.: 7 Q. - if it was the AC or the DC and we know it 8 was the DC system that failed that day because 9 it was inadequate lube oil flow. 10 MR. DIDOMENICO: 11 A. Right. Yes, I would agree with that, but if 12 you're asking me whether I know whether the DC 13 system failed or not, if it was ever called 14 upon, you see what the consequences when it 15 doesn't work. 16 GREENE, Q.C.: 17 Q. Right, and that's, we don't know if it was 18 called upon before. We know the faulty motor 19 was in place for four years. The faulty motor 20 - 21 MR. DIDOMENICO: 22 A. I think you're drawing a conclusion that 23 doesn't have a basis. 24 GREENE, Q.C.: 25 Q. Well we know the faulty motor went in in 2009</p>
<p style="text-align: right;">Page 170</p> <p>1 supply adequate lube oil to the turbines and 2 the degree to which they functioned properly?" 3 So that was the question and that question 4 referred us to another one, we need to go back 5 to the other question and this was the dates 6 when all (phonetic) had to provide when the 7 lube oil pump system worked. So it wasn't 8 just the DC one, which is the one we're 9 talking about that failed, which didn't have 10 adequate flow, it was for the AC, we have the 11 primary AC system, we have the backup AC 12 system and we have the DC system, and it was 13 the DC system that failed, and that was what 14 PR-PUB-201 asked about. So if you scroll down 15 that answer, we see in the last paragraph that 16 Hydro doesn't maintain the data to be able to 17 show which of the systems was functioning, 18 which wasn't functioning. So in fact, based 19 on the evidence on the record, we don't know 20 if the DC pump system functioned properly. 21 MR. DIDOMENICO: 22 A. Can we scroll down a little bit further on 23 this? I was just trying to figure out which 24 one it was, but I mean, here we do have a 25 record going back to 1990.</p>	<p style="text-align: right;">Page 172</p> <p>1 and when we went to ask Hydro to provide the 2 number of times the DC system functioned, they 3 said their records weren't able to provide 4 that data for us. 5 MR. DIDOMENICO: 6 A. Agreed. 7 GREENE, Q.C.: 8 Q. So I'm trying, when I looked at that, I said 9 how can I draw the conclusion that the DC 10 system actually has functioned as intended? 11 MR. DIDOMENICO: 12 A. Because if it had been called upon and was 13 unable to function properly, you would have 14 had a catastrophic failure, multiple times 15 over. 16 GREENE, Q.C.: 17 Q. Like we did in January 2013, right. 18 MR. DIDOMENICO: 19 A. But again, over 45 years, nothing had 20 occurred. By implication, the system was 21 operated properly when needed. 22 GREENE, Q.C.: 23 Q. But unfortunately we don't have the proof that 24 it actually did function as intended. 25 MR. DIDOMENICO:</p>

Page 173

1 A. We don't have the direct proof, you're right.
 2 GREENE, Q.C.:
 3 Q. No, and we do know we had a faulty motor in
 4 there for at least four years when the DC
 5 system wasn't called upon to work. So your
 6 first report, as I said, dealt with the
 7 testing of the adequate lube oil flow, it was
 8 only in your surrebuttal that we got into the
 9 additional problems with the motor, so what
 10 you were dealing with initially was the
 11 failure to detect through testing that we had
 12 a problem with the motor. What I want to talk
 13 about now which is what you addressed in your
 14 surrebuttal was the fact that the motor was
 15 faulty to begin with. You only dealt with the
 16 second one so far which was, well the test,
 17 they didn't do a test to determine that it
 18 didn't work. So as you know, from Liberty's
 19 report, there were three problems with the
 20 motor. One was the flush boxes were offset
 21 and the other was the motor's neutral plane
 22 was misaligned and then there was a resister
 23 setting at the plant. We know from the
 24 evidence to date that the contract that Hydro
 25 had with the contractor who actually did

Page 174

1 repair the motors required that tests be done
 2 on the motor and that the test results be
 3 provided to Hydro at the time of the return of
 4 the motor, is that correct?
 5 MR. DIDOMENICO:
 6 A. That's correct.
 7 GREENE, Q.C.:
 8 Q. I guess you would agree that that is a good
 9 quality oversight requirement and good
 10 practice?
 11 MR. DIDOMENICO:
 12 A. I would.
 13 GREENE, Q.C.:
 14 Q. And why would it be important to do that?
 15 MR. DIDOMENICO:
 16 A. To simply verify what had happened.
 17 GREENE, Q.C.:
 18 Q. Given that it is the critical motor, okay.
 19 Now you were also present this morning when
 20 Mr. LeDrew gave evidence in response to
 21 questions from Mr. Fleming where, as I
 22 understood the evidence, not having the
 23 benefit of the transcript, that Mr. LeDrew
 24 acknowledged that either the test wasn't done
 25 or if done, it wasn't done properly because it

Page 175

1 should have detected the problems with the
 2 motor before it was returned to the plant, is
 3 that correct?
 4 MR. DIDOMENICO:
 5 A. That was his testimony. I would add a comment
 6 to that, that in addition to that, I would
 7 suggest that there other possibilities, namely
 8 that something occurred during transport or
 9 something occurred during installation. The
 10 simple reality was nobody knows what actually
 11 occurred. We just don't know.
 12 GREENE, Q.C.:
 13 Q. And so we had a problem with the motors, which
 14 you're saying we don't know what the problem
 15 was or when it occurred. We know that Hydro,
 16 even when the motor was returned, didn't test
 17 to see, to make sure they had the test
 18 results, nor did they test at that time for
 19 adequate lube oil flow. So the motor was
 20 faulty, no test done to detect the--that we
 21 can prove that repairs were done and three, no
 22 test done when it was put in place to see if
 23 the system functioned.
 24 MR. DIDOMENICO:
 25 A. But you're presuming the motor was faulty.

Page 176

1 You started your statement by saying the motor
 2 was faulty.
 3 GREENE, Q.C.:
 4 Q. Well it had problems.
 5 MR. DIDOMENICO:
 6 A. Why would they go into--a 45 year operating
 7 history, never had a problem, motor shows up,
 8 I assume it's faulty, why would I do that?
 9 GREENE, Q.C.:
 10 Q. I didn't say anything about whether Hydro
 11 would have assumed or not, but I understand
 12 the evidence on the record to show that there
 13 were problems with that motor?
 14 MR. DIDOMENICO:
 15 A. Yes, there were problems with the motor.
 16 GREENE, Q.C.:
 17 Q. Okay. I didn't go to the next step as to what
 18 Hydro should take from its relationship with
 19 its contractor.
 20 MR. DIDOMENICO:
 21 A. Okay, but again, that's after the fact, but
 22 yes.
 23 GREENE, Q.C.:
 24 Q. If we go to the common mode failure and here,
 25 this has nothing to do with the findings of

Page 177	Page 179
<p>1 prudence and I'd like to go to Liberty's 2 report, page 63, Liberty's July 6th report. 3 And I just wanted to make sure I understood La 4 Capra's position, and again, it's not relevant 5 for the issue before the Board, it's only 6 relevant in terms of going forward to see if 7 there's still a risk of failure and from that 8 perspective. As I understood what Liberty was 9 saying there, the AC system was lost, relied 10 on the DC system, which was the third line of 11 defence and they raised a concern about that, 12 that when you're down to the DC system because 13 the other two systems have failed because of a 14 loss of power, that could be called a common 15 mode failure, and raised the issue as to 16 whether Hydro should consider any additional 17 action with respect to taking into account the 18 risk associated with that. Would you like to 19 add anything as to--are you happy with how I 20 have described Liberty's concern or was there 21 anything you would like to add to it? 22 MR. DIDOMENICO: 23 A. No, I think you summarized their concerns. 24 GREENE, Q.C.: 25 Q. Okay, and then when I went to your response</p>	<p>1 And I guess at this point Hydro has testified 2 that it has not done any further analysis in 3 addition to the work that it has done on the 4 AC systems. So Hydro hasn't actually done any 5 analysis with respect to this issue, have 6 they? 7 MR. DIDOMENICO: 8 A. I would just add in addition to the AC system, 9 they have also done work on the DC system, so 10 basically they've worked on the entire lube 11 oil system. 12 GREENE, Q.C.: 13 Q. That's fair. 14 MR. DIDOMENICO: 15 A. Fair enough. 16 GREENE, Q.C.: 17 Q. But they haven't done any additional analysis 18 to determine the risk of the common mode 19 failure that Liberty describes, what would be 20 the options of addressing it in terms of cost 21 and reliability, is that correct? 22 MR. DIDOMENICO: 23 A. I have not seen a formal analysis of that, no. 24 GREENE, Q.C.: 25 Q. Okay, so both you and Hydro are saying that</p>
<p>1 and we can go to it, if you like, the way I 2 understood your response to be and in fact, 3 Hydro's response when they gave evidence at 4 the hearing, was we have done, taken 5 additional steps to ensure the integrity of 6 the first two systems, so that we don't think 7 that the risk of failure is going to occur 8 again, so don't worry about the fact that we 9 might be down to the DC system and only have 10 one system in place. Is that a layman's 11 summary of it? 12 MR. DIDOMENICO: 13 A. Yes. 14 GREENE, Q.C.: 15 Q. Okay, and now I did want to take you to, if 16 you go to page 22 of your first reply because 17 in your surrebuttal you simply restated what 18 was in your original report. And you say, at 19 some point, this is on the bottom of page 22 20 of 39. You say, "At some point a utility 21 needs to ask itself how much redundancy is 22 enough. Any analysis, such as this, needs to 23 account for not only the cost of potential 24 benefits, but also the likelihood of 25 occurrence over the unit's remaining life.</p>	<p>1 because we've done work on the DC lube oil 2 system, don't worry about the common mode 3 failure, but no analysis has been done? 4 MR. DIDOMENICO: 5 A. Work, again, has been done on both the AC and 6 the DC system. 7 GREENE, Q.C.: 8 Q. But in terms of the analysis of the risk of a 9 common mode failure as described by Liberty, 10 the options to prevent it, the cost, the 11 reliability implications. 12 (12:45 p.m.) 13 MR. DIDOMENICO: 14 A. It has not been done in a formal documented 15 way. 16 GREENE, Q.C.: 17 Q. Okay. So if we could just talk about unit 1 18 and again, your conclusions, as a customer, I 19 guess I would want to go through each fact and 20 then your conclusion, and as I do, we'll stop 21 to see if you agree. The first fact I think 22 that's undisputed is the fact that adequate 23 lube oil is critical for the unit to work and 24 without adequate lube oil, then there is a 25 potential for severe damage?</p>

Page 181	Page 183
<p>1 MR. DIDOMENICO: 2 A. Agreed. 3 GREENE, Q.C.: 4 Q. It is also because it is so critical that 5 there are three systems for the supply of lube 6 oil to the units at Holyrood? 7 MR. DIDOMENICO: 8 A. Agreed. 9 GREENE, Q.C.: 10 Q. Okay. The next fact is that it is a rare 11 event or not that often that we need to go to 12 the third lube oil system to supply the oil. 13 MR. DIDOMENICO: 14 A. Yes. 15 GREENE, Q.C.: 16 Q. We don't know for sure how many times in the 17 past the DC lube oil system was actually 18 required to work or did function? 19 MR. DIDOMENICO: 20 A. For sure, we don't know, no. 21 GREENE, Q.C.: 22 Q. We know that Hydro did not test for adequate 23 lube oil flow because in part they relied on 24 the original supplier and they relied on the 25 fact that there hadn't been an incident in the</p>	<p>1 motor, that is Mr. LeDrew's evidence this 2 morning. 3 MR. DIDOMENICO: 4 A. It's certainly likely that that would be the 5 case. 6 GREENE, Q.C.: 7 Q. Okay. So now we know that in January 2013 8 with those series of events that I just took 9 you through, we know that there was an 10 inadequate lube oil flow, that the unit 11 failed, there was serious consequences, 9 or 12 10 million dollars and as I said, in thinking 13 about each of these actions, as a rate payer 14 and as a customer of Hydro, in those 15 circumstances, you believe that it Hydro was 16 not imprudent and that the customers of Hydro 17 should bare the cost of damages for that unit? 18 MR. DIDOMENICO: 19 A. I do not believe that they were imprudent in 20 this case, no, not at all, for all the reasons 21 we have already discussed, I could summarize 22 if you like. 23 GREENE, Q.C.: 24 Q. But you don't disagree with any of the facts 25 that we just went through?</p>
Page 182	Page 184
<p>1 past, is that correct? 2 MR. DIDOMENICO: 3 A. They relied on their original OEM 4 recommendation, along with the expertise of 5 the staff that was on hand to oversee the 6 operation. 7 GREENE, Q.C.: 8 Q. They also had required that tests be done on 9 the motor prior to its return to the plant to 10 ensure that the motor was in good condition. 11 MR. DIDOMENICO: 12 A. Yes. 13 GREENE, Q.C.: 14 Q. We know that neither Hydro nor the contractor 15 can provide proof that those tests were done, 16 is that correct? 17 MR. DIDOMENICO: 18 A. That's correct. 19 GREENE, Q.C.: 20 Q. We also know generally that if the test had 21 been--although I think you may not agree with 22 me on this one, although I think Mr. LeDrew 23 did this morning, that if the test had been 24 done, it would have detected--done properly, 25 it would have detected the problems with the</p>	<p>1 MR. DIDOMENICO: 2 A. I don't disagree with the individual elements 3 of what you said, but you're not painting the 4 entire picture, you're just going down a list 5 of facts. 6 GREENE, Q.C.: 7 Q. And you draw a different conclusion than 8 Liberty did from the very same facts? 9 MR. DIDOMENICO: 10 A. I do. Absolutely. 11 GREENE, Q.C.: 12 Q. And that I, as a customer, may also draw or 13 any customer when looking at those - 14 MR. DIDOMENICO: 15 A. I don't know what the typical customer would 16 think. 17 GREENE, Q.C.: 18 Q. But you do, there's no dispute with the facts 19 as we just went through. Okay, those are all 20 my questions, thank you. 21 CHAIRMAN: 22 Q. Okay, I guess we're over to Mr. O'Brien. 23 MR. PHILLIP DIDOMENICO, CROSS-EXAMINATION BY MR. LIAM 24 O'BRIEN 25 MR. O'BRIEN:</p>

Page 185	Page 187
<p>1 Q. Thank you, Mr. Chair. Good morning gentlemen, 2 or good afternoon, I should say. It would 3 have been a good morning last week, how is 4 that. I'm going to start with, I want to get 5 a little bit of background and really just 6 because I didn't note too much of a discussion 7 in your reports, just some sort of what 8 principles you would apply in terms of a 9 prudence review of this type. I saw in 10 Liberty's report there was a background given 11 in terms of how they would apply certain 12 principles there. What types of principles do 13 you normally apply in a prudence analysis? 14 MR. DIDOMENICO: 15 A. I think in one of our responses we indicated 16 that we were applying very similar, namely the 17 notion of--did they take actions at the time 18 with the information they had available that 19 was reasonable. 20 MR. O'BRIEN: 21 Q. Okay, and that's really what you're looking 22 at. 23 MR. DIDOMENICO: 24 A. Without the benefit of hindsight, let me add 25 that.</p>	<p>1 A. I'm sure we asked for some clarifications on 2 some issues, but it wasn't anything that was 3 outside of those two issues. 4 MR. O'BRIEN: 5 Q. Okay, and have you taken any steps since doing 6 your report, say to review further 7 documentation for the purposes of your 8 testimony here today? 9 MR. DIDOMENICO: 10 A. Only what we just--we mentioned that we had 11 been looking at the transcripts. 12 MR. O'BRIEN: 13 Q. Just the transcripts, okay. 14 MR. DIDOMENICO: 15 A. And only the transcripts, I might add, that 16 relate to these two events. 17 MR. O'BRIEN: 18 Q. Okay, all right. The black start - 19 MR. ATHAS: 20 A. One second please. 21 MR. O'BRIEN: 22 Q. Oh sure. 23 MR. ATHAS: 24 A. Just to clarify, in the conversations that we 25 had with Hydro, then there was, then more</p>
<p>1 MR. O'BRIEN: 2 Q. Okay, without the benefit of hindsight. And 3 in terms of at the time, it's the information 4 and the individuals at the time that's 5 important, those are the ones who would have 6 made the decisions, is that right? 7 MR. DIDOMENICO: 8 A. Absolutely. Right. 9 MR. O'BRIEN: 10 Q. Okay. In terms of the process that you 11 followed, I've got a fair understanding from 12 your discussion with Ms. Greene that this was 13 a fairly, your analysis, you only had so much 14 time to do that when you initially got 15 involved, and in terms of having looked at 16 only two issues here, I'm assuming you were 17 just instructed based on your testimony to 18 look at these two particular issues? 19 MR. DIDOMENICO: 20 A. That's correct. 21 MR. O'BRIEN: 22 Q. Okay. And the documents you reviewed, did you 23 request any additional documents after what 24 you were given by Hydro to review? 25 MR. DIDOMENICO:</p>	<p>1 reports came to us that they had, either a 2 data request response that they got from 3 somebody or some other kind of data and other 4 things, so while we say all the information is 5 from Hydro, we didn't get these two books 6 dropped in here and say, here, these are the 7 results of conversations with various bodies 8 to understand what's going on and based on our 9 trying to, you know, come up to speed with 10 what the situation was when the decision would 11 be made. 12 MR. O'BRIEN: 13 Q. Sure. And I assume and just to carry through 14 on that point, there are RFIs asked and 15 answered after the fact of your first report, 16 that kind of thing, that you would have been 17 given that information as well, after 18 following or filing your first report? Is 19 there anything additional? 20 MR. ATHAS: 21 A. Yes, we had discussions after the first 22 report, especially after Liberty filed their 23 reply. 24 MR. O'BRIEN: 25 Q. And I guess I'm more focussed on whether or</p>

Page 189	Page 191
<p>1 not you felt there was anything missing from 2 the initial material that you had to ask for. 3 There was nothing of that concern? 4 MR. DIDOMENICO: 5 A. Nothing of major consequence, it was more 6 clarification related questions, not that 7 something's missing. 8 MR. O'BRIEN: 9 Q. Okay, and I'm going to try to focus must of my 10 questions this morning on the black start 11 issue because I think that Ms. Greene has 12 covered off the unit 1 turbine for the most 13 part, anything that I had questions on, but 14 the black start, there was just a couple of, a 15 few lines that I did want to cover with you. 16 First of all, I just wanted to get an idea for 17 the record as to what, what your definition of 18 black start would be? 19 MR. DIDOMENICO: 20 A. My definition would be consistent with NERC's 21 definition which is the ability of a facility 22 to start without the aid of outside supply. 23 MR. O'BRIEN: 24 Q. Okay, so really when we talk about what 25 Hydro's plan was from 2011 forward and using</p>	<p>1 were aware if there were concerns that Hydro 2 had back in 2008 about capacity issues maybe 3 looking out into the future and looking at 4 whether or not they needed another CT 5 somewhere on the Avalon peninsula, maybe in at 6 Holyrood, anywhere else, were you aware of any 7 of those concerns? 8 MR. DIDOMENICO: 9 A. I was not. 10 MR. O'BRIEN: 11 Q. I wonder if we could have a look at your 12 report at page--your August 7th report, page 3 13 and I'm looking at page 3 at the bottom, so 14 that would be page 5 of 39. And the first 15 bullet there at the top, their decision, 16 "Since the Holyrood gas turbine was 42 years 17 old in 2008, the inspection revealed that a 18 significant amount of work was needed to be 19 done to it, Hydro became concerned that the 20 unit may be approaching the end of its 21 reliable life." Is that something that was 22 indicated to you in a conversation with Hydro? 23 Can you tell me where you got that 24 information? 25 MR. DIDOMENICO:</p>
<p>Page 190</p> <p>1 Hardwoods, it's not a true black start 2 scenario, is it? 3 MR. DIDOMENICO: 4 A. This is where I want to clarify. When we 5 start talking about a region, as opposed to an 6 individual unit, okay, you never did not have 7 the ability to restart the Avalon peninsula, 8 you didn't have the ability to restart the 9 Holyrood unit, okay, just to make that 10 distinction clear. 11 MR. O'BRIEN: 12 Q. Sure, okay. 13 MR. DIDOMENICO: 14 A. Because sometimes it's used interchangeably 15 and I want to make sure that's clear. 16 MR. O'BRIEN: 17 Q. If we focus just on the Holyrood plant, then 18 there was, if you're going to use Hardwoods as 19 the option or the answer, the solution - 20 MR. DIDOMENICO: 21 A. I wouldn't call that black start for Holyrood, 22 yes. 23 MR. O'BRIEN: 24 Q. Okay, all right, and thank you for that 25 clarification. I wonder whether or not you</p>	<p>Page 192</p> <p>1 A. Can I scroll down a little bit? It is a 2 footnote, I need to go to the bottom of the 3 page, please. I believe it's footnote No. 2. 4 MR. O'BRIEN: 5 Q. Yeah, it was footnoted in there and I just 6 wanted to know whether or not you had a 7 similar discussion with Hydro in your 8 conversations over whether or not, back in 9 2009, there was a concern at that time over 10 the lifespan of that unit. 11 MR. DIDOMENICO: 12 A. I believe that came up, sure. 13 MR. O'BRIEN: 14 Q. Okay, all right, and would you have, based on 15 that, would your thoughts on the 16 reasonableness and the decision at that point 17 in time to focus on refurbishment of the GT 18 versus look at other options, can you give me 19 any comments on what you would have on that? 20 If you're looking at a 42 year GT here which 21 Hydro is thinking is reaching the end of its 22 life, are there other options that should have 23 been considered at that time? 24 MR. DIDOMENICO: 25 A. I'm not sure how to address that. I mean,</p>

Page 193	Page 195
<p>1 there are always options. The notion that a 2 gas turbine is 42 years old is certainly not 3 unprecedented within North America. There are 4 lots of very old combustion turbines, largely 5 because just the manner in which they are 6 utilized. Could they have looked at other 7 things? That's a system planning question, 8 it's probably one for Hydro's system planning 9 folks, Mr. Humphries in particular.</p> <p>10 MR. O'BRIEN: 11 Q. And would you have--well if I throw into the 12 mix then what I had asked you earlier, the 13 concern about possible capacity issues, short- 14 term capacity issues, would that have been 15 something Hydro ought to have considered at 16 that time with respect to black start as well?</p> <p>17 MR. DIDOMENICO: 18 A. Sure. It's somewhat outside the scope of what 19 we were asked to look at.</p> <p>20 MR. O'BRIEN: 21 Q. Okay.</p> <p>22 MR. DIDOMENICO: 23 A. I mean, it is a legitimate system planning 24 effort, I mean, that's the kind of thing you 25 look at as part of normal system planning.</p>	<p>1 their system planning considerations for other 2 kinds of capacity.</p> <p>3 MR. O'BRIEN: 4 Q. But now that you do know it, would that change 5 your opinion at all in terms of the approach 6 here for Hydro in dealing with black start?</p> <p>7 MR. DIDOMENICO: 8 A. I don't believe it does. Again, because your 9 approach was founded on the fact that they 10 were going to make significant investment in 11 that facility to improve its availability.</p> <p>12 MR. O'BRIEN: 13 Q. Okay, but that's the Hardwoods, yeah, okay.</p> <p>14 MR. DIDOMENICO: 15 A. That's Hardwoods, yes, it is.</p> <p>16 MR. O'BRIEN: 17 Q. I mean, I'm sort of talking prior to this in 18 terms of - 19 (1:00 p.m.)</p> <p>20 MR. ATHAS: 21 A. Well as a planner at times, I mean, the fact 22 that they were trying to, they used the 23 flexibility of the size and the relatively 24 short duration of the installation of a 25 combustion turbine, compared to other kinds of</p>
<p style="text-align: right;">Page 194</p> <p>1 MR. O'BRIEN: 2 Q. And it's not something you were asked to look 3 at?</p> <p>4 MR. DIDOMENICO: 5 A. No.</p> <p>6 MR. ATHAS: 7 A. And clearly we're aware from the transcripts 8 that there was--that Hydro was evaluating 9 options for black start at Holyrood relative 10 to their potential implementation of an, and 11 ultimate implementation of a combustion 12 turbine at that site. That was also needed 13 for general capacity, not black start.</p> <p>14 MR. O'BRIEN: 15 Q. Right.</p> <p>16 MR. ATHAS: 17 A. So they were going to get a two for one out of 18 that investment, so to speak. So we now know 19 about that, you know, we can't hide the fact 20 what we've read.</p> <p>21 MR. O'BRIEN: 22 Q. Sure.</p> <p>23 MR. ATHAS: 24 A. But it was not, as Mr. DiDomenico said, it's 25 not part of our scope to start looking at</p>	<p style="text-align: right;">Page 196</p> <p>1 capacity to figure out what the right time 2 would be, and from the dialogue that was going 3 on, it sounds very normal, very common that 4 that was going on and it surprised me that it 5 was, that people were talking about both of 6 these in context, the issue of black start and 7 the issue of the need for system capacity.</p> <p>8 MR. O'BRIEN: 9 Q. Because there's a dual role there that CT 10 could play for capacity and the black start.</p> <p>11 MR. ATHAS: 12 A. Yeah, there's a potential for a dual role and 13 it needs to be considered and obviously they 14 thought it was a very good path to rely on.</p> <p>15 MR. O'BRIEN: 16 Q. Okay, and do you know--did you have any 17 understanding in terms of how Hydro's thought 18 process may have changed over the years from 19 2008 forward with respect to capacity and 20 system planning? That wasn't part of your 21 review?</p> <p>22 MR. DIDOMENICO: 23 A. No, it wasn't.</p> <p>24 MR. ATHAS: 25 A. It wasn't part of our review.</p>

Page 197	Page 199
<p>1 MR. O'BRIEN: 2 Q. Did you know that in 2010 there was generation 3 planning support that indicated there was 4 going to be system capacity issues as early as 5 2015? 6 MR. DIDOMENICO: 7 A. I wasn't aware of that. 8 MR. ATHAS: 9 A. I think I might have seen that in the 10 transcript, I'm not sure, but it sounds 11 familiar, but it's familiar in the last couple 12 of--in the last day, not necessarily - 13 MR. O'BRIEN: 14 Q. It wasn't part of your review? 15 MR. ATHAS: 16 A. It certainly wasn't part of our review. 17 MR. O'BRIEN: 18 Q. And you were aware then in 2010 there was a 19 stop work order on the Holyrood gas turbine, 20 is that right? 21 MR. ATHAS: 22 A. Correct. 23 MR. DIDOMENICO: 24 A. On the Holyrood? 25 MR. ATHAS:</p>	<p>1 With that information, ought they have to have 2 considered different approaches to the black 3 start when you have Holyrood GT was out of 4 service in 2010? 5 MR. ATHAS: 6 A. Nothing, albeit very little knowledge that we 7 have on that issue now, nothing that I know 8 now tells me that they didn't give fair 9 consideration to all the options, including to 10 some degree factoring in the knowledge that at 11 some point they would need system capacity. 12 So it doesn't change my view that the decision 13 was reasonable and their process was 14 reasonable. 15 MR. O'BRIEN: 16 Q. I wonder if we could look at page 5 here and I 17 think I'm looking at the bottom, so it's page 18 7 of 39, the last bullet. This is March, 2010 19 and under the decision here, the last bullet 20 here, you've indicated "Hydro informed the 21 Board about its decision to withdraw the 22 overhaul proposal from its capital program and 23 assess other options." So this is with 24 respect to the Holyrood GT and the Board was 25 concerned about the lack of black start</p>
<p>Page 198</p> <p>1 A. Yes, on the Holyrood. 2 MR. O'BRIEN: 3 Q. Yeah, Holyrood gas turbine at that point. 4 MR. DIDOMENICO: 5 A. You go back and forth between Hardwoods and 6 Holyrood. 7 MR. O'BRIEN: 8 Q. I understand, it confuses me sometimes too. 9 Having known that there were concerns for 10 capacity issues out into 2015 or now knowing 11 that and also knowing there was a stop work 12 order on the Holyrood GT, would that change 13 your opinion at all as to how Hydro should 14 have approached the black start issue? 15 MR. ATHAS: 16 A. Now that's the definition of hindsight. 17 MR. O'BRIEN: 18 Q. No, I understand, I'm just--no, no, it's not 19 necessarily the definition of hindsight, I'm 20 asking if you had of known that in preparing 21 your report, you told us today that you didn't 22 know that information in preparing your 23 report, presumably the individuals at Hydro, 24 in 2010, knew that there was capacity issues 25 on the horizon, on the short-term horizon.</p>	<p>Page 200</p> <p>1 capability at HTGS through, so Hydro addressed 2 the problem by determining new generation 3 options and also addressing the OHS stop work 4 order concerns. What new generation options 5 were you aware of that were addressed in March 6 of 2010? 7 MR. DIDOMENICO: 8 A. The only options, you say in March of 2010? 9 MR. O'BRIEN: 10 Q. Uh-hm. Is that the purchase of the new CT, is 11 that essentially what's being - 12 MR. DIDOMENICO: 13 A. That's really the only thing. 14 MR. ATHAS: 15 A. The CT. 16 MR. O'BRIEN: 17 Q. So you would have known when writing this 18 report that back in March, 2010, Hydro would 19 have had in its mind the purchase of a new CT? 20 MR. DIDOMENICO: 21 A. That they were considering that possibility, I 22 think that's fair to say. 23 MR. O'BRIEN: 24 Q. Okay, that's fair to say, okay. One of the 25 things I wanted to ask you about, when I</p>

Page 201	Page 203
<p>1 questioned Mr. Humphries, he's the VP of 2 systems planning and operations, about Hydro's 3 generation planning, I was informed that Hydro 4 hadn't decided or it appeared to me that in 5 2010 Hydro hadn't made a decision on whether 6 or not the system plan for the future would 7 have required a CT at that point in time. In 8 fact, they were looking at two sort of 9 options, two scenarios. One involving a fixed 10 link and one involving the isolated island 11 situation. In fact, I got the understanding 12 from Mr. Humphries that the decision on 13 whether or not a CT was going to be purchased 14 wasn't made until the end of 2012.</p> <p>15 MR. DIDOMENICO: 16 A. I don't think we were trying to infer that a 17 decision had been made. We were saying that 18 there were considerations being given.</p> <p>19 MR. O'BRIEN: 20 Q. Oh no, I understand.</p> <p>21 MR. DIDOMENICO: 22 A. You just said the decision.</p> <p>23 MR. O'BRIEN: 24 Q. I was just going to lead into a question, I 25 wanted to get your thought process on when you</p>	<p>1 "interim", 33 years, but I mean, so the fact 2 that there is some fluctuation on the exact 3 timing of the CT going in place and as a 4 matter of fact, there would be fluctuation of 5 exactly when it happens after they decide to 6 do it because there's been times when projects 7 take a little longer, for whatever it is, from 8 permeating conditions, from delivery and 9 anything else. So to narrowly say that you 10 have to have that nailed, that decision, I 11 disagree.</p> <p>12 MR. O'BRIEN: 13 Q. And when you're talking about duration, so I 14 can understand what you're saying, you don't 15 necessarily have the exact date in mind, but 16 you know this is what the final solution is 17 going to be, a CT is going to be in place, 18 that's the final solution, whether it's two 19 and a half years or three years may not be-- 20 it's a matter of degree and that may be how 21 you would analyze it, is that right?</p> <p>22 MR. ATHAS: 23 A. That's correct, I mean, there wasn't any way 24 to probably do it or, and certainly no 25 evidence that it was done that there was a</p>
<p>1 consider the reasonableness of the interim 2 option used to Hardwoods, should there not be 3 some certainty around when the final proposal 4 or the final solution is going to come about 5 before you analyze the reasonableness of the 6 interim solution? Do you know what I'm 7 saying? I mean, there didn't seem to be some 8 certainty--there didn't seem to be any 9 certainty as to when that solution was going 10 to come about and how do you analyze that in 11 terms of whether or not the interim solution 12 of Hardwoods was appropriate?</p> <p>13 MR. ATHAS: 14 A. It's a matter of degree. You know, if you-- 15 and this is just in general versus, if I was 16 making a decision that ultimately an interim 17 period would end when I had a new CT there, 18 and it might be three years, it might be four, 19 it might be five and they're all the same 20 interim period from the standpoint of managing 21 risk versus costs, then you don't need to know 22 with certainty. If it's three years versus 33 23 years, you probably want to narrow that scope 24 because that would be, in everybody's opinion 25 here, too long a period to be labelled as</p>	<p>1 detailed, quantitative analysis that 2 probabilistically said what could happen over 3 a three year period that would tell people 4 that three is okay, four is no good.</p> <p>5 MR. O'BRIEN: 6 Q. Okay, I was going to ask that, but I 7 understand.</p> <p>8 MR. ATHAS: 9 A. Nor do I think, the assumptions that people 10 would have to make in that analysis to get to 11 the point where three is okay, four is good, 12 no matter how thorough the math looks and how 13 crisp the statistic looks at the end, there's 14 going to be judgment placed in there.</p> <p>15 MR. O'BRIEN: 16 Q. Sure.</p> <p>17 MR. ATHAS: 18 A. And, you know, judgment sometimes is placed on 19 the overall decision; sometimes they're placed 20 on all the numbers that go into a quantitative 21 analysis, but you know, I'd like someone to 22 show me sometime around planning aspects where 23 there hasn't been some degree of judgment put 24 in.</p> <p>25 MR. O'BRIEN:</p>

Page 205

1 Q. Sure, well let's put aside duration then, what
 2 if there's a question over whether or not
 3 there was going to be a CT at all? How would
 4 that sort of enter into your thought process
 5 in terms of the interim solution here of
 6 Hardwoods? Because up until the end of
 7 November 2012, I understand the CT was only
 8 going to be part of one scenario, all right,
 9 the Island Interconnected scenario--sorry, the
 10 Isolated Island scenario. It wasn't going to
 11 be part of the Island Interconnected scenario
 12 and the decision to start to use Hardwoods was
 13 made in 2012, in mid 2012, at a time when
 14 Hydro didn't know if a CT was actually going
 15 to be used. Does that enter into your
 16 analysis?
 17 MR. DIDOMENICO:
 18 A. Before I try to answer that, just to be clear,
 19 Hardwoods was always part of -
 20 MR. O'BRIEN:
 21 Q. Oh I understand that, yes.
 22 MR. DIDOMENICO:
 23 A. Well no, but you didn't say that, I'm just
 24 trying to be clear that Hardwoods was always
 25 part of the area restoration plan, always.

Page 206

1 MR. O'BRIEN:
 2 Q. I understand that.
 3 MR. DIDOMENICO:
 4 A. Okay, just to be clear. It wasn't like in
 5 2012 they just decided, hey, you know what,
 6 we're going to use Hardwoods. That's when
 7 they decided to use Hardwoods as a primary
 8 source for restarting Holyrood.
 9 MR. O'BRIEN:
 10 Q. Right.
 11 MR. DIDOMENICO:
 12 A. And not as part of the area restoration, just
 13 to be clear.
 14 MR. O'BRIEN:
 15 Q. No, I understand.
 16 MR. ATHAS:
 17 A. And I would just categorize that in our
 18 conversations and our readings, there is no
 19 indication that for whatever it closes out the
 20 period, the interim period, whether it's the
 21 CT or some other option, that the decision of
 22 exposure of not having black start at
 23 Holyrood, resident to Holyrood, was viewed--
 24 was an interim decision. I mean, that was all
 25 in the context and that interim decision of

Page 207

1 reasonableness is what we're all about in our
 2 investigation, so you know, to speculate that
 3 there wasn't or should have been consideration
 4 on, that this was a permanent solution or a
 5 very long range solution, I don't want to go
 6 there because I have no indication that
 7 anybody at Hydro would have been, you know,
 8 comfortable in making this decision if it was
 9 longer than interim.
 10 MR. DIDOMENICO:
 11 A. To add to that, if I may, we never had any
 12 conversations with Hydro where they indicated
 13 this was anything other than an interim
 14 solution.
 15 MR. O'BRIEN:
 16 Q. And I never got any impression from any of the
 17 witnesses that this was anything other than an
 18 interim solution. What I'm trying to
 19 understand, I guess, is in terms of analyzing
 20 the decisionmaking process for Hydro, we know
 21 that in 2010 there was a stop work order. We
 22 know that in 2011 when the GT came back on
 23 line, it was for emergency purposes only at
 24 that point in time and there was some work
 25 done on it, but we know that in 2012 it was

Page 208

1 out of commission. So we know at that point
 2 in time anyway there's not going to be on-site
 3 black start for Holyrood, right?
 4 MR. DIDOMENICO:
 5 A. Agree.
 6 MR. O'BRIEN:
 7 Q. And Hydro's decision was to continue to, and
 8 I'll use "continue" because Hardwoods was
 9 always available, but to continue to use
 10 Hardwoods as the restoration for Holyrood.
 11 MR. DIDOMENICO:
 12 A. For an interim period, yes.
 13 MR. O'BRIEN:
 14 Q. Well for an interim period and what I'm
 15 wondering at that point in time is had you
 16 considered whether or not the fact that a CT
 17 may never come along, whether or not that
 18 decision was appropriate?
 19 MR. DIDOMENICO:
 20 A. That's a hypothetical that I guess I don't
 21 agree with as a foundation for a question.
 22 MR. O'BRIEN:
 23 Q. In terms of it being hypothetical, we're
 24 talking about what decisions were made at a
 25 particular time with the information that

Page 209	Page 211
<p>1 Hydro had. All we can look at is facts. I'm 2 not asking about, sort of looking backwards, 3 I'm asking in 2012, Hydro hadn't made the 4 decision on whether or not, which scenario it 5 was going to take, so with that information, 6 they hadn't made the decision that a CT was 7 going to be in the future.</p> <p>8 MR. DIDOMENICO: 9 A. Excuse me for interrupting, but they hadn't 10 made a decision, but lots of options are under 11 consideration. There's ample evidence, I do 12 believe, that there was plenty of discussion 13 going around this issue. They hadn't made the 14 decision, we agree.</p> <p>15 MR. O'BRIEN: 16 Q. Okay. And what I'm wondering is when you look 17 at that in terms of the reasonableness of that 18 decision, your evidence appears to be the 19 reasonableness is based on the fact that a CT 20 is coming?</p> <p>21 MR. DIDOMENICO: 22 A. That something was coming.</p> <p>23 MR. ATHAS: 24 A. That something is coming. See, that's the -- 25 it's within their power to control that the</p>	<p>1 Q. And that's what I'm asking, whether or not - 2 MR. ATHAS: 3 A. And I think that's wrong because they had 4 control over other options. We don't know 5 whether -- I mean, the backup plan could have 6 been let's put the diesels in that are in 7 there now as a long term solution. If that 8 was the only way they could close the interim 9 period. You know, but I just don't -- I mean, 10 it's witnessed that they have other options 11 and it witnessed that it's within their 12 control, so second guessing their comfort with 13 the use of interim planning is not something 14 where I'd like to go.</p> <p>15 (1:15 p.m.) 16 MR. O'BRIEN: 17 Q. Okay. And in terms of once Hydro had made a 18 decision to move forward with a CT, we come to 19 the end of November and then the CT is part of 20 both scenarios at that point in time. Knowing 21 that there was a -- were you asked to look at 22 Hydro's thought process in pursuing that 23 purchase of that CT?</p> <p>24 MR. DIDOMENICO: 25 A. No.</p>
<p>1 interim period ends. So for them to make an 2 assumption that this is going to be an interim 3 solution is natural. It's very -</p> <p>4 MR. DIDOMENICO: 5 A. It's reasonable.</p> <p>6 MR. ATHAS: 7 A. It's very reasonable. They can -- this is not 8 an uncertainty as to when this rare weather 9 event is going to happen. This is like they 10 are deciding on this solution for an interim 11 basis and they have the ability in concert 12 with the Board approving their investments to 13 end the interim period. You know, whether 14 it's the CT, whether it's something else, you 15 know, they could end it.</p> <p>16 MR. O'BRIEN: 17 Q. Okay.</p> <p>18 MR. ATHAS: 19 A. So it's -- it sounds like what you're 20 suggesting is was it -- should -- was it 21 careless because they were -- because they 22 didn't have absolute certainty of an 23 implementation that would end the interim 24 period.</p> <p>25 MR. O'BRIEN:</p>	<p>1 MR. O'BRIEN: 2 Q. Nothing at all?</p> <p>3 MR. DIDOMENICO: 4 A. No.</p> <p>5 MR. O'BRIEN: 6 Q. And would the steps taken in pursuing that 7 affect your opinion on how long the interim 8 solution ought to have been in place?</p> <p>9 MR. ATHAS: 10 A. I think that it's the exact -- that question 11 is answered in my opinion that they have 12 control over the interim period, so it doesn't 13 -- so it's not relevant.</p> <p>14 MR. O'BRIEN: 15 Q. And I think that's where I was going. They do 16 have control over the interim period. So once 17 they make that decision, the utility has the 18 control over when to end that interim period.</p> <p>19 MR. ATHAS: 20 A. Yeah.</p> <p>21 MR. O'BRIEN: 22 Q. Okay. You had made some comments just in 23 terms of the likelihood of a scenario where 24 black start might have been -- at Holyrood 25 might have been necessary. Were you aware</p>

Page 213	Page 215
<p>1 that there was a situation back in '94 when 2 all transmission lines going into Holyrood 3 were out? 4 MR. DIDOMENICO: 5 A. I was. 6 MR. O'BRIEN: 7 Q. You were aware of that, okay. 8 MR. DIDOMENICO: 9 A. Yes. Can I - 10 MR. O'BRIEN: 11 Q. Yeah, sure. 12 MR. DIDOMENICO: 13 A. Can I qualify one thing? You said that black 14 start was necessary. Black start would be 15 advantageous, not necessary, but advantageous. 16 MR. O'BRIEN: 17 Q. Okay. And just explain that in terms - 18 MR. DIDOMENICO: 19 A. I just want to qualify - 20 MR. O'BRIEN: 21 Q. But explain that to me. I'd give you that 22 opportunity. 23 MR. DIDOMENICO: 24 A. Well, again, as we've discussed multiple 25 times, one of the biggest benefits is pre-</p>	<p>1 A. It's an improvement. Can we leave it at that, 2 that it's an improvement? 3 MR. O'BRIEN: 4 Q. Okay. In terms of that knowledge that the 5 transmission lines had been down back in '94, 6 is that something that -- so this is not just 7 a hypothetical now that Hydro is looking at. 8 This is something that has actually happened 9 before. Is that -- does that enter into your 10 mind set as to whether or not it was 11 reasonable to take significant steps to have 12 black start on site? 13 MR. DIDOMENICO: 14 A. We were aware of that and again, it tends to 15 point to the unlikelihood of that event 16 occurring. It did occur, but it occurred two 17 times or three times, gone back and forth two 18 or three times, over the recorded history of 19 the management team that was in place. You 20 know, two times in a 25 or whatever, 30 year 21 period of time needs to be measured. It's not 22 -- that's not suggesting to me that it's going 23 to happen every year or it's going to happen - 24 - you know what I'm saying? 25 MR. O'BRIEN:</p>
<p>1 warming. 2 MR. O'BRIEN: 3 Q. Right. 4 MR. DIDOMENICO: 5 A. So that's an advantage to that scenario. It's 6 not a must. It's not -- that's what I'm 7 trying to - 8 MR. O'BRIEN: 9 Q. No, you can wait until the transmission lines 10 are - 11 MR. DIDOMENICO: 12 A. In other words, the lights are not going to 13 stay out unless if you didn't have black start 14 at that facility. That's all I'm trying to 15 communicate. 16 MR. O'BRIEN: 17 Q. No, I understand that. 18 MR. DIDOMENICO: 19 A. That's my distinction between necessary and an 20 improvement. 21 MR. O'BRIEN: 22 Q. I understand that. But you would agree it is 23 a significant improvement to be able to warm 24 the generators? 25 MR. DIDOMENICO:</p>	<p>1 Q. Yeah, but it's still something you have to 2 plan for. 3 MR. DIDOMENICO: 4 A. The risk associated with it is less than you 5 might think. 6 MR. O'BRIEN: 7 Q. But it's still something, as you've indicated 8 to Ms. Greene, that a utility has to plan for? 9 MR. DIDOMENICO: 10 A. Yes. 11 MR. ATHAS: 12 A. They have to consider. 13 MR. O'BRIEN: 14 Q. They have to consider? 15 MR. DIDOMENICO: 16 A. Absolutely. 17 MR. O'BRIEN: 18 Q. But they don't have to plan for? 19 MR. ATHAS: 20 A. Well, there's a -- sometimes the word "plan" 21 is used with the implication that to plan for 22 or consider means you end up making an 23 investment and that's not how I would use it 24 as a plan. That's why I went to the other 25 word "consider". If you -- they considered</p>

<p style="text-align: right;">Page 217</p> <p>1 that there was a slight decrease in 2 reliability associated with the interim 3 solution versus -- so, interim solutions that 4 would have in some way put black start 5 generation there sooner, okay. So that's -- 6 so in that case, that's -- they plan for it. 7 I mean, when you plan for -- when you plan as 8 a distribution company to restore the system, 9 when you plan for outages, you're not planning 10 to avoid them by under grounding everything. 11 You're planning what to do about them and 12 stuff. So it's just a different -- it's a 13 different animal than plan means invest. One 14 answer, as Phil said, is -- the simple answer 15 is to invest, you know, and just throw money 16 after every problem, get more metal on the 17 ground, put things, more generation at 18 substation, every place you want to go and 19 cover as much -- cover every conceivable risk 20 that you could possibly think of and then 21 some. But that's not planning. That's one 22 answer. If someone wants to take that route, 23 that's fine. But planning can also mean that 24 you -- that's it's reasonable to take some 25 exposure.</p>	<p style="text-align: right;">Page 219</p> <p>1 MR. DIDOMENICO: 2 A. You know, that's fundamental throughout our 3 report and we talk about engineering judgment 4 as to what's going on. That's a judgment 5 call. I can't give you a number. 6 MR. O'BRIEN: 7 Q. Okay. 8 MR. DIDOMENICO: 9 A. All I can tell you is it's a judgment call 10 based on all the factors that are surrounding 11 the situation. 12 MR. ATHAS: 13 A. And outside of coming in, whether it's for a 14 month or whether it's for a year, is not going 15 to get to the level of understanding of the 16 system and all its particular nuances and the 17 like and the weather and everything else that 18 goes into -- that needs to go into that 19 judgment and some of that is judgment that 20 gets integrated into the brain in some way, 21 shape or form to make that informed decision 22 without being quantified for a machine to do. 23 So, I mean, so that's -- that's why we can use 24 the word "reasonable" is that the process of 25 relying on skilled people with knowledge of</p>
<p style="text-align: right;">Page 218</p> <p>1 MR. O'BRIEN: 2 Q. And in this particular case though, planning 3 was going to involve investing at some point. 4 MR. ATHAS: 5 A. Yes, at some point. 6 MR. O'BRIEN: 7 Q. Yeah, okay. And when you say taking the 8 significant risk, it was going to be taking -- 9 sorry, I shouldn't say significant, taking a 10 risk, it was involving a risk that had already 11 come about and Hydro had already seen had 12 happened before where transmission was out? 13 MR. DIDOMENICO: 14 A. That the peninsula was isolated from the rest 15 of the grid, yes. 16 MR. O'BRIEN: 17 Q. Yeah, so it's not a hypothetical risk in that 18 context? 19 MR. DIDOMENICO: 20 A. No. No, not in that context. It's a 21 possibility that it might occur, but it's very 22 low possibility. 23 MR. O'BRIEN: 24 Q. Okay. And how much of a risk is necessary 25 before you would think steps had to be taken?</p>	<p style="text-align: right;">Page 220</p> <p>1 the system and the like to make a reasonable 2 decision is what the very basis of our report 3 is. 4 MR. O'BRIEN: 5 Q. Okay. I wonder, Mr. Chair, I don't have too 6 much more, but I think I could pare it down 7 fairly well overnight, if we could break here. 8 CHAIRMAN: 9 Q. Good. 10 ADJOURNED AT 1:24 P.M.</p>

1 CERTIFICATE

2 I, Judy Moss, hereby certify that the foregoing is a true
3 and correct transcript of a hearing in the matter of
4 Newfoundland and Labrador Hydro's General Rate
5 Application heard on the 2nd day of November, A.D., 2015
6 before the Commissioners of the Public Utilities Board,
7 St. John's, Newfoundland and Labrador and was transcribed
8 by me to the best of my ability by means of a sound
9 apparatus.
10 Dated at St. John's, Newfoundland and Labrador
11 this 2nd day of November, A.D., 2015
12 Judy Moss

<p>-\$-</p> <p>\$411,000 [1] 32:7 \$500,000.00 [1] 75:11 \$763,000 [1] 32:10</p> <hr/> <p>-.-</p> <p>'15 [1] 146:12 '94 [2] 213:1 215:5</p> <hr/> <p>---</p> <p>-10 [2] 76:3,4 -20 [1] 76:4 -40 [7] 75:22,25 76:22 78:20 81:17,19,21 -50 [1] 75:22</p> <hr/> <p>-1-</p> <p>1 [16] 9:20 11:11,14 15:13 27:8 31:12 32:6 100:2 101:12,14 115:16 117:2 118:5 139:22 180:17 189:12 1.11 [1] 40:16 1.2 [2] 31:9 32:3 1.3 [1] 16:4 10 [5] 28:9 62:11 76:25 144:11 183:12 100 [12] 1:20 2:6 3:24 17:14,18 20:17 21:23 23:1 25:21 90:12 118:8 118:14 1000 [1] 95:23 101 [1] 9:20 10:00 [1] 57:25 10:15 [1] 73:17 10:30 [1] 92:10 10:45 [1] 104:17 11 [7] 1:24 63:2 99:9 138:8 139:1 145:8 167:3 11-hour [1] 144:24 11:25 [1] 105:1 11:30 [1] 108:23 11:45 [1] 124:1 11th [2] 33:12 34:6 12 [3] 156:18,21,22 120 [1] 21:3 12:00 [1] 139:11 12:15 [1] 153:14 12:30 [1] 165:14 12:45 [1] 180:12 13 [1] 119:9 14 [7] 13:16 122:8,9,15 122:19 147:5 152:21 14th [2] 110:14 130:20 15 [1] 99:9 153 [1] 1:22 17 [1] 98:14 170 [1] 26:22 179 [1] 44:4</p>	<p>17th [1] 156:4 18 [1] 130:24 19 [1] 109:4 1986 [1] 27:20 1990 [3] 102:10 138:25 170:25 1990s [1] 103:8 19th [1] 14:14 1:00 [1] 195:19 1:15 [1] 211:15 1:24 [1] 220:10 1st [1] 87:17</p> <hr/> <p>-2-</p> <p>2 [5] 5:2 6:15 32:8 100:2 192:3 2.3 [1] 119:11 20 [2] 107:6 144:11 2006 [1] 109:8 2007 [1] 67:6 2008 [4] 149:23 191:2,17 196:19 2009 [5] 33:18 69:17 72:23 171:25 192:9 2010 [24] 7:24 8:3,18,20 11:18 13:5 14:10 71:17 71:21 74:2 75:4 98:18 99:15 156:11 197:2,18 198:24 199:4,18 200:6,8 200:18 201:5 207:21 20103 [1] 51:7 2011 [23] 4:19 5:24 6:21 7:8 9:10,11,22,23 10:2 11:15 13:12 14:6,8,11 42:22 44:2 54:13,20 71:17 75:4 120:23 189:25 207:22 2012 [41] 19:2,5,8,19 20:1,7,8,13 21:18,18 22:1 23:23 24:4,6,23 26:11 28:16 49:3 71:17 98:21,24 99:10,19 124:18 125:4 128:17 129:25 130:10 131:15 136:10 137:13 146:8 149:2,23 201:14 205:7,13,13 206:5 207:25 209:3 2013 [47] 16:6,8,22 23:10 23:18,20 26:12,14,16 33:12 34:6 42:6,18 46:15 47:14 49:23 51:13,17 52:5,15 54:8,22 57:18 58:6 59:13 63:1 64:6 66:24 67:7,13 71:18,21 74:2 80:18,21,23 81:5 96:18 101:23 102:10,15 121:6,8 139:1,21 172:17 183:7 2013-2020 [1] 28:11 2014 [25] 23:3,7 33:1 42:7,18 54:8,22 57:19 65:1 67:11 72:23 73:22 74:1 77:8 81:6 84:20 86:21 88:6,14,22 90:4 91:4 92:13 94:7 155:11 2014/2015 [3] 87:5</p>	<p>88:14 89:17 2015 [29] 1:18 2:21 3:10 3:24 4:13 7:22 11:21 19:7,17 24:4 26:7 31:11 32:7,15,18,23 74:1 88:20 88:23 89:6 91:1 94:7 136:19 137:11 155:13 197:5 198:10 221:5,11 2020 [3] 27:15 86:17,19 208 [1] 62:7 21 [3] 156:4 163:4 169:1 22 [2] 178:16,19 224 [1] 98:11 23rd [1] 105:23 24 [1] 106:1 24/7 [1] 96:25 25 [4] 15:12 142:13 149:24 215:20 26 [4] 4:25 149:22 151:7 151:24 28th [1] 98:10 29th [1] 62:5 2nd [3] 33:1 221:5,11</p> <hr/> <p>-3-</p> <p>3 [3] 13:20 191:12,13 30 [4] 1:23 27:21 144:12 215:20 3000 [1] 107:17 30th [3] 14:6,11,13 31 [3] 7:11 40:17 106:10 32 [5] 4:21 17:21 18:15 18:17 20:16 33 [2] 202:22 203:1 351 [1] 32:8 371 [4] 11:14 13:20 15:12 27:9 38 [1] 108:11 39 [13] 8:15 9:9 106:1,10 108:11 119:9 122:15,19 163:4 169:1 178:20 191:14 199:18</p> <hr/> <p>-4-</p> <p>4 [2] 130:20,22 40 [4] 107:6 109:3 164:15 164:16 42 [3] 191:16 192:20 193:2 44 [1] 149:12 45 [2] 172:19 176:6</p> <hr/> <p>-5-</p> <p>5 [2] 191:14 199:16 50 [12] 19:3,15 20:4,10 21:4,10,11,19 22:7 24:7 24:13,20 50/50 [1] 66:13 52 [2] 156:15,23 54 [1] 149:12 55 [1] 84:25</p>	<p>-6-</p> <p>6 [2] 27:9 100:2 60 [13] 18:22,24 19:3,15 20:11 21:4,12,20 24:7 24:15,21 97:8,13 6000 [1] 109:21 63 [3] 84:21 86:9 177:2 64 [1] 156:20 6th [3] 112:12 149:12 177:2</p> <hr/> <p>-7-</p> <p>7 [3] 8:15 40:16 199:18 70 [1] 9:20 7th [6] 105:20 110:13 112:6 152:21 163:4 191:12</p> <hr/> <p>-8-</p> <p>8 [1] 9:9</p> <hr/> <p>-9-</p> <p>9 [3] 14:8 130:20 183:11 90 [1] 165:5 90s [1] 63:16 9:15 [1] 12:14 9:26 [1] 113:14 9:30 [1] 27:5 9:45 [1] 41:12</p> <hr/> <p>-A-</p> <p>A.D [2] 221:5,11 a.m [10] 12:14 27:5 41:12 57:25 73:17 92:10 104:17 105:1 108:23 124:1 ABB [2] 63:21 77:4 ability [14] 64:13 81:11 81:22 82:14 132:13 138:10 141:3 149:6 154:13 189:21 190:7,8 210:11 221:8 able [27] 19:22 21:14 25:14 46:14 51:1 53:13 58:8 66:22 67:12,15 88:23 92:12,22 93:6,21 127:13 129:13 130:4 137:5 145:13 148:19,21 150:7 151:9 170:16 172:3 214:23 above [1] 70:16 absolute [1] 210:22 absolutely [10] 16:14 19:24 89:11 104:24 129:16,21 154:25 184:10 186:8 216:16 absolve [1] 168:14 absolves [2] 168:9,11 AC [11] 35:16,17 101:18 170:10,11,11 171:7 177:9 179:4,8 180:5 accelerated [4] 82:24</p>	<p>86:20 88:12 91:9 accept [4] 119:16 133:2 134:3 148:12 acceptable [5] 75:21,24 104:22 146:17 152:6 accepted [1] 45:9 access [2] 58:13 97:15 accomplish [1] 89:19 accomplished [1] 88:21 accordance [2] 28:8 74:17 account [4] 30:10 153:2 177:17 178:23 accrues [1] 133:25 accruing [1] 133:17 accumulated [1] 92:19 accumulating [1] 25:6 acetylene [1] 62:8 achieve [1] 148:21 acknowledge [2] 29:17 160:6 acknowledged [4] 146:24 147:8 168:22 174:24 acquired [2] 18:24 159:19 act [1] 160:8 acted [3] 38:12 156:25 162:11 action [7] 41:3 55:24 62:16 90:10 160:16 165:23 177:17 actions [5] 81:16 87:22 161:6 183:13 185:17 activities [1] 94:19 activity [1] 93:23 actual [5] 6:2 17:18 65:24 76:11 79:16 add [16] 19:3 21:14 32:11 114:8 124:3 144:17 148:6 161:10 169:5 175:5 177:19,21 179:8 185:24 187:15 207:11 adding [2] 20:21 21:1 addition [9] 87:24 95:18 114:10 126:2 162:16 169:7 175:6 179:3,8 additional [18] 18:23 22:18 29:9 88:7,18 100:18 119:1 129:2 131:14 145:8 148:14 162:6 173:9 177:16 178:5 179:17 186:23 188:19 address [8] 7:1,16 17:13 52:17,21 108:5 113:12 192:25 addressed [10] 5:23 51:14 92:20,20 107:23 110:17 165:11 173:13 200:1,5 addressing [3] 9:14 179:20 200:3 adequate [15] 95:24 163:22 164:3,13 167:15 167:18 168:20 169:22</p>
---	---	--	---	--

<p>170:1,10 173:7 175:19 180:22,24 181:22 ADJOURNED [1] 220:10 adjusted [2] 18:23 24:14 adjustment [1] 33:21 adjustments [2] 35:19 37:6 Administration [1] 108:16 admirable [1] 165:9 adopt [2] 69:18 111:6 advantage [1] 214:5 advantageous [2] 213:15,15 advise [1] 5:8 advised [2] 14:19 120:22 advising [1] 108:2 affect [3] 3:2 78:14 212:7 affected [1] 77:15 affecting [2] 4:16 78:6 afternoon [2] 97:12 185:2 again [42] 9:13 15:3 37:20 38:5 54:12 59:12 93:2 106:4 111:13 117:15 130:17,22 132:25 133:9 137:9 138:9 140:2 142:19 144:4 147:4,17 148:6,13 151:24 152:4,20 162:6 163:5,10 164:9 165:24 167:20 169:5 172:19 176:21 177:4 178:8 180:5 180:18 195:8 213:24 215:14 against [6] 41:4,18 42:7 60:17 61:12,15 age [2] 62:24 103:5 agencies [1] 7:5 aging [2] 82:19,21 ago [4] 114:6 126:3 164:15,16 agree [27] 19:18 41:8 114:4 119:22 121:13,24 123:21 124:21 130:12,15 132:17 134:19 157:13 160:25 166:3,9,14,18 167:11 171:11 174:8 180:21 182:21 208:5,21 209:14 214:22 agreed [10] 55:9 64:1 132:15 134:13 141:2 148:16 150:2 172:6 181:2 181:8 agreeing [1] 141:13 agrees [1] 167:7 aid [3] 20:20,22 189:22 air [11] 82:4 84:14,21,25 85:21 86:6,9 87:18 88:8 88:9,13 alarms [1] 96:9 albeit [1] 199:6 align [1] 33:17 allow [1] 89:19 allowed [5] 6:22 156:7</p>	<p>156:13 157:14 159:4 alluded [1] 135:21 almost [4] 13:16 66:12 66:19 109:3 along [4] 92:6 99:1 182:4 208:17 alternate [1] 147:6 alternative [4] 16:4 18:25 147:12,14 always [18] 21:3 68:16 70:24 90:19 123:17,21 125:9 128:18,23 141:17 148:6 154:21 155:9 193:1 205:19,24,25 208:9 AMEC [7] 11:12 12:20 14:19 27:10 29:3,7 125:6 America [7] 42:24 44:3 46:5 48:13 49:23 53:2 193:3 American [2] 61:8,14 amount [7] 2:4 26:24 40:20 75:9 112:25 158:23 191:18 amounts [1] 113:11 ample [1] 209:11 amplification [1] 128:22 amplify [1] 133:10 analysis [30] 12:23 24:12 24:16 29:18 30:7 42:23 44:2 55:25 61:1 65:4 77:7 79:4 93:14 100:16 136:17,20 137:4 178:22 179:2,5,17,23 180:3,8 185:13 186:13 204:1,10 204:21 205:16 analyze [5] 29:3,4 202:5 202:10 203:21 analyzing [1] 207:19 animal [1] 217:13 annual [6] 70:3,7 72:7 81:2 89:17 90:22 answer [23] 32:5 38:8 53:7 62:10 64:3 75:20 112:9 115:13 117:8 118:12 124:14 136:25 143:16 150:13 151:5 164:19 165:16 170:15 190:19 205:18 217:14,14 217:22 answered [2] 188:15 212:11 answers [2] 73:20 146:7 anticipated [4] 8:14 19:16 24:2 46:9 anticipating [4] 24:5,6 39:2 146:8 anyway [3] 68:24 139:23 208:2 apart [3] 5:2 6:11,11 apparatus [1] 221:9 apparent [1] 159:1 appeared [2] 102:22 201:4 Appendix [13] 8:11,15</p>	<p>9:9 105:21 106:1,2,3 110:12,13 112:7 130:22 144:20 152:21 application [15] 4:23 17:14,18,21 18:15 20:18 26:6 73:23,25 74:11,25 75:2,7 99:25 221:5 applications [1] 17:15 applied [1] 155:24 apply [3] 185:8,11,13 applying [2] 155:19 185:16 approach [3] 113:24 195:5,9 approached [1] 198:14 approaches [1] 199:2 approaching [2] 87:17 191:20 appropriate [7] 25:20 66:6 120:6 167:1 168:24 202:12 208:18 approval [3] 74:4 155:19 155:25 approved [1] 159:8 approving [1] 210:12 April [5] 98:18,24 99:15 99:19 155:11 area [8] 30:2 44:15 113:15 125:20 128:23 157:9 205:25 206:12 areas [4] 44:18 45:6 50:22 107:12 arises [1] 89:24 arose [1] 107:23 arrive [1] 14:1 arriving [1] 16:25 aside [1] 205:1 aspect [2] 95:12,14 aspects [5] 1:25 33:20 44:17 109:19 204:22 assemblies [1] 33:22 assess [1] 199:23 assessment [12] 5:3 6:16 8:1 9:6 11:13,17,21 12:11 13:25 14:21 138:17 154:4 asset [9] 42:22 43:15 44:1 54:13 55:5,18 56:14 82:21 90:20 assets [2] 91:25 142:8 assist [3] 88:24 162:1,7 assistance [2] 17:17 168:5 associated [5] 123:2 161:13 177:18 216:4 217:2 Associates [5] 105:10 109:7,8 130:25 167:7 associating [1] 159:25 association [1] 158:9 assume [4] 44:11 145:16 176:8 188:13 assumed [2] 27:19 176:11</p>	<p>assuming [3] 86:21 89:20 186:16 assumption [1] 210:2 assumptions [2] 30:9 204:9 Athas [61] 105:9,16 106:4 108:10,12,17,24 109:24 110:2,21 111:3 111:10 112:1,16,21 113:9 114:17 117:18 124:2,25 126:18 144:16 145:17 148:5 151:6 157:20 159:11 161:9 162:19,25 187:19,23 188:20 194:6 194:16,23 195:20 196:11 196:24 197:8,15,21,25 198:15 199:5 200:14 202:13 203:22 204:8,17 206:16 209:23 210:6,18 211:2 212:9,19 216:11 216:19 218:4 219:12 athe [1] 201:22 attached [4] 7:21 17:20 20:17 130:21 attachment [8] 9:20 11:11,14 15:13 27:8 100:2 139:22 160:10 attempt [1] 6:25 attempted [1] 8:3 attempts [2] 5:11 7:4 attention [1] 26:2 August [20] 1:18 2:3,7 2:15,21 3:10,24 4:12 7:21,22 14:6,11,13 105:19 110:13 112:6 121:6 152:21 163:4 191:12 availability [5] 21:19 101:22 150:20 151:23 195:11 available [23] 2:3,9 22:11,13 23:11 26:10 29:14 30:3 41:2 111:17 117:5 124:10 127:14 129:3 130:10 131:2 135:18 149:21,24 150:22 151:25 185:18 208:9 Avalon [13] 3:2 30:2 92:1 93:13,16 123:7 125:24 131:11 140:21,23 148:7 190:7 191:5 average [1] 149:22 avoid [1] 217:10 awarded [2] 40:22 162:24 aware [28] 9:25,25 29:13 29:17,21 42:9,11 59:18 59:25 60:18 78:24 79:24 83:8 89:21 120:12 127:21 137:2 155:22 162:23 191:1,6 194:7 197:7,18 200:5 212:25 213:7 215:14 away [3] 2:2 51:21 57:21 awry [1] 40:11</p>	<p>B [13] 8:11,15 9:9 79:15 105:21 106:1,3 110:12 110:13 112:7 130:22 144:20 152:21 B1L03 [3] 77:6 78:1 79:1 B1L17 [1] 94:9 Bachelor [1] 106:17 Bachelor's [1] 108:13 background [3] 105:12 185:5,10 backlog [10] 49:21 50:1 51:14,18,21,21,23 87:14 89:14 92:3 backlogged [1] 86:25 backlogs [6] 50:12,20 50:23,24 51:25 89:3 backup [7] 130:12 131:14,16 134:17 149:4 170:11 211:5 backwards [1] 209:2 bad [4] 58:7 59:21 61:20 159:3 balance [3] 153:7,7 154:23 balancing [1] 143:6 Baltimore [1] 107:9 Banfield [4] 10:5,9 11:1 11:3 bare [1] 183:17 based [14] 32:24 41:19 80:11 120:8 126:5 139:9 139:17,24 170:18 186:17 188:8 192:14 209:19 219:10 basis [24] 16:4,5,19,21 16:25 28:19 90:21 95:7 95:9 119:17 123:3,10 133:3 135:10 139:6 141:19 143:19 165:1 166:24,25 167:23 171:23 210:11 220:2 bear [1] 30:3 bearing [1] 96:4 became [8] 12:21 52:7 123:8 128:18 130:10 131:3 156:12 191:19 become [1] 78:24 becoming [2] 20:11,14 begin [2] 146:1 173:15 behind [3] 71:18 79:22 80:7 belief [1] 110:25 below [2] 27:22,22 beneficial [1] 144:4 benefit [13] 101:3,5 129:2,10,12 133:15,17 133:24 142:19 148:14 174:23 185:24 186:2 benefits [4] 100:10,14 178:24 213:25 best [7] 14:1 110:24 153:22 154:12 158:10,11 221:8 better [10] 19:22 33:6 51:6,9 53:5 80:6 121:22</p>
---	--	--	--	---

-B-

129:8,10 141:14 betting [1] 167:25 between [18] 27:17 35:16 64:5,15 71:21 72:23 74:2 75:22 79:20 103:2 119:1 119:23 121:18 125:19,21 160:22 198:5 214:19 bias [1] 93:7 big [1] 60:9 biggest [1] 213:25 binders [2] 116:2,5 bit [15] 13:21 31:6 40:18 57:4 58:7 79:7 106:23 118:12 131:5 133:10 153:6 158:1 170:22 185:5 192:1 black [112] 1:19,21 6:24 15:21,22 16:2 23:24,24 24:9 28:6 99:25 113:14 115:15 116:19 118:4 119:3,13,17,25 120:13 121:4 122:24 123:2,6,22 124:4,5,9,11,19 125:12 125:20,22 126:21,22 127:3,9,12,15,21 128:12 128:19 129:1,8,12 130:1 130:14,25 131:10,10,16 131:24,24 132:8,19 134:12,14 137:24 139:1 140:4,8,25 141:15 143:20 144:1 145:2,25 147:9 148:13,18,19 149:16,18 150:21 151:9,15 152:1 153:11 155:10,17,20,25 156:8,10,16 157:1,5,14 159:8 187:18 189:10,14 189:18 190:1,21 193:16 194:9,13 195:6 196:6,10 198:14 199:2,25 206:22 208:3 212:24 213:13,14 214:13 215:12 217:4 blackout [2] 27:18,20 blank [1] 153:8 blast [10] 82:4 84:14,21 84:25 85:21 86:9 87:18 88:8,9,13 Board [41] 5:1 9:18,23 10:1,6 26:6 73:24,25 74:3,9,12 101:20 102:21 105:8 106:6,9 107:1 118:8 119:15 120:16,22 121:4,7 156:25 157:3,15 158:3,4,19,22 159:2,7,8 160:5 161:23 162:7 177:5 199:21,24 210:12 221:6 bodies [1] 188:7 boiler [1] 168:3 book [1] 153:8 books [1] 188:5 Boston [2] 107:9,17 bottom [10] 8:12,16 55:13 98:11 106:11,13 178:19 191:13 192:2 199:17 box [1] 33:22 boxes [6] 77:18 78:1,6,7 79:16 173:20 brain [1] 219:20	breach [2] 41:5,6 break [9] 64:13 68:6 72:6 81:20,22,23 104:22 158:24 220:7 breakdown [1] 72:21 breaker [27] 2:23 54:2,3 54:6,18 55:14 56:1 69:21 70:16 77:5,20 78:4,7 79:9,11,14,21 80:5,19 80:20 81:11 82:10 92:15 93:12,17 94:9,16 breakers [32] 3:6 31:11 32:8 57:8 70:1 75:16 76:2,8 78:1,15,25 82:4 82:14,18,25 83:5,12 84:12,14,16,17,21 85:1 85:13,19,21 86:10 87:1 87:19 88:9,10,14 breath [1] 78:13 breathing [1] 153:23 brief [2] 31:7 109:25 briefly [6] 45:15 87:22 105:11 106:8,25 108:20 bring [5] 4:20 26:25 77:4 112:5 167:4 bringing [1] 89:9 Brook [7] 62:20,23 102:24 103:2,4 104:1,5 brought [11] 26:1 28:24 28:25 30:3 88:10,15 90:3 93:6 100:20,22 135:5 brush [1] 33:22 brushes [1] 33:21 budget [7] 4:20,23 5:23 5:24 6:2 7:9 11:16 budgeted [1] 32:21 Budgeting [1] 109:18 budgets [1] 74:14 building [1] 97:21 built [2] 21:22,24 bullet [8] 7:23 8:18 9:12 149:14 168:16 191:15 199:18,19 bunch [1] 90:13 bushings [6] 65:15,22 66:1,4 67:5 68:13 business [3] 51:24 108:16 161:17 buy [4] 143:2,2,3,4	canvas [1] 46:4 canvassed [5] 50:7 53:1 54:23 56:10 60:15 canvassing [3] 53:21 57:9 59:19 capability [22] 15:21,23 22:17 37:18 123:3,22 126:21,22 128:12,19 129:1 131:24,25 137:24 147:9 148:13 149:17 151:10,16 156:10,16 200:1 capacity [17] 21:16 26:19 101:1 119:1 191:2 193:13,14 194:13 195:2 196:1,7,10,19 197:4 198:10,24 199:11 capital [10] 4:19,22 5:23 5:24 6:2 7:9 11:16 108:6 109:18 199:22 Capra [15] 7:20,25 8:16 9:10 10:13 105:10,22,24 109:8,10 110:15,17 112:9 130:24 167:6 Capra's [2] 112:6 177:4 carbon [1] 33:21 care [1] 168:12 career [3] 47:7 107:7,10 careful [1] 140:3 careless [1] 210:21 carried [4] 80:25 122:11 122:17,21 carry [2] 40:19 188:13 case [11] 41:18 55:20 116:1 153:2 168:13,13 168:18 183:5,20 217:6 218:2 cases [1] 165:21 catastrophe [1] 166:10 catastrophic [2] 68:24 172:14 catch [3] 55:1 73:25 90:10 catch-up [2] 31:10 32:14 categorize [1] 206:17 categorizing [1] 140:4 caused [1] 93:5 causes [2] 34:5 72:10 CBA [1] 8:22 centre [3] 34:20 36:21 48:5 centres [1] 124:5 certain [4] 18:25 58:11 133:22 185:11 certainly [20] 10:13 28:15 41:8 61:13 73:14 90:2 92:17 107:5 118:14 123:25 136:2 141:7 149:9 155:7 163:1 166:7 183:4 193:2 197:16 203:24 certainty [5] 202:3,8,9 202:22 210:22 CERTIFICATE [1] 221:1 certify [1] 221:2	cetera [1] 13:25 Chair [17] 1:5,10 31:3 98:5 104:11,16,24 105:6 105:6,14,19,19 109:24 111:13,22 185:1 220:5 CHAIRMAN [19] 1:1 1:6 30:24 31:18,22 83:18 83:24 84:5 96:15,16 97:19 98:1 104:12,18 105:2 110:6 111:18 184:21 220:8 challenging [1] 3:5 change [23] 32:7,9 35:19 43:14 52:22,25 54:2,15 54:17 56:16 58:4,5 68:4 82:2,7,12,22,25 94:18 163:12 195:4 198:12 199:12 changed [4] 68:1 82:5 90:4 196:18 changer [4] 62:14 63:5 93:15 103:15 changes [14] 33:4 42:16 45:16,17 49:10,11 57:7 58:9 82:3 90:15,22 91:2 91:8 160:18 characteristics [1] 23:14 chatting [1] 113:2 check [3] 19:21 56:1,2,3 checked [1] 80:21 checks [1] 81:2 cheque [1] 153:8 chicken [1] 104:21 chronology [1] 120:20 circuit [10] 82:4 84:14 84:21,25 85:21 86:10 87:18 88:8,10,13 circumstances [3] 138:6 153:10 183:15 claim [2] 41:18,23 claims [1] 156:21 clap [1] 20:7 clarification [3] 84:9 189:6 190:25 clarifications [1] 187:1 clarify [6] 99:19 124:7 128:6 148:10 187:24 190:4 classified [1] 92:4 clause [1] 41:10 clauses [1] 41:15 clear [11] 20:11 39:23 50:18 52:21 97:1 190:10 190:15 205:18,24 206:4 206:13 cleared [1] 97:13 clearing [1] 97:21 clearly [2] 40:3 194:7 clients [1] 38:21 close [1] 211:8 closed [1] 80:22 closely [1] 159:23 closer [1] 100:24	closes [1] 206:19 Closest [1] 105:7 co-ordinated [1] 3:15 cold [8] 12:17 78:3 79:8 79:11,17,21 80:6 81:11 colder [3] 77:15 78:14 78:25 colleague [3] 105:9 109:1 161:21 College [1] 106:16 combination [2] 135:16 135:16 combustion [8] 4:8 18:17 24:13,14,21 193:4 194:11 195:25 comfort [1] 211:12 comfortable [1] 207:8 coming [15] 3:3 16:23 59:8 62:14 63:5 70:2 96:24 103:14 117:22 147:4 165:1 209:20,22 209:24 219:13 command [1] 78:2 comment [2] 157:9 175:5 commented [1] 15:15 comments [3] 77:6 192:19 212:22 commercial [1] 40:19 commission [1] 208:1 COMMISSIONER [4] 94:25 95:1,17 96:13 Commissioners [6] 83:23,25 84:3 128:9 162:2 221:6 committed [2] 24:24 90:24 Committee [1] 109:18 common [8] 166:17,21 176:24 177:14 179:18 180:2,9 196:3 communicate [1] 214:15 communicating [1] 158:4 communication [7] 63:20 119:23 120:6,12 121:3,20 122:1 communications [3] 119:21 121:12,22 company [3] 74:10 113:17 217:8 compare [3] 60:17 61:12 61:15 compared [1] 195:25 comparison [1] 57:4 compartment [4] 62:15 93:15 103:15,23 compensation [1] 156:22 competence [1] 12:17 compilation [1] 61:13 complaint [1] 31:21 complete [9] 35:23 39:7
-C-				
C [1] 79:15 Cabot [1] 48:6 calendar [1] 70:14 calibrated [5] 37:7,14 37:22 38:14 40:6 calibration [1] 36:22 calls [9] 115:7 116:12,23 116:25 117:12,17 135:20 135:24 139:25 Cambridge [1] 109:7 Canada [1] 75:23 cannot [1] 70:16				

43:25 66:23 86:7,17 88:13 89:19 96:18 completed [12] 13:11 32:14,17 36:15 42:21 43:25 52:5 67:13 80:17 82:9 87:1,18 completely [3] 2:14 21:22 40:5 completing [2] 74:15 90:25 completion [1] 90:13 comply [1] 70:21 component [1] 101:19 comprehensive [1] 8:1 computerized [1] 53:17 conceivable [1] 217:19 concept [1] 160:14 concern [9] 143:5 152:5 152:13,18 177:11,20 189:3 192:9 193:13 concerned [8] 48:25 57:15,16 92:24 143:5 155:4 191:19 199:25 concerns [7] 9:15 102:23 177:23 191:1,7 198:9 200:4 concert [1] 210:11 concerted [1] 51:18 conclusion [12] 12:12 16:14,18,24 17:1 79:25 135:13 158:6 171:22 172:9 180:20 184:7 conclusions [4] 119:11 122:8 163:6 180:18 conclusive [2] 78:16 80:16 condenser [1] 22:17 condition [17] 5:3 6:15 8:1 9:6 11:12,16,21 12:11 13:24 14:20 65:25 66:10 68:1 77:16,18 78:5 182:10 conditions [3] 41:16 78:8 203:8 conduct [2] 34:14 60:25 conducted [1] 39:9 conference [6] 115:7 116:12 117:12 135:20,24 139:25 conferences [1] 60:13 confident [1] 53:12 configuration [2] 21:6 25:15 confirm [4] 6:7 63:5 110:11 131:12 confirmation [1] 96:10 confused [2] 83:20 142:3 confuses [1] 198:8 connected [2] 130:5 141:5 connection [3] 92:13 118:25 160:22 conscious [4] 5:5 133:2 135:13 146:3	consciously [4] 122:25 135:7,11 144:22 consequence [4] 160:7 160:10 162:16 189:5 consequences [2] 171:14 183:11 consider [9] 20:25 29:9 51:6 177:16 202:1 216:12 216:14,22,25 considerable [2] 26:20 26:23 consideration [6] 20:19 25:8 75:19 199:9 207:3 209:11 considerations [2] 195:1 201:18 considered [8] 25:19 136:21 192:23 193:15 196:13 199:2 208:16 216:25 considering [1] 200:21 consistent [3] 49:22 60:2 189:20 consolidate [1] 14:24 constantly [1] 97:5 consult [1] 57:22 consultant [1] 154:14 consultation [2] 63:20 66:2 consultative [1] 48:22 consulted [2] 63:9 76:6 consulting [4] 107:3,11 108:22 109:6 contactors [1] 89:24 contacts [1] 76:9 contains [1] 106:2 context [12] 124:15 125:15 141:12 144:5,13 145:18 151:18 168:15 196:6 206:25 218:18,20 contexts [1] 140:6 continual [1] 91:6 continue [6] 89:2 102:22 156:14 208:7,8,9 continued [2] 100:8 143:23 continuing [2] 19:13 160:19 contract [9] 34:12 40:14 40:23,23 41:6,6,11 96:23 173:24 contractor [15] 33:16 35:12 38:2,12,20 40:15 74:4 88:15,22 97:3,7,23 173:25 176:19 182:14 contractor's [1] 33:24 contractors [4] 41:19 75:3 89:3,10 contracts [1] 41:14 contrary [1] 157:4 contributed [1] 71:22 contributing [1] 122:2 contributor [1] 34:5 control [12] 78:1,6,7	79:16 96:6 110:18 209:25 211:4,12 212:12,16,18 convenience [1] 158:11 conversation [2] 63:3 191:22 conversations [11] 42:3 59:18,24 63:14,16 139:17 187:24 188:7 192:8 206:18 207:12 cooling [2] 95:11,14 cools [1] 96:7 Coordinator [1] 107:16 copies [1] 60:16 copy [4] 10:18 43:18 115:2 137:3 corporate [1] 48:20 correct [72] 1:3 7:4,18 8:6,24 9:1 13:14,18 15:25 16:16 23:1 32:15 32:17 33:18 34:2 35:8 49:16 58:14 62:22 69:14 86:1,12 87:3 89:16 106:19,21 108:16,18 112:13,15,17 115:17 118:11 120:1,24 121:1,8 122:3,5 123:13,23 128:15 128:20,22 129:14 130:1 131:17 137:13,15 138:19 138:21 139:4 148:22,24 154:5 160:16 163:18,23 164:1,6 169:14 174:4,6 175:3 179:21 182:1,16 182:18 186:20 197:22 203:23 221:3 corrected [1] 36:6 corrective [2] 51:2,22 correctly [8] 37:14,22 38:15 39:8,9 40:1,6,7 correspondence [2] 46:11 48:9 cost [35] 18:21 19:1 27:13 27:17 100:6,9,13,18 101:2,5,7,8 133:16,23 142:19 143:7,15 145:6 152:24 153:3,5,7,13 154:6,21,23 155:5 156:7 157:14 158:10 159:10 178:23 179:20 180:10 183:17 costing [1] 32:20 costs [4] 28:11 32:6,11 202:21 Council [1] 61:9 counsel [2] 62:4 102:21 couple [7] 48:20 74:20 102:21 109:17 163:23 189:14 197:11 course [11] 8:20,22 24:23 62:16 64:20 94:2 112:6 143:13 145:23 149:23 155:3 cover [4] 45:6 189:15 217:19,19 coverage [1] 158:7 covered [3] 41:7 44:22 189:12 Coxworthy [65] 1:8,9	1:14,15 2:13,19 3:7,22 4:9,18 5:16,21 6:5,10,20 7:7,19 8:7 9:2,8 10:11 10:24 11:9 12:1,5,9,24 13:3,10,15,19 14:18 15:2 15:7,11 16:1,13,17 17:5 17:12,25 18:4,8,12,13 19:23 20:5,15 21:17 22:3 22:12,19,23 23:6,16,21 24:19 25:17 26:8,15 27:6 29:12 30:6,14,21 crews [4] 3:18 72:12,22 88:11 crisp [1] 204:13 criteria [1] 49:13 critical [8] 124:19 156:13 156:19 159:3 166:4 174:18 180:23 181:4 cross [1] 164:10 cross-examination [8] 1:14 31:1 84:7 94:25 96:15 111:17,20 184:23 CT [38] 1:20 2:6 3:24 17:14,19 24:17,21 28:4 98:13 101:1 118:9,14,16 119:18 125:9 133:4 148:20 191:4 196:9 200:10,15,19 201:7,13 202:17 203:3,17 205:3,7 205:14 206:21 208:16 209:6,19 210:14 211:18 211:19,23 current [2] 18:24 32:10 customer [6] 4:22 180:18 183:14 184:12,13 184:15 customers [7] 71:5 100:23 127:23 133:18 153:3 155:3 183:16 CV [1] 106:13 cycle [9] 65:13 70:2 82:6 82:6,21 85:16,18 87:14 90:12 cycles [1] 90:24	45:17 101:16,18 163:23 164:4 167:16 169:21,25 170:8,12,13,20 171:7,8 171:12 172:2,9 173:4 177:10,12 178:9 179:9 180:1,6 181:17 dead [1] 71:14 deal [3] 37:24 128:9 163:24 dealing [3] 134:1 173:10 195:6 dealt [7] 31:4 52:20 96:2 163:21 164:2 173:6,15 debatable [2] 122:25 135:7 December [4] 13:12 14:8,13 87:17 decide [1] 203:5 decided [4] 8:21 201:4 206:5,7 deciding [1] 210:10 decision [68] 8:19 9:13 23:22 28:16 49:13,14 56:16 67:1 69:17 113:22 119:13,15,16 120:15 123:1 133:2,9,11 134:25 135:8,11,14 136:9,22 137:12,20,21 143:21,22 144:18,24 145:11 146:4 157:4 158:2,15,25 159:1 159:4 188:10 191:15 192:16 199:12,19,21 201:5,12,17,22 202:16 203:10 204:19 205:12 206:21,24,25 207:8 208:7 208:18 209:4,6,10,14,18 211:18 212:17 219:21 220:2 decisionmaking [1] 207:20 decisions [6] 50:19 153:2 153:18,20 186:6 208:24 decrease [2] 144:21 217:1 deduce [1] 67:12 deemed [1] 159:3 defence [2] 164:16 177:11 defend [1] 107:24 defer [3] 49:14 64:11 81:5 deferral [3] 33:4 91:19 92:3 deferrals [2] 49:12 72:3 deferred [10] 5:24 50:16 51:20 52:3,8,11 92:16 92:19 93:11 159:14 deferring [1] 72:5 deficiencies [1] 160:16 deficiency [1] 156:14 deficient [1] 156:12 defined [1] 70:15 definitely [4] 80:19 91:7 103:17 113:24 definition [6] 148:19 189:17,20,21 198:16,19
--	---	--	--	---

-D-

<p>degradation [2] 66:5 145:5</p> <p>degraded [1] 69:3</p> <p>degree [8] 108:13 131:20 159:18 170:2 199:10 202:14 203:20 204:23</p> <p>degrees [1] 95:24</p> <p>delay [1] 14:13</p> <p>deliveries [1] 3:18</p> <p>delivery [1] 203:8</p> <p>DENIS [1] 31:1</p> <p>Department [2] 97:11 107:21</p> <p>departments [2] 71:21 73:6</p> <p>depended [1] 4:6</p> <p>depending [5] 58:21,25 60:22 116:15 138:6</p> <p>deployed [1] 124:11</p> <p>describe [2] 106:25 108:20</p> <p>described [5] 5:4 46:24 52:6 177:20 180:9</p> <p>describes [1] 179:19</p> <p>design [3] 62:23 86:7 103:5</p> <p>designed [1] 102:13</p> <p>desk [1] 116:2</p> <p>desktop [1] 12:16</p> <p>despite [2] 38:16 76:23</p> <p>detail [5] 31:5 61:17 71:19 103:1 106:7</p> <p>detailed [2] 73:5 204:1</p> <p>details [1] 4:5</p> <p>detect [2] 173:11 175:20</p> <p>detected [3] 175:1 182:24,25</p> <p>deteriorate [1] 68:7</p> <p>determination [1] 162:5</p> <p>determine [6] 21:19 66:3 77:17 169:17 173:17 179:18</p> <p>determined [2] 7:25 9:16</p> <p>determining [2] 9:15 200:2</p> <p>developed [5] 4:5 18:23 47:24 48:25 55:12</p> <p>developing [4] 46:3 48:22 50:6 56:9</p> <p>development [2] 20:21 48:10</p> <p>dialogue [1] 196:2</p> <p>DiDomenico [224] 105:8 105:15 106:3,10,12,20 107:4 108:9 109:1 110:2 110:19 111:1,8,24 112:14 114:7,19 115:1,18,24 116:7,13,20 117:3,9,14 117:23 118:10,22 119:4 120:2,7,25 121:9,15,21 122:4 123:14,24 124:23 125:14,18 126:10,15,24 127:6,16,20 128:5,14,21</p>	<p>129:5,15,20 130:6,16 131:18 132:3,9,16,24 133:7,21 134:18 135:1 135:15 136:1,13,23 137:6 137:14,23 138:4,20 139:3 139:8,16 140:1,13,17,22 141:6,18 142:5,22 144:3 144:8 146:6,11,18 147:1 147:16,22 148:3,15,23 149:8 150:1,8,12,17,25 151:4,17 152:8,17 153:15 154:7,24 155:6,21 157:8 157:18 160:13 163:17 164:5,18,23 165:25 166:6 166:13,20 167:10,19 168:10 169:4,13 170:21 171:4,10,21 172:5,11,18 172:25 174:5,11,15 175:4 175:24 176:5,14,20 177:22 178:12 179:7,14 179:22 180:4,13 181:1,7 181:13,19 182:2,11,17 183:3,18 184:1,9,14,23 185:14,23 186:7,19,25 187:9,14 189:4,19 190:3 190:13,20 191:8,25 192:11,24 193:17,22 194:4,24 195:7,14 196:22 197:6,23 198:4 200:7,12 200:20 201:15,21 205:17 205:22 206:3,11 207:10 208:4,11,19 209:8,21 210:4 211:24 212:3 213:4 213:8,12,18,23 214:4,11 214:18,25 215:13 216:3 216:9,15 218:13,19 219:1 219:8</p> <p>diesel [2] 157:15 159:9</p> <p>diesels [12] 28:24 155:10 155:17,25 158:3,5,10,15 159:2,19,22 211:6</p> <p>difference [4] 27:16 32:20 35:16 148:9</p> <p>different [16] 6:6,9 7:5 44:9,9,18 50:20,22 52:14 86:5 88:6 140:6 184:7 199:2 217:12,13</p> <p>differential [2] 100:9 100:13</p> <p>difficult [1] 77:17</p> <p>difficulty [1] 151:12</p> <p>dig [1] 64:1</p> <p>dilemma [1] 143:8</p> <p>diligent [1] 82:20</p> <p>direct [2] 84:3 173:1</p> <p>DIRECT-EXAMINATION [1] 105:17</p> <p>directed [1] 97:6</p> <p>direction [2] 110:18 167:21</p> <p>directly [3] 31:23 107:14 136:4</p> <p>disagree [9] 157:19,21 161:1,5,6 167:5 183:24 184:2 203:11</p> <p>disagreement [1] 163:10</p> <p>disallowance [2] 157:2</p>	<p>157:7</p> <p>disallowed [1] 159:5</p> <p>disapproval [1] 104:20</p> <p>discounting [1] 100:6</p> <p>discovered [1] 35:20</p> <p>discuss [2] 31:8 105:11</p> <p>discussed [9] 45:18 49:10 54:2 71:16 91:15 91:24 101:17 183:21 213:24</p> <p>discusses [1] 9:11</p> <p>discussing [1] 138:9</p> <p>discussion [17] 20:19 42:15 56:18 57:23 65:9 79:7 80:3,4 98:20 99:9 99:17 101:15 141:9 185:6 186:12 192:7 209:12</p> <p>discussions [3] 114:4 137:10 188:21</p> <p>dismantle [1] 64:14</p> <p>dismantled [1] 94:16</p> <p>dispute [2] 121:18 184:18</p> <p>disruption [1] 27:19</p> <p>distinction [2] 190:10 214:19</p> <p>distribution [3] 109:19 127:25 217:8</p> <p>division [1] 25:4</p> <p>Doble [2] 66:2 67:3</p> <p>document [14] 9:21 11:19 13:22 14:25 15:4 18:7,9,15,17 27:9 49:11 76:11 105:21 136:24</p> <p>documentation [16] 42:16 48:9 49:2,16 50:18 52:14 53:1 57:7 90:9 115:14 116:6,11 118:6 118:13 137:3 187:7</p> <p>documented [12] 32:25 50:17 70:19 71:10,14,25 73:7,8 80:9 83:9 113:25 180:14</p> <p>documents [2] 186:22 186:23</p> <p>doesn't [17] 9:21 10:13 35:5 58:13 66:8 68:5,15 70:4,24 95:13 152:5 165:10 170:16 171:15,23 199:12 212:12</p> <p>dollar [1] 75:9</p> <p>dollars [7] 28:12 31:9 32:4 40:21 142:7 158:24 183:12</p> <p>done [89] 1:18 2:5,20 3:9 3:10,11 4:25 5:2,4,8 6:14 6:25 7:14,16 22:2 23:9 24:16 25:3 35:4,6,9,12 35:23 38:2,3,14 39:14 39:15,25 40:1,3,3 43:13 44:8,17 46:10 50:13 51:1 52:1 53:14,18 54:14 55:17 61:2 62:20,22 64:4 65:3,4,11,12,20 67:7 69:25 70:7 71:12 74:16 85:10 87:9,23 88:25 93:4</p>	<p>97:10 136:18 159:21 174:1,24,25,25 175:20 175:21,22 178:4 179:2,3 179:4,9,17 180:1,3,5,14 182:8,15,24,24 191:19 203:25 207:25</p> <p>double [1] 22:16</p> <p>doubted [1] 39:25</p> <p>down [41] 2:8,15,23 7:23 13:21 19:11,13 20:7 25:16 26:22 27:10 32:9 40:18 45:5 61:22 68:6 68:13 81:20,22,23 84:25 90:8 94:10 96:20 97:15 102:3 106:11 122:15 130:3 138:23 145:20 149:13 156:5 170:14,22 177:12 178:9 184:4 192:1 215:5 220:6</p> <p>draft [2] 14:3,5</p> <p>drain [5] 54:5,16 56:23 57:24 94:14</p> <p>drained [1] 94:17</p> <p>drains [1] 54:4</p> <p>draw [4] 79:24 172:9 184:7,12</p> <p>drawing [1] 171:22</p> <p>drifted [1] 97:10</p> <p>driven [2] 48:3 72:2</p> <p>drop [1] 71:14</p> <p>dropped [1] 188:6</p> <p>due [7] 8:19 9:14 53:18 64:12 70:2 81:5 156:22</p> <p>duel [2] 196:9,12</p> <p>dug [1] 79:3</p> <p>duration [3] 195:24 203:13 205:1</p> <p>durations [1] 145:4</p> <p>during [17] 2:7,12,15 4:1 4:6 25:2 27:14 33:17,24 35:13 42:14 73:19 77:18 78:2 144:18 175:8,9</p> <p>dynamically [1] 34:25</p>	<p>42:7 63:13 117:17 174:24 188:1</p> <p>electric [7] 27:18 107:2 107:9,11 108:21 109:2 110:4</p> <p>electrical [4] 61:8 106:17 114:15 129:24</p> <p>electrically [2] 131:3 140:18</p> <p>element [3] 3:19 120:3 126:1</p> <p>elements [6] 2:24 3:4 133:22 161:5 171:5 184:2</p> <p>eliminate [1] 5:14</p> <p>eluding [1] 47:25</p> <p>email [6] 10:5,17,19 11:1 11:2,3</p> <p>emails [2] 10:4 98:15</p> <p>embodies [1] 134:6</p> <p>emergency [5] 6:23 28:19 47:18 97:2 207:23</p> <p>emphasis [1] 50:16</p> <p>emphasizing [1] 153:4</p> <p>employees [4] 88:7,18 88:24 96:25</p> <p>employment [1] 106:25</p> <p>end [30] 11:17 13:5 15:1 20:1 27:15 35:23 37:24 44:14 64:15 71:5 86:17 89:6 91:1 100:21,24 101:6 122:16 127:22 191:20 192:21 201:14 202:17 204:13 205:6 210:13,15,23 211:19 212:18 216:22</p> <p>ended [1] 38:6</p> <p>ends [1] 210:1</p> <p>energy [3] 109:7 125:23 131:2</p> <p>engagement [1] 38:23</p> <p>engine [3] 6:3 21:15 22:17</p> <p>engineer [1] 65:4</p> <p>engineering [9] 26:4 48:19 66:3 67:3 106:17 108:14,15 143:2 219:3</p> <p>enhance [1] 88:25</p> <p>enhancement [1] 94:20</p> <p>enhancements [1] 22:10</p> <p>ensure [8] 40:25 93:7,9 94:14 146:23 162:14 178:5 182:10</p> <p>enter [3] 205:4,15 215:9</p> <p>entire [5] 3:14 30:2 150:19 179:10 184:4</p> <p>entity [1] 165:3</p> <p>environment [1] 164:25</p> <p>envisioned [1] 7:16</p> <p>equipment [16] 3:17,18 3:20 12:18 36:22,22 37:5 37:7,13 38:13 56:21 62:12 65:3 97:4 164:15 168:19</p> <p>especially [1] 188:22</p>
---	---	---	---	--

-E-

early [8] 3:15 23:23
84:20 86:21 97:12 103:8
146:12 197:4

easiest [2] 142:25 143:1

east [3] 100:21,23 101:6

easy [1] 158:12

economic [2] 29:18 30:8

Edison [2] 107:9,17

education [1] 106:15

effect [4] 46:12 80:13
82:13 146:10

effectiveness [1] 109:16

effort [8] 3:15 26:9,24
48:16 51:18 72:16 151:19
193:24

efforts [1] 151:22

eight [5] 70:17 71:1,11
166:19 167:3

either [7] 19:14 36:15

<p>essential [1] 143:25 essentially [4] 114:8 129:10 164:8 200:11 establish [1] 154:21 established [2] 50:21 156:16 estimate [2] 32:10,25 estimated [2] 18:25 32:21 estimates [2] 18:21 26:4 estimating [1] 117:15 et [1] 13:25 evaluating [1] 194:8 Evan [1] 48:6 event [32] 23:10 28:10 41:3 46:19 47:2 58:12 58:20 59:1 60:23 64:4 77:19 78:3,5 97:2,6,16 114:12 123:7 130:3 136:17 139:1 141:10,21 142:16 143:24 144:10 145:7,8,19 181:11 210:9 215:15 events [17] 8:17 23:7 42:6,17 45:19 47:13 50:5 53:2 54:22 57:18 59:9 60:12 101:23 114:11 120:21 183:8 187:16 everybody's [1] 202:24 evidence [34] 1:23 7:22 15:14 19:1 35:5 38:19 40:2 52:10 73:23 105:20 105:22,22,25 106:2 110:3 110:13 111:6,16 117:22 117:22 124:15 136:10 137:10 165:19 170:19 173:24 174:20,22 176:12 178:3 183:1 203:25 209:11,18 exacerbated [1] 58:7 exact [10] 62:10 77:17 109:4 112:22 116:21 152:2 158:23 203:2,15 212:10 exactly [5] 91:18 103:20 104:4 116:22 203:5 EXAMINATION [1] 98:7 example [2] 60:7 127:5 examples [1] 131:8 exception [2] 132:22,25 exceptional [1] 72:9 exceptionally [1] 72:1 exclusively [3] 107:7 118:16 127:8 Excuse [1] 209:9 execute [3] 37:18 39:17 46:24 executing [1] 46:22 execution [1] 25:4 exhaust [1] 5:12 exhaustive [1] 47:10 exhibit [1] 149:17 existed [3] 130:13 146:25 163:25</p>	<p>existing [6] 57:13 85:19 85:21 87:1 155:17 163:7 expanded [1] 25:15 expansion [4] 21:1,11 24:12 118:20 expect [9] 13:9 38:13 56:7 67:17 158:16 159:17 165:3,7,12 expectation [2] 37:9 151:22 expected [12] 10:15 11:17 13:4,7 27:16 32:6 32:13 36:5 66:19 74:15 74:19 165:17 expecting [1] 158:18 expense [2] 74:9,11 expenses [1] 74:12 experience [12] 69:7 101:24 102:9 106:8 107:2 107:3 108:21,22 114:14 145:1 151:13 153:19 experiencing [2] 78:4 159:24 expert [1] 110:3 expertise [6] 107:12 113:18,24 167:23,24 182:4 experts [4] 167:22 168:3 168:3 169:6 explain [6] 100:11 101:20 102:25 131:5 213:17,21 explained [2] 64:8 71:19 explaining [1] 103:12 exposed [1] 142:14 exposure [5] 138:18 142:12 145:6 206:22 217:25 expressed [2] 121:14 167:4 extension [1] 151:21 extensive [3] 92:23 106:5 110:1 external [1] 93:8 extinguishing [1] 86:5 extraordinary [3] 74:10 74:12 75:8 extrapolate [1] 68:18 extremely [1] 134:2 eye [1] 120:11 eyes [2] 12:17 93:8</p> <hr/> <p style="text-align: center;">-F-</p> <hr/> <p>f [1] 156:25 face [2] 159:5,5 faced [1] 143:10 facilitate [1] 127:9 facilities [3] 44:10 51:24 59:7 facility [10] 30:1 40:11 97:25 124:12 145:20 152:11 165:2 189:21 195:11 214:14</p>	<p>fact [53] 36:25 38:16 41:19 76:23 114:1 120:18 123:17 125:10 128:17 130:9 132:20 134:11 135:6 139:14 140:9 141:11,21 142:4 143:17 143:22 145:13 148:18 151:18 152:9 157:4 158:6 159:21 161:7 163:11 164:11 166:11,18 169:18 170:18 173:14 176:21 178:2,8 180:19,21,22 181:10,25 188:15 194:19 195:9,21 201:8,11 203:1 203:4 208:16 209:19 factor [5] 65:10,19 67:24 147:13 148:1 factoring [1] 199:10 factors [12] 33:13 36:20 37:16 47:21 78:6 122:1 134:24 136:21 138:16 141:23 146:3 219:10 facts [5] 183:24 184:5,8 184:18 209:1 fail [2] 66:18 67:18 failed [13] 64:6,22 67:11 68:18,23 104:2,13 170:9 170:13 171:8,13 177:13 183:11 failing [1] 33:16 fails [3] 38:16 67:19 79:9 failure [35] 27:13 28:10 30:8 33:11 34:5,10 47:22 54:18 55:25 62:3 63:22 68:5,24 77:4,7 79:1,4 80:11,13 92:15 93:5 115:16 156:23 164:13 166:9 169:21 172:14 173:11 176:24 177:7,15 178:7 179:19 180:3,9 failures [2] 75:18 93:11 fair [18] 4:10 13:4,4 17:1 17:6 20:8 24:5 28:14 39:5 40:11 59:4 91:9 179:13,15 186:11 199:8 200:22,24 fairly [3] 31:7 186:13 220:7 fall [1] 80:18 falling [3] 47:17,18,19 Falls [1] 19:11 false [2] 37:3 40:8 familiar [7] 47:9 72:20 118:19,25 119:5 197:11 197:11 far [2] 62:8 173:16 faulty [9] 171:18,19,25 173:3,15 175:20,25 176:2 176:8 feature [1] 23:11 features [1] 22:18 February [6] 6:21 9:10 9:11,22 10:2 120:23 fellow [1] 48:6 felt [2] 150:5 189:1 few [9] 32:10 45:15 75:15 83:1 98:5 110:16 114:6</p>	<p>141:22 189:15 field [2] 77:18 100:19 figure [2] 170:23 196:1 file [1] 115:4 filed [7] 7:9,10 105:20 110:9 112:11 116:1 188:22 filings [3] 112:24 113:3 188:18 filled [1] 156:18 final [10] 14:4,5,7,12,14 14:14 202:3,4 203:16,18 finally [3] 73:22 97:13 156:15 finance [1] 33:6 financial [2] 161:14 162:15 financially [1] 160:15 finding [7] 122:2 160:4 160:11,20 161:13 162:5 162:9 findings [3] 113:11,13 176:25 fine [4] 72:24 93:17,17 217:23 finished [2] 84:2,4 firms [2] 109:6,7 first [38] 14:10 31:8 63:10 74:20 78:24 100:3 106:9 107:6 114:14 119:9 119:12,20 122:16 123:9 123:20 124:5,8 126:4 130:23,24 131:7,7 134:10 135:12 156:10 163:5,20 167:5 169:19 173:6 178:6 178:16 180:21 188:15,18 188:21 189:16 191:14 five [8] 8:13,16 32:4 117:17 129:9 144:19 145:20 202:19 five-year [1] 31:9 fixed [1] 201:9 flag [2] 71:10 169:9 flagged [1] 167:24 fleet [4] 47:8 107:17 108:3,4 Fleming [112] 30:25 31:1 31:2,20 32:2,19 33:2,10 33:23 34:3,11,21 35:2 35:10,21 36:8,13 37:2 37:10,19 38:1,10 39:4 39:22 40:13 41:17,25 42:4,13 43:9,17,23 44:12 44:20 45:3,14 46:2,13 46:25 47:11,23 48:7,24 49:9,19 50:4 51:4,11 52:9,23 53:20 54:1,19 55:11,19 56:4,24 57:5 57:14 58:3 59:3,11,17 60:1,24 61:18,23 62:2 62:25 63:12,23 64:2,23 65:8 66:11,16 67:10,16 68:20 69:10,15 70:9,13 70:23 71:9,15 72:11,18 73:11,18 74:18,23 75:10 75:14 76:13,19 77:11,21 78:17,23 79:6,19 80:2</p>	<p>80:10 81:7,15 82:11 83:4 83:10,16 90:2 174:21 flexibility [1] 195:23 flow [15] 47:21 95:14,20 163:22 164:3 167:18 168:21,21 169:22 170:10 171:9 173:7 175:19 181:23 183:10 fluctuation [2] 203:2,4 flush [1] 173:20 focus [4] 26:3 189:9 190:17 192:17 focused [2] 88:20 98:19 focussed [1] 188:25 folks [3] 46:21 153:23 193:9 follow [2] 99:1 159:2 followed [3] 71:17 120:14 186:11 following [5] 17:20 47:5 53:6 121:7 188:18 follows [1] 16:5 footnote [2] 192:2,3 footnoted [1] 192:5 forced [1] 149:19 forecast [3] 19:17 58:23 59:7 forecasted [1] 58:21 foregoing [1] 221:2 foresee [2] 145:19 165:22 foreseeable [3] 143:18 145:15,18 forgive [1] 140:3 form [1] 219:21 formal [2] 179:23 180:14 forth [3] 125:21 198:5 215:17 forward [15] 22:9 26:6 70:22 89:9,13,20 91:8 99:15 161:1,5,8 177:6 189:25 196:19 211:18 fossil [1] 107:18 found [11] 21:23 34:17 35:13 54:21,24 56:10 75:23 77:16 80:1 124:17 125:3 foundation [2] 109:10 208:21 founded [1] 195:9 four [15] 72:12 82:5,13 83:1 84:11 85:14,18 90:11 117:17 129:9 171:19 173:4 202:18 204:4,11 frame [3] 86:14 142:17 160:2 free [2] 76:10,17 frequency [2] 56:19 57:3 Friday [2] 1:17,23 front [1] 15:1 fronts [1] 160:24 FTEs [1] 73:7 full [4] 18:20 21:16</p>
---	---	---	--	---

152:24 157:14 fully [1] 87:10 function [5] 27:15 149:6 172:13,24 181:18 functional [1] 167:7 functionality [1] 147:11 functioned [6] 170:2,20 171:2 172:2,10 175:23 functioning [2] 170:17 170:18 fundamental [3] 43:16 160:23 219:2 Fundamentally [1] 115:2 funds [1] 41:2 future [12] 19:12 20:21 20:25 21:2,15 27:2 58:14 89:4 160:9 191:3 201:6 209:7	126:13 156:6 219:18 gone [3] 62:9 90:15 215:17 good [27] 1:10 26:4 31:6 39:5 67:5 78:20 95:22 111:22,25 112:2 116:8 120:16 132:13,21,22 143:21 147:14 174:8,9 182:10 185:1,2,3 196:14 204:4,11 220:9 GRA [1] 31:13 gradually [1] 68:6 gray [19] 4:20 8:13 17:23 18:2,6,11 21:20 22:11 22:13 25:11,22 31:25 98:9 105:25 106:12,24 108:11 112:5 122:15 Gray's [1] 17:17 great [3] 31:5 72:25 160:18 greater [1] 103:1 green [1] 100:19 Greene [165] 35:11 65:14 98:15 99:25 100:4 111:19 111:20,21 112:3,18 113:4 114:13,21 115:12,21 116:4,9,17 117:1,6,11 117:20,25 118:18,24 119:8 120:4,19 121:2,11 121:17,23 122:6 123:19 124:13 125:2,16 126:8 126:12,20 127:1,11,18 128:3,7,16,25 129:11,17 129:22 130:8,18 131:22 132:5,11,18 133:5,19 134:8,20 135:3,22 136:7 136:15 137:1,8,16 138:1 138:13,22 139:5,12,19 140:11,15,19,24 141:8 141:20 142:20 143:12 144:6,14 145:12,22 146:15,20 147:3,19,24 148:11,17,25 149:10 150:3,10,14,23 151:2,11 152:3,12,19 154:2,18 155:1,8,23 157:12 159:6 160:3 161:24 162:22 163:2,19 164:7,21 165:15 166:2,8,15 167:2,12 168:8,17 169:10,15 171:1 171:6,16,24 172:7,16,22 173:2 174:7,13,17 175:12 176:3,9,16,23 177:24 178:14 179:12,16,24 180:7,16 181:3,9,15,21 182:7,13,19 183:6,23 184:6,11,17 186:12 189:11 216:8 grid [15] 29:14 30:10 124:6,10 126:6,13,16 127:14 129:19 131:2 132:1,7 145:3 148:20 218:15 ground [1] 217:17 grounding [1] 217:10 group [5] 25:3 43:16 48:3,20 55:18 growth [1] 24:4 GT [7] 8:2 192:17,20	198:12 199:3,24 207:22 guarantee [1] 95:13 guaranteed [2] 159:15 159:16 guess [37] 5:5 14:14 17:4 17:17 22:6 33:5 41:6 55:9 58:25 60:2 66:25 67:8 72:4 78:10,12 79:14 82:20 87:23 88:21 89:7 89:18 92:2 103:19 120:13 148:12 157:19 161:25 166:3 168:25 169:16 174:8 179:1 180:19 184:22 188:25 207:19 208:20 guessing [1] 211:12	91:12,17 92:11 98:11,17 98:25 99:6,11,21 100:2 100:15 116:23 117:7 135:25 136:2 Henderson's [1] 15:14 hereby [1] 221:2 hesitant [1] 76:18 hey [1] 206:5 hide [1] 194:19 high [3] 72:2,8 149:17 higher [5] 52:7 64:12 71:4 81:23 146:24 highlight [2] 158:14,14 highlighted [1] 158:1 Highways [1] 97:11 hindsight [5] 161:4 185:24 186:2 198:16,19 hire [1] 74:4 hired [3] 75:3 88:7 168:2 hiring [1] 88:24 history [4] 107:1 165:6 176:7 215:18 hit [2] 34:23 35:13 hits [2] 71:11 96:7 hitting [1] 35:25 Holyrood [103] 1:21 2:5 2:8,24 3:3,6,9 7:12 8:2 15:21,22 20:10 21:5 23:25 24:8,18 28:4,5,15 28:19 29:2,14 30:1 33:12 44:11,21 45:18 58:6,9 58:12 59:2 85:11 91:25 94:10 98:13,19 101:9 115:15,16 119:3,19,25 121:5 123:3,23 124:12 124:19,20 125:10,13,22 126:4,17,22,25 127:4,4 127:7 128:10,13,20 129:2 129:13,23 130:2,14 131:1 132:1 137:25 140:20 141:1,15 143:20 144:2 145:21 148:21 153:11 156:11,17 166:5 169:24 181:6 190:9,17,21 191:6 191:16 194:9 197:19,24 198:1,3,6,12 199:3,24 206:8,23,23 208:3,10 212:24 213:2 honest [1] 39:3 horizon [2] 198:25,25 hour [3] 27:18 104:19,22 hours [3] 27:21 138:8 145:9 HTGS [1] 200:1 Humphries [23] 1:12 9:25 12:6,7 19:21,25 20:12 21:8,25 22:5,15 22:21 23:4,8,19 25:9,12 25:25 43:7 104:10 193:9 201:1,12 HVDC [1] 20:23 Hydro [130] 4:25 5:1 7:22,25 8:20 9:14,17 14:21 16:6 17:7 21:18 24:1,6 34:4 39:24 41:3 42:7,17,21 43:25 49:20	53:6 56:12 83:11 84:3 87:22 105:20 112:10,20 113:7 114:5,10 115:8,13 116:11 117:13 119:23 120:22 121:3 122:25 131:9,10,23 133:1 135:7 135:20 136:17,19 137:2 137:5 139:10,18 141:14 143:21 144:23 145:24 146:8,22 147:20 149:1,4 150:6 155:24 156:7,10 156:12,13,15,19,21,25 157:13,17 160:7 161:7 162:6,16 163:11 164:12 164:17 165:2,19,20 167:15 168:1,2 169:18 170:16 172:1 173:24 174:3 175:15 176:10,18 177:16 179:1,4,25 181:22 182:14 183:14,15,16 186:24 187:25 188:5 191:1,19,22 192:7,21 193:15 194:8 195:6 198:13,23 199:20 200:1 200:18 201:3,5 205:14 207:7,12,20 209:1,3 211:17 215:7 218:11 Hydro's [40] 15:16 35:3 44:10 73:24 89:2 91:16 92:7 105:22 110:12,14 112:7 113:22 118:20 119:12 123:21 124:4,16 124:22 128:8,11,18 129:25 130:20 131:15 132:8 147:6 151:12 152:25 154:3 155:16 163:7 167:20 178:3 189:25 193:8 196:17 201:2 208:7 211:22 221:4 hypothetical [4] 208:20 208:23 215:7 218:17
<hr/> -G- <hr/> gas [28] 5:12 6:23 7:12 19:16 20:10 21:20 24:8 28:17,24 62:8 64:25 86:5 86:7 102:24 103:7,9,22 107:9 123:6,11 125:5 147:7,20 151:13 191:16 193:2 197:19 198:3 gassing [1] 103:14 gathered [1] 12:18 gearbox [2] 5:13 6:4 general [9] 40:19 41:16 44:23 69:16 127:8 129:6 194:13 202:15 221:4 generally [7] 35:17 69:8 109:14 118:11 155:22,22 182:20 generate [1] 145:14 generated [2] 43:11 44:14 generating [5] 97:8 100:25 107:18 108:3,4 generation [15] 1:21 9:15,16 19:12 20:1 24:12 30:2 118:20 127:24 197:2 200:2,4 201:3 217:5,17 generator [6] 2:6 20:22 20:24 21:13 22:16 149:21 generators [1] 214:24 gentlemen [10] 1:11 30:22 105:7,10,14 110:11 110:18 111:16,23 185:1 given [19] 7:12 20:23 28:6 65:20 67:11 71:5 104:19 118:2,6 138:18 139:25 152:9 153:12 165:19 174:18 185:10 186:24 188:17 201:18 giving [3] 25:11 103:13 151:14 GLYNN [14] 1:4 10:22 11:7 15:9 31:15 45:8,12 49:7 53:24 58:1 61:25 73:15 83:21 84:1 goes [5] 20:18 49:14	<hr/> -H- <hr/> half [8] 8:17 22:16 104:22 107:10 109:3 142:15 150:21 203:19 hand [3] 99:5,7 182:5 happening [9] 9:7 51:17 62:19 65:22 74:19 83:3 93:14 95:8 104:7 happy [1] 177:19 hard [2] 28:5 31:16 Hardwoods [52] 16:3 23:23 29:8,9 123:6,6,11 124:7 125:11 126:7,11 126:14,17 128:17,23 129:4 130:10,14 131:3 131:13 132:2,6,14 134:15 147:7,20 148:6 149:3,6 149:14,22 150:6 151:10 151:13 152:4,6,16 190:1 190:18 195:13,15 198:5 202:2,12 205:6,12,19,24 206:6,7 208:8,10 Haynes [5] 10:5,10 11:1 98:17 136:11 head [1] 73:10 heading [1] 58:22 hear [1] 31:21 heard [3] 60:12 136:10 221:5 hearing [3] 31:16 178:4 221:3 heat [3] 96:2,4,12 held [1] 107:13 help [4] 60:21 77:4,9 147:17 helped [1] 131:5 helpful [1] 58:25 hence [1] 149:15 Henderson [64] 1:12,23 2:11,17,22 3:13,25 4:14 9:24 10:3,20 12:2,3 15:17 16:10 19:2,20 23:22 24:11 25:1,23 26:13,17 29:6,20 30:11 30:19 33:8 42:10 43:1 43:20 44:5,16,24 45:10 49:17,24 50:9 51:8,16 52:18 53:10 67:22 69:5 69:13 74:7,21 75:6,12	<hr/> -I- <hr/> IC [2] 7:10 11:14 IC-NLH [1] 4:24 IC-NLH-026 [1] 17:6 IC-NLH-26 [2] 5:9 6:14 idea [4] 114:3 120:16 127:12 189:16 ideally [1] 23:15 identified [14] 19:3,5,8 92:18 93:13,18 94:1,4,9 94:12,17,21 162:13 168:7 identify [2] 51:1 93:2 identifying [1] 24:13 imagine [1] 161:15 immediate [2] 27:4 69:7 immediately [2] 17:20 18:14 impact [5] 28:2 80:1 91:16,19 92:7 impacted [1] 79:17 impacts [1] 27:23 implement [1] 157:24 implementation [3] 194:10,11 210:23 implemented [4] 42:17		

91:2,3 123:5 implication [2] 172:20 216:21 implications [1] 180:11 implied [1] 159:16 implies [2] 131:9 153:17 imply [1] 159:15 importance [2] 153:10 158:4 important [10] 134:24 147:11,13 149:5,9 158:7 158:24 168:22 174:14 186:5 imposed [1] 158:23 impression [2] 74:25 207:16 improper [1] 121:19 improve [5] 90:19 151:23 152:10 161:8 195:11 improved [1] 163:9 improvement [10] 91:6 152:15 160:22 161:3,3 162:12 214:20,23 215:1 215:2 improvements [1] 100:22 improving [1] 151:19 imprudence [14] 122:2 156:9 157:16,23 158:22 158:25 160:4,12,21 161:2 161:13 162:9,18 163:15 imprudent [6] 157:5 162:6 164:12 165:13 183:16,19 imprudently [2] 157:1 162:11 in-depth [1] 12:23 in-feed [2] 19:5,10 in-service [1] 26:7 inability [1] 71:22 inaction [1] 160:1 inadequacies [1] 163:25 inadequate [3] 121:19 171:9 183:10 inappropriate [2] 121:25 149:16 Inc [1] 105:10 incentive [1] 160:8 incidences [1] 145:2 incident [3] 28:13 169:3 181:25 incidents [2] 115:5,20 inclement [1] 58:11 include [3] 3:23 11:5 54:16 included [3] 32:23 42:23 77:7 includes [2] 51:22 106:15 including [7] 29:8 41:10 44:2 109:17 137:3 139:21 199:9 incoming [1] 96:24	incorporating [1] 22:9 incorrect [1] 39:19 incorrectly [4] 36:17 38:3 39:14 40:3 increase [2] 21:2 82:20 increased [1] 81:10 incremental [3] 101:2,5 101:8 incumbent [1] 146:22 incur [2] 101:8 133:23 indeed [1] 157:5 independent [3] 93:6 113:20,25 indicate [7] 54:11,15 67:4 71:25 77:3 79:18 80:16 indicated [13] 17:6 20:3 42:21 62:13 79:5 80:23 100:17 185:15 191:22 197:3 199:20 207:12 216:7 indicates [4] 10:25 14:3 95:6 139:20 indicating [1] 100:12 indication [6] 11:2 36:25 43:24 67:25 206:19 207:6 indications [1] 77:14 indicative [1] 151:24 individual [3] 48:4 184:2 190:6 individuals [9] 116:12 116:14,15,19 136:16 137:11 166:22 186:4 198:23 industrial [2] 4:22 38:21 industry [12] 46:14,19 48:11 50:8,23 53:5 54:8 55:2 107:5,8,12 109:2 inert [1] 86:6 infamous [1] 95:3 infer [3] 161:10,11 201:16 information [45] 4:21 7:11 10:1 13:23 14:2 18:24 25:6,6 30:17 54:11 61:2 72:19 76:10,18 111:14 115:4,19,22,23 115:25 116:3 118:2,3,7 118:17 120:8 135:17,18 136:6 139:9,14,24 150:4 154:16,20 162:4 185:18 186:3 188:4,17 191:24 198:22 199:1 208:25 209:5 informed [5] 10:6 119:15 199:20 201:3 219:21 infrastructure [1] 59:6 infrequently [1] 142:11 initial [2] 164:2 189:2 input [2] 145:10 155:2 inquire [1] 46:11 inquiries [1] 49:2 inquiry [2] 53:23 60:3 inside [1] 43:14	inspection [4] 12:19 36:3 64:14 191:17 installation [2] 175:9 195:24 installed [3] 24:8 54:5 54:25 instance [3] 55:22 134:1 138:7 instructed [1] 186:17 insulation [2] 67:24 69:3 insulator [1] 68:1 insulators [2] 68:5,16 insurance [2] 40:22 41:10 integrated [1] 219:20 integration [2] 20:20 20:22 integrity [1] 178:5 intended [7] 5:22 15:18 39:1 141:17 167:9 172:10 172:24 intending [1] 17:8 interchangeably [1] 190:14 interconnected [5] 114:15 118:21 144:1 205:9,11 interim [43] 23:24 119:17 123:3,12,12,15 125:11 130:17 133:3 134:4,11,25 145:7 146:9 152:7 202:1,6,11,16,20 203:1 205:5 206:20,24 206:25 207:9,13,18 208:12,14 210:1,2,10,13 210:23 211:8,13 212:7 212:12,16,18 217:2,3 internal [4] 11:2 64:14 93:7 136:20 interpret [1] 150:24 interpretation [1] 115:8 interpreting [1] 115:11 interrupted [1] 127:10 interrupting [1] 209:9 interviews [2] 114:9 135:19 introduce [3] 3:5 105:4 106:8 introduced [1] 94:13 invest [2] 217:13,15 investigating [1] 165:4 investigation [10] 35:20 54:18 77:5 80:15 82:9 92:23 93:2,10 94:2 207:2 investigator [1] 48:17 investing [2] 151:19 218:3 investment [9] 108:6 152:14 158:8,19 159:24 160:1 194:18 195:10 216:23 investments [4] 142:7,8 142:8 210:12 invoice [1] 36:14	involve [2] 75:15 218:3 involved [14] 7:5 33:16 42:24 45:17 46:9 48:18 54:2 108:1 109:1 136:9 137:12 153:20 159:13 186:15 involving [3] 201:9,10 218:10 island [13] 19:4,13,14 27:20 72:13 114:15 118:21 119:2 143:25 201:10 205:9,10,11 isolated [9] 19:4,14 131:3 140:10,16,18 201:10 205:10 218:14 issue [37] 5:17,22 6:12 17:13 31:8 39:10 60:9 78:24 92:2 93:20,24 119:20 120:10 125:19 128:9 134:1 144:24 145:6 153:1 159:10 163:6,11 163:21 164:24 167:24 168:1,7 169:9 177:5,15 179:5 189:11 196:6,7 198:14 199:7 209:13 issued [1] 8:20 issues [34] 6:19 7:1,16 16:20 20:2 31:4 58:6 91:14,24 102:24 107:22 108:5 109:13 113:13,23 115:15 118:4,7 120:13 133:8 136:5 165:1,11 166:12 186:16,18 187:2 187:3 191:2 193:13,14 197:4 198:10,24 it'll [2] 81:21,22 item [3] 56:22 72:15 144:20 items [1] 81:4 itself [11] 6:3 20:9 96:6 97:16 104:5 124:18 127:22 161:21,22 162:9 178:21	177:2 jump [1] 31:6 June [1] 33:1 jurisdictions [5] 49:3 56:10 60:5 83:6,13 justification [1] 7:13 justify [1] 143:11 <hr/> -K- <hr/> keep [12] 53:13 97:1,24 119:14 129:13 130:2 138:10 140:2 141:3 155:19 156:5 167:18 keeps [1] 53:17 key [3] 58:11,24 59:8 kick [1] 85:13 kilometres [1] 97:9 kind [8] 56:6 79:17 109:15 120:10 166:23 188:3,16 193:24 kinds [2] 195:2,25 knew [1] 198:24 knowing [5] 26:19 154:15 198:10,11 211:20 knowledge [9] 23:10 41:23 47:3 110:25 115:19 199:6,10 215:4 219:25 known [4] 144:22 198:9 198:20 200:17 knows [1] 175:10 <hr/> -L- <hr/> labelled [2] 161:19 202:25 Labrador [4] 19:10 221:4,7,10 lack [7] 97:21 119:22 122:1 137:24 163:21 164:3 199:25 laid [1] 3:14 landed [1] 94:2 large [6] 2:4 3:19 18:7,9 97:4 142:8 largely [2] 167:25 193:4 larger [3] 20:22,24 21:13 last [25] 7:23 31:3 42:15 52:24 58:4,5,5 62:6,9 67:6 75:15 86:21 91:15 122:10,20 134:23 142:13 146:1 147:4 170:15 185:3 197:11,12 199:18,19 lasted [1] 27:20 late [3] 4:3 19:6 97:12 latest [1] 19:7 lawyer [1] 104:13 layman's [1] 178:10 lead [2] 48:17 201:24 leading [1] 114:11 leaks [2] 5:12,12 learning [1] 6:4 least [7] 10:4,8 17:7 35:5 143:14 153:5 173:4
-J-				
January [33] 23:7,18,20 24:4,6,23 26:12,14,16 28:16 33:12 34:6 42:6 42:18 46:15 47:14 57:18 58:6 64:22 67:11 90:4 91:4 92:13 96:17 101:23 102:10,15 114:11 121:7 124:18 139:1 172:17 183:7 jet [1] 6:2 Jim [1] 10:5 job [1] 143:7 John [3] 105:9,16 126:2 John's [5] 100:21,24 101:6 221:7,10 joint [2] 48:16 60:20 jotting [1] 90:8 judgment [9] 153:22 204:14,18,23 219:3,4,9 219:19,19 Judy [2] 221:2,12 July [4] 112:12,23 149:12				

<p>leave [1] 215:1 led [2] 33:14 75:17 LeDrew [76] 1:13 5:10 5:19 6:1,8,17 7:3,17 8:5 8:25 9:5,24 11:24 12:10 12:15 13:1,8,13,17 14:8 14:16,22 15:5,15,24 16:9 16:15 17:2,10 33:19 34:1 34:7,16,24 35:7,15 36:2 36:10,19 37:4,15,23 38:4 38:18 39:12 40:9 41:13 41:22 42:2,8 43:3,12 45:1,25 46:8,17 47:6,15 48:1,14 49:5 58:15 86:4 95:2,15,21 96:22 97:22 99:4 101:13,25 102:12 102:17 174:20,23 182:22 LeDrew's [1] 183:1 left [6] 21:13 34:17 39:11 99:5,7 153:18 legal [1] 41:3 legislative [1] 143:13 legitimate [1] 193:23 length [2] 71:16 146:7 less [4] 32:21 142:18 152:1 216:4 lessen [1] 162:14 level [27] 5:2 6:15 11:12 11:16,20 12:12,16,21 13:11,24 14:20 27:11 64:25 95:19 100:22 130:11 131:14 133:3 134:2,16 145:4 147:8 160:21 161:2,3 163:15 219:15 levels [6] 62:13 63:17 103:7,9,14,22 liability [1] 40:20 LIAM [1] 184:23 Liberty [17] 112:11,24 113:10 121:14,18,25 131:9 149:14 156:9 158:10 161:1 166:16 177:8 179:19 180:9 184:8 188:22 Liberty's [10] 149:11 156:4,6,24 160:24 173:18 177:1,2,20 185:10 life [4] 151:21 178:25 191:21 192:22 lifespan [1] 192:10 lifted [2] 9:14 120:24 lights [3] 128:1 155:5 214:12 likelihood [4] 134:2 142:16 178:24 212:23 likely [6] 25:10 67:12 99:18 144:10,12 183:4 likes [1] 162:10 limited [5] 112:25 114:9 138:17,18 144:21 line [6] 1:24 39:23 98:14 131:7 177:10 207:23 lines [9] 3:2 99:9 130:3,5 145:20 189:15 213:2 214:9 215:5</p>	<p>link [3] 20:23 79:20 201:10 list [4] 52:1 75:25 80:24 184:4 listed [1] 63:8 listen [1] 94:4 listening [1] 90:2 litigation [1] 42:5 living [1] 153:23 load [5] 17:24 18:3,10 19:17 24:4 local [4] 15:20,22 28:4 38:24 locating [1] 22:25 location [1] 58:24 locations [3] 44:9 59:8 59:21 longer [7] 28:17,18 66:9 144:9,9 203:7 207:9 look [47] 15:18 16:20 22:20,22 23:14 26:24 27:14,21 29:7,16 30:1 32:5 50:24 53:11 58:18 58:23 59:8 61:8,10 62:10 67:3,5 69:1 70:1 100:3 101:2 103:19 104:4 113:19,20 118:4 135:9 147:13 149:13 157:11 162:3 165:21 186:18 191:11 192:18 193:19,25 194:2 199:16 209:1,16 211:21 looked [7] 11:23 27:12 30:5 65:4 172:8 186:15 193:6 looking [54] 16:7 20:4 21:13 22:6,8,9,24 25:5,7 25:10,13 26:9,21 27:2 29:23,24 30:13 45:7 46:1 50:11 54:23 56:2,5 91:7 99:2 122:18 128:10 130:23 133:12,13,14,15 133:16 142:6 147:20,25 149:1,3 161:4 162:2 165:8 169:16 184:13 185:21 187:11 191:3,3 191:13 192:20 194:25 199:17 201:8 209:2 215:7 looks [2] 204:12,13 lose [1] 96:18 loss [4] 47:20,21 119:16 177:14 lost [4] 138:14 141:2 156:10 177:9 lots [5] 47:21 164:25 165:2 193:4 209:10 low [13] 66:20 75:17 76:24 82:14 134:2 141:10 141:23,24 142:17,18,19 143:17 218:22 lower [4] 36:12 75:25 76:3 133:2 Loyola [1] 106:16 lube [28] 101:16,19 102:5 113:14 163:8,22 164:13 166:4,9 167:15,16 168:20 169:25 170:1,7 171:2,9</p>	<p>173:7 175:19 179:10 180:1,23,24 181:5,12,17 181:23 183:10 lubricated [1] 96:1 lubricating [1] 96:3 lubrication [3] 95:11 95:25 96:3 <hr/> <p style="text-align: center;">-M-</p> <hr/> MacDougall [25] 98:4 98:7,8 99:8,13,23 101:10 102:8,14,19 104:8,15,23 105:3,5,17,18 106:22 108:8,19 109:23 110:8 110:23 111:5,12 machine [4] 7:6 25:22 95:23 219:22 Madam [1] 111:19 main [3] 5:13 34:9 96:19 maintain [2] 97:24 170:16 maintained [2] 69:21 80:5 maintenance [85] 31:10 32:14 33:16,17 35:22,24 44:23 49:12,15,21 50:15 50:17 51:2,14,19,22 52:2 52:4,4 53:4,14,16,18 54:3,13 55:5 56:17,20 64:12,19,21 65:12 66:23 69:16,18,19,20 71:6,20 71:23 72:3,6,13,22 74:1 74:6 79:22,25 80:7,12 80:17,25 81:3,10 82:2,4 82:8,20,23 84:10,11 85:14 86:20,25 87:25 88:13,19 89:10,14,25 90:23 91:14,20 92:3,17 92:19 93:4,12,20,22 94:3 94:11,18 104:6 108:7 major [5] 7:13 34:4 38:21 127:10 189:5 management [15] 42:22 44:1 53:16 90:20 106:16 108:4 109:16 110:4 122:25 135:7,10 144:23 152:25 161:16 215:19 manager [4] 48:5,17 56:15 143:8 managers [1] 153:19 managing [1] 202:20 manner [5] 46:23 103:8 140:8 159:19 193:5 manufacturer [11] 62:12 63:3,10,15 75:21 76:22 77:2 78:10 81:16 88:11 103:11 March [10] 8:18,20 70:5 70:6 77:8 99:10 199:18 200:5,8,18 market [6] 21:20 22:11 22:14 25:11,22 26:11 marketplace [1] 38:24 Masters [2] 108:14,15 material [4] 7:10 115:6 115:6 189:2</p>	<p>math [1] 204:12 matter [8] 9:23 113:18 116:19 202:14 203:4,20 204:12 221:3 matters [2] 1:2 131:20 maximum [3] 69:23 70:15,20 may [38] 10:8 14:9 15:15 39:5 46:10 53:7 56:21 57:23 58:22,23 59:1 68:9 68:9,11 72:2 75:17 78:14 78:15 79:16 83:1 84:24 89:3,22 125:15 133:25 133:25 137:11,12 142:10 148:6 182:21 184:12 191:20 196:18 203:19,20 207:11 208:17 MBA [1] 106:15 mean [30] 2:24 7:8 29:14 60:12 66:24 70:4 90:13 91:18 104:19 124:3 126:19 134:6 142:17 150:24 151:21 170:24 192:25 193:23,24 195:17 195:21 202:7 203:1,23 206:24 211:5,9 217:7,23 219:23 means [5] 149:24 168:11 216:22 217:13 221:8 meant [1] 124:14 measure [1] 65:25 measured [2] 39:19 215:21 measurement [1] 68:2 measurements [1] 37:6 measures [1] 149:20 Mechanical [2] 108:14 108:15 mechanism [5] 55:1 77:15 79:9 80:11 86:6 medical [1] 97:2 meet [5] 19:16 38:16 71:22 89:16 115:7 meeting [2] 37:8 156:12 mega [2] 1:20 3:24 megawatt [21] 2:6 17:14 17:19 18:22,25 19:16 20:17 21:20,23 22:7 23:1 24:7,7,14,21,21 25:22 26:23 109:21 118:8,14 megawatts [7] 19:4 20:4 20:11 21:3,4 24:15 107:18 memos [1] 137:4 mention [1] 142:23 mentioned [15] 16:10 48:15 62:12 65:24 66:9 113:10,15 114:23 116:11 118:2 138:15 144:19 155:14 161:21 187:10 messed [1] 44:4 met [2] 38:12 156:20 metal [1] 217:16 method [1] 53:12 methods [1] 42:16</p>	<p>mic [1] 31:23 mid [2] 155:12 205:13 mid-2014 [1] 156:14 middle [2] 84:24 112:23 might [17] 9:25 19:21 52:15,16 89:7 91:9 141:21 178:9 187:15 197:9 202:18,18,19 212:24,25 216:5 218:21 million [4] 31:9 32:4 40:20 183:12 millions [2] 28:12 142:7 mind [5] 138:2 160:2 200:19 203:15 215:10 Mine [1] 114:18 minimization [1] 154:5 minimize [1] 152:24 minimizing [1] 153:3 minute [1] 126:3 misaligned [6] 33:22 36:1,17 38:17 39:8 173:22 misinterpreted [1] 161:11 misleading [1] 160:2 misoperations [1] 92:16 missed [1] 63:24 missing [2] 189:1,7 mistaken [1] 161:15 mistakes [1] 33:24 misunderstanding [2] 84:17 115:10 mix [1] 193:12 mode [6] 47:22 176:24 177:15 179:18 180:2,9 modifications [1] 20:20 moisture [1] 54:6 moment [2] 17:24 18:3 monetary [1] 161:22 money [4] 143:1 158:12 158:17 217:15 monitor [1] 66:1 monitoring [2] 62:15 66:10 month [1] 219:14 monthly [1] 81:1 months [8] 13:16 67:19 156:15,18,20,21,22,23 Moore [79] 1:12 32:16 32:22 43:5 52:5 54:10 55:3,16,23 56:13 57:1 57:11,20 58:17 59:5,14 59:23 60:6 61:5,21 62:7 62:21 63:6,18,25 64:7 65:2,23 66:14,21 67:14 69:24 70:11,18 71:2,13 71:24 72:14 73:3,13 76:5 76:15 77:1,13,23 78:21 79:2,12,23 80:8,14 81:13 81:25 82:16 83:7,14 84:13,19 85:5,9,15,20 85:25 86:11,15,22 87:2 87:6,11,16 88:1,5 89:5 89:15 90:5,17 102:20</p>
--	--	---	---	--

103:3 104:9 morning [11] 1:10 97:12 111:22,25 112:2 174:19 182:23 183:2 185:1,3 189:10 Moss [2] 221:2,12 most [9] 31:4 46:21 61:14 62:3 116:24 119:14 124:8 145:1 189:12 motor [41] 33:12,14,17 34:8,14,18 36:4,11,21 38:25 39:7 41:20 45:17 45:19 164:1 167:13,14 167:18 168:23 171:18,19 171:25 173:3,9,12,14,20 174:2,4,18 175:2,16,19 175:25 176:1,7,13,15 182:9,10 183:1 motor's [1] 173:21 motors [9] 35:16,17,17 35:18 46:7,16 47:12 174:1 175:13 move [6] 4:19 7:23 8:8 11:10 163:3 211:18 moved [4] 4:11 20:13 84:10 90:11 moving [2] 4:16 89:9 Ms [36] 1:4 8:13 10:22 11:7 15:9 17:17,23 18:2 18:6,11 31:15,25 35:11 45:8,12 49:7 53:24 58:1 61:25 65:14 73:15 83:21 84:1 98:9,14 99:25 100:4 105:25 106:11,24 108:11 112:5 122:15 186:12 189:11 216:8 muddled [1] 125:19 multiple [2] 172:14 213:24 Muskrat [1] 19:11 must [8] 4:11 39:14 63:24 112:23 154:21 167:8 189:9 214:6	need [24] 19:3 20:10 24:2 27:1,3,4 42:19 89:24 94:5 119:1 129:1 140:3 148:20 156:13,18,20 168:5 169:5 170:4 181:11 192:2 196:7 199:11 202:21 needed [14] 2:10 8:2 15:22 21:5 54:15 74:3 75:1,2 149:25 163:12 172:21 191:4,18 194:12 needs [6] 150:22 178:21 178:22 196:13 215:21 219:18 negative [3] 157:17 160:6,10 negligence [2] 41:5,8 neither [1] 182:14 NERC [4] 61:9,10,13,19 NERC's [1] 189:20 neutral [2] 33:20 173:21 never [16] 36:18 38:24 47:1 148:8 165:4,6,6,8 165:21 167:25 169:17 176:7 190:6 207:11,16 208:17 new [36] 6:4 9:15,16 24:17 28:5,23,24 46:3 47:24 48:10,22 50:6 54:4 54:23 55:13 56:9 57:12 57:15,16 85:23 86:7,10 90:12 95:3 98:13 118:8 119:18 133:4 143:2,3,3 200:2,4,10,19 202:17 Newfoundland [8] 60:18,19 114:16 117:21 129:24 221:4,7,10 news [1] 31:7 next [17] 8:9 33:5 64:19 64:21 105:4,7,8 106:14 121:3 122:7 135:5 137:17 138:23 162:7 168:24 176:17 181:10 nine [1] 144:19 NLH-002 [1] 27:8 NLH-004 [1] 75:20 NLH-026 [1] 11:15 NLH-200 [1] 101:12 nobody [4] 96:20 97:20 164:17 175:10 nominal [1] 18:22 none [8] 7:15,15 28:25 42:11 83:8 137:4 167:23 168:6 nor [4] 28:4 175:18 182:14 204:9 normal [6] 34:19 103:24 127:2 160:9 193:25 196:3 normally [5] 14:24 51:23 66:8 69:25 185:13 North [9] 42:23 44:3 46:5 48:12 49:23 53:2 61:8,14 193:3 Northeast [3] 109:4,9 109:20 Northeastern [1]	106:18 note [3] 42:18 62:1 185:6 noted [9] 10:23 11:8 15:10 45:13 49:8 53:25 58:2 73:16 121:3 nothing [22] 26:1 28:2,3 53:8 54:14 82:1 83:11 92:21 93:9,18,25 94:8 110:7 139:23 168:15 172:19 176:25 189:3,5 199:6,7 212:2 noticed [1] 120:21 notation [3] 160:14 185:17 193:1 November [6] 19:8 20:6 205:7 211:19 221:5,11 now [55] 11:14 36:11 45:23 47:25 49:13 51:5 51:6,10 54:3 58:10,19 61:1 69:4 81:17 82:3 85:1 86:16 88:19 90:21 94:14 95:7 98:20 99:24 101:11 102:3 104:22 107:6 108:9 111:16 117:15 121:12 125:10 129:1 130:19 132:21 134:21 135:5 137:17 142:14 149:1 155:9,14 157:10 173:13 174:19 178:15 183:7 194:18 195:4 198:10,16 199:7,8 211:7 215:7 nuances [1] 219:16 nub [1] 94:7 number [30] 4:15 8:11 8:12 37:5 40:7 44:4,18 70:17,19 71:10,14 72:2 72:9 75:11 82:25 84:22 90:3 91:15 117:16 138:18 144:20 152:1,2 153:1,25 161:6 167:3 169:3 172:2 219:5 numbers [2] 62:9 204:20 numerical [3] 65:20 153:17 154:11 numerous [1] 36:23	object [1] 166:21 objective [1] 93:23 obligation [2] 156:19 156:21 observed [1] 39:18 obtain [2] 20:10 24:3 obtaining [1] 5:2 obvious [1] 120:9 obviously [6] 10:25 60:8 92:24 93:20 114:2 196:13 occasions [2] 80:21 153:1 occur [10] 27:19 89:3 141:10 142:10 143:18,19 144:10 178:7 215:16 218:21 occurred [11] 29:10 36:24 98:24 139:2 142:10 172:20 175:8,9,11,15 215:16 occurrence [1] 178:25 occurring [4] 28:13 134:3 142:16 215:16 occurs [1] 126:4 October [8] 1:23 11:17 13:5 14:10 62:5 98:10 110:14 130:20 odd [1] 164:16 OEM [5] 46:20,23 167:20 169:6 182:3 off [8] 37:1 65:1 73:9 89:22 96:19 126:19 145:6 189:12 offered [1] 77:20 offices [1] 162:3 offline [1] 126:4 offset [1] 173:20 often [5] 141:11 142:2 143:19 153:18 181:11 OHS [2] 9:14 200:3 oil [35] 5:12 96:3,6,11 101:16,20 102:5 113:14 163:8,22 164:13 166:4 166:10 167:15,16 168:20 168:24 169:22,25 170:1 170:7 171:2,9 173:7 175:19 179:11 180:1,23 180:24 181:6,12,12,17 181:23 183:10 old [3] 191:17 193:2,4 omelet [1] 157:22 omissions [1] 32:11 on-site [3] 119:17 167:21 208:2 once [8] 35:17 65:3 84:3 120:14 133:1 164:10 211:17 212:16 one [100] 2:4 7:21 11:16 11:20 12:13,16,21 17:15 18:21 21:21,23 22:22 25:19 26:18 27:11,24 33:15 38:23 40:4,17,20 40:24 41:9 42:19 44:13 44:21 45:16 49:10 62:11 63:13 72:10 76:3,3 77:8	77:19 80:6 81:3 85:10 88:17 89:7 91:12 94:10 94:17 95:2,12 98:16 102:1,23 103:23 107:15 122:1,13 123:10 128:22 129:12 131:8 133:22 134:9,10,23 137:17 138:14,15 141:2,23 143:2 144:17 146:6 147:4 150:15,18,18 151:8 152:20 157:21 160:20 163:3 169:2,11,25 170:4 170:8,8,24 173:16,20 178:10 182:22 185:15 187:20 193:8 194:17 200:24 201:9,10 205:8 213:13,25 217:13,21 ones [3] 8:8 85:23 186:5 ongoing [4] 72:15,16 87:25 151:22 online [1] 47:16 Ontario [1] 47:7 open [4] 21:14 54:5 55:14 97:25 opened [1] 80:22 opening [1] 111:15 operate [7] 30:8 39:1 80:6,20 81:21,23 82:14 operated [3] 2:12 78:8 172:21 operating [14] 74:9,14 75:16,22,24 76:8 78:12 78:25 80:19 101:23 102:9 164:24 165:5 176:6 operation [13] 44:18 78:7,15 79:18,21 103:24 107:24,25 125:8 153:24 168:4 169:8 182:6 operations [9] 48:3,5 48:17 91:16 92:8 108:3 108:6 110:5 201:2 opinion [31] 62:14 77:9 77:20 78:9,20,22,22 103:13 120:5 122:14,23 123:10 125:4 134:24 137:18 146:16,21 147:10 147:25 149:5 151:14 154:3 157:6 162:17 164:14 168:25 195:5 198:13 202:24 212:7,11 opinions [1] 162:7 opportunity [8] 21:14 46:4 62:17 64:20 65:6 103:19 104:3 213:22 opposed [6] 8:11 15:21 16:24 123:16 140:14 190:5 option [17] 21:4 28:6 29:10,16 40:5 69:2 123:12 128:18 130:15 132:2 141:16 147:15 150:6,9 190:19 202:2 206:21 options [26] 9:17 15:19 16:11 18:18 24:25 25:5 27:13,17,24 28:25 68:21 179:20 180:10 192:18,22 193:1 194:9 199:9,23
--	--	--	---	--

-N-

-O-

200:3,4,8 201:9 209:10 211:4,10 oral [1] 139:24 order [21] 5:18 6:13 7:1 8:19 9:4,13 120:23 127:22 150:20 158:3,5 158:19 159:2,7,8 167:13 167:15 197:19 198:12 200:4 207:21 orienting [1] 20:9 original [7] 4:4 164:15 168:19 169:2 178:18 181:24 182:3 originally [2] 3:23 84:20 otherwise [3] 2:2 11:22 77:3 ought [3] 193:15 199:1 212:8 ours [3] 50:24 51:25 60:17 ourselves [1] 37:18 outage [4] 7:11 28:10 144:25 149:19 outages [7] 3:21 90:14 91:5 92:9 97:6 121:8 217:9 outcome [2] 145:9,16 outlined [4] 4:24 5:9 6:14 14:23 output [1] 21:3 outside [7] 12:17 74:4 75:3 187:3 189:22 193:18 219:13 outstanding [2] 11:18 42:6 overall [4] 101:16,19 102:11 204:19 overhaul [2] 8:21 199:22 overhauled [1] 6:3 overnight [1] 220:7 overriding [1] 92:2 oversee [3] 168:4 169:8 182:5 oversight [1] 174:9 own [3] 50:2 94:4 97:3 owner [1] 168:9 OXFORD [4] 94:25 95:1,17 96:13	152:21,23 156:4 163:4 166:19 167:3 169:1 177:2 178:16,19 191:12,12,13 191:14 192:3 199:16,17 pages [1] 163:24 painting [1] 184:3 panel [8] 1:7 11:20 33:6 33:7 42:24 94:24 105:4 105:7 paragraph [13] 5:7,7 18:20 100:3 122:11,16 122:16,20 130:24 131:8 138:23 152:24 170:15 parallel [1] 83:3 paramount [1] 120:10 pare [1] 220:6 part [39] 4:4 7:10 23:25 25:8 45:23 54:12 55:7 55:24 57:13 61:7 65:11 96:8 100:12 116:23,24 123:17 125:25 128:23 136:2 137:17 143:25 146:5 148:7 157:21 168:25 181:23 189:13 193:25 194:25 196:20,25 197:14,16 205:8,11,19 205:25 206:12 211:19 participants [1] 48:21 particular [19] 25:13 56:22 68:17 73:5 92:1,9 93:22 113:13 115:5 138:7 153:10,25 154:10 168:18 186:18 193:9 208:25 218:2 219:16 particularly [1] 149:15 parties [1] 106:6 parts [2] 95:25 96:1 party [1] 42:3 pass/fail [5] 65:18 66:9 66:13,13 68:14 passed [4] 18:18 36:15 36:18,25 past [7] 29:11 67:3 160:16 169:12,18 181:17 182:1 path [1] 196:14 PAUL [2] 1:12,14 pause [2] 152:5,13 payer [1] 183:13 paying [1] 133:18 penalized [1] 160:15 penalties [1] 161:22 penalty [7] 157:16,24 158:9,22,25 161:14 162:15 peninsula [12] 3:2 123:7 125:24 126:19 131:11 132:10 140:21,23 148:8 190:7 191:5 218:14 people [19] 46:9 54:25 56:11 58:24 59:9 93:6 97:14 120:11 136:8 144:23 153:21 154:13,16 168:2,6 196:5 204:3,9 219:25 per [4] 27:18 73:7,8	153:21 percent [7] 28:9 90:12 142:19 149:23,24 151:7 151:24 perfectly [1] 81:19 performance [7] 51:3 107:16,20,22 160:22 161:2 162:12 performing [1] 66:4 perhaps [3] 1:25 5:7 9:24 period [31] 2:7 27:14 28:11 74:13 97:23 107:25 114:24 134:4 142:12 144:9 145:7 146:9,16,23 156:15 202:17,20,25 204:3 206:20,20 208:12 208:14 210:1,13,24 211:9 212:12,16,18 215:21 permanent [5] 119:19 123:4 134:5 146:13 207:4 permeating [1] 203:8 person [1] 47:24 personal [1] 166:12 personnel [4] 58:8,11 61:19 117:13 perspective [3] 120:14 133:14 177:8 phase [1] 55:13 phases [1] 79:15 phenomena [1] 103:18 Phil [2] 105:8 217:14 PHILLIP [2] 105:15 184:23 phonetic [1] 170:6 physically [2] 97:17 103:21 pick [1] 47:21 picked [1] 36:6 picture [2] 29:8 184:4 piece [4] 66:23 93:3 97:11 139:13 pieces [3] 4:7,11 97:4 place [29] 21:6 51:12 58:19 60:11,19 86:20 90:16 92:21 95:4,10 114:6 146:14 152:10 158:11,12,19 159:21 160:19,19 163:14 169:2 171:19 175:22 178:10 203:3,17 212:8 215:19 217:18 placed [8] 34:15 54:4 58:16 61:19 119:18 204:14,18,19 placing [1] 159:1 plan [71] 3:14,23 4:1,4 4:11 66:6,7 68:12 69:16 69:18,19,20,23 70:3,15 71:17 72:7 74:17,20 84:10,11 86:9 89:2,13 89:22 90:22 92:21 104:6 124:16 125:9,25,25 126:1 128:19,24 129:25 131:1 131:10,11,13,15,16,19 131:21 132:8,12,19,21	134:13,14,17 148:7 149:5 152:9 155:11,14 189:25 201:6 205:25 211:5 216:2 216:8,18,20,21,24 217:6 217:7,7,9,13 plane [2] 33:20 173:21 planned [2] 62:17 64:19 planner [1] 195:21 planning [39] 3:20 19:9 20:2 24:12 43:15 55:18 56:15 58:20 70:8 89:8 89:17 109:11,12,12 110:4 113:22 123:21 124:4 125:8 127:3 128:11 142:1 145:24 193:7,8,23,25 195:1 196:20 197:3 201:2 201:3 204:22 211:13 217:9,11,21,23 218:2 plans [2] 118:21 155:16 plant [50] 4:2 21:2 30:13 39:21 96:19,20,21 97:8 115:15,16 119:25 121:5 123:23 124:20 125:8,13 125:22,23 126:23,25 127:4,13,17,21 128:10 128:11,13 129:2,23 130:4 132:1,14 140:20 141:1 143:3 144:2 145:25 147:9 148:14,21 153:12 156:11 156:17 164:25 166:5 168:9 173:23 175:2 182:9 190:17 plants [1] 47:8 play [2] 52:7 196:10 plenty [1] 209:12 plow [2] 96:21 97:7 plowing [1] 97:5 plows [1] 96:19 plus [2] 48:17 96:3 PM [3] 50:14 68:11 81:3 PMs [1] 74:16 point [37] 4:1 13:2 17:7 21:2,15 25:16 28:3 38:9 39:15 63:4 69:9 72:24 85:1 107:15 119:5 139:13 150:16 155:18 156:3,12 163:10 178:19,20 179:1 188:14 192:16 198:3 199:11 201:7 204:11 207:24 208:1,15 211:20 215:15 218:3,5 pointing [1] 126:3 points [1] 95:22 pole [5] 77:18,25 78:6,7 79:16 poles [1] 79:14 policy [2] 40:20 41:7 poor [1] 67:20 portion [6] 81:3 101:16 105:24 116:8 125:23,24 portrays [1] 28:21 posed [1] 99:18 position [9] 35:4 73:24 124:21,22 141:14 143:23 156:24 160:23 177:4 positioned [1] 153:22	positions [2] 107:13 109:11 positive [2] 37:3 96:10 possibilities [1] 175:7 possibility [6] 20:21,24 22:8 200:21 218:21,22 possible [16] 1:19 4:12 10:17 17:4,9 21:7 24:17 25:20,25 55:4 64:16 68:7 68:8 69:6 146:22 193:13 possibly [1] 217:20 potential [6] 101:18 166:11 178:23 180:25 194:10 196:12 power [34] 2:9 29:13 47:8,20 60:18,19 65:10 65:19 67:24 87:7,19 88:15,19 106:18 109:2 124:6,9 126:5,13,16,19 127:23 129:18 132:1,7 132:13 141:5 143:3,15 145:14 148:20 164:25 177:14 209:25 PR [2] 11:10 169:19 PR-PUB [2] 27:7 101:11 PR-PUB-201 [1] 170:14 PR-PUB-NLH-003 [3] 9:19 10:14 139:20 PR-PUB-NLH-179 [2] 42:20 43:24 PR-PUB-NLH-182 [1] 40:15 practice [3] 50:8 60:5 174:10 practices [10] 42:22,23 44:1,2 50:20,21 94:19 113:21 114:5 159:13 practicum [1] 159:20 pre [2] 138:9 213:25 precise [1] 117:16 predicted [1] 27:16 Predominantly [1] 145:1 prefer [1] 162:20 preferred [4] 19:15 124:17,21 141:16 prefiled [3] 106:4 110:1 111:14 preliminary [1] 1:2 preparation [3] 11:21 60:8 61:11 prepared [3] 14:3 32:25 60:12 preparing [3] 164:10 198:20,22 present [1] 174:19 presentations [1] 60:13 presented [3] 29:22 100:17 104:5 President [2] 91:13 136:12 pressing [1] 27:3 pressure [3] 47:17,19 47:19
-P- P [1] 161:19 p.m [7] 139:11 153:14 165:14 180:12 195:19 211:15 220:10 page [71] 1:22 7:22 8:9,9 8:10,11,12,13,15,15 9:9 9:9,20 11:13 13:20 14:2 15:12 16:4 17:21 18:12 18:14,15,16,19,21 20:16 27:9 32:9 40:16 62:6,6 98:11 100:2 102:1 105:25 106:9,15 108:11 119:9 122:8,9,12,15,18,18,21 122:22 130:20,22,24 144:19 147:5 149:12,12				

presumably [2] 30:16 198:23	production [2] 11:19 102:6	80:24	173:2 174:7,13,17 175:12 176:3,9,16,23 177:24 178:14 179:12,16,24 180:7,16 181:3,9,15,21 182:7,13,19 183:6,23 184:6,11,17	135:17 155:14 163:20 164:9,9 194:20
presume [1] 16:22	profound [1] 161:23	PUB-NLH-201 [1] 169:20	qualified [2] 105:12 110:3	readily [1] 117:4
presuming [1] 175:25	program [11] 65:12 82:24 83:2 84:24 86:20 90:11,20 91:1,6 94:13 199:22	Public [2] 107:21 221:6	qualify [3] 118:11 213:13 213:19	reading [8] 38:6 63:10 65:21 66:10,25 67:20 68:19 165:18
pretty [1] 53:11	programs [1] 44:23	public's [1] 120:11	quality [1] 174:9	readings [5] 39:18 63:2 66:1 67:3 206:18
prevent [1] 180:10	progress [1] 74:16	pull [5] 31:12 42:20 98:9 99:24 101:11	quantification [2] 138:3 138:5	ready [4] 4:7 14:6,7 141:4
preventative [28] 31:10 44:23 49:11,14,21 50:14 50:17 51:13,19 52:2,4 53:4,14 56:17,20 64:12 65:11 69:19,20 71:23 74:6 79:22 80:12,25 81:9 88:18 89:14 91:14	progressively [1] 161:4	pulled [1] 105:25	quantified [1] 219:22	reality [1] 175:10
previous [11] 5:11 19:1 47:7 68:2 122:11,18,21 131:15 132:21 134:17 146:6	project [5] 5:23 25:4 38:5 157:2,5	pump [5] 95:3,6,8 170:7 170:20	questioning [3] 39:23 102:22 161:19	realize [1] 168:5
previously [3] 1:13 29:25 130:13	projects [2] 159:20 203:6	pumps [3] 47:18 95:9 169:25	questions [22] 30:23 31:7 33:3 35:11 62:4 63:14 64:3 71:12 73:19 75:15 83:17,22 84:6 96:14 98:5,12 102:21 174:21 184:20 189:6,10 189:13	really [9] 38:6 97:16 98:17 137:18 158:13 185:5,21 189:24 200:13
primarily [3] 48:3 131:1 136:12	proof [5] 40:21 168:16 172:23 173:1 182:15	purchase [3] 200:10,19 211:23	quarterly [1] 81:2	reason [9] 29:1 35:9 39:16 74:2,8 82:17 100:25 147:2 164:11
primary [5] 100:25 102:4 164:11 170:11 206:7	proper [4] 1:22 2:9 17:21 18:15	purchased [1] 201:13	questioned [1] 201:1	reasonable [13] 16:3 150:9 155:5 165:13 185:19 199:13,14 210:5 210:7 215:11 217:24 219:24 220:1
principal [3] 119:12 123:10 164:16	properly [12] 33:17 38:13 41:21 80:5,20,20 170:2,20 172:13,21 174:25 182:24	purchasing [1] 28:5	questioning [3] 39:23 102:22 161:19	reasonableness [6] 192:16 202:1,5 207:1 209:17,19
principles [3] 185:8,12 185:12	proposal [4] 8:21 30:16 199:22 202:3	purely [1] 66:24	quotes [1] 77:9	reasons [6] 52:11 67:8 71:16,18 169:11 183:20
prioritizing [1] 72:5	propose [1] 111:15	purpose [1] 127:8	quotes [1] 77:9	receipt [1] 125:6
priority [6] 52:7 64:13 71:4 72:8 92:5 94:5	proposed [3] 14:23 147:12,14	purposes [5] 6:23 40:24 41:9 187:7 207:23	quick [1] 96:17	received [4] 13:6 115:2 116:10 139:9
proactively [1] 52:20	protocol [1] 58:19	pursued [1] 29:1	quickly [5] 26:25 87:17 91:4,5 145:14	recently [1] 11:23
probabilistically [1] 204:2	protocols [2] 60:11,17	pursuing [2] 211:22 212:6	quite [4] 3:15 39:3 55:4 68:7	RECESS [1] 104:25
probability [5] 28:10 133:16 149:18,20,20	prove [2] 159:22 175:21	pushed [1] 65:1	quote [2] 77:24 122:19	recognizing [1] 53:7
problem [17] 18:5,5 37:20 41:2 58:14 165:5 165:7,21 168:12 169:12 169:18 173:12 175:13,14 176:7 200:2 217:16	provide [26] 2:9 30:17 61:6,16 63:20 95:10,24 110:3 127:3 130:11 131:14 134:16 136:19 137:3,5 143:14 147:8 151:9 156:19 167:14 169:22,24 170:6 172:1,3 182:15	put [40] 10:16 21:6 26:5 26:9,11 39:20 41:23 50:15 54:7,20 55:12 59:20 73:23,24 76:1,16 76:20 77:24 83:5,11 88:11 89:8 91:8,10 95:4 98:22 125:12 141:12 154:10 158:2,15,19 159:2 161:1 175:22 204:23 205:1 211:6 217:4,17	quotes [1] 77:9	recognition [5] 12:10 12:25 14:9 38:25 117:19
problems [9] 5:15 65:15 173:9,19 175:1 176:4,13 176:15 182:25	provided [5] 14:4 110:17 115:13 118:1 174:3	puts [1] 168:14	raised [2] 177:11,15	recommend [2] 81:16 82:7
procedure [14] 34:20 36:3 37:21,22 45:24 50:6 53:5,6 55:12 57:12,15 57:16,18 59:20	provider [3] 34:13,14 41:24	putting [4] 76:24 94:14 99:14 159:20	range [2] 78:13 207:5	recommendation [4] 56:3 65:5 156:6 182:4
procedures [3] 95:4 163:8,13	provides [2] 96:3 148:14	-Q-	rare [7] 97:16 141:21 142:4 143:24 145:24 181:10 210:8	recommendations [2] 28:9 46:20
proceed [1] 4:12	providing [3] 37:17 38:20 125:23	Q.C [156] 111:20,21 112:3,18 113:4 114:13 114:21 115:12,21 116:4 116:9,17 117:1,6,11,20 117:25 118:18,24 119:8 120:4,19 121:2,11,17,23 122:6 123:19 124:13 125:2,16 126:8,12,20 127:1,11,18 128:3,7,16 128:25 129:11,17,22 130:8,18 131:22 132:5 132:11,18 133:5,19 134:8 134:20 135:3,22 136:7 136:15 137:1,8,16 138:1 138:13,22 139:5,12,19 140:11,15,19,24 141:8 141:20 142:20 143:12 144:6,14 145:12,22 146:15,20 147:3,19,24 148:11,17,25 149:10 150:3,10,14,23 151:2,11 152:3,12,19 154:2,18 155:1,8,23 157:12 159:6 160:3 161:24 162:22 163:2,19 164:7,21 165:15 166:2,8,15 167:2,12 168:8,17 169:10,15 171:1 171:6,16,24 172:7,16,22	rate [4] 73:2 109:13 183:13 221:4	recommended [4] 27:25 55:24 62:16 82:1
proceeding [6] 24:24 27:23 111:7 112:10 160:17 161:18	province [2] 6:22 38:22	rather [3] 68:6 107:13 120:17	rated [1] 36:4	recommending [1] 12:22
proceedings [1] 11:22	province's [1] 97:7	rating [5] 62:24 66:20 81:18,18 103:5	rates [4] 73:5,9 75:21 109:13	record [34] 10:12,16,23 11:5,8 15:10 39:6 43:19 45:13 49:8 53:25 58:2 62:1 63:19 72:19,24 73:4 73:16,21 76:12,21 99:20 114:11 115:4 116:21 118:15 120:22 124:16 150:5 152:4 170:19,25 176:12 189:17
proceeds [1] 16:23	provision [1] 20:25	rationale [1] 24:1	re [2] 72:4 84:2	recorded [2] 39:18 215:18
process [28] 9:6 38:19 40:10 47:9 48:18,22,23 51:6,9,12 52:3 54:15 56:8 64:9,11 119:15 137:13 144:18 145:11 163:12 186:10 196:18 199:13 201:25 205:4 207:20 211:22 219:24	prudence [6] 17:16 112:12 161:20 177:1 185:9,13	re-direct [4] 98:3,7 104:10,11	re-direct [4] 98:3,7 104:10,11	records [2] 80:22 172:3
processes [1] 163:7	prudent [3] 107:24 113:17 143:24	re-prioritize [1] 71:6	re-prioritize [1] 71:6	recourse [1] 126:5
produce [1] 133:4	prudently [2] 159:21 160:8	re-prioritizing [1] 92:4	reach [1] 35:18	recover [3] 41:4 156:7 157:14
	PSI [3] 95:7,12,19	reaches [1] 157:3	reaching [4] 33:14 36:4 37:11 192:21	recovered [2] 32:4 87:10
	PUB [3] 10:14 17:16 75:19	reaction [1] 161:12	read [15] 17:3 40:23 46:11 74:24 77:8 100:4 100:7 102:1 122:19	recovery [12] 31:9 33:4 74:17 87:24 90:25 158:16 158:16,20 159:9,14,24 159:25
	PUB-013 [1] 99:24			
	PUB-NLH-002 [1] 11:11			
	PUB-NLH-003 [1] 139:22			
	PUB-NLH-174 [1]			

<p>recruitment [1] 72:16 rectify [1] 6:11 red [1] 71:10 redeveloping [1] 61:3 reduce [1] 7:5 reduced [2] 84:22,23 redundancy [1] 178:21 redundant [1] 101:18 refer [2] 10:13 152:23 reference [3] 29:24 30:18 67:8 references [2] 19:18 118:14 referred [7] 8:3 9:18 99:15,19 100:1,19 170:4 referring [4] 1:22 8:10 8:10 136:24 reflects [1] 89:18 refurbished [2] 28:8,23 refurbishing [2] 15:19 28:4 refurbishment [1] 192:17 regard [1] 102:11 regarding [1] 119:13 regardless [3] 19:9,9 50:22 regards [1] 95:3 region [1] 190:5 regular [3] 95:7,9 167:22 regularly [2] 50:25 60:20 regulator [4] 154:22 160:12 162:10,18 relate [1] 187:16 related [9] 17:15 107:14 115:20 118:3,15 119:2 136:4 138:16 189:6 relates [2] 48:10 57:7 relation [1] 7:14 relationship [1] 176:18 relative [9] 68:2 101:9 108:2 115:5 116:1 142:9 160:24 163:8 194:9 relatively [1] 195:23 relevant [4] 115:3 177:4 177:6 212:13 reliability [30] 27:17 61:9 100:6,10,14,22 101:5 107:16 130:12 133:3,13,15,24 134:16 143:6,7 144:22 145:4,5 151:20 152:10,16 153:7 153:11,13 154:10,23 179:21 180:11 217:2 reliable [6] 132:23 143:14,25 150:6 151:14 191:21 reliance [4] 124:7 147:6 167:20 168:9 relied [11] 137:9 139:14 148:9 149:2 151:15 154:3 164:14 177:9 181:23,24 182:3</p>	<p>rely [8] 125:7 131:1 135:12 142:3 148:2 153:25 167:23 196:14 relying [5] 123:5 134:15 159:7 169:7 219:25 remain [3] 5:15 155:12 156:1 remainder [3] 88:22 90:25 131:4 remaining [1] 178:25 remember [4] 62:11 80:3 136:3 144:4 remove [1] 96:12 removed [1] 85:4 removes [1] 96:4 repair [2] 37:8 174:1 repaired [2] 35:18 38:25 repairs [4] 7:24 8:3 12:20 175:21 repeat [3] 79:10 91:21 132:4 repeated [1] 165:23 repeating [1] 140:2 repeats [1] 162:15 replace [2] 5:12 86:9 replaced [2] 69:4 85:6 replacement [8] 66:7 68:12 69:7,8 82:24 83:2 84:24 90:11 replacements [1] 2:23 replacing [2] 3:17 15:20 replicate [1] 93:21 replicated [1] 77:19 reply [12] 7:22 105:20 105:21,22 106:1 110:9 110:12 112:7 156:4 163:4 178:16 188:23 report [70] 7:9,20 8:13 8:16 9:10 11:12 14:3,5,5 14:7,12,15 15:16 17:20 17:22 18:14,16,16 19:9 20:2,16 27:10,11 43:10 43:13 44:13 53:13 55:9 77:8,25 79:4 107:21 112:4,6,12 113:10,16 119:6,10,21 121:14 125:6 130:21 134:21 136:25 149:11 158:1 163:4,20 163:20 164:2 165:18 166:16 173:6,19 177:2,2 178:18 185:10 187:6 188:15,18,22 191:12,12 198:21,23 200:18 219:3 220:2 reported [1] 9:17 reporting [3] 49:15 52:13,16 reports [9] 12:19 33:1 52:13 110:15 115:25 136:20 137:4 185:7 188:1 request [7] 6:15 11:6 30:16 32:3 121:7 186:23 188:2 requested [1] 13:25 requests [2] 115:25</p>	<p>135:18 require [2] 61:19 69:20 required [17] 26:5 33:15 34:13,23 35:25 40:18 45:21,23 89:6 149:22 162:16,17,21 174:1 181:18 182:8 201:7 requirement [8] 20:3 20:14 22:7 40:25 97:1 119:3 143:14 174:9 requirements [2] 101:1 109:14 requires [1] 149:19 research [5] 22:2 23:9 109:6,6,7 resident [1] 206:23 resister [1] 173:22 resolve [1] 6:18 resource [3] 109:12,16 149:19 resources [2] 2:2 64:17 respect [39] 9:12 50:1,19 56:19 57:3,23 60:20 82:2 91:24 92:14 101:14,19 101:21 102:10 106:10 107:1 110:12,15 118:7 118:20 119:24 120:3 121:4,12 122:23 136:21 141:9 154:4 155:16 156:24 157:1,6 164:2,12 177:17 179:5 193:16 196:19 199:24 respecting [1] 96:17 respond [1] 59:9 response [21] 4:21,24 11:15 42:19 58:25 60:8 60:20 61:11 65:16,17 101:15 121:6 139:20 158:3 162:8 165:20 174:20 177:25 178:2,3 188:2 responses [1] 185:15 responsibilities [1] 107:19 responsible [2] 136:12 166:23 rest [4] 30:10 123:8 138:11 218:14 restart [4] 126:5,16 190:7,8 restarting [1] 206:8 restated [1] 178:17 restoration [6] 125:20 128:24 148:7 205:25 206:12 208:10 restore [2] 127:23 217:8 restoring [1] 127:9 restrictions [4] 76:1,24 83:5,12 result [7] 41:5 47:20 54:17 69:6 92:16 93:5 162:13 resulted [6] 5:17 6:12 22:25 52:8 80:19 93:15 results [5] 53:23 61:4 174:2 175:18 188:7</p>	<p>resumes [4] 1:13 106:3 106:5 110:1 retained [3] 112:10,20 114:23 retention [2] 113:5,7 retest [1] 65:6 retesting [1] 64:25 retroactively [1] 16:24 return [4] 1:16 128:19 174:3 182:9 returned [3] 36:6 175:2 175:16 returning [1] 96:11 revealed [1] 191:17 revenue [1] 109:14 review [31] 5:8 11:20 12:17 17:16 31:14 42:21 42:25 43:11 44:1,14 54:14 55:5,7 67:4 92:18 93:19 112:12 115:8 118:19 119:11 122:7 137:9 159:18 163:6 185:9 186:24 187:6 196:21,25 197:14,16 reviewed [6] 20:23 94:10 115:6 119:7 120:9 186:22 reviewing [2] 13:22 114:10 reviews [2] 44:8,17 revised [1] 105:23 Revision [1] 31:12 revisions [1] 105:24 revisited [1] 152:25 RFI [4] 32:6,13 40:17 57:13 RFI-26 [1] 4:22 RFIs [5] 31:13 42:19 73:7 110:16 188:14 RFP [1] 14:25 right [49] 3:17 33:3 35:13 36:14 39:13 44:7 47:25 58:16 63:1 66:15 70:12 71:3 74:22 76:16 78:22 85:11 86:16 87:15 88:2 89:8,25 95:16 98:2,20 98:23 99:16,22 132:12 143:1 154:22 157:10 159:12 171:11,17 172:17 173:1 186:6,8 187:18 190:24 192:14 194:15 196:1 197:20 203:21 205:8 206:10 208:3 214:3 rigorous [1] 49:16 risk [30] 123:1 134:4 135:8,12 137:20,21 138:3 138:14,17 140:25 141:10 141:22,24 143:17 146:4 146:24 162:14 177:7,18 178:7 179:18 180:8 202:21 216:4 217:19 218:8,10,10,17,24 risks [1] 3:5 road [6] 25:16 68:13 96:20 97:7,9,15 roads [1] 97:1 Rob [1] 16:10</p>	<p>ROBERT [1] 1:12 role [6] 43:15,16 91:13 107:15 196:9,12 root [5] 54:17 55:25 72:10 77:7 79:4 rose [1] 163:14 rotating [1] 95:25 route [5] 10:6 19:14 97:8 97:13 217:22 routes [1] 97:25 routine [1] 94:20 ruling [1] 158:21 run [3] 38:15 120:16 154:15 running [4] 36:12 88:4 130:4 154:13</p> <hr/> <p style="text-align: center;">-S-</p> <p>safety [1] 166:12 Sam [1] 10:5 sanction [2] 19:11 157:16 save [1] 73:21 saw [1] 185:9 says [5] 36:14 62:10 81:18,21 100:5 scenario [11] 28:19 38:11 139:2 190:2 205:8 205:9,10,11 209:4 212:23 214:5 scenarios [2] 201:9 211:20 schedule [13] 4:16 14:23 14:24 69:8 70:21 71:23 74:6 75:5 86:16 88:12 89:16 91:9 94:3 scheduled [3] 65:5 70:3 87:25 schedules [2] 18:22 79:25 scheduling [1] 26:5 Science [2] 106:17 108:14 scope [7] 15:16 44:7 113:6 114:8 193:18 194:25 202:23 scratch [1] 21:22 scroll [7] 13:21 27:10 122:15 149:13 170:14,22 192:1 scrolling [1] 156:5 se [1] 153:21 search [4] 22:25 23:2,17 24:20 season [2] 64:19,21 second [17] 8:18 9:12 14:12 18:20 21:1,15 77:24 100:4,7,12 107:10 138:24 152:24 167:6 173:16 187:20 211:12 secondary [2] 95:6 126:11 section [5] 17:16 27:12 40:16,18 119:11</p>
---	---	---	--	--

see [39] 10:4 13:22 16:12 24:25 26:24 38:11 44:21 45:4,21,22 46:5 53:9,22 53:22 57:9 59:20 61:3 73:1 82:22 91:22 92:12 99:2 103:14 106:13 113:20 122:12 132:2 136:17 152:15 155:9 160:21 170:15 171:14 175:17,22 177:6 180:21 202:8 209:24	show [7] 35:5 40:21 67:20 68:15 170:17 176:12 204:22 showed [1] 77:14 showing [3] 66:5 102:2 102:3 shown [11] 39:11 65:15 67:13 68:8,9,22,22,25 69:2,12 160:18 shows [7] 32:6,8 40:2 49:3 67:23 101:21 176:7 shut [1] 2:15 side [4] 48:19 99:3,5,7 significant [12] 75:9 100:18 113:11 151:19 152:15 162:10 191:18 195:10 214:23 215:11 218:8,9 similar [6] 25:21 27:20 29:10 108:25 185:16 192:7 similarities [1] 103:1 Similarly [1] 93:12 simple [2] 175:10 217:14 simply [4] 99:16 110:10 174:16 178:17 sincere [1] 39:3 site [16] 25:7 98:19 100:19 101:9 123:22 125:5,9 128:12,20 137:24 143:21 167:22 168:2 169:7 194:12 215:12 siting [2] 24:17 98:13 sitting [2] 116:2 165:7 situation [20] 21:12 22:11 25:22 26:22 27:2 27:19 28:14 29:2,10 30:4 72:4 117:4 124:18 128:8 147:10 161:8 188:10 201:11 213:1 219:11 situations [1] 162:23 six [25] 7:22 8:10 9:10 57:3 65:13 68:10 69:16 69:18,19,22,22 70:2,5 70:25 81:2,4 82:6,12 83:1 84:10 85:16,18,24 87:10,14 size [4] 22:16,16 23:11 195:23 sizes [1] 21:9 skilled [1] 219:25 slight [1] 217:1 slow [3] 78:9 79:18,20 slower [1] 34:8 snow [2] 96:24 97:21 snowclearing [1] 96:18 solely [2] 123:5 148:9 solid [1] 97:10 solution [38] 16:7 19:15 23:24,25 24:3,10 25:11 25:18 119:19 123:4,13 123:16,18 124:17 130:17 134:5 142:25 146:9,13 152:7 156:17 190:19 202:4,6,9,11 203:16,18	205:5 207:4,5,14,18 210:3,10 211:7 212:8 217:3 solutions [1] 217:3 someone [3] 52:16 204:21 217:22 something's [1] 189:7 sometime [1] 204:22 sometimes [5] 190:14 198:8 204:18,19 216:20 somewhat [3] 75:25 84:22 193:18 somewhere [3] 65:21 84:25 191:5 soon [3] 17:4,8 130:5 sooner [1] 217:5 sorry [12] 8:9 9:16 17:24 18:1 26:16 28:5 79:10 99:2 122:17 152:22 205:9 218:9 sort [9] 4:17 53:19 66:8 165:23 185:7 195:17 201:8 205:4 209:2 sound [2] 98:20 221:8 sounds [5] 66:12,19 196:3 197:10 210:19 source [5] 100:25 129:18 149:16 154:12 206:8 sources [2] 129:6,7 speak [8] 19:22 31:23 84:23 85:10 88:8 120:11 127:7 194:18 speaking [2] 20:3 103:11 speaks [2] 150:19 167:20 specific [26] 12:25 43:21 44:6,15 50:16 56:22 59:24 66:12 82:7 90:9 91:25 107:2 108:21 112:19 118:3,15 120:3 134:1 136:24 139:13 144:24 145:7,8,10 165:2 171:5 specifically [8] 25:9 44:10 60:15 92:14 94:9 110:16 133:8 159:9 specification [3] 167:21 169:6,8 specifics [2] 25:12 61:22 specify [1] 16:6 spectrum [3] 65:21 66:18 67:18 speculate [2] 162:20 207:2 speculation [1] 66:25 speed [15] 33:15 34:8,23 34:25 35:13,18,19,25 36:4,12 37:1,12 38:6,16 188:9 spend [3] 122:12 137:19 143:1 spending [1] 108:6 spent [3] 109:17 152:14 157:25 spoke [2] 2:1 47:2 spring [1] 86:21	square [1] 89:7 St [5] 100:21,24 101:6 221:7,10 staff [6] 114:10 115:8 136:3 139:18 143:2 182:5 stakeholders [1] 119:24 stand [3] 1:13 29:1 76:22 standard [13] 38:12 41:15 46:5,15,20 48:11 53:5 54:8 55:2 59:20 60:5 61:10,16 standards [3] 61:9,10 159:23 standby [4] 47:17 58:16 102:5,7 standing [2] 78:11,18 standpoint [1] 202:20 start [123] 1:19,21 6:24 15:21,22 16:3 21:4 23:24 23:24 24:9 28:6 41:3 47:18 81:20,22 99:25 113:14 115:15 116:19 118:5 119:3,14,17,25 120:13 121:5 122:24 123:2,7,22 124:4,5,9,11 124:20 125:13,20,22 126:21,22 127:3,9,12,13 127:15 128:12,19 129:1 129:8,12 130:1,14 131:1 131:10,10,16,24,24 132:8 132:19 134:13,14 137:24 139:1 140:4,9 141:1,15 143:20 144:1 145:2,25 147:9 148:13,18,19 149:16,18 150:21 151:9 151:15 152:1 153:11 155:10,17,20,25 156:8 156:11,16 157:1,5,15 159:8 166:3 185:4 187:18 189:10,14,18,22 190:1,5 190:21 193:16 194:9,13 194:25 195:6 196:6,10 198:14 199:3,25 205:12 206:22 208:3 212:24 213:14,14 214:13 215:12 217:4 started [9] 23:2,17,20 24:22 113:2 114:3 129:7 168:23 176:1 starting [5] 1:24 28:15 122:8 127:21 149:18 starts [1] 18:21 state [1] 109:21 statement [8] 40:11 100:11 111:15 135:10 139:7 161:23 167:6 176:1 states [3] 16:21 43:25 149:14 station [7] 1:21 58:9 59:9 61:20 81:1 96:23 97:16 stationary [1] 96:1 stationed [1] 58:12 stationing [1] 58:23 stations [2] 3:1 88:17 statistic [2] 150:19 204:13 statistics [1] 7:12	status [2] 119:24 121:4 stay [2] 51:20 214:13 staying [1] 74:5 step [8] 21:9 124:8 125:11 134:10,10 154:19 162:8 176:17 steps [8] 4:23 6:13 21:19 178:5 187:5 212:6 215:11 218:25 stigma [1] 161:12 still [12] 20:16 28:9 32:13 38:15 40:7 125:12 152:15 156:2 160:5 177:7 216:1 216:7 Stony [7] 62:20,23 102:23 103:2,4 104:1,5 stood [1] 19:19 stop [13] 5:17 6:12 7:1 8:19 9:3,13 108:12 120:23 180:20 197:19 198:11 200:3 207:21 storm [5] 60:7,8,12 97:5 104:20 storms [3] 60:21 61:11 96:24 strategic [1] 109:12 stretch [1] 97:18 strikes [1] 142:24 strikingly [1] 108:25 strong [1] 78:19 strongly [1] 78:18 struck [2] 164:10 165:17 structure [2] 49:15 52:13 struggling [1] 162:1 study [5] 16:4,5,19,21 16:25 stuff [1] 217:12 Subject [1] 19:21 Subsequent [1] 108:1 subsequently [1] 62:20 substantially [1] 121:16 substation [1] 217:18 successful [3] 7:2 102:2 102:4 such [10] 20:9 54:3 58:4 58:5 60:25 66:5 82:5 91:9 118:8 178:22 sudden [2] 68:4,19 suddenly [2] 68:6,24 suffered [1] 41:4 suggest [5] 46:21 52:19 100:23 104:19 175:7 suggested [3] 5:13 12:22 103:16 suggesting [2] 210:20 215:22 suggestion [2] 40:2 75:17 suggestions [1] 160:25 suitable [1] 149:4 summarize [4] 27:22 122:14,23 183:21
---	--	--	---	---

<p>summarized [2] 164:8 177:23 summarizes [1] 137:18 summary [3] 109:25 156:18 178:11 summer [5] 4:2,3 16:6,8 16:22 Sunnyside [14] 62:3 63:2 64:5 77:5 91:25 92:14 93:11 102:25 103:2,6,10 103:21,25 104:2 supervision [1] 88:17 supplied [1] 131:2 supplier [3] 164:15 168:19 181:24 supply [10] 54:13 55:9 127:10,14 129:6,7 170:1 181:5,12 189:22 support [1] 197:3 supposed [1] 141:25 surely [1] 29:16 surmising [1] 47:4 surprised [1] 196:4 surrebuttal [9] 110:10 110:14 130:19,21 144:21 166:19 173:8,14 178:17 surrounding [2] 48:9 219:10 switch [6] 2:5,14,15,20 2:25 3:9 switching [1] 3:5 sworn [4] 1:13 105:14 105:15,16 synchronous [1] 22:17 system [83] 2:10 19:4 20:20 27:12,18 53:16,17 58:22 95:11,20 96:6 101:1,17,20,22 102:5,7 102:11 114:15 118:21 123:8 127:3,10 129:24 131:4 138:11 140:10 144:1 153:24 154:15 156:8,13,20 163:8,23 164:4 166:4,4,10,17 167:8,8,16 169:21 170:7 170:11,12,12,13,20 171:2 171:8,13 172:2,10,20 173:5 175:23 177:9,10 177:12 178:9,10 179:8,9 179:11 180:2,6 181:12 181:17 193:7,8,23,25 195:1 196:7,20 197:4 199:11 201:6 217:8 219:16 220:1 systems [9] 101:18 106:18 168:6 170:17 177:13 178:6 179:4 181:5 201:2</p>	<p>takes [1] 18:9 taking [8] 17:24 18:3 153:2 163:11 177:17 218:7,8,9 talks [2] 8:17 150:19 tank [3] 96:5,6,9 tap [4] 62:14 63:5 93:15 103:15 target [4] 90:12 96:7,11 113:3 team [6] 94:4 116:18,24 117:2 135:20 215:19 teams [2] 116:14 117:7 tearing [1] 7:6 technical [3] 25:3,4 48:19 technically [1] 168:5 technicians [1] 59:21 technology [1] 85:6 telling [1] 5:1 tells [1] 199:8 temperature [9] 75:22 75:24 78:12 80:6 81:12 96:5,7,9,11 temperatures [13] 75:16 75:17 76:2,8 77:16 78:4 78:14 79:1,17,21 81:24 82:15 95:23 temporary [3] 88:7,24 156:17 tends [1] 215:14 tension [1] 155:9 TERANCE [1] 1:12 term [17] 21:21 24:9 43:15 55:17 56:14 66:7 66:10 123:4 134:5 140:5 141:19 144:11 165:12 166:21 168:11 193:14 211:7 terminal [2] 81:1 97:15 terms [41] 3:10 4:16 7:13 12:12 13:23,24 14:1 15:18 23:22 24:3,16 28:7 28:20 29:2,23 30:18,18 50:14 91:19 118:15 155:4 177:6 179:20 180:8 185:8 185:11 186:3,10,15 195:5 195:18 196:17 202:11 205:5 207:19 208:23 209:17 211:17 212:23 213:17 215:4 test [66] 1:20 32:24 34:25 35:4,23 36:16,16,25 37:3 37:14 38:2,15 39:7,8,14 39:16,17,25 40:3 45:23 46:3,23 47:16,25 48:2 48:10 49:1 56:9 57:8 62:18,19 63:4 64:4 65:10 65:14,18,19,19,25 67:6 67:7,12,19,23 68:8,10 69:11,12 89:17 103:17 164:13 166:17 167:7 168:20 173:16,17 174:2 174:24 175:16,17,18,20 175:22 181:22 182:20,23 testament [1] 116:3</p>	<p>tested [7] 34:22 37:11 41:21 45:20,20,22 95:7 testified [1] 179:1 testimony [8] 42:14 73:19 95:6 142:24 153:5 175:5 186:17 187:8 testing [27] 1:19 3:24 34:14,18,22 35:14 36:15 37:21,22 40:10 41:20 42:16 45:17 46:6,15 47:12,13 77:14 90:8 95:4 95:12,18,19 163:22 164:3 173:7,11 tests [8] 46:18 49:4 54:23 61:3 67:21 174:1 182:8 182:15 thank [24] 1:10 8:14 11:10 15:8 18:19 30:22 31:3 83:17 94:23 98:2,5 99:24 101:11 102:20 104:9 105:6,19 106:24 108:9 109:24 111:22 184:20 185:1 190:24 that'll [1] 77:9 themselves [1] 125:3 theories [1] 38:7 thereafter [1] 23:18 thereby [1] 123:5 therefore [2] 100:20 132:19 thermal [1] 47:8 they've [6] 16:25 28:6 29:4 38:14,15 179:10 thinking [4] 92:8 164:19 183:12 192:21 third [4] 69:1 149:14 177:10 181:12 thorough [1] 204:12 thought [7] 131:12 138:16 196:14,17 201:25 205:4 211:22 thoughts [1] 192:15 three [30] 1:24,25 2:7 11:13 32:9 67:19 77:25 79:14,15 97:9 107:25 109:21 113:1 129:9 133:22 139:2,15 142:13 144:20 173:19 175:21 181:5 202:18,22 203:19 204:3,4,11 215:17,18 three-year [1] 146:16 threshold [2] 75:13 76:3 through [34] 5:5,6 20:13 20:18 32:5 35:20 36:3 45:5,15 51:1 52:3 75:1 76:9 80:22 87:21 88:14 90:3 92:17 93:18 97:5 97:17 98:15 102:22 106:7 111:16 120:20 142:24 173:11 180:19 183:9,25 184:19 188:13 200:1 throughout [4] 58:12 63:16 74:13 219:2 throw [2] 193:11 217:15 thrown [2] 140:5,6 thunder [1] 20:7</p>	<p>tie [1] 93:22 tied [1] 93:10 timed [1] 3:17 timeframe [2] 13:6 151:21 timelines [2] 13:23 14:1 timely [1] 120:6 times [19] 3:12 42:14 70:25 138:18 139:2,15 139:21 141:22 142:13 172:2,14 181:16 195:21 203:6 213:25 215:17,17 215:18,20 timing [3] 3:11 4:6 203:3 today [4] 85:11 107:15 187:8 198:21 together [2] 73:23,24 tolerance [1] 146:5 tolerate [5] 123:1 135:8 135:11 137:20,22 too [7] 64:8 144:17 165:10 185:6 198:8 202:25 220:5 took [4] 2:1 44:13 115:13 183:8 tools [3] 50:3,11 90:20 top [10] 8:11 21:12 73:10 97:14 106:14 122:9,18 122:20 147:5 191:15 topic [2] 1:16 116:15 totally [1] 5:14 touch [1] 10:9 towards [1] 41:24 track [8] 39:5 50:2 53:13 53:17 72:15 90:21 94:6 107:20 tracked [2] 53:15 72:12 tracking [10] 49:21 50:1 50:3,12,14,19,23 51:2 103:7,9 traded [1] 145:6 transcribed [1] 221:7 transcript [8] 62:6 65:16 74:24 98:9 155:15 174:23 197:10 221:3 transcripts [7] 115:3,3 119:7 187:11,13,15 194:7 transfers [2] 102:2,4 transformer [24] 62:22 63:21 64:5,15,22 65:9 65:13 69:21 70:16 84:12 92:15 93:16 103:4,6,7 103:10,12,17,20,21,24 103:25 104:1,4 transformers [8] 31:11 32:7 70:1 87:7,9,19 88:15,19 transmission [7] 109:19 127:25 143:3 213:2 214:9 215:5 218:12 transport [1] 175:8 trapped [1] 97:20 travel [1] 32:11 trend [4] 68:3,9,16,25</p>	<p>trending [1] 68:15 tried [2] 13:21 158:14 trip [1] 78:2 trips [1] 126:4 trivializes [1] 166:24 true [4] 110:24 130:7 190:1 221:2 try [5] 31:19 51:20 70:20 189:9 205:18 trying [22] 6:11 39:24 44:6 73:21 90:19 97:24 99:1 128:6 133:10 141:12 143:10 158:13 169:16 170:23 172:8 188:9 195:22 201:16 205:24 207:18 214:7,14 turbine [27] 4:8 7:12,14 19:16 20:10 21:1,20 24:8 24:13,14,22 26:18 28:18 123:6,11 125:5 147:7,21 151:13 168:3 189:12 191:16 193:2 194:12 195:25 197:19 198:3 turbines [6] 2:8,8 18:18 28:24 170:1 193:4 turn [10] 7:20 15:12 17:13 27:7 33:11 40:14 45:21 62:5 75:19 106:9 turning [2] 6:24 34:8 turns [3] 70:25 76:21 139:23 two [50] 11:12 13:11,24 14:20 27:11 33:13,20,24 40:4 45:6 68:21 76:1 80:21 83:13 97:4 101:14 101:17 105:7,9 109:5,6 110:10,15 113:1,12 115:5 115:14,20 116:1,5 118:3 129:9 136:5 139:21 142:14,15 177:13 178:6 186:16,18 187:3,16 188:5 194:17 201:8,9 203:18 215:16,17,20 two-turbine [2] 25:15 25:18 type [12] 12:18 28:13 46:6,16 60:14 61:9 69:23 80:13 115:23 142:19 153:18 185:9 types [3] 3:19 56:20 185:12 typical [2] 165:20 184:15 typically [4] 55:17,21 66:2 103:13</p>
<p style="text-align: center;">-T-</p> <p>T1 [3] 62:3 102:25 103:2 T2 [2] 102:24 103:2 table [8] 27:22 28:20,21 32:6,8 101:12,14 108:25 tactic [3] 56:17 82:3,8 tactics [1] 88:6</p>		<p style="text-align: center;">-U-</p> <p>UFOP [2] 149:20,22 Uh-hm [1] 200:10 ultimate [4] 12:12 119:16 120:15 194:11 ultimately [2] 56:16 202:16 unable [1] 172:13 unavailability [1] 151:8 unavailable [1] 138:12 unbeknownst [1] 34:9</p>		

<p>uncertainty [2] 155:16 210:8</p> <p>under [11] 52:2 69:23 75:19 78:8 88:17 110:18 163:5 167:3 199:19 209:10 217:10</p> <p>understand [40] 27:23 28:12 32:12,12 34:12 35:3 36:11 45:18 49:12 50:25 52:10 58:6 62:19 67:21 69:17 75:20 81:8 84:9 86:19 92:25 95:10 108:13 112:11 125:4 141:13 147:18 176:11 188:8 198:8,18 201:20 203:14 204:7 205:7,21 206:2,15 207:19 214:17 214:22</p> <p>understood [7] 6:6 63:15 117:8 174:22 177:3 177:8 178:2</p> <p>undertaking [21] 10:18 11:5,18,19 15:3 30:15 43:18 45:9 48:8 49:8 52:24 54:13 55:10 56:6 57:6 60:3 62:1 63:8,19 73:1,12</p> <p>undertakings [1] 56:8</p> <p>undervalues [1] 166:22</p> <p>undiagnosed [1] 75:18</p> <p>undisputed [1] 180:22</p> <p>unfortunate [2] 145:9 160:17</p> <p>unfortunately [2] 58:4 172:23</p> <p>unit [33] 18:22 22:7,16 23:13 25:14 26:18,23 28:7 102:5 103:25 115:16 117:2 118:5 126:5 150:21 150:21 151:15,20,25 153:24 154:14 163:3 166:11 169:24 180:17,23 183:10,17 189:12 190:6 190:9 191:20 192:10</p> <p>unit's [2] 150:19 178:25</p> <p>units [10] 102:7 107:18 107:20 129:13 130:2 138:11 141:3 145:13 151:9 181:6</p> <p>University [1] 106:18</p> <p>unknown [2] 71:4 72:6</p> <p>unlatch [1] 78:2</p> <p>unless [4] 89:10,24 160:14 214:13</p> <p>unlikelihood [1] 215:15</p> <p>unlikely [1] 144:11</p> <p>unnamed [1] 83:6</p> <p>unplanned [1] 89:21</p> <p>unprecedented [1] 193:3</p> <p>unreliable [1] 149:15</p> <p>unsuccessful [1] 8:8</p> <p>up [49] 4:20 12:18 31:12 32:11 36:6 38:6 39:11 40:17 42:20 44:4 47:21 55:1 59:10 62:9 70:5 71:5,6 72:17 73:25 78:5</p>	<p>81:19 90:10 96:12 97:8 97:14 98:9,20 99:24 101:11 102:1 105:25 106:23 112:5 114:11 115:7 116:12 129:24 130:4 131:6,15 158:24 165:1,6 168:1 176:7 188:9 192:12 205:6 216:22</p> <p>update [1] 9:17</p> <p>updated [1] 10:1</p> <p>updating [1] 9:23</p> <p>upside [1] 96:8</p> <p>urgency [2] 14:20 26:21</p> <p>used [21] 6:22 15:18 21:21,24 25:21,21 28:23 28:23,24 88:6 125:7 150:7,9,20 158:8 159:22 190:14 195:22 202:2 205:15 216:21</p> <p>useful [3] 150:20 158:8 159:22</p> <p>uses [3] 76:3,3,4</p> <p>using [5] 89:23 90:21 140:7 168:11 189:25</p> <p>usually [1] 165:10</p> <p>utilities [42] 44:3 46:4 47:2,4 48:12 49:22,25 50:7 53:1,21 54:9,24 55:7 56:19,22 57:2,9,17 57:22 59:13,15,19,19 60:4,9,14,16 61:14 75:23 76:1,7,12,23 107:2,21 108:2 109:4,9,20 127:2 141:25 221:6</p> <p>utility [23] 60:10 76:9 107:5,8,11 108:21 109:2 109:21 110:4 142:25 143:8 153:9 154:20 155:2 158:18 159:12 160:8,15 161:16 162:10 178:20 212:17 216:8</p> <p>Utilization [1] 149:19</p> <p>utilized [3] 28:17,18 193:6</p>	<p>varying [1] 95:22</p> <p>vehicle [1] 97:17</p> <p>vendor [2] 40:19 41:1</p> <p>vendor's [1] 41:5</p> <p>vendors [1] 25:7</p> <p>verified [1] 167:16</p> <p>verify [3] 103:22 167:8 174:16</p> <p>version [2] 14:4,11</p> <p>versus [10] 153:13 154:23 161:3,4 165:13 192:18 202:15,21,22 217:3</p> <p>via [2] 10:6 135:18</p> <p>Vice [2] 91:13 136:11</p> <p>VICE-CHAIR [24] 84:7,15 85:2,7,12,17,22 86:2,8,13,18,24 87:4,8 87:13,20 88:3 89:1,12 90:1,7 91:11,23 94:22</p> <p>view [6] 28:3 52:21 100:12 121:12 153:9 199:12</p> <p>viewed [1] 206:23</p> <p>views [1] 34:4</p> <p>vis-a-vis [1] 92:8</p> <p>visit [1] 117:21</p> <p>volume [2] 95:13,19</p> <p>VP [1] 201:1</p>	<p>whim [1] 142:9</p> <p>whole [8] 7:6 22:2 90:13 92:2 93:23 97:23 116:24 136:3</p> <p>wider [1] 16:2</p> <p>willing [1] 113:19</p> <p>winter [2] 24:16 26:20</p> <p>wise [2] 23:11,11</p> <p>withdraw [2] 8:21 199:21</p> <p>withdrawn [2] 5:25 8:23</p> <p>within [11] 13:6 21:9 24:1 69:22 70:10,14 74:14 147:2 193:3 209:25 211:11</p> <p>without [11] 7:6 91:4 148:20 154:15 160:20 161:14 180:24 185:24 186:2 189:22 219:22</p> <p>witnessed [2] 211:10,11</p> <p>witnesses [1] 207:17</p> <p>wonder [5] 112:5 190:25 191:11 199:16 220:5</p> <p>wondered [2] 139:6,23</p> <p>wondering [4] 81:8 100:10 208:15 209:16</p> <p>word [7] 15:17 130:12 153:16 161:19 216:20,25 219:24</p> <p>wording [1] 41:15</p> <p>words [2] 132:21 214:12</p> <p>worked [7] 47:7 93:17 93:17 102:13 167:17 170:7 179:10</p> <p>workforce [2] 88:25 89:18</p> <p>works [2] 114:1 167:8</p> <p>world [1] 20:8</p> <p>worry [3] 142:2 178:8 180:2</p> <p>worse [2] 28:20 29:5</p> <p>worst [2] 58:22 126:3</p> <p>worth [6] 100:9,13 101:7 107:18 142:7 165:5</p> <p>writing [1] 200:17</p> <p>written [4] 10:8 52:13 116:10 119:6</p> <p>wrong [5] 23:1 38:6 41:1 99:3 211:3</p>	<p>71:11,11 73:6,9 74:20 82:12,13 83:1,1 85:19 107:6,7 108:1 109:3,4 109:17 114:6 142:14,15 142:15 144:11,12,12 153:25 164:15,16 165:5 169:3 171:19 172:19 173:4 191:16 193:2 196:18 202:18,22,23 203:1,19,19</p> <p>yet [1] 156:20</p> <p>Young [1] 10:8</p> <p>yourself [1] 55:1</p>
		<p>-W-</p>		
		<p>-V-</p>		
	<p>V-89 [1] 32:1</p> <p>V-NLH-089 [1] 31:12</p> <p>vacancies [7] 71:20 72:2 72:9,12,17,20,21</p> <p>vacancy [3] 73:1,5,8</p> <p>vacuum [1] 133:12</p> <p>validate [7] 37:8 47:16 62:18 63:9 102:24 103:17 104:6</p> <p>value [4] 66:8 153:17 154:11,12</p> <p>values [2] 28:7 30:8</p> <p>valve [3] 56:23 57:24 94:14</p> <p>valves [1] 55:13</p> <p>various [5] 42:14 108:5 109:11 131:8 188:7</p> <p>vary [1] 138:5</p>			
		<p>-Y-</p>		