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<p>1 February 14, 2012</p> <p>2 (9:35 a.m.)</p> <p>3 CHAIRMAN:</p> <p>4 Q. Well, good morning everybody. I understand</p> <p>5 there's no preliminary objections or</p> <p>6 preliminary issues I should say, but I just</p> <p>7 wanted to announce that we will be breaking</p> <p>8 regularly. I was lectured inside about the</p> <p>9 lack of breaks, so I'm going to be</p> <p>10 automatically breaking at, I don't know, an</p> <p>11 hour and a half, two hours. It depends on, I</p> <p>12 guess, how the questioning goes and a natural</p> <p>13 point to stop the proceedings. So, I think</p> <p>14 Mr. Johnson, you're still up, so I'll turn it</p> <p>15 over to you, sir.</p> <p>16 GREENE, Q.C.:</p> <p>17 Q. Excuse me for a moment, Mr. Chair. I think</p> <p>18 there is actually now a preliminary matter</p> <p>19 that Nalcor would like to address and it has</p> <p>20 to do with the undertakings that were asked</p> <p>21 yesterday.</p> <p>22 O'REILLY, Q.C.:</p> <p>23 Q. There were three, I think, Mr. Chairman.</p> <p>24 There were three matters that came up</p> <p>25 yesterday for which undertakings were given</p>	<p>1 Chairman, Commissioners. We took a look at</p> <p>2 the work we did to prepare the estimate for</p> <p>3 the one in 150 year return period and our view</p> <p>4 of this is that the cost of going to one in</p> <p>5 500 would be in the order of 225 to 250</p> <p>6 million dollars. That's a very preliminary</p> <p>7 estimate, so we'd have to do more analysis to</p> <p>8 firm that up, but that's a reasonable view at</p> <p>9 this point.</p> <p>10 CHAIRMAN:</p> <p>11 Q. And your preference is to look at gas</p> <p>12 generation as a -</p> <p>13 MR. BENNETT:</p> <p>14 A. - as the alternative.</p> <p>15 CHAIRMAN:</p> <p>16 Q. As the alternative.</p> <p>17 MR. BENNETT:</p> <p>18 A. That's correct.</p> <p>19 O'REILLY, Q.C.:</p> <p>20 Q. And the third item, Mr. Chairman, was the --</p> <p>21 there was a question, I think, by the Consumer</p> <p>22 Advocate about the comparison of PIRA prices</p> <p>23 and the National Energy Board prices, whether</p> <p>24 or not they were comparable, and the NEB</p> <p>25 prices use inflation adjusted prices. I think</p>
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<p>1 and I think we can respond to those now. The</p> <p>2 first dealt with the date when the carbon tax</p> <p>3 would have been applicable, and I've put on</p> <p>4 the -- made the Commissioners -- that shows</p> <p>5 up, that information shows up in Exhibit 101</p> <p>6 Muskrat Falls Project, pages 65. Page 65,</p> <p>7 that's the Navigant report, and I don't know</p> <p>8 if someone wants to speak to that over there,</p> <p>9 if we can pull that up? You have copies of it</p> <p>10 there. And according to the Navigant report,</p> <p>11 it's 2017.</p> <p>12 CHAIRMAN:</p> <p>13 Q. Okay, alright.</p> <p>14 O'REILLY, Q.C.:</p> <p>15 Q. Anyway that's addressed in that exhibit, that</p> <p>16 question.</p> <p>17 CHAIRMAN:</p> <p>18 Q. I'd like to look at that, yeah.</p> <p>19 O'REILLY, Q.C.:</p> <p>20 Q. Okay. The other is what is the cost of -- the</p> <p>21 incremental cost in going to one in 500 as</p> <p>22 opposed to one in 150, that issue. The cost</p> <p>23 is -- Gilbert, do you want to -</p> <p>24 MR. BENNETT:</p> <p>25 A. It's Gilbert Bennett. Good morning, Mr.</p>	<p>1 that's correct, is it?</p> <p>2 MR. GOUDIE:</p> <p>3 A. It's Steve Goudie. The NEB and the EIA</p> <p>4 referenced prices in CA-53 would be in</p> <p>5 constant dollars. I think there's 2008 or</p> <p>6 2009 constant dollars. And our Exhibit 4 as</p> <p>7 filed would be in nominal dollars. So if you</p> <p>8 compared our nominal dollars to the constant</p> <p>9 dollars from EIA and NEB, you would</p> <p>10 incorrectly conclude that there was a great</p> <p>11 disparity in those forecasts.</p> <p>12 O'REILLY, Q.C.:</p> <p>13 Q. That's it.</p> <p>14 GREENE, Q.C.:</p> <p>15 Q. I also had one preliminary matter and it's to</p> <p>16 deal with the witnesses when they're speaking.</p> <p>17 I wonder if you could identify yourself,</p> <p>18 because in looking at the transcript last</p> <p>19 night, a lot of the comments made by Mr.</p> <p>20 Humphries or statements made by Mr. Humphries</p> <p>21 were attributed to Mr. Kean. So I think it</p> <p>22 would be helpful as you go to speak if you do</p> <p>23 remember to identify your name each time.</p> <p>24 Thank you.</p> <p>25 MR. JOHNSON:</p>

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1 Q. Thank you. Good morning, gentlemen. I'd like
 2 to sort of take up where we left off yesterday
 3 when we were talking about the sensitivity
 4 analysis and I guess for the benefit of people
 5 who are here present today or people who may
 6 be watching on the webcast, could you just
 7 briefly explain what the purpose is of the
 8 sensitivity analysis in the context of
 9 comparing the two options for study before
 10 this panel.
 11 MR. GOUDIE:
 12 A. The purpose of the sensitivity analysis is to
 13 identify the critical variables that are
 14 leveraging our decision making on the
 15 investment analysis. So we will try to
 16 identify those variables in the CPW analysis
 17 that are most important to the results coming
 18 out of the strategist generation expansion
 19 plans. So we would vary fuel prices. We
 20 could vary capital costs. We could vary load
 21 and see what the pertinent impacts are on the
 22 CPW preference for Interconnected Island.
 23 MR. JOHNSON:
 24 Q. And of course, the reference case preference
 25 for the Muskrat Falls Labrador-Island link,

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1 based on the assumption embedded that we have
 2 been working with, is nearly a 2.2 billion
 3 dollar preference in 2010 dollars for Muskrat
 4 Falls over Labrador-Island link or over the
 5 Isolated option. I would like to, if we
 6 could, Mike, bring up page 207 of the MHI
 7 report, in particular Table 42?
 8 And I guess the first sensitivity that
 9 I'd bring your attention to this morning,
 10 having visited some of the earlier
 11 sensitivities listed there yesterday, is the
 12 one numbered eight, being the Labrador-Island
 13 HVDC link and Muskrat Falls capital cost
 14 increased by 50 percent. So in other words,
 15 if we were to increase the present estimates
 16 for the Muskrat Falls and Labrador-Island link
 17 scenario by 50 percent, we would see an
 18 evening out in the preference between the two
 19 options. There still would be a nearly 200
 20 million dollar preference for the Muskrat
 21 Falls Labrador-Island link scenario. And I
 22 guess, at that stage, it's more of a comment
 23 for people who are watching these proceedings
 24 when they see a possibility of the preference
 25 being largely erased under that scenario,

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1 could you just give a comment to us about the
 2 thinness of the preference if we change the
 3 assumptions to that extent?
 4 MR. GOUDIE:
 5 A. This is Steve Goudie. That sensitivity
 6 represents a 50 percent increase in the in-
 7 service capital cost of the Muskrat Falls
 8 generation investment and the Labrador-Island
 9 link. It is the leverage in the analysis, so
 10 if those two major capital components did
 11 increase by 50 percent, the CPW preference for
 12 the Interconnected alternative would begin to
 13 approach zero.
 14 MR. BENNETT:
 15 A. It's Gilbert Bennett. Maybe I can add to
 16 that. I think the question though that has to
 17 be considered is the likelihood of that
 18 scenario.
 19 MR. JOHNSON:
 20 Q. That's what was I -
 21 MR. BENNETT:
 22 A. Okay. So, you know, the risk, yes, if you do
 23 the analysis, you increase the capital cost by
 24 50 percent, that is the analytical outcome,
 25 but the question that begs itself is what's

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1 the likelihood of that and what steps are we
 2 taking in order to minimize that situation.
 3 MR. JOHNSON:
 4 Q. Right, right. And I guess we could plug in
 5 whatever number we wanted to this and it'll
 6 produce a mathematical result. What -- from
 7 Nalcor's standpoint, what -- if we look at,
 8 you know, a range, let's say the textbook
 9 range around DG2, should we use a high
 10 sensitivity test? Is that instructive to us?
 11 Is that the one we ought to use in your
 12 judgment?
 13 MR. BENNETT:
 14 A. I think from my perspective, the sensitivity
 15 analysis has demonstrated a sensitivity on
 16 capital cost and then I think, you know, from
 17 our perspective, the steps to be taken would
 18 be to mitigate that exposure. So, you know,
 19 it comes back to all of the techniques and
 20 approaches that Mr. Harrington and Mr. Kean
 21 described yesterday in order to narrow in that
 22 range and to mitigate and diminish that
 23 sensitivity and that concern.
 24 (9:45 a.m.)
 25 MR. JOHNSON:

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<p>1 Q. If we look at scenario nine, again another</p> <p>2 thin outcome, and perhaps not an outlandish</p> <p>3 scenario whereby we would be assuming that</p> <p>4 over the long run the fuel costs would</p> <p>5 decrease by 20 percent, annual load growth</p> <p>6 would decrease by 20 percent as well on top of</p> <p>7 that and then the third whammy, if you will,</p> <p>8 you'd have the capital cost increasing for</p> <p>9 Muskrat Falls generating station and the</p> <p>10 Labrador-Island link by 20 percent and we</p> <p>11 arrive at a preference of about 159 million</p> <p>12 dollars in 2010 dollars for the Muskrat Falls</p> <p>13 option over the Labrador-Island link. Just</p> <p>14 comment on that scenario, in terms of -- put</p> <p>15 some commentary around that scenario.</p> <p>16 MR. BENNETT:</p> <p>17 A. Sure. Well, I think, you know, one</p> <p>18 observation that I would make is that we look</p> <p>19 at other situations that are also reasonable</p> <p>20 and should be considered. If you're doing</p> <p>21 this analysis at DG3, we would have a clearer</p> <p>22 view of the Federal loan guarantee. We know</p> <p>23 the Federal loan guarantee diminishes the CPW</p> <p>24 of the Interconnected alternative. A current</p> <p>25 fuel price forecast would improve the CPW</p>	<p>1 A. The fundamental value in the Federal loan</p> <p>2 guarantee is to reduce the cost of financing</p> <p>3 and therefore the interest expenses included</p> <p>4 in the generation assets and the transmission</p> <p>5 facilities.</p> <p>6 MR. JOHNSON:</p> <p>7 Q. And the underlying reason being that Canada's</p> <p>8 credit rating, being AAA, allows access or</p> <p>9 their standing behind the project allows the</p> <p>10 borrowers for the project to get access to</p> <p>11 cheaper funds?</p> <p>12 MR. BENNETT:</p> <p>13 A. They have a -- yes, they have a strong credit</p> <p>14 rating, there's no question.</p> <p>15 MR. JOHNSON:</p> <p>16 Q. At DG3, I believe -- in terms of the status of</p> <p>17 the guarantee, at DG3 -- in DG2, up 'til DG2,</p> <p>18 it wasn't -- it was a possibility because the</p> <p>19 commitment had not been yet announced by the</p> <p>20 Prime Minister. Now several months ago, the</p> <p>21 commitment was announced. How will that</p> <p>22 change your using that as an input at DG3?</p> <p>23 MR. BENNETT:</p> <p>24 A. I think it -- at the next stage of analysis,</p> <p>25 we will have further insight in the terms of</p>
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<p>1 preference for the Interconnected Island</p> <p>2 alternative as well. So, I think that, again,</p> <p>3 the importance and value of the sensitivity</p> <p>4 analysis is to give us a basis for further</p> <p>5 analysis and to highlight and identify the</p> <p>6 areas where we need to focus attention. That</p> <p>7 as a predictive tool, their usefulness is</p> <p>8 limited because we're dealing with our earlier</p> <p>9 analytical inputs. So, in terms of</p> <p>10 highlighting areas for focus, they're</p> <p>11 absolutely valuable. In terms of identifying</p> <p>12 the areas where we need to do more work and to</p> <p>13 further advance and define the numbers,</p> <p>14 they're extremely valuable, but the next step</p> <p>15 in this process will be to look at the numbers</p> <p>16 at a later stage, at Decision Gate 3, where</p> <p>17 you have further clarity on all the input</p> <p>18 information.</p> <p>19 MR. JOHNSON:</p> <p>20 Q. You referenced the guarantee and just explain</p> <p>21 for those who may be looking on what role that</p> <p>22 plays in the sensitivity analysis. Why is it</p> <p>23 that that changes or has a bearing upon the</p> <p>24 preference?</p> <p>25 MR. BENNETT:</p>	<p>1 the loan guarantee and we'll be in a better</p> <p>2 position to specifically identify the</p> <p>3 financing terms, the financing and commercial</p> <p>4 parameters that we're using for the project</p> <p>5 and we'll have much greater clarity in that</p> <p>6 input.</p> <p>7 MR. JOHNSON:</p> <p>8 Q. Finally, the final thin scenario, as we go</p> <p>9 down to scenario ten, where we assume an</p> <p>10 annual load decrease of 880 gigawatt hours and</p> <p>11 then we assume on top of that that the capital</p> <p>12 cost associated with the Muskrat Falls</p> <p>13 generating station and Labrador-Island link</p> <p>14 cost increase by ten percent, again, your</p> <p>15 commentary on that sensitivity.</p> <p>16 MR. BENNETT:</p> <p>17 A. I mean, my perspective is exactly the same as</p> <p>18 it was for number nine. It's a good</p> <p>19 analytical tool. It's valuable input. It</p> <p>20 highlights the areas that we need to focus</p> <p>21 attention on, but again, it doesn't include</p> <p>22 the benefit of the Federal loan guarantee, nor</p> <p>23 does it include the cost of carbon.</p> <p>24 MR. JOHNSON:</p> <p>25 Q. In terms of looking at the base case estimate</p>

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<p>1 of the Isolated Island option, which is right</p> <p>2 up at number one, on top of the chart there,</p> <p>3 it has a cumulative present worth of 8.8</p> <p>4 billion dollars and I guess my question would</p> <p>5 be are there -- in Nalcor's assessment, are</p> <p>6 there areas where Nalcor has been conservative</p> <p>7 in relation to costs or factors that impact</p> <p>8 upon the CPW preference or the CPW of the</p> <p>9 Isolated Island option? I'm trying to get a</p> <p>10 sense of, you know, were you conservative in</p> <p>11 any of your inputs on that?</p> <p>12 MR. BENNETT:</p> <p>13 A. I think our efforts were -- I would</p> <p>14 characterize them as reasonable. We've used</p> <p>15 reasonable inputs, reasonable forecast</p> <p>16 information and the results are as they're</p> <p>17 presented. I wouldn't call them conservative.</p> <p>18 I wouldn't call them optimistic. I think</p> <p>19 they're reasonable.</p> <p>20 MR. JOHNSON:</p> <p>21 Q. Okay. I just wanted to get a sense of that,</p> <p>22 in terms of our looking at it, whether we</p> <p>23 should say well, Nalcor said that was</p> <p>24 conservative. But I guess the point that you</p> <p>25 made a second ago was that it doesn't include</p>	<p>1 Q. So not a -- so is the takeaway not a material</p> <p>2 difference?</p> <p>3 MR. STRATTON:</p> <p>4 A. It would not be material, so low forecast.</p> <p>5 MR. JOHNSON:</p> <p>6 Q. Under the reference case, when is our -- if</p> <p>7 things pan out in accordance with the</p> <p>8 assumptions in the reference case, when is our</p> <p>9 next energy deficit?</p> <p>10 MR. HUMPHRIES:</p> <p>11 A. It's Paul Humphries. Our next energy deficit</p> <p>12 will be in the 2020 time period.</p> <p>13 MR. JOHNSON:</p> <p>14 Q. 20?</p> <p>15 MR. HUMPHRIES:</p> <p>16 A. Around 2020.</p> <p>17 MR. JOHNSON:</p> <p>18 Q. And how about capacity?</p> <p>19 MR. HUMPHRIES:</p> <p>20 A. We are predicting a capacity shortfall for</p> <p>21 2015.</p> <p>22 MR. JOHNSON:</p> <p>23 Q. If we were to assume that overnight we lose</p> <p>24 880 gigawatts of load, I guess, in 2013, what</p> <p>25 would that do to our next energy deficit and</p>
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<p>1 certain costs pertaining to possibilities of</p> <p>2 greenhouse gases, okay.</p> <p>3 MR. BENNETT:</p> <p>4 A. That's right.</p> <p>5 MR. JOHNSON:</p> <p>6 Q. In terms of the industrial load forecast, we</p> <p>7 spoke about that a bit yesterday and I think</p> <p>8 there were some updates to load projections in</p> <p>9 the case of some of the industrial customers</p> <p>10 and I was interested in knowing whether there</p> <p>11 had been an update in relation to Vale's load</p> <p>12 since the reference case.</p> <p>13 MR. BENNETT:</p> <p>14 A. Turn to Mr. Paul Stratton here for this one.</p> <p>15 MR. STRATTON:</p> <p>16 A. It's Paul Stratton. We do have an update on</p> <p>17 the peak requirements from Vale, but they did</p> <p>18 not provide us any energy requirements update</p> <p>19 to the forecast. So from that point of</p> <p>20 reference, their demand requirement is</p> <p>21 modestly down, but we would expect their</p> <p>22 energy requirements to be at the same load</p> <p>23 factor that it would have been in the earlier</p> <p>24 cases.</p> <p>25 MR. JOHNSON:</p>	<p>1 next capacity deficit?</p> <p>2 MR. HUMPHRIES:</p> <p>3 A. Well, if that were to happen overnight, both</p> <p>4 of those deficits would change. They would</p> <p>5 move out into the future. What the exact</p> <p>6 dates are I wouldn't be able to tell you right</p> <p>7 now, but they would not be 2015 and 2020.</p> <p>8 MR. JOHNSON:</p> <p>9 Q. Okay.</p> <p>10 GREENE, Q.C.:</p> <p>11 Q. I wonder if you would be able to provide that</p> <p>12 information? That is one of the areas that I</p> <p>13 had hoped to ask as well.</p> <p>14 MR. HUMPHRIES:</p> <p>15 A. Yes, we should be able to provide that.</p> <p>16 MR. JOHNSON:</p> <p>17 Q. Okay. In relation to the in-feed option, as</p> <p>18 described in the reference, what is the role</p> <p>19 of Upper Churchill power?</p> <p>20 MR. BENNETT:</p> <p>21 A. In the current reference case, we use power</p> <p>22 from Churchill Falls I think beyond the 2057</p> <p>23 time frame.</p> <p>24 MR. JOHNSON:</p> <p>25 Q. And what's the reason why we would need it</p>

1 beyond 2057?

2 MR. BENNETT:

3 A. At that point I think we see a small energy
4 shortfall with the energy supplied from
5 Muskrat Falls.

6 MR. JOHNSON:

7 Q. I guess a question that was put to me
8 yesterday was what would be the role of Upper
9 Churchill prior to that or you know, the major
10 date of 2041. I don't know if that's --
11 obviously 2041 is not within the two
12 strategist scenarios, but I guess people would
13 be interested in knowing why we're waiting
14 until 2057 for it, I guess.

15 MR. BENNETT:

16 A. Well, if Muskrat Falls is in the -- is
17 available for the supply and the supply can be
18 met from Muskrat Falls, then we have
19 sufficient energy supply from that facility
20 and we don't need additional energy on the
21 Island system until the 2057 time frame.

22 MR. JOHNSON:

23 Q. A follow up question from a customer who was
24 watching the proceedings yesterday had to do
25 with Nalcor yesterday advised that the

1 reference price versus expected price and I
2 wonder if Nalcor has any observations with
3 respect to possible use of an expected price
4 as opposed to a reference price?

5 MR. GOUDIE:

6 A. Yes, this is Steve Goudie. We certainly did
7 review MHI's review of that. PIRA does
8 provide -- well, we subscribe to two services
9 from PIRA Energy. One is the basic oil
10 retainer service and in addition to that, we
11 subscribe to the scenario planning service and
12 it is that service that gives us the high and
13 low and the expected pricing. We don't get
14 that from the basic service. Their high and
15 low pricing is very, very useful for us
16 because it identifies again the leverage that
17 fuel has in the isolated island case, and the
18 sensitivities are one way of addressing what
19 the uncertainty of fuel is, it's a key to
20 address the uncertainty of fuel. The use of
21 an expected forecast which is a weighting of
22 the low and the reference and the high is a
23 proper way to proceed if you're addressing
24 uncertainty from a statistical point of view.
25 So when we come to do our basic analysis for

1 Maritime link would provide 475 megawatts of
2 backup energy for Newfoundland if there was an
3 outage on the transmission line from Muskrat
4 Falls and the question goes on to say that
5 Nalcor also said that Muskrat Falls would
6 proceed without a Maritime link. So the
7 question is if no Maritime link, what is the
8 backup plan for the island?

9 MR. HUMPHRIES:

10 A. This is Paul Humphries. As we indicated
11 yesterday, based on the analogy I went through
12 yesterday with the actual exposure that we
13 would have in the event of a loss of the link
14 and the probabilities of being there, we feel
15 that from a probabilistic perspective, we
16 would be in a situation no different than we
17 are today and we would not need additional
18 backup beyond the capacity on the island, but
19 we also in the opportunity of should it be
20 deemed that additional backup is required, we
21 could add additional combustion turbine.

22 MR. JOHNSON:

23 Q. The next question I have is: as you know, in
24 the MHI report in relation to fuel price
25 forecasting, MHI makes some commentary about

1 interconnected island, we can use a reference
2 price forecast or we can use the expected.
3 The expected has a higher low run price than
4 our reference forecast, and that's why the MHI
5 result shows that if we use an expected as
6 opposed to a reference, the preference for the
7 interconnected island will increase by a
8 substantial degree.

9 (10:00 a.m.)

10 MR. JOHNSON:

11 Q. Okay, do you know the amount by which you
12 would increase if you used that methodology?

13 MR. GOUDIE:

14 A. It is in the MHI Report. There's a Table - I
15 don't have it exactly, but it basically goes
16 from 2.5 to - the preference would go from 2.5
17 to about 2.6 billion dollars, I believe.

18 MR. JOHNSON:

19 Q. That's at Table 41 at Page 205.

20 MR. GOUDIE:

21 A. Yes, you can see there that if you use the
22 expected fuel prices as opposed to reference,
23 that the CPW preference increases to 2.6
24 billion from 2.2 billion.

25 MR. JOHNSON:

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<p>1 Q. Okay, and the weightings, I understand that -</p> <p>2 in the two paragraphs up from that table, MHI</p> <p>3 says, "The impact on the CPW using the</p> <p>4 expected price rather than the reference price</p> <p>5 was examined based on the March 202010</p> <p>6 forecast, the prices provided by PIRA set out</p> <p>7 on Page 10 of 37 in Exhibit 43, an assumed</p> <p>8 weightings of 50 percent/25 percent/ 25</p> <p>9 percent, the resultant expected prices are</p> <p>10 higher than the reference prices". These</p> <p>11 assumed ratings, can you fill us in on what -</p> <p>12 or assume weightings, can you fill us in on</p> <p>13 what that means?</p> <p>14 MR. GOUDIE:</p> <p>15 A. The weightings would be PIRA's assessment of</p> <p>16 the likelihood of those scenarios. I don't</p> <p>17 believe they characterize them as assumed</p> <p>18 weightings. I think they characterize them as</p> <p>19 probabilities.</p> <p>20 MR. JOHNSON:</p> <p>21 Q. So the 50 percent probability, that would be</p> <p>22 their -</p> <p>23 MR. GOUDIE:</p> <p>24 A. The reference.</p> <p>25 MR. JOHNSON:</p>	<p>1 MR. HUMPHRIES:</p> <p>2 A. This is Paul Humphries. Transmission loss,</p> <p>3 that is the - because of the resistive nature</p> <p>4 of a transmission system, there is a loss</p> <p>5 generated through the transmission, so that at</p> <p>6 the end of the day you will get less power out</p> <p>7 of the end of the line than you put in at the</p> <p>8 beginning.</p> <p>9 MR. JOHNSON:</p> <p>10 Q. Okay, and that would be a concern particularly</p> <p>11 over long distances like 1100 kilometres?</p> <p>12 MR. HUMPHRIES:</p> <p>13 Q. Over the long distance, yes, and also on the</p> <p>14 level of load on the line, as losses increase</p> <p>15 proportionately with the loading on the line.</p> <p>16 MR. JOHNSON:</p> <p>17 Q. Okay, and in terms of the HVDC, is that - is</p> <p>18 HVDC over AC technology better for losses or</p> <p>19 is there any - does it have any bearing on it?</p> <p>20 MR. HUMPHRIES:</p> <p>21 A. Generally HVDC has a better loss performance</p> <p>22 than AC.</p> <p>23 MR. JOHNSON:</p> <p>24 Q. And how would these losses translate into</p> <p>25 having an effect on the CPW for the options?</p>
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<p>1 Q. That would be their best assessment, and then</p> <p>2 25 percent would be the high, 25 percent would</p> <p>3 be the low?</p> <p>4 MR. GOUDIE:</p> <p>5 A. That's correct.</p> <p>6 MR. JOHNSON:</p> <p>7 Q. Okay. I'm going to turn to a slightly</p> <p>8 different topic having to do with HVDC system</p> <p>9 losses. If we could bring up page 206 of the</p> <p>10 MHI Report. At Section 12.20, MHI says that</p> <p>11 "Nalcor assumed HVDC system losses are set at</p> <p>12 5 percent. However, there is reason to</p> <p>13 believe they could be higher based on a</p> <p>14 response to RFI NHI Nalcor 62. If the loss</p> <p>15 percentage is 10 percent, which is Nalcor's</p> <p>16 worse case design scenario, then there will be</p> <p>17 higher transmission losses associated with the</p> <p>18 Labrador-Island Link HVDC system when</p> <p>19 operating at capacity. An incremental</p> <p>20 increase of 5 percent of system losses may</p> <p>21 result in the addition of 150 million dollars</p> <p>22 to the CPW cost for the in-feed option". First</p> <p>23 just to start off, just explain to us what</p> <p>24 we're talking about when we're talking about</p> <p>25 transmission losses?</p>	<p>1 MR. HUMPHRIES:</p> <p>2 A. Well, if the losses are higher than were</p> <p>3 anticipated in the analysis, you are actually</p> <p>4 getting less energy from the line. So that</p> <p>5 has to be made up from another source.</p> <p>6 MR. JOHNSON:</p> <p>7 Q. Okay, and I guess what is your comment about</p> <p>8 the possibility that transmission losses could</p> <p>9 be higher as stated by MHI?</p> <p>10 MR. HUMPHRIES:</p> <p>11 A. At periods when the link is operating at full</p> <p>12 capacity, the losses will be higher, but on an</p> <p>13 average, they will be closer to the 5 percent</p> <p>14 range than they are to the 10 percent overall</p> <p>15 average loss, based on the anticipated</p> <p>16 loadings of that line.</p> <p>17 MR. JOHNSON:</p> <p>18 Q. And is there any dispute with the mathematics</p> <p>19 of MHI that if they're 10 percent, then it</p> <p>20 does add 150 million, or has that been</p> <p>21 checked?</p> <p>22 MR. HUMPHRIES:</p> <p>23 A. I'm not sure that we've verified that.</p> <p>24 MR. GOUDIE:</p> <p>25 A. The way that - Steve Goudie, sorry. The way</p>

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<p>1 that we would probably have looked at that is</p> <p>2 if the loss rate had have been 10 percent from</p> <p>3 the start as an input to our analysis, then</p> <p>4 the amount of energy being delivered from</p> <p>5 Labrador would have been greater, and given a</p> <p>6 defined rate of return for the Muskrat Falls</p> <p>7 Project, we would have reduced the supply</p> <p>8 price from the \$76.00 per megawatt hour to</p> <p>9 something a little bit lower because that</p> <p>10 price is set at the busbar, it depends how</p> <p>11 much power is going out - how much energy is</p> <p>12 flowing out.</p> <p>13 MR. JOHNSON:</p> <p>14 Q. Okay, when will you know or have a - as I</p> <p>15 understand your reply to a Board question,</p> <p>16 which is for the record, PUB 84, Nalcor</p> <p>17 advised that transmission losses will be</p> <p>18 evaluated further in conjunction with</p> <p>19 conductor, converter, and transmission</p> <p>20 optimization during detailed engineering prior</p> <p>21 to project sanction, and could you advise us,</p> <p>22 inform us, as to how you will get a better</p> <p>23 handle on what those transmission losses will</p> <p>24 be in conjunction with those processes just</p> <p>25 described?</p>	<p>1 Q. Okay, and that's where those maximums would be</p> <p>2 reached?</p> <p>3 MR. HUMPHRIES:</p> <p>4 A. Yes.</p> <p>5 MR. JOHNSON:</p> <p>6 Q. I have a question regarding oil. It's</p> <p>7 addressed in Section 12.10 of the MHI Report.</p> <p>8 It's basically inventory. That's at page 197.</p> <p>9 Just to get your comment and try to understand</p> <p>10 this, it indicates that, "Nalcor did not</p> <p>11 include the carrying cost of fuel inventory,</p> <p>12 which is normally part of the rate base</p> <p>13 component used in determining the cost of</p> <p>14 service for the utility". MHI goes on to say,</p> <p>15 "In the current comparative analysis of CPWs,</p> <p>16 the value of fuel inventory would only be</p> <p>17 significantly different between the two</p> <p>18 options in the period where Holyrood is no</p> <p>19 longer generating base load power which exists</p> <p>20 mostly from 2017 and on. If fuel inventory</p> <p>21 carrying costs were included in the CPW</p> <p>22 analysis, the consequence would be an increase</p> <p>23 in the CPW for the isolated island option, and</p> <p>24 accordingly would serve to further increase</p> <p>25 the gap between the two CPW values". I guess</p>
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<p>1 MR. HUMPHRIES:</p> <p>2 A. Well, as we progress with the design and</p> <p>3 specification and tendering of these</p> <p>4 particular elements, be it the converter</p> <p>5 station equipment, transformers, and the</p> <p>6 transmission line, we will know the exact</p> <p>7 components that go in there and we will have a</p> <p>8 handle on the physical impedances of these</p> <p>9 systems and we will be able to do a better</p> <p>10 estimation of the losses, more accurate</p> <p>11 estimations.</p> <p>12 MR. JOHNSON:</p> <p>13 Q. Is there a likelihood that there could be as</p> <p>14 high as 10 percent losses? You know, is that</p> <p>15 in the cards?</p> <p>16 MR. HUMPHRIES:</p> <p>17 A. Close to 10 percent, yes, that could be if the</p> <p>18 line is at full peak load, but we have to</p> <p>19 realize that the line will not - when we look</p> <p>20 at Muskrat Falls, Muskrat Falls is an 824</p> <p>21 megawatt facility with approximately 60</p> <p>22 percent capacity factor. It is not possible</p> <p>23 for Muskrat Falls to load that line at 824</p> <p>24 megawatts 24 hours a day, 365 days a year.</p> <p>25 MR. JOHNSON:</p>	<p>1 my question is, is that a material enough</p> <p>2 figure to worry about, is there any</p> <p>3 significance to that number?</p> <p>4 MR. GOUDIE:</p> <p>5 A. That cost is accounted for once we move out of</p> <p>6 the Strategist framework and into the revenue</p> <p>7 requirement framework. So it's not a cost</p> <p>8 that's accounted for directly in Strategist,</p> <p>9 but it is a cost that's accounted for when we</p> <p>10 take the Strategist output and begin to build</p> <p>11 the total revenue requirement for the company,</p> <p>12 and that is - to your question, it is not a</p> <p>13 material cost.</p> <p>14 MR. JOHNSON:</p> <p>15 Q. Okay. If I could turn you to page 187,</p> <p>16 Section 12.4 of the MHI Report. This is a</p> <p>17 discussion of the Muskrat Falls PPA, and it</p> <p>18 basically indicates, "That the premise</p> <p>19 supporting the use of a PPA approach relies on</p> <p>20 the base assumption that Newfoundland and</p> <p>21 Labrador Hydro will sign a take-or-pay</p> <p>22 contract with Nalcor for the specified</p> <p>23 Newfoundland and Labrador Hydro energy</p> <p>24 purchases from Muskrat Falls that Strategist</p> <p>25 has projected. As equity owner of the Muskrat</p>

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1 Falls Project, Nalcor will eventually receive
 2 its target return on the investment over the
 3 life of the asset based on the volumes
 4 consumed", and then it goes on to explain
 5 that, "To determine the PPA prices, it was
 6 assumed that all firm output 4.5 terawatt
 7 hours generated by the Muskrat Falls
 8 generating facility would be sold. Then the
 9 internal rate of return would be 11 percent
 10 and equity financing would be 100 percent.
 11 These assumptions resulted in a price of
 12 approximately \$76.00 a megawatt hour in 2010
 13 dollars, escalated at 2 percent in nominal
 14 terms". Could you for the purpose of people
 15 who are watching this webcast tell us the
 16 difference between PPA and cost of service
 17 because in another section MHI talks about if
 18 there's any difference in CPW terms when using
 19 the PPA in the cost of service? Just explain
 20 the PPA and why it was chosen?

21 MR. GOUDIE:

22 A. I guess if we start with the cost of service
 23 framework because we're all - or some of us
 24 are more familiar with that, if we bring the
 25 Muskrat Falls investment into a cost of

1 MR. JOHNSON:

2 Q. So under cost of service, if it was all lumped
 3 in to rate base, cost of service wouldn't care
 4 how much the customer was actually taking out
 5 of generating facility by way of energy, it
 6 would just be charging - they'd have to
 7 collect the cost of that generating facility
 8 through the rate no matter what you took?

9 MR. GOUDIE:

10 A. That's correct. So irrespective of output,
 11 that cost would have to be collected once it's
 12 rate based.

13 MR. JOHNSON:

14 Q. Okay, and in terms of that model, how did you
 15 fix upon that sort of model, how did that come
 16 within the contemplation of Nalcor?

17 MR. GOUDIE:

18 A. Well, that would have been something that we
 19 work through with our financial advisors
 20 because essentially when you move to the PPA
 21 approach, you're really focused on cash flow
 22 and you're not focused on net book value of
 23 the asset. All that matters is cash and being
 24 able to meet your obligations and meet a
 25 threshold or hurdle return across the period

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1 service framework, then the revenue
 2 requirement is not dependent on the output
 3 sold from the facility. So in the first year
 4 of following in service, the revenue
 5 requirement will be a function of its
 6 depreciation charge and its return on rate
 7 base. So 100 percent of the net book value of
 8 that plant will be subject to a cost of
 9 service calculation in year one. By contrast,
 10 with a PPA approach, instead of the focus
 11 being on the net book value of the asset as it
 12 goes into service, you're focused on the
 13 internal rate of return or the return on
 14 equity over the life of the project, and the
 15 advantage for consumers is that following a
 16 PPA approach, your initial pricing will be
 17 lower, plus it will be constant in real
 18 inflation adjusted terms. By contrast with a
 19 cost of service approach, you're going to have
 20 very high initial unit charges because we
 21 cannot absorb all of the output of Muskrat
 22 Falls onto the island system. We only require
 23 about 40 percent of it in the first year. So
 24 the unit charge of that will be very, very
 25 high.

1 of time that you're evaluating, given the
 2 output of the plant that's being sold to the
 3 island.

4 (10:15 a.m.)

5 MR. JOHNSON:

6 Q. So in terms of - you use the example or you
 7 made reference to the fact that if you were
 8 going with a cost of service approach, given
 9 the fact that the customers on the island
 10 would not be taking the full Muskrat Falls
 11 power for a number of years out, that the
 12 impact on the customer would be great, I take
 13 it?

14 MR. GOUDIE:

15 A. That's correct.

16 MR. JOHNSON:

17 Q. And so if we did it that way, what would we be
 18 talking about in terms of the amount that
 19 would have to be charged for generation, say?

20 MR. GOUDIE:

21 A. We have answered that question in an RFI for
 22 the PUB. I think it's PUB 46. So the
 23 question was if the cost of service pricing
 24 were applied in determining the power of
 25 purchase price, what would be the power of

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<p>1 purchase price paid by Hydro to Nalcor from</p> <p>2 Muskrat Falls power and energy in the first</p> <p>3 calendar year supply, and the answer to that</p> <p>4 is that it would be \$214.00 per megawatt hour</p> <p>5 in the first year.</p> <p>6 MR. JOHNSON:</p> <p>7 Q. And so that would be on a per kilowatt hour</p> <p>8 charge, 21 cents, basically. You make the</p> <p>9 point there that it would decline each year</p> <p>10 thereafter as the island sales base grows and</p> <p>11 the return on rate base declines. Just</p> <p>12 explain that?</p> <p>13 MR. GOUDIE:</p> <p>14 A. The Labrador-Island link is funded on a cost</p> <p>15 of service basis, or it's analyzed, I should</p> <p>16 say, on a cost of service basis. So in the</p> <p>17 early years of the transmission link, the</p> <p>18 revenue requirement reflects the high net book</p> <p>19 value and as that asset is depreciated over</p> <p>20 time, the return on rate base applies to net</p> <p>21 book value, which is book value less</p> <p>22 depreciation, and that return on rate base</p> <p>23 will decline over time as the asset is</p> <p>24 depreciated. So, therefore, the cost of</p> <p>25 service on the Labrador-Island transmission</p>	<p>1 Consumer Advocate that we would file a revised</p> <p>2 answer to that dealing with that, and we're</p> <p>3 hoping to have that sometime today, and I've</p> <p>4 indicated that, so that we will have a revised</p> <p>5 RFI filed on that question, that should be</p> <p>6 ready, and then if there's a question that</p> <p>7 comes out of that, well, fine, we can deal</p> <p>8 with it, but we would like to refile the RFI.</p> <p>9 MR. JOHNSON:</p> <p>10 Q. Okay.</p> <p>11 O'REILLY, Q.C.:</p> <p>12 Q. Is that satisfactory?</p> <p>13 MR. JOHNSON:</p> <p>14 Q. Okay. Now regarding DG 3, I just want to look</p> <p>15 ahead a little bit, we heard yesterday that</p> <p>16 there is going to be a review of all DG 3</p> <p>17 inputs at that Decision Gate stage, and an</p> <p>18 updated CPW analysis, and as well there's</p> <p>19 going to be updates as relates to the various</p> <p>20 reliability issues that we canvassed</p> <p>21 yesterday, whether it be integration, etc.</p> <p>22 What is planned in terms of having that</p> <p>23 reviewed, let's say, to make sure that it's</p> <p>24 all copasetic, what sort of processes will</p> <p>25 that be worked through?</p>
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<p>1 link will decline.</p> <p>2 MR. JOHNSON:</p> <p>3 Q. Okay, and -</p> <p>4 MR. GOUDIE:</p> <p>5 A. Actually, no, I'm sorry, I'm talking about the</p> <p>6 Labrador-Island transmission link. I should</p> <p>7 be talking about Muskrat Falls, sorry, but</p> <p>8 it's the same principle.</p> <p>9 MR. JOHNSON:</p> <p>10 Q. Same principle, okay. There was a question</p> <p>11 that was posed by a customer was what would be</p> <p>12 the - what would be or what is the incremental</p> <p>13 standalone kilowatt hour cost of Muskrat Falls</p> <p>14 power all the way to Soldiers Pond under - I</p> <p>15 guess under that - I guess that's the question</p> <p>16 that's basically posed in #27, I believe.</p> <p>17 O'REILLY, Q.C.:</p> <p>18 Q. Yeah, and I think we indicated - Mr. Chairman,</p> <p>19 just to step in here, there was a response to</p> <p>20 that question that was filed in CA-27, I think</p> <p>21 it was, 27 or 28, and there was some issue</p> <p>22 about whether or not that would inform - the</p> <p>23 answer to that would inform this process, but</p> <p>24 there seems to be a lot of curiosity about the</p> <p>25 issue, and so we agreed yesterday with the</p>	<p>1 MR. BENNETT:</p> <p>2 A. Certainly within - this is Gilbert Bennett.</p> <p>3 Within Nalcor, we will subject our internal</p> <p>4 analysis to review by consultants within our</p> <p>5 own Decision Gate process. Our CEO, Ed</p> <p>6 Martin, who is the gatekeeper of that process</p> <p>7 may request reviews within our own internal</p> <p>8 context, and I guess I can't comment on what</p> <p>9 might happen beyond that if anything.</p> <p>10 (10:31 a.m.)</p> <p>11 MR. JOHNSON:</p> <p>12 Q. I think it might be a space now where I'm</p> <p>13 going to have to consider if I have anything</p> <p>14 left. I just want to check notes, Mr.</p> <p>15 Chairman, if I could.</p> <p>16 CHAIRMAN:</p> <p>17 Q. We shall break. I'm not even asking you all,</p> <p>18 we're just going to break.</p> <p>19 (RECESS)</p> <p>20 (10:48 a.m.)</p> <p>21 MR. JOHNSON:</p> <p>22 Q. I think, Mr. O'Reilly, you have a point to</p> <p>23 make.</p> <p>24 O'REILLY, Q.C.:</p> <p>25 Q. Yes. Mr. Chairman, Mr. Stratton, who spoke</p>

1 previously in response to a question from the
 2 Consumer Advocate on the projection for the
 3 Vale load, he'd like to make a correction to
 4 his previous response, I think, so he's
 5 sitting in the chair there and would like to
 6 address that.
 7 CHAIRMAN:
 8 Q. Sure.
 9 MR. STRATTON:
 10 A. Paul Stratton. I just want to clarify what my
 11 statements that were made previously that with
 12 respect to the Vale load being lower or higher
 13 based on a set of numbers that were provided
 14 to us recently, and with respect to the Vale
 15 load requirement that was included in our DG 2
 16 analysis, the new power requirement provided
 17 to us from Vale are modestly higher, not
 18 modestly lower, and my earlier statements were
 19 with respect to an interim number that was
 20 provided to us last spring, but, of course,
 21 were not included in the DG 2 analysis. The
 22 end result of that the requirements are
 23 modestly higher and that would improve the
 24 preference for the island link.
 25 MR. JOHNSON:

1 Q. Okay. Perhaps what we could have is just
 2 confirmation of the change in terms of what
 3 was in the reference case and what it's now,
 4 so we're dealing with some harder numbers
 5 maybe.
 6 MR. STRATTON:
 7 A. Yes, that can be provided, yes.
 8 MR. JOHNSON:
 9 Q. Mr. Chairman, I don't have anything further
 10 for the panel at this stage. However, I would
 11 say there may be something arising from Board
 12 Counsel's questions that I might wish to
 13 pursue further. As well, just for the benefit
 14 of people who may be watching and providing me
 15 email questions, you know, some of them are
 16 coming in early in the morning and at night
 17 time, I'm going to get those together and file
 18 them in the proceeding pursuant to my role for
 19 Nalcor to answer. There are some further
 20 outstanding questions because there's been a
 21 number of questions, a good number of
 22 questions asked in recent days, which not
 23 unexpectedly have not been answered as yet, so
 24 we're going to have a meeting of counsel to
 25 determine where we are on that, and what the

1 schedule will be around that. So I just want
 2 to let people know that I'm getting the
 3 messages and they'll be put on the record.
 4 CHAIRMAN:
 5 Q. You're listening.
 6 MR. JOHNSON:
 7 Q. I'm listening.
 8 O'REILLY, Q.C.:
 9 Q. Mr. Chairman, that's fine, and we can discuss
 10 that - counsel will discuss it, appreciating
 11 the fact that most of the questions up to
 12 February 6th, I think, was the last bunch that
 13 remain outstanding, but leading up to the
 14 preparation for this, it's just been trying to
 15 get the resources to get all these answers
 16 together and get them filed, and we're working
 17 on it - we have a status report to the Board
 18 last Friday and to counsel as to where we were
 19 and when we expect it. These additional ones
 20 that you're getting now, of course, will go in
 21 the pile to be dealt with, but, you know,
 22 there's a limit to the resources we have
 23 available, particularly while these
 24 proceedings are going on at the same time.
 25 We're endeavouring to do it. We'll work it

1 out.
 2 CHAIRMAN:
 3 Q. Okay, thank you. So Madam Greene, I think
 4 it's your turn.
 5 GREENE, Q.C.:
 6 Q. Thank you, Mr. Chair. Good morning, gentlemen.
 7 I'd like to follow up first with one of the
 8 questions that Mr. Johnson asked just before
 9 the break, and it concerns power from the
 10 Upper Churchill Power Plant. In responding to
 11 the question, Mr. Bennett went to the power
 12 and energy built into the analysis that would
 13 come in in 2057. I'd like to discuss the
 14 availability of Upper Churchill power prior to
 15 that because that is one of the issues that
 16 has been raised as to why can't the province
 17 wait until 2041 when it will access to Upper
 18 Churchill power, and I just wanted Nalcor to
 19 have the opportunity to be able to respond to
 20 that question, and I'd like to bring Mr.
 21 Bennett to MHI Nalcor #3 where that question
 22 was asked by the Board. Could you bring up
 23 that RFI, please, Mr. McNiven. So Mr.
 24 Bennett, with this as a reference, can you
 25 explain why it is not economic to wait until

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<p>1 2041 to access the Upper Churchill power?</p> <p>2 MR. BENNETT:</p> <p>3 A. Yes, thank you. So there are a couple of</p> <p>4 considerations here. First of all, from an</p> <p>5 economic perspective, I guess, if we look at</p> <p>6 waiting until 2041, the Holyrood facility</p> <p>7 would continue in service for another 30 years</p> <p>8 approximately from today, we would have to</p> <p>9 install scrubbers and precipitators on that</p> <p>10 facility, we would still continue with our</p> <p>11 thermal expansion plan until 2041. So in</p> <p>12 looking at the economics, the outcome of our</p> <p>13 analysis was that there would be a substantial</p> <p>14 premium from an economic perspective to</p> <p>15 maintaining an isolated scenario until 2041,</p> <p>16 and then interconnecting at that point in</p> <p>17 time.</p> <p>18 GREENE, Q.C.:</p> <p>19 Q. If you'd turn to page 3 of 3 to that answer,</p> <p>20 on line 17 to 20 we see the impact on the CPW</p> <p>21 analysis. Could you please explain what that</p> <p>22 would be, Mr. Bennett?</p> <p>23 MR. BENNETT:</p> <p>24 A. Well, what we're doing here is looking at the</p> <p>25 cost on the system between now and 2041. We</p>	<p>1 GREENE, Q.C.:</p> <p>2 Q. Okay. One additional question related to that</p> <p>3 is concerning the amount of recall power still</p> <p>4 available from the Upper Churchill power</p> <p>5 contract. What consideration has been given</p> <p>6 by Nalcor to bringing in the remaining</p> <p>7 available power over the transmission link</p> <p>8 when it is built?</p> <p>9 MR. BENNETT:</p> <p>10 A. There is a small amount of capacity of power</p> <p>11 available from Churchill Falls in the peak</p> <p>12 winter season, but at this point in time with</p> <p>13 Muskrat Falls delivering 4.9 terawatt hours to</p> <p>14 the system, we have more than sufficient</p> <p>15 energy from Muskrat to meet our needs here on</p> <p>16 the island.</p> <p>17 GREENE, Q.C.:</p> <p>18 Q. In terms of the power policy and the</p> <p>19 Electrical Power Control Act for least cost</p> <p>20 power, have you considered whether the</p> <p>21 recalled power would be a lower rate and a</p> <p>22 lower value than Muskrat Falls power, and</p> <p>23 whether under the power policy that should be</p> <p>24 the first to be brought over the link?</p> <p>25 MR. BENNETT:</p>
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<p>1 have the thermal expansion plan in there, so</p> <p>2 the scrubbers and precipitators at Holyrood,</p> <p>3 #6 fuel oil, are continued in this plan until</p> <p>4 that point in time. From there, a comparison</p> <p>5 to the interconnected plan, we would then</p> <p>6 interconnect with Labrador and we would import</p> <p>7 energy from Labrador to the island. Now one</p> <p>8 consideration in there is the price reference</p> <p>9 that's used for that supply, and I guess from</p> <p>10 a broad perspective, there are two ways that</p> <p>11 energy could flow. That energy could flow</p> <p>12 into the market post 2041 because the power</p> <p>13 contract will have expired, or we can move it</p> <p>14 to the island. In both cases, that energy has</p> <p>15 value and we've used that value in our</p> <p>16 analysis.</p> <p>17 GREENE, Q.C.:</p> <p>18 Q. So one of the primary reasons is the</p> <p>19 requirement to burn fuel at Holyrood or</p> <p>20 another oil fired plant until such time as</p> <p>21 that power would be available, the cost of</p> <p>22 that makes it uneconomic and is a major factor</p> <p>23 in the CPW analysis?</p> <p>24 MR. BENNETT:</p> <p>25 A. That's correct.</p>	<p>1 A. Well, if the link and Muskrat Falls are looked</p> <p>2 at in tandem or together as a combined supply</p> <p>3 and transmission facility, then Muskrat Falls</p> <p>4 at the outset has the ability to meet all of</p> <p>5 the needs and the marginal cost of Muskrat</p> <p>6 Falls energy at that point in time will be</p> <p>7 zero.</p> <p>8 GREENE, Q.C.:</p> <p>9 Q. But in terms of the cost of the remaining</p> <p>10 recall, would that be a lower cost than the</p> <p>11 Muskrat Falls power?</p> <p>12 MR. BENNETT:</p> <p>13 A. I suppose you could look at the 80 megawatts</p> <p>14 that's available in the winter, but the</p> <p>15 question is if you only look at that 80</p> <p>16 megawatts, you haven't created a business case</p> <p>17 for the transmission link. So, therefore,</p> <p>18 there's no way to get it here.</p> <p>19 GREENE, Q.C.:</p> <p>20 Q. No, and I - if the link is already built, the</p> <p>21 question is who should have - is Nalcor</p> <p>22 considering providing the remaining recall</p> <p>23 power at the lower rates available if it's</p> <p>24 cheaper and selling the more expensive Muskrat</p> <p>25 Falls energy west?</p>

1 MR. BENNETT:

2 A. I guess, at the end of the day when you look
3 at the total value, the value is available on
4 a consolidated basis from either source.

5 GREENE, Q.C.:

6 Q. And that has not been factored into the
7 analysis?

8 MR. BENNETT:

9 A. That has not been factored into our analysis.

10 GREENE, Q.C.:

11 Q. I'd like to turn now the Decision Gate
12 process, and we did have discussion around
13 that yesterday, and we did hear yesterday the
14 difference between Decision Gate 2 and
15 Decision Gate 3, and how Nalcor has used or
16 chosen the Decision Gate process to assist as
17 it moves forward with the development and I
18 will not go through that ground again, but
19 there was some follow up from Mr. Johnson's
20 questions where we still have some uncertainty
21 with respect to some of the areas that were
22 covered yesterday. The first thing I wanted
23 to talk about is the Decision Gate 2, which is
24 the point that Nalcor has passed, it was the
25 point where project selection to proceed

1 GREENE, Q.C.:

2 Q. Revision 1, yes. It's just a confirmation of
3 the capital cost estimates. So we see there
4 in line 9 to 10 -

5 MR. KEAN:

6 A. Yes, that is correct, they were prepared in
7 2010.

8 GREENE, Q.C.:

9 Q. So the information on the project cost
10 estimates that's before the Board were
11 finalized and completed as of August, 2010?

12 MR. KEAN:

13 A. Yes, that is correct.

14 GREENE, Q.C.:

15 Q. In looking at Decision Gate 2, which used the
16 capital cost estimate that we have from
17 August, 2010, we had some discussion yesterday
18 as to what that meant for a project
19 definition, and yesterday, I believe, Mr.
20 Harrington indicated that, and possibly Mr.
21 Kean, but that certainly at Decision Gate 2
22 the degree of project definition is less than
23 at what you're anticipating for and chosen as
24 Decision Gate 3. So the degree of project
25 definition is less at Decision Gate 2 in

1 further to detailed engineering, is that
2 correct?

3 MR. BENNETT:

4 A. Yes, that is correct.

5 GREENE, Q.C.:

6 Q. And the Decision Gate 2 decision was made in
7 November of 2010, is that correct?

8 MR. BENNETT:

9 A. Yes, it is.

10 GREENE, Q.C.:

11 Q. And the capital cost estimates that were used
12 in the CPW analysis that was completed and
13 filed with the Board were actually done as of
14 August, 2010, is that correct? We can go to
15 PUB Nalcor 39.

16 MR. BENNETT:

17 A. I was looking for confirmation from either
18 Jason or Paul, but my understanding is that's
19 correct.

20 GREENE, Q.C.:

21 Q. Yes, and if you'd like to go check, Mr.
22 Bennett, we can take a moment. It's PUB
23 Nalcor 39.

24 MR. MCNIVEN:

25 Q. Is that Revision 1?

1 comparison to Decision Gate 3, is that
2 correct?

3 MR. KEAN:

4 A. Yes, that is correct.

5 (11:00 a.m.)

6 GREENE, Q.C.:

7 Q. And yesterday Mr. Harrington indicated it
8 would be approximately 5 percent, and I
9 wondered if you - I'd like him to comment on
10 that today. The amount of project definition
11 that one could typically expect to see at
12 Decision Gate 2 is what percentage?

13 MR. HARRINGTON:

14 A. Well, the AACE standard, which I hope someone
15 can help me out -

16 MR. KEAN:

17 A. Jason Kean. Typically the amount of
18 definition is driven by the amount of
19 engineering done is a typical factor in that
20 regard, and for a Gateway Phase 2, which is
21 typically called Front End Loading Phase 2 in
22 the industry, it's somewhere in the range of 5
23 to 10 percent, depending on the type of
24 project and the new technology employed or
25 not.

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<p>1 GREENE, Q.C.:</p> <p>2 Q. And the project definition is one of the key</p> <p>3 factors in developing the project cost</p> <p>4 estimate, is that correct?</p> <p>5 MR. KEAN:</p> <p>6 A. Yes, the project definition is one of the key</p> <p>7 aspects. However, there are several other</p> <p>8 aspects.</p> <p>9 GREENE, Q.C.:</p> <p>10 Q. But presumably you need to know what your</p> <p>11 project is to be able to determine what the</p> <p>12 cost will be to build it, is that correct?</p> <p>13 MR. KEAN:</p> <p>14 A. Yes, that is correct.</p> <p>15 GREENE, Q.C.:</p> <p>16 Q. Yesterday we also talked about the range that</p> <p>17 we associate with a Decision Gate 2 estimate,</p> <p>18 and the AACE Class 4 estimate which is the</p> <p>19 standard and which has been applicable for</p> <p>20 Decision Gate 2, I think it was indicated the</p> <p>21 range is to a +50 on the high side, to a range</p> <p>22 of -50 on the low side. That is the range for</p> <p>23 DG 3 Class 4 estimate?</p> <p>24 MR. KEAN:</p> <p>25 A. The range for a DG 2 estimate as per AACE</p>	<p>1 know what the standard is, which could be as</p> <p>2 high as 50 percent to the extreme on one side,</p> <p>3 and the question is, having worked with the DG</p> <p>4 2 classed estimate, where you feel that you</p> <p>5 fall within that range of the standard, and</p> <p>6 without reading the transcript, and we can if</p> <p>7 you'd like me to, but I guess to paraphrase</p> <p>8 it, I think - and Mr. Harrington acknowledged</p> <p>9 in replying to the question that Mr. Johnson</p> <p>10 was pushing him a little bit, but that if he</p> <p>11 would be in the range of 15 to 20 percent if -</p> <p>12 he thought you were closer to the middle of</p> <p>13 the range versus the extremes, and I just</p> <p>14 wanted to follow up with you today on that.</p> <p>15 MR. HARRINGTON:</p> <p>16 A. Paul Harrington. Okay, I wish to clarify your</p> <p>17 question there. Within the standard that</p> <p>18 you've quoted, AACEI, there's the wide range</p> <p>19 of +50 to -30, but they also quote +20 to -15</p> <p>20 range as well. So that's the narrow band that</p> <p>21 they're talking about, and I think in my</p> <p>22 testimony yesterday, I indicated I thought</p> <p>23 that we were closer to the narrower range.</p> <p>24 Does that answer your question?</p> <p>25 GREENE, Q.C.:</p>
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<p>1 recommended practice, 18R 97, is in the range</p> <p>2 of - for a wide range of industries, -50 to</p> <p>3 +50. However, we did as part of the overall</p> <p>4 evaluation of the cost estimate for the</p> <p>5 project, as in our submission in November,</p> <p>6 stated that we went through a risk analysis in</p> <p>7 June 2010, which gave us much greater clarity</p> <p>8 on what the actual accuracy was.</p> <p>9 GREENE, Q.C.:</p> <p>10 Q. Okay. I guess, perhaps we went to the range,</p> <p>11 and again it's really not - I'm not looking</p> <p>12 for a specific number from you, but I guess</p> <p>13 one of the issues yesterday, Mr. Johnson in</p> <p>14 talking about the range, which is the range</p> <p>15 expressed by the international standard which</p> <p>16 is a broad range, then brought you to your</p> <p>17 view of the range for the current DG 2</p> <p>18 estimate that you have used. In looking at</p> <p>19 the transcript, and I just wanted to have some</p> <p>20 clarification around it today, because in</p> <p>21 reading it and listening yesterday there was a</p> <p>22 little bit - I was confused or left with some</p> <p>23 confusion as to where you actually were with</p> <p>24 your view of your range, what you think</p> <p>25 Nalcor's estimate is within that range. We</p>	<p>1 Q. Yes, and I guess in fairness to - probably we</p> <p>2 should go to the transcript, page 141 from</p> <p>3 yesterday. If you look at lines 13 to 17,</p> <p>4 page 141.</p> <p>5 MR. HARRINGTON:</p> <p>6 A. Yes.</p> <p>7 GREENE, Q.C.:</p> <p>8 Q. So you just confirm what you've just said, you</p> <p>9 believe you're more in the middle of the</p> <p>10 range. Then, I guess, Mr. Bennett also</p> <p>11 commented on Nalcor's perspective on where it</p> <p>12 feels its DG 2 estimate is within that range,</p> <p>13 and if we look further down on page 142, lines</p> <p>14 12 to 17, Mr. Bennett stated with respect to</p> <p>15 the range that it wasn't appropriate for</p> <p>16 Nalcor to state where it thought it was within</p> <p>17 the range at this point in time. So my</p> <p>18 question to you to further understand the type</p> <p>19 of information we had at DG 2, and when we</p> <p>20 look at some of the sensitivities as to the</p> <p>21 relevance of the sensitivities, I wondered,</p> <p>22 Mr. Bennett, in light of - my understanding is</p> <p>23 that Nalcor is for this range at -50, which is</p> <p>24 the extreme range, that for DG 2 estimate,</p> <p>25 that you are not willing - that you're not</p>

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<p>1 prepared to say where you are, your view, 2 within that range?</p> <p>3 MR. BENNETT:</p> <p>4 A. Well, I think that when you look at the 5 process that's followed, of course, we will 6 never know the accuracy of the estimate until 7 you have a final cost to compare it against. 8 I mean, that's the nature of the process that 9 we're in, and as Mr. Harrington and Mr. Kean 10 pointed out, there is an evolution and 11 progression of the design of the project and, 12 therefore, there is a continued evolution and 13 increasing accuracy of estimates using the 14 practices that they both set out in their 15 presentation yesterday. So when we look at 16 that, you know, we identify some trends. 17 First of all, as Mr. Harrington pointed out, 18 we've done extensive investigation on site, we 19 went through a - completed a risk 20 identification process, and we have focused 21 attention on the key risks that we see in the 22 project planning and project execution. So 23 from there, it's fine to say, yes, we think 24 that we have that done, but for Nalcor to say 25 the estimate is within this specific range,</p>	<p>1 particular case when you read the question, it 2 was, "What was the degree or range of accuracy 3 used by Nalcor for the Decision Gate 2 4 estimate for Muskrat Falls power". The answer 5 didn't come back with the range. It's one of 6 those times sometimes 2 and 2 is not 4, it's 2 7 and 2 is green. So I wondered if you could 8 help me understand the answer to that question 9 as to how that deals with the range of 10 accuracy around the DG 2 estimate?</p> <p>11 MR. KEAN:</p> <p>12 A. Jason Kean. I would like to direct you to PUB 13 Nalcor 42.</p> <p>14 GREENE, Q.C.:</p> <p>15 Q. I'd like to deal with 43 first, please, 16 because the question was very specific 17 question, and then we can go, of course, to 18 42, but let's deal with 43.</p> <p>19 MR. KEAN:</p> <p>20 A. PUB Nalcor 43 doesn't explicitly respond to 21 the question as noted. It does provide 22 clarity as to what is the contingency that was 23 included in the DG 2 analysis.</p> <p>24 GREENE, Q.C.:</p> <p>25 Q. And the contingency, you mentioned to me</p>
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<p>1 it's a very difficult thing to do based on the 2 nature of the process that we're in. So 3 people have pointed out that the extreme edge 4 of the range is -30 to +50 percent. There is 5 a narrow end of the spectrum, as Mr. 6 Harrington just pointed out as well, but other 7 than completing the analysis that we've done, 8 other than reviewing the nature of the work 9 that's been completed, it would be very 10 difficult to say that we think that the 11 estimate is, you know, at this point in time 12 within these specific parameters. That was 13 the point I was trying to make yesterday.</p> <p>14 GREENE, Q.C.:</p> <p>15 Q. Right, and we're only talking about a DG2 16 Class estimate as well.</p> <p>17 MR. BENNETT:</p> <p>18 A. That's correct.</p> <p>19 GREENE, Q.C.:</p> <p>20 Q. I wonder, Mr. McNiven, if you could bring up, 21 please, PUB Nalcor 43. The Board had asked 22 this question as well during the RFI process, 23 and this was - sometimes when we ask 24 questions, you are asking 2 and 2, and you 25 expect the answer to be 4, but in this</p>	<p>1 before that one of the elements in a project 2 cost estimate is the estimate of the cost, the 3 capital cost estimate. Another component is 4 the contingency, is that correct?</p> <p>5 MR. KEAN:</p> <p>6 A. Yes, that is correct.</p> <p>7 GREENE, Q.C.:</p> <p>8 Q. So the answer to the question then on Nalcor 9 43 with respect to a contingency, did that 10 really relate to the accuracy range?</p> <p>11 MR. KEAN:</p> <p>12 A. Yes, contingency does relate to accuracy.</p> <p>13 GREENE, Q.C.:</p> <p>14 Q. Oh, I'm sure it does, but can you explain - 15 and that's why perhaps you can help me 16 understand the answer and how it related to 17 what the range was?</p> <p>18 MR. KEAN:</p> <p>19 A. Yes, if I could direct you to PUB Nalcor 42.</p> <p>20 GREENE, Q.C.:</p> <p>21 Q. Sure.</p> <p>22 MR. KEAN:</p> <p>23 A. This particular RFI, the response deals with 24 particularly on the accuracy, as stated in the 25 - for DG 2, and if I could quote, "According</p>

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1 to AACE International Recommended Practice,
2 #18R-97, typically accuracy ranges for a Class
3 4 estimate can be -15 to -30 on the low side,
4 to +20 to +50 percent on the high side,
5 depending on the technical complexity of the
6 project, the degree of project definition,
7 appropriate reference information, and
8 inclusion of appropriate contingency
9 determination".

10 GREENE, Q.C.:

11 Q. Thank you. So that is one of the components
12 that goes into the estimate and then you apply
13 the range when you get to the total project
14 cost?

15 MR. KEAN:

16 A. That's correct.

17 GREENE, Q.C.:

18 Q. The next decision point is Decision Gate 3.
19 The degree of accuracy that would be
20 associated with a project cost estimate for DG
21 3 is the AACE Class 3 estimate, is that
22 correct?

23 MR. KEAN:

24 A. Yes, that is correct.

25 GREENE, Q.C.:

1 MR. KEAN:

2 A. Yes, most certainly we will have greater
3 confidence.

4 GREENE, Q.C.:

5 Q. We heard a little bit yesterday about the work
6 that has been ongoing since November 2010
7 until the current date. I'd like now to talk
8 about the commitments that have been made to
9 give us an appreciation of how much work has
10 been done. I wonder, Mr. McNiven, if you
11 could bring up PUB Nalcor 178.

12 MR. MCNIVEN:

13 Q. PUB Nalcor 178?

14 GREENE, Q.C.:

15 Q. PUB Nalcor 178.

16 MR. MCNIVEN:

17 Q. I don't have that -

18 GREENE, Q.C.:

19 Q. With respect to that, it was a response to an
20 RFI that was filed, I believe on Friday, so we
21 can go through it as well. The question was
22 how much money had been spent by Nalcor from
23 DG 2, which was November 2010, up until the
24 end of December 31st, until just six weeks
25 ago? So how much money was spent.

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1 Q. And the range of accuracy for that level is?

2 MR. KEAN:

3 A. The range of accuracy for a Class 3, it varies
4 depending on the industry, but as per AACEI
5 Recommended Practices, it's usually in the
6 range of -20 to -10 on the low side, +10 to
7 +30 on the high side. I will also add that in
8 the aspects of hydro power construction, which
9 of course is the project that we're speaking
10 of today, there is a working group that is
11 sitting to develop appropriate recommended
12 practice for that industry, and I'm actually
13 sitting on that working group. So that will
14 provide in future greater clarity.

15 GREENE, Q.C.:

16 Q. Around the range of accuracy for hydro?

17 MR. KEAN:

18 A. Yes.

19 GREENE, Q.C.:

20 Q. So as we move forward to DG 3, we would expect
21 to see a better - because you have more
22 project definition for the project, the
23 expectation is that you have more confidence
24 in the cost estimate that will be used at that
25 decision point, is that correct?

1 MR. HARRINGTON:

2 A. In the response to PUB Nalcor 178, the answer
3 was the total expenditures incurred for the
4 period from DG 2, November 2010, to December
5 31st, 2011, was approximately 82.8 million
6 dollars.

7 GREENE, Q.C.:

8 Q. Okay, and then the forecast expenditures until
9 DG 3?

10 MR. HARRINGTON:

11 Q. The forecast expenditures from January 1st,
12 2012, up to DG 3, are estimated at
13 approximately 12 to 15 million dollars per
14 month.

15 (11:15 a.m.)

16 GREENE, Q.C.:

17 Q. And I believe yesterday you indicated that you
18 expected to be in a position to make a
19 Decision Gate 3 decision in June of 2012, is
20 that correct?

21 MR. HARRINGTON:

22 A. That's correct.

23 GREENE, Q.C.:

24 Q. So that would be approximately using the 15
25 million - another 90 million dollars you

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<p>1 expect to spend?</p> <p>2 MR. HARRINGTON:</p> <p>3 A. Within the region of 12 to 15 million</p> <p>4 dollars per month at the high end, yes.</p> <p>5 GREENE, Q.C.:</p> <p>6 Q. And that would give some indication of the</p> <p>7 amount of engineering, financial, other type</p> <p>8 work that has been done to further refine the</p> <p>9 project definition, to further define the</p> <p>10 project cost estimate, is that correct?</p> <p>11 MR. HARRINGTON:</p> <p>12 A. That is correct.</p> <p>13 GREENE, Q.C.:</p> <p>14 Q. Part of the work that has been ongoing is to</p> <p>15 prepare tenders as well that will be required</p> <p>16 for the work, is that correct?</p> <p>17 MR. HARRINGTON:</p> <p>18 A. That is correct.</p> <p>19 GREENE, Q.C.:</p> <p>20 Q. I wonder, Mr. McNiven, if you could go to the</p> <p>21 website for Nalcor for Lower Churchill, where</p> <p>22 the tenders are posted. I wonder if you could</p> <p>23 just describe some of the tenders that are</p> <p>24 outstanding, whether this list is up to date,</p> <p>25 and to give us an indication of the total</p>	<p>1 MR. HARRINGTON:</p> <p>2 A. It's very - I mean, we're in a bidding</p> <p>3 process, so for me to provide the Board or</p> <p>4 anybody with information that would provide to</p> <p>5 the bidder -</p> <p>6 GREENE, Q.C.:</p> <p>7 Q. And I don't mean by individual tender. I just</p> <p>8 meant a sum - rule of thumb, you know, how</p> <p>9 much money, the value of the work that's ready</p> <p>10 to be awarded from a global perspective, not</p> <p>11 by each individual.</p> <p>12 MR. HARRINGTON:</p> <p>13 A. Oh, okay. We can do that. Would you like me</p> <p>14 to step through the package titles now?</p> <p>15 GREENE, Q.C.:</p> <p>16 Q. I don't know if you need to do the titles, but</p> <p>17 you can give some indication of the type of</p> <p>18 work you're ready to go to tender with.</p> <p>19 MR. KEAN:</p> <p>20 A. This is Jason Kean. I can step through each</p> <p>21 of the RFPs, Request for Proposals, from the</p> <p>22 top, if you wish, and provide clarity as to</p> <p>23 the scope and boundaries of those.</p> <p>24 GREENE, Q.C.:</p> <p>25 Q. Or some of them can be broken down by subject,</p>
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<p>1 value of the tenders that are ready to be</p> <p>2 awarded?</p> <p>3 MR. HARRINGTON:</p> <p>4 A. I can talk to the actual package titles, but I</p> <p>5 really don't have the value of those at my</p> <p>6 fingertips.</p> <p>7 GREENE, Q.C.:</p> <p>8 Q. I wonder if Nalcor could provide some</p> <p>9 indication of the total value of the tenders</p> <p>10 that are either now ready - that are listed as</p> <p>11 pending, or ready to be awarded.</p> <p>12 O'REILLY, Q.C.:</p> <p>13 Q. I'm sorry, would you repeat that?</p> <p>14 GREENE, Q.C.:</p> <p>15 Q. I wonder if Nalcor could provide an indication</p> <p>16 of the value of the tenders that are listed as</p> <p>17 being ready to be awarded or that are pending,</p> <p>18 the ones they have listed on the website?</p> <p>19 O'REILLY, Q.C.:</p> <p>20 Q. A listing of those?</p> <p>21 GREENE, Q.C.:</p> <p>22 Q. Just the value - no, the listing is there; the</p> <p>23 value, how much money are we talking about</p> <p>24 that Nalcor is ready to award or almost ready</p> <p>25 to award.</p>	<p>1 like, getting the site ready. I was thinking</p> <p>2 more of a high level - we don't need to go</p> <p>3 through each line item.</p> <p>4 MR. KEAN:</p> <p>5 A. So these - okay. Starting Package CH0048,</p> <p>6 there was an expression of interest issued,</p> <p>7 and subsequently a request for proposal for</p> <p>8 the actual clearing of vegetation associated</p> <p>9 with the access road and the laydown areas at</p> <p>10 the Muskrat Falls site. That then facilitates</p> <p>11 the construction of the access road, which is</p> <p>12 noted as Package CH004, which is approximately</p> <p>13 a 19 kilometre access road from the Trans</p> <p>14 Labrador Highway to the generation site at</p> <p>15 Muskrat Falls. Further, if you could just</p> <p>16 scroll up again, there are noted some packages</p> <p>17 for equipment associated with construction</p> <p>18 power, specifically Package PH0036, 37, 38,</p> <p>19 that are packages that are required to</p> <p>20 facilitate the distribution of construction</p> <p>21 power around the Muskrat Falls construction</p> <p>22 site. That is some of the key early</p> <p>23 infrastructure works that must be established.</p> <p>24 You will also note on the top there is a</p> <p>25 Package CT0341, which is an Expression of</p>

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1 Interest related to the right-of-way clearing
2 of the transmission line between Muskrat Falls
3 and Churchill Falls. There is also Packages
4 CH0023 and 24, which are Expression of
5 Interest related to seek firms that may wish
6 to participate in the clearing of the Muskrat
7 Falls reservoir. Package CH003 and CH002
8 relate to the facilities, the infrastructure
9 facilities that must be established at Muskrat
10 Falls, specifically the 1500 person
11 accommodations complex and the associated
12 administrative buildings.

13 GREENE, Q.C.:

14 Q. So in looking at this, you get the impression
15 that Nalcor is putting itself in a position to
16 start the project immediately with DG 3
17 approval. Is that correct?

18 MR. BENNETT:

19 A. We're preparing for potential project sanction
20 and I think there is a -- there are two stages
21 to our Decision Gate process. First is a
22 series of analyses that need to be done in
23 order to confirm a sanction decision, at which
24 point funds will be made available for
25 construction start. The other aspect of our

1 Q. Yesterday we talked a bit about the activities
2 that must be done before you're in a position
3 to move to DG3 and I think your slide 43
4 listed some of the principal activities. Some
5 of these activities are within Nalcor's
6 control and some are with external parties.
7 Mr. Harrington mentioned yesterday or said
8 yesterday that you would be in a position to
9 make a Decision Gate 3 in June. Did that
10 include all of the activities with external
11 parties or was it related only to Nalcor's
12 activities?

13 MR. HARRINGTON:

14 A. Paul Harrington. I was referring to the
15 activities that were within my control.

16 GREENE, Q.C.:

17 Q. So that would be doing the project definition,
18 updating your cost estimate, those kinds of
19 things? Is that correct?

20 MR. HARRINGTON:

21 A. Those kinds of things, that is correct.

22 GREENE, Q.C.:

23 Q. There are other activities that are listed
24 here on the slide. The first one, which is
25 the engineering to increase project definition

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1 planning process is to make sure that we're
2 ready to take that work on and in order to
3 demonstrate and be actually prepared, we need
4 to get expressions of interest, request for
5 proposals compiled so that we understand the
6 costs and we're prepared to move.

7 Issuing the RFP is not a commitment to
8 ultimately award the RFP, an important point
9 to make. I think the other important point
10 here is that some of these packages are of
11 significant value and it's important for us to
12 have those as inputs into our DG3 estimates.
13 So activities like reservoir clearing, the
14 construction camp, those are large ticket
15 items in the capital cost estimate and would
16 need to be -- it would be very helpful if they
17 were available to us in greater detail than we
18 would have from initial estimate.

19 GREENE, Q.C.:

20 Q. Do you plan on awarding any of these contracts
21 or these tenders prior to DG3?

22 MR. BENNETT:

23 A. A decision has not been made to award those
24 packages.

25 GREENE, Q.C.:

1 and obtain a class three estimate, that's what
2 you and I just talked about, isn't it, Mr.
3 Harrington?

4 MR. HARRINGTON:

5 A. Paul Harrington. Yes, that is correct.

6 GREENE, Q.C.:

7 Q. Okay. Similarly, the next one, the
8 procurement and contracting of long lead
9 times, that's again within Nalcor's control?
10 Is that correct?

11 MR. HARRINGTON:

12 A. That's correct, and the previous question kind
13 of alluded to some of that activity.

14 GREENE, Q.C.:

15 Q. The next bullet, aboriginal consultations and
16 agreements, that would be one I would classify
17 in the category of there is an external party
18 that has some input into the timing for that.
19 Can you provide an anticipated date when that
20 will be concluded to your satisfaction to
21 allow you to move to DG3?

22 MR. HARRINGTON:

23 A. The aboriginal consultation of course, you
24 know, we have the New Dawn Agreement with the
25 Innu Nation which was a significant step along

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<p>1 that path towards DG3 and in fact towards DG2.</p> <p>2 We are also carrying out consultations with</p> <p>3 aboriginal groups in accordance with the</p> <p>4 requirements of the environmental assessment</p> <p>5 processes which are under way. So aboriginal</p> <p>6 consultation is an ongoing event. We also</p> <p>7 consult with aboriginal groups regarding</p> <p>8 permitting as well. So it's an ongoing thing.</p> <p>9 It's not necessarily on or off. It's just</p> <p>10 making sure that, yes, that's something that</p> <p>11 we check that we're on target.</p> <p>12 GREENE, Q.C.:</p> <p>13 Q. So that's not a trigger that must be pulled</p> <p>14 before you get to DG3?</p> <p>15 MR. HARRINGTON:</p> <p>16 A. Yes, it's a degree of readiness. Can I</p> <p>17 characterize it in that way? It's not</p> <p>18 necessarily on or off. It's a matter of how</p> <p>19 far along you are and you know, it's up to</p> <p>20 others to make that decision, yes, we are far</p> <p>21 enough along.</p> <p>22 GREENE, Q.C.:</p> <p>23 Q. Now the environmental release is the next</p> <p>24 bullet where -- is that a situation where</p> <p>25 there actually has to -- there will be a</p>	<p>1 Comprehensive Study for the transmission, the</p> <p>2 Labrador-Island transmission link will be</p> <p>3 filed imminently with the two governments. It</p> <p>4 is a comprehensive study. It's not a panel</p> <p>5 process. That will go into that process</p> <p>6 within, I expect, the next month and a half.</p> <p>7 GREENE, Q.C.:</p> <p>8 Q. So again, that would be more definitive than</p> <p>9 the aboriginal consultations? There will be</p> <p>10 clearance or no clearance that will allow you</p> <p>11 to go to DG3?</p> <p>12 MR. BENNETT:</p> <p>13 A. That's right.</p> <p>14 GREENE, Q.C.:</p> <p>15 Q. We've already had limited discussion on the</p> <p>16 Federal loan guarantee. Is that something</p> <p>17 that must be in place before DG3 decision can</p> <p>18 be made?</p> <p>19 MR. BENNETT:</p> <p>20 A. I think that decision would depend on the</p> <p>21 progress and outcome of negotiations at the</p> <p>22 time. You know, we're working with Canada.</p> <p>23 The province is working with Canada. I can't</p> <p>24 make a determination as to whether that's a</p> <p>25 prerequisite.</p>
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<p>1 definite point at which you know you have</p> <p>2 environmental release and you can proceed? Is</p> <p>3 that different than the aboriginal</p> <p>4 consultations?</p> <p>5 MR. BENNETT:</p> <p>6 A. It's Gilbert Bennett. Yes, we will receive</p> <p>7 ultimately a response to the Joint Panel</p> <p>8 Review Report in the form of a decision by the</p> <p>9 Federal and Provincial governments.</p> <p>10 GREENE, Q.C.:</p> <p>11 Q. And that dealt with the generation facilities?</p> <p>12 MR. BENNETT:</p> <p>13 A. Yes, that's right.</p> <p>14 GREENE, Q.C.:</p> <p>15 Q. Do you have an update as to the anticipated</p> <p>16 date for that decision?</p> <p>17 MR. BENNETT:</p> <p>18 A. Those are both Cabinet decisions and we</p> <p>19 wouldn't have a committed date from either</p> <p>20 government.</p> <p>21 GREENE, Q.C.:</p> <p>22 Q. What about the environmental assessment</p> <p>23 process for the transmission line?</p> <p>24 MR. BENNETT:</p> <p>25 A. The Environmental Impact Statement</p>	<p>1 GREENE, Q.C.:</p> <p>2 Q. So that's a maybe, okay. What about the</p> <p>3 agreement with Emera and the Maritime link?</p> <p>4 MR. BENNETT:</p> <p>5 A. The analysis that we've used for DG2 is not --</p> <p>6 does not indicate that Emera and the</p> <p>7 conclusion of those agreements is a</p> <p>8 prerequisite to selecting Muskrat Falls or the</p> <p>9 Labrador-Island link as a preferred</p> <p>10 alternative.</p> <p>11 GREENE, Q.C.:</p> <p>12 Q. Other activities that would be done before</p> <p>13 DG3, we've talked about some of them as well.</p> <p>14 One is a new load forecast. Is that correct,</p> <p>15 an update of the load forecast and the</p> <p>16 generation expansion plan?</p> <p>17 MR. HUMPHRIES:</p> <p>18 A. Yes, that's correct.</p> <p>19 GREENE, Q.C.:</p> <p>20 Q. When do you anticipate that that will be</p> <p>21 completed?</p> <p>22 MR. HUMPHRIES:</p> <p>23 A. That will be done in anticipation of DG3,</p> <p>24 which is midyear, June.</p> <p>25 GREENE, Q.C.:</p>

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1 Q. The CPW analysis, will that be updated for
2 Decision Gate 3?
3 MR. HUMPHRIES:
4 A. It's Paul Humphries. Yes, it will.
5 GREENE, Q.C.:
6 Q. And again, the timing for that?
7 MR. HUMPHRIES:
8 A. It will be at the same time of the strategist
9 analysis. It will all be done as a complete
10 package.
11 GREENE, Q.C.:
12 Q. And it all comes together in midyear, is it?
13 MR. HUMPHRIES:
14 A. Yeah.
15 GREENE, Q.C.:
16 Q. When the engineering work is done as well?
17 (11:30 a.m.)
18 MR. HUMPHRIES:
19 A. Well, there's going to be -- there will be a
20 slight delay between the finalization of costs
21 and the completion of that review and
22 analysis, updated analysis, but it will all be
23 in that general time frame, yes.
24 GREENE, Q.C.:
25 Q. And there had been a previous risk assessment,

1 Q. So the risk assessment you'll have done to
2 support the DG3 decision will identify all of
3 the major risks that you will have identified
4 at that point in time? Is that correct?
5 MR. KEAN:
6 A. Yes, that is the intention.
7 GREENE, Q.C.:
8 Q. And it will include what the mitigation
9 strategies are to deal with the identified
10 risks?
11 MR. KEAN:
12 A. Jason Kean. Yes, that is the intention.
13 GREENE, Q.C.:
14 Q. Another item that had been mentioned in the
15 documentation filed by Nalcor that was a
16 critical factor is the successful completion
17 of your pilot on the horizontal drilling. Do
18 you view that as a show stopper for DG3, in
19 other words, you must have a successful
20 completion of a pilot for the HDD drilling?
21 MR. HARRINGTON:
22 A. This is Paul Harrington. Currently, the
23 horizontal directional drilled hole is at 1.5
24 kilometres. So you know, we're pretty close
25 right now to doing the initial hole. The

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1 a project risk assessment completed for DG2.
2 Will there be an updated risk assessment
3 provided for the project as of DG3?
4 MR. KEAN:
5 A. Jason Kean. Yes, the risk assessment process
6 is an ongoing process. A thorough and
7 comprehensive risk analysis will be completed
8 pre DG3 to define the appropriate accuracy, as
9 well as a contingency recommendation.
10 GREENE, Q.C.:
11 Q. And that updated risk assessment will identify
12 the key risks as determined following your
13 detailed engineering? Is that correct? And
14 the mitigation strategies that deal with the
15 risks?
16 MR. KEAN:
17 A. Jason Kean. Risk management is an ongoing
18 activity within the project. The purpose of
19 the risk analysis is to translate -- is now
20 once you have completed a base cost and
21 schedule expectation, you consider the risks
22 that are around those and the analysis
23 facilitates a more informed decision about
24 contingencies ranges.
25 GREENE, Q.C.:

1 second part of that geotechnical information
2 that we're gathering and putting together will
3 include a reaming out of that existing hole.
4 So you know, it's not an on-off type
5 situation. We are pretty confident that we --
6 you know, that the technology is robust. We
7 just wanted to gather all of the geotechnical
8 information together on that pilot hole to
9 make sure that we weren't missing anything.
10 GREENE, Q.C.:
11 Q. So will the successful completion of the
12 pilot, will you require that that be completed
13 before you make a DG3 decision?
14 MR. HARRINGTON:
15 A. No.
16 GREENE, Q.C.:
17 Q. Okay. So that's not one, what I call a show
18 stopper?
19 MR. HARRINGTON:
20 A. No.
21 GREENE, Q.C.:
22 Q. Okay. Are there other items that must be
23 completed before you'll be able to move
24 through DG3, other than the ones we've just
25 talked about?

1 MR. HARRINGTON:

2 A. I think there was another slide which
3 identified -- again, you know, some of them
4 are within my purview and some aren't, so it's
5 difficult for me to answer that question
6 absolutely because I can't.

7 GREENE, Q.C.:

8 Q. If you look at the slide that's up there now
9 that we talked about first, slide 43, those
10 are the ones that Nalcor had outlined as being
11 required prior to DG3. We just talked about
12 some additional ones that weren't shown on
13 slide 43 and my question is: in addition to
14 what's on slide 43 and in addition to the ones
15 we just talked about, is there anything, from
16 your perspective, that needs to be completed
17 before you're in a position to make the
18 decision at DG3?

19 MR. HARRINGTON:

20 A. Paul Harrington. Looking at this list, which
21 is fairly broad, I would say that from a
22 project perspective, we've covered off all of
23 the items there.

24 GREENE, Q.C.:

25 Q. And the anticipation right now is that all of

1 GREENE, Q.C.:

2 Q. I meant in terms of a DG3 for your project
3 definition to allow you to go to tender. I
4 meant complete but for what you require for
5 DG3.

6 MR. HARRINGTON:

7 A. Well, of course, if it's complete.

8 GREENE, Q.C.:

9 Q. And all the other activities -- my only point
10 is that all of these activities are going to
11 come together in midyear so that you can make
12 a decision.

13 MR. BENNETT:

14 A. It's Gilbert Bennett. To the extent that some
15 of those factors are beyond our control, we
16 couldn't commit that they would be done
17 ultimately by midyear.

18 GREENE, Q.C.:

19 Q. And that -

20 MR. BENNETT:

21 A. But we have an expectation that, you know, if
22 those processes process normally, yes, they
23 would be complete by midyear.

24 GREENE, Q.C.:

25 Q. Okay. So that's all I was -- what is the

1 these activities will be at a point where you
2 hope to be able to make a decision
3 approximately midyear about proceeding to
4 project sanction?

5 MR. HARRINGTON:

6 A. That is correct.

7 GREENE, Q.C.:

8 Q. For all of the factors we just talked about?
9 They're all going to come together so that in
10 midyear you will be in a position to review
11 and make a recommendation on whether you have
12 successfully met DG3?

13 MR. HARRINGTON:

14 A. Paul Harrington. Yes, that is what the
15 project team is striving to achieve.

16 GREENE, Q.C.:

17 Q. Okay. So the anticipated date, not only for
18 the project engineering work to be complete
19 and the project estimate and the schedule to
20 be updated, it is actually June for all of
21 those activities? Is that what I take from
22 your response?

23 MR. HARRINGTON:

24 A. Paul Harrington here. The engineering
25 complete, I think is what you said?

1 anticipated date for all of these activities.
2 It is the same, okay. And at that point in
3 time, at DG3, we see that we do have a fuller
4 definition of the project and a more -- from
5 your perspective, you will have greater
6 confidence in the cost estimates that we have
7 before the -- than we have the estimate that's
8 now before the Board?

9 MR. HARRINGTON:

10 A. I couldn't quite hear what you said at the end
11 there, sorry.

12 GREENE, Q.C.:

13 Q. Okay. Right now, as we've already talked
14 about, the estimate that the Board has before
15 it is as of August 2010?

16 MR. HARRINGTON:

17 A. That is correct.

18 GREENE, Q.C.:

19 Q. You hope to make a decision in midyear on
20 proceeding to project sanction where you will
21 have an updated number of items that are
22 critical to you, one of which will be a new
23 cost estimate for the project which will be
24 based on a better definition as you've evolved
25 the definition of what's required for the

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<p>1 project?</p> <p>2 MR. HARRINGTON:</p> <p>3 A. Yes, that is correct.</p> <p>4 GREENE, Q.C.:</p> <p>5 Q. So approximately midyear in 2012, there will</p> <p>6 be all of this updated information available</p> <p>7 which will provide a greater -- which will be</p> <p>8 different than what's now before the Board in</p> <p>9 terms of the cost estimate, the degree of</p> <p>10 accuracy for that estimate, the project</p> <p>11 definition, et cetera?</p> <p>12 MR. HARRINGTON:</p> <p>13 A. Yes.</p> <p>14 GREENE, Q.C.:</p> <p>15 Q. I wanted now to turn to the topic of load, so</p> <p>16 perhaps Mr. Stratton might like to join the</p> <p>17 panel for this.</p> <p>18 Yesterday, Mr. Stratton, you stated that</p> <p>19 the last forecast or the forecast that was</p> <p>20 used for the analysis that is before the Board</p> <p>21 was 2010 load forecast? Is that correct?</p> <p>22 MR. STRATTON:</p> <p>23 A. Paul Stratton. Yes, that is correct.</p> <p>24 GREENE, Q.C.:</p> <p>25 Q. Okay. When does Nalcor normally prepare a</p>	<p>1 GREENE, Q.C.:</p> <p>2 Q. In terms of the forecast that was presented to</p> <p>3 the Board for the analysis for the in-feed</p> <p>4 versus Isolated island scenario, did you</p> <p>5 extend the normal time frame that you look at</p> <p>6 in doing the load forecast?</p> <p>7 MR. STRATTON:</p> <p>8 A. Yes, that is correct. Our traditional</p> <p>9 forecast would be for a period of 20 years.</p> <p>10 GREENE, Q.C.:</p> <p>11 Q. And how did you take it then from the 20-year</p> <p>12 period you normally do for the entire period</p> <p>13 for the sensitivity analysis, which is what,</p> <p>14 57 years or so after 2067?</p> <p>15 MR. STRATTON:</p> <p>16 A. Yes, the methodology that we applied in this</p> <p>17 instance was we looked at the total provincial</p> <p>18 require -- or sorry, the total island</p> <p>19 requirements of load in the latter period of</p> <p>20 the forecast and we took an average of the</p> <p>21 last five year period and projected that out</p> <p>22 an average load increment and extended that</p> <p>23 out with allowances for electric heat</p> <p>24 saturation in the province because one of the</p> <p>25 major drivers of load in the province is</p>
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<p>1 load forecast?</p> <p>2 MR. STRATTON:</p> <p>3 A. Paul Stratton. Our forecasting process is</p> <p>4 generally an annual forecast process that is</p> <p>5 undertaken in the fall of the year and is</p> <p>6 finalized sometime in the spring of the year.</p> <p>7 What's involved with that is an economic</p> <p>8 forecast from the Department of Finance that</p> <p>9 flows into that, an energy price forecast that</p> <p>10 is provided to us from the PIRA Energy Group,</p> <p>11 and our own internal estimates of wholesale</p> <p>12 pricing of electricity.</p> <p>13 GREENE, Q.C.:</p> <p>14 Q. So this is an annual exercise that you look at</p> <p>15 every year normally?</p> <p>16 MR. STRATTON:</p> <p>17 A. That is correct.</p> <p>18 GREENE, Q.C.:</p> <p>19 Q. Why wasn't it done for 2011?</p> <p>20 MR. STRATTON:</p> <p>21 A. Because of all the -- we decided to keep a</p> <p>22 consistent set of forecasts and information to</p> <p>23 flow into this, the DG2 analysis and to</p> <p>24 complete this process with the Public</p> <p>25 Utilities Board.</p>	<p>1 electric heat. Once our electric heat is</p> <p>2 saturated, then our load will be more a</p> <p>3 function of our economic growth in the</p> <p>4 province and the end, or I guess we tailored</p> <p>5 that down in the load forecast to what we</p> <p>6 expect would be an economic growth load for</p> <p>7 the island.</p> <p>8 GREENE, Q.C.:</p> <p>9 Q. One of the questions that has arisen is the</p> <p>10 length of the forecast period, and what is</p> <p>11 your level of confidence in taking out what</p> <p>12 you normally do for a 20-year forecast, out</p> <p>13 for an additional 37 years? Does that affect</p> <p>14 the confidence level you have in your load</p> <p>15 forecast?</p> <p>16 MR. STRATTON:</p> <p>17 A. I guess as a load forecaster, I would expect</p> <p>18 that as time goes out in the load forecast,</p> <p>19 there is the possibility that there would be</p> <p>20 more error in that forecast. But the</p> <p>21 methodology that we have used, as a</p> <p>22 forecaster, I believe that to be a reasonable</p> <p>23 forecast over that time.</p> <p>24 GREENE, Q.C.:</p> <p>25 Q. Okay. Looking at the industrial component of</p>

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1 the load forecast and just to get an
 2 appreciation for the size of that in
 3 comparison to the load, would you agree that
 4 the total -- the industrial load as a
 5 percentage of the total Island load can vary
 6 from 17 to 20-21 percent depending on the year
 7 we're looking at in your forecast period?
 8 MR. STRATTON:
 9 A. I think I need to see a point of reference
 10 here.
 11 GREENE, Q.C.:
 12 Q. If you want to look at Exhibit 1, Addendum 3.
 13 Normally what is the percentage of the
 14 industrial load of the total island load?
 15 That was the only question I was asking, and
 16 I'm saying it varies year by year, but roughly
 17 is in the range 17-18 percent up to 20-21
 18 percent over the forecast period.
 19 MR. STRATTON:
 20 A. I'm not sure I understand your question,
 21 sorry.
 22 GREENE, Q.C.:
 23 Q. Of the total load for the island, so much is
 24 domestic. We usually broke it down into big
 25 categories as domestic or residential load;

1 this assumption that my support team have done
 2 the calculations properly for me, because
 3 they've also -- and I don't expect you to do
 4 the calculation there, but -
 5 MR. STRATTON:
 6 A. Well, in our -
 7 GREENE, Q.C.:
 8 Q. - roughly 17 to 20 percent is the industrial
 9 load?
 10 MR. STRATTON:
 11 A. Yes, that is correct.
 12 GREENE, Q.C.:
 13 Q. Okay. And it's just to give people a context
 14 of what we're talking about. There's no trick
 15 questions. It's just to give people a
 16 context. The next is of the industrial load,
 17 what percentage is the Corner Brook load? So
 18 if we're talking roughly 20 percent as
 19 industrial load, who's your largest customer
 20 and what percentage of the industrial load is
 21 Corner Brook Pulp and Paper Mill? There see,
 22 I've given you a hint in the question of
 23 Corner Brook.
 24 MR. STRATTON:
 25 A. Corner Brook will represent the largest load

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1 there's the industrial load.
 2 MR. STRATTON:
 3 A. Correct.
 4 GREENE, Q.C.:
 5 Q. Two of them together, the residential load
 6 which in that I include general service, all
 7 of your small businesses, that plus the large
 8 industrial customers make up the total island
 9 load.
 10 MR. STRATTON:
 11 A. Correct.
 12 GREENE, Q.C.:
 13 Q. Okay. What's the breakdown between those two
 14 big components of the load? The residential
 15 load is what percent versus the industrial
 16 load?
 17 (11:45 a.m.)
 18 MR. STRATTON:
 19 A. I'm not sure I have those numbers in front of
 20 me. I can get them.
 21 GREENE, Q.C.:
 22 Q. Sure. It's only at a high level. We have a
 23 total island load composed of two big
 24 components. What's the percentage of one and
 25 roughly, if you look at it, let's accept for

1 in the industrial customer class.
 2 GREENE, Q.C.:
 3 Q. Okay. And subject to checking, will you agree
 4 that it's roughly -- it's over half of the
 5 industrial load comes from the Corner Brook
 6 Pulp and Paper mill, subject to checking?
 7 MR. STRATTON:
 8 A. Corner Brook is roughly 800 and -- sorry,
 9 roughly 960 gigawatt hour load and our total
 10 industrial load requirement I believe is
 11 approximately around 1200 gigawatt hours.
 12 GREENE, Q.C.:
 13 Q. I'm sorry, I didn't hear the last part, your
 14 total?
 15 MR. STRATTON:
 16 A. Total industrial requirements would be
 17 approximately 1200 gigawatt hours.
 18 GREENE, Q.C.:
 19 Q. And Corner Brook load is?
 20 MR. STRATTON:
 21 A. Now that's currently.
 22 GREENE, Q.C.:
 23 Q. Yes.
 24 MR. STRATTON:
 25 A. That's not in the forecast.

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1 GREENE, Q.C.:
 2 Q. Right. So if you look out over the period
 3 again at the forecast, subject to checking,
 4 you'll agree that Kruger is at least half of
 5 the load generally of the industrial load?
 6 MR. STRATTON:
 7 A. Roughly speaking, yes.
 8 GREENE, Q.C.:
 9 Q. Okay. And yesterday we had a little bit of
 10 discussion about how you determine the
 11 industrial load forecast.
 12 MR. STRATTON:
 13 A. That's correct.
 14 GREENE, Q.C.:
 15 Q. Okay. And I understand from your answer that
 16 you do that by having discussions directly
 17 with the customer because they know their
 18 business best and you -
 19 MR. STRATTON:
 20 A. That is correct.
 21 GREENE, Q.C.:
 22 Q. And in fact, you mentioned, I believe, you
 23 have two -- twice during the year, you do
 24 receive updated forecasts from your industrial
 25 customers. Is that correct?

1 with them twice a year?
 2 MR. STRATTON:
 3 A. We would -- in the past, we have always been
 4 consistent in our approach with dealing with
 5 the industrial customers and their
 6 requirements and back when Abitibi's, Abitibi
 7 Stephenville and Abitibi Grand Falls, were
 8 still operating, those forecasts would have
 9 been maintained in our forecast until the
 10 definitive notices were given to the province
 11 that they ceased to exist.
 12 GREENE, Q.C.:
 13 Q. Okay. So when you did have the updates of the
 14 industrial customer load annually, the closure
 15 of the two mills was not forecast? Is that
 16 correct, based on how you got your annual
 17 updates from them?
 18 MR. STRATTON:
 19 A. That is correct.
 20 GREENE, Q.C.:
 21 Q. You mentioned what the total requirements of
 22 the Corner Brook mill is. I believe you
 23 mentioned it was 900 and -
 24 MR. STRATTON:
 25 A. Approximately 965 gigawatt hours a year.

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1 MR. STRATTON:
 2 A. Typically we would go out for two -- twice a
 3 year for updates to their forecast, yes,
 4 that's correct.
 5 GREENE, Q.C.:
 6 Q. And you also advised that you had recent
 7 discussions with Corner Brook and that there
 8 was no significant or material change in their
 9 load forecast?
 10 MR. STRATTON:
 11 A. That is accurate.
 12 GREENE, Q.C.:
 13 Q. Is that correct?
 14 MR. STRATTON:
 15 A. That is correct.
 16 GREENE, Q.C.:
 17 Q. We have seen in the past the impact that the
 18 closures of the mills can have on the total
 19 load requirements for the island. We have
 20 seen that in some of the documentation that
 21 Nalcor has supplied how the load has dropped
 22 when the two mills owned by Abitibi closed.
 23 Did you follow the same process when you were
 24 doing the load forecast when you were
 25 supplying Abitibi, that you had discussions

1 GREENE, Q.C.:
 2 Q. Okay. For the purpose of the analysis, Hydro
 3 chose to do a sensitivity using 880 gigawatt
 4 hours, which is somewhat less than the Corner
 5 Brook load, the total requirements of the
 6 mill, and we talked yesterday about the impact
 7 that that would have. I wonder if we could go
 8 to PUB-Nalcor-51, please? And if you could
 9 scroll down? We talked about that yesterday.
 10 If the 880 gigawatt hours or the 140 megawatt
 11 load is taken out of the forecast starting in
 12 2013 -- so if the load is lost and we don't
 13 have -- that amount of load is lost, there was
 14 a question yesterday with respect to the
 15 impact that that would have on the capacity
 16 deficit and the energy deficit and I wonder,
 17 Mr. Humphries, in terms of that, again subject
 18 to check, for the calculations done, would you
 19 agree that the capacity deficit is probably
 20 2020-2021?
 21 MR. HUMPHRIES:
 22 A. Yes, I'd agree it's in that range.
 23 GREENE, Q.C.:
 24 Q. Okay. And the energy deficit would be into
 25 2030-2031?

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1 MR. HUMPHRIES:
 2 A. Subject to check, yes, I agree with that.
 3 GREENE, Q.C.:
 4 Q. And I'm just checking my numbers as well for -
 5 - I think I gave you the right numbers that --
 6 so if that amount of load is lost, it has a
 7 significant impact on when capacity is
 8 required and energy as well? Is that correct?
 9 MR. HUMPHRIES:
 10 A. Yes, it would.
 11 GREENE, Q.C.:
 12 Q. And I just wonder because the MHI report
 13 referred to the significance of the industrial
 14 load for the total island load requirement,
 15 given the small nature of our industrial base,
 16 three customers going to one and additional
 17 one, and with the history of the two mill
 18 closures and with the significance of this
 19 type of load on your generation expansion
 20 plan, has Hydro considered doing any
 21 independent studies with respect to the pulp
 22 and paper industry in the province and its
 23 forecast future?
 24 MR. HUMPHRIES:
 25 A. No, we have not.

1 reduction were to come prior, obviously the
 2 urgency of the decision to make a capacity or
 3 energy decision has changed.
 4 GREENE, Q.C.:
 5 Q. So given that, one of the considerations is --
 6 or has Nalcor considered moving in an
 7 incremental way to put -- right now a capacity
 8 deficit in 2015 and your energy deficit is
 9 what, 2020-2021? Would you consider putting
 10 in something to address the peaking problem
 11 before you run into the energy problem by
 12 adding a combustion turbine or doing a small
 13 hydro site to gain additional certainty with
 14 respect to the future load of your industrial
 15 customer group?
 16 MR. HUMPHRIES:
 17 A. Well, in reality, that's what's happening. We
 18 are adding a combustion turbine for the
 19 capacity issue in for 2015. So that window,
 20 our energy deficit is 2020. So there is a
 21 time frame there.
 22 GREENE, Q.C.:
 23 Q. In terms of adding additional combustion
 24 turbines.
 25 MR. HUMPHRIES:

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1 GREENE, Q.C.:
 2 Q. The sensitivity or the analysis supplied to
 3 the Board assumes that the Corner Brook load
 4 is there until 2067? Is that correct?
 5 MR. STRATTON:
 6 A. Paul Stratton. Yes, that's correct.
 7 GREENE, Q.C.:
 8 Q. Okay. And we also heard yesterday, of course,
 9 that there's also an assumption that there is
 10 no new industrial load?
 11 MR. STRATTON:
 12 A. That is correct as well.
 13 GREENE, Q.C.:
 14 Q. Have you considered doing any sensitivities
 15 around the impact on the generation expansion
 16 plan of the loss of a significant industrial
 17 load and how that will be factored into your
 18 analysis?
 19 MR. HUMPHRIES:
 20 A. Paul Humphries. Again, the timing of that
 21 reduction is a significant factor. If that
 22 reduction in load would come post the Muskrat
 23 Falls decision, I think the analysis has shown
 24 that the Interconnected alternative is still
 25 the cost effective choice. But prior -- if the

1 A. Beyond the -
 2 GREENE, Q.C.:
 3 Q. Yeah. The one that you've already built into
 4 your plan.
 5 MR. HUMPHRIES:
 6 A. No, we really haven't considered that, no.
 7 GREENE, Q.C.:
 8 Q. I'd like to look at the load growth in
 9 Labrador in so far as it impacts the load on
 10 the island and I wonder if you would go to
 11 PUB-Nalcor 16, please, Mr. McNiven?
 12 MR. MCNIVEN:
 13 A. 16?
 14 GREENE, Q.C.:
 15 Q. 16. There's been -- Mr. Johnson brought you
 16 to some commentary in the media in his
 17 questions yesterday. Another one as -- and we
 18 just talked about another issue that has been
 19 in the media which was the future of the
 20 Corner Brook mill. This one deals with the
 21 media coverage of potential load growth in
 22 Labrador and this one is framed in terms of a
 23 specific -- a potential specific load growth
 24 and I'd like you to comment first about the
 25 potential for the load growth for Rio Tinto

1 with respect to the mine in Labrador, given
 2 there's been so much media attention to it.
 3 Is Nalcor aware of future load requirements of
 4 expansion?
 5 MR. HUMPHRIES:
 6 A. Yes, we are.
 7 GREENE, Q.C.:
 8 Q. And what is the order of magnitude of that?
 9 Because based on the media reports, it would
 10 be a very significant increase in load for
 11 you.
 12 MR. HUMPHRIES:
 13 A. It has the potential to be a significant
 14 increase in load, yes.
 15 GREENE, Q.C.:
 16 Q. The question was if that load were to
 17 materialize as you just -- as the
 18 announcements in the media, what impact it
 19 would have on your generation expansion plan?
 20 And when you say it would be a significant
 21 expansion of load, could you indicate an order
 22 of magnitude that you are -- is the potential
 23 you're talking about?
 24 MR. HUMPHRIES:
 25 A. It could be up to a 500 megawatt load,

1 MR. HUMPHRIES:
 2 Q. It's less speculative than the aluminum
 3 smelter--it would be less speculative than the
 4 aluminum smelter, but it's still not what we
 5 would consider a firm request.
 6 GREENE, Q.C.:
 7 Q. And how does Nalcor then plan for future
 8 potential load growth? Do you need a signed
 9 power contract? How do you build that into
 10 your planning?
 11 MR. HUMPHRIES:
 12 A. Well generally on the Island--in the Island
 13 scenario, yes, we would have to have a firm
 14 commitment from a customer because in most
 15 cases it would involve a requirement to build
 16 and add additional resource, so--and there
 17 would be a lead time, be it three to five
 18 years, whatever would be required to establish
 19 that generation.
 20 GREENE, Q.C.:
 21 Q. So if we were fortunate enough for a large
 22 customer to come, you'd say, sorry, we--come
 23 back in three or five years?
 24 MR. HUMPHRIES:
 25 A. No, that's not necessarily the case, there are

1 additional load.
 2 GREENE, Q.C.:
 3 Q. Are there other potential load growth that you
 4 expect in Labrador--or that is anticipated in
 5 the same way as Rio Tinto?
 6 MR. HUMPHRIES:
 7 A. Well there are numerous, I guess,
 8 opportunities in Labrador, as there have been
 9 for the past twenty years we've been talking
 10 about load increases in Labrador, and we
 11 continually interface with these potential
 12 customers, but we have no firm commitment from
 13 either of those yet, including IOC, so it's
 14 difficult to incorporate that into the
 15 planning process in any real kind of way that
 16 you would commit dollars to, to address until
 17 we have a firm commitment.
 18 GREENE, Q.C.:
 19 Q. In the past there has been also a discussion
 20 about an aluminum smelter which was--didn't
 21 occur, I'd say that was speculative, are you
 22 saying that the potential for the expansion in
 23 Labrador that we're talking about here is as
 24 speculative as the aluminum smelter would have
 25 been?

1 things that you could do in the interim,
 2 particularly in Labrador. On the Island, an
 3 isolated scenario is you don't have many
 4 options; there's not much you can do. But in
 5 Labrador, we do have existing recall energy,
 6 there's the opportunity to import energy for a
 7 customer in the interim, and if we do build
 8 Muskrat Falls, there will be excess capacity
 9 in Muskrat Falls available to supply a new
 10 customer in short notice.
 11 (12:00 p.m.)
 12 GREENE, Q.C.:
 13 Q. That's a good lead into where I wanted to go
 14 next. If we scroll down to--the question was:
 15 If the load materialized, how would you meet
 16 the load? So if you can please keep going
 17 down, the answer was--it's the next page
 18 actually--the answer was that in the event any
 19 of the projects proceed, you would have two
 20 terawatt hours of production available from
 21 Muskrat 'cause this is what you don't require
 22 and you don't have it committed to Emera, so
 23 rather than selling out west, you'll use it in
 24 Labrador and also your recall power. And then
 25 we have Cull Island at the larger site would

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<p>1 also be available to meet those needs. So</p> <p>2 they would have to be, Gull Island would have</p> <p>3 to be developed, of course, which would--if</p> <p>4 these loads materialize?</p> <p>5 HUMPHRIES:</p> <p>6 A. Well again it depends on the ultimate size, if</p> <p>7 it's an extremely large load, Gull Island may</p> <p>8 make sense, but there are also alternatives</p> <p>9 available on the Island that we could develop,</p> <p>10 the remaining hydros and wind, now the fact</p> <p>11 that we would have an interconnection, that</p> <p>12 would help to address a, what I would call a</p> <p>13 medium size problem.</p> <p>14 GREENE, Q.C.:</p> <p>15 Q. So there would be future developments to</p> <p>16 address it. Can we go, please, to PUB-NALCOR-</p> <p>17 72? I will give you a moment to read that,</p> <p>18 Mr. Humphries. This talks about if the load</p> <p>19 materializes in Labrador, just as announced by</p> <p>20 IOC or Rio Tinto, how that would use the</p> <p>21 energy from Muskrat Falls and if you read</p> <p>22 through, I'll give you a moment, but the</p> <p>23 question will be is that by 2027 all of</p> <p>24 Muskrat Falls would be required to supply the</p> <p>25 load and then we would start to see a deficit</p>	<p>1 A. Depending on the size of the load, we could</p> <p>2 have a significant impact on expansion plan,</p> <p>3 yes.</p> <p>4 GREENE, Q.C.:</p> <p>5 Q. Is Nalcor in discussions now? And I'm not</p> <p>6 going to the content of the discussions, but</p> <p>7 do you have any expectation as to when there</p> <p>8 might be greater certainty with respect to</p> <p>9 these potential loads in Labrador?</p> <p>10 MR. HUMPHRIES:</p> <p>11 A. No, I do not.</p> <p>12 GREENE, Q.C.:</p> <p>13 Q. I'd like to turn now to the issue of the</p> <p>14 probabilistic reliability assessment and MHI's</p> <p>15 recommendations that that type of reliability</p> <p>16 assessment be completed certainly before</p> <p>17 decision gate 3? I wonder if you could bring</p> <p>18 up slide 65, Mr. McNiven, from Nalcor's</p> <p>19 presentation yesterday. So here Nalcor is</p> <p>20 responding to one of MHI's recommendations and</p> <p>21 if you go to the next slide please? I took</p> <p>22 that slide and your information yesterday to</p> <p>23 be that you are agreeing with MHI's</p> <p>24 recommendation and that you will be doing the</p> <p>25 type of probabilistic reliability assessment</p>
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<p>1 on the Island.</p> <p>2 MR. HUMPHRIES:</p> <p>3 A. Could you page down a bit please?</p> <p>4 GREENE, Q.C.:</p> <p>5 Q. So the idea being that yes, if this load</p> <p>6 materializes and if you're going to use</p> <p>7 Muskrat to supply it, we're going to run out</p> <p>8 of Muskrat energy to meet the Island load</p> <p>9 requirements in the--around 2027, so you would</p> <p>10 have to develop something else for the Island?</p> <p>11 MR. HUMPHRIES:</p> <p>12 A. We would have to develop another source,</p> <p>13 whether it was for the Island or alternately -</p> <p>14 GREENE, Q.C.:</p> <p>15 Q. Right, so this could have a significant impact</p> <p>16 then on the generation expansion plan, should</p> <p>17 the--for the Island, should the Industrial</p> <p>18 load actually develop in Labrador?</p> <p>19 MR. HUMPHRIES:</p> <p>20 A. It would have an effect on the expansion plan</p> <p>21 overall, yes.</p> <p>22 GREENE, Q.C.:</p> <p>23 Q. And it would be a significant impact,</p> <p>24 depending on the size of the load?</p> <p>25 MR. HUMPHRIES:</p>	<p>1 for the overall in-feed option, including the</p> <p>2 generation facility and the link as</p> <p>3 recommended by MHI. Is that what I should</p> <p>4 have taken from that?</p> <p>5 MR. HUMPHRIES:</p> <p>6 A. Yeah, we will be doing the probabilistic</p> <p>7 models for the link and incorporating that in</p> <p>8 our probabilistic generation expansion</p> <p>9 analysis, yes. So the probabilistic--the</p> <p>10 forced outage rate which we are currently</p> <p>11 using in our analysis was based on a previous</p> <p>12 probabilistic model and then we agree it was</p> <p>13 old and dated, but we are currently in the</p> <p>14 process of updating that model to reflect the</p> <p>15 current thinking of the Muskrat Falls Maritime</p> <p>16 Link and that will be incorporated in the new</p> <p>17 analysis for DG3.</p> <p>18 GREENE, Q.C.:</p> <p>19 Q. You're talking about the PTI studies for the</p> <p>20 1980s?</p> <p>21 MR. HUMPHRIES:</p> <p>22 A. Yes, I am.</p> <p>23 GREENE, Q.C.:</p> <p>24 Q. So you have accepted MHI's recommendation?</p> <p>25 MR. HUMPHRIES:</p>

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<p>1 A. Yes.</p> <p>2 GREENE, Q.C.:</p> <p>3 Q. Was there any reason why you hadn't updated</p> <p>4 the 1980 studies prior to now?</p> <p>5 MR. HUMPHRIES:</p> <p>6 A. We're in the process, for DG2 we did not have</p> <p>7 them updated, we were in the process of</p> <p>8 updating.</p> <p>9 GREENE, Q.C.:</p> <p>10 Q. On the NERC Standards, I'd like to go to that</p> <p>11 recommendation. Again you addressed that</p> <p>12 yesterday and that would be slide 69, Mr.</p> <p>13 McNiven. Does Nalcor agree that compliance</p> <p>14 with NERC's Standards now has become part of</p> <p>15 the phrase "good utility practice" which is</p> <p>16 commonly used by utilities, they state they're</p> <p>17 complying with good utility practice and right</p> <p>18 now in Canada that would include compliance</p> <p>19 with NERC's Standards?</p> <p>20 MR. HUMPHRIES:</p> <p>21 A. Compliance with NERC's Standards in Canada is</p> <p>22 still mandatory--or still discretionary or</p> <p>23 voluntary, sorry, so again it's left up to the</p> <p>24 discretion of the jurisdiction in question,</p> <p>25 but when we look at dealing with entities in</p>	<p>1 actual level of compliance that would be</p> <p>2 required to satisfy the--NPCC, Northeast Power</p> <p>3 Co-ordinating Council requirements for full</p> <p>4 membership. Whether that would mean a blanket</p> <p>5 adoption of all the reliability standards or a</p> <p>6 portion of those, or adapting some of those to</p> <p>7 current situations, particularly on the Island</p> <p>8 system where we're exploring those</p> <p>9 opportunities and we feel, because of the</p> <p>10 nature of the connection that we have or will</p> <p>11 have with the North American grid, both to</p> <p>12 Labrador and to Nova Scotia, if that happens,</p> <p>13 because it's a HVDC link, the significance of</p> <p>14 reliability events on the Island will have</p> <p>15 less of an impact on the neighbouring</p> <p>16 jurisdictions. So some of the conditions on</p> <p>17 the Island that may not necessarily comply</p> <p>18 fully with NERC Standards at this stage, it</p> <p>19 may not be mandatory that we would need those</p> <p>20 in place, day one, or even ever and they could</p> <p>21 be grandfathered.</p> <p>22 GREENE, Q.C.:</p> <p>23 Q. I am going to ask you about the implications</p> <p>24 of that for your interconnection with Nova</p> <p>25 Scotia, just in July, 2011, the Nova Scotia</p>
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<p>1 the United States or participating in the</p> <p>2 market, the significance of these standards</p> <p>3 becomes more important and in some cases would</p> <p>4 be considered mandatory for operating in those</p> <p>5 markets.</p> <p>6 GREENE, Q.C.:</p> <p>7 Q. It's my understanding that eight of the ten</p> <p>8 provinces, the utilities in eight of ten</p> <p>9 provinces now comply with NERC Standards, with</p> <p>10 the only two exceptions being PEI and</p> <p>11 Newfoundland, is that your understanding?</p> <p>12 MR. HUMPHRIES:</p> <p>13 A. I think that's correct.</p> <p>14 GREENE, Q.C.:</p> <p>15 Q. If we look at slide 69 and this was in</p> <p>16 response to the recommendation in the MHI</p> <p>17 report that Nalcor undertake a self assessment</p> <p>18 and get ready for compliance with NERC. I</p> <p>19 wasn't sure and this is one I wanted Nalcor to</p> <p>20 comment on, as to whether they agree with that</p> <p>21 recommendation or not and what action they're</p> <p>22 taking in response to it?</p> <p>23 MR. HUMPHRIES:</p> <p>24 A. Yes, we agree with that and we are doing a</p> <p>25 self assessment prior to DG3 to determine the</p>	<p>1 Utility Board has mandated that Nova Scotia</p> <p>2 Power follow NERC Standards. Have you looked</p> <p>3 at the implications of if there is to be an</p> <p>4 interconnection with Nova Scotia, what that</p> <p>5 will mean for Newfoundland?</p> <p>6 MR. HUMPHRIES:</p> <p>7 A. Yes, and we have to look at what it means for</p> <p>8 Newfoundland as opposed to what means to Nova</p> <p>9 Scotia as well.</p> <p>10 GREENE, Q.C.:</p> <p>11 Q. Um.</p> <p>12 MR. HUMPHRIES:</p> <p>13 A. Yes, we enter in discussion with ourselves and</p> <p>14 Nova Scotia and the regulator to determine</p> <p>15 what those implications are.</p> <p>16 GREENE, Q.C.:</p> <p>17 Q. And are you able to say at this point in time</p> <p>18 in that consideration whether it will require</p> <p>19 additional work to be included with respect to</p> <p>20 any aspects of the Muskrat Falls project,</p> <p>21 which would affect the project definition</p> <p>22 and/or the project costs?</p> <p>23 MR. HUMPHRIES:</p> <p>24 A. I'm not in a position to say definitely, no, I</p> <p>25 am not.</p>

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<p>1 GREENE, Q.C.:</p> <p>2 Q. Do you anticipate that it will?</p> <p>3 MR. HUMPHRIES:</p> <p>4 A. We don't anticipate that it will be</p> <p>5 significant.</p> <p>6 GREENE, Q.C.:</p> <p>7 Q. Some--you mentioned that the current</p> <p>8 reliability criteria, you would be assessing</p> <p>9 those as well with the compliance with respect</p> <p>10 to NERC? Can you just give a little, perhaps</p> <p>11 overview from your perspective the differences</p> <p>12 between Nalcor's or Hydro's planning criteria</p> <p>13 and system operational requirements and what</p> <p>14 would be required if you do--if you are</p> <p>15 required to meet NERC's Standards?</p> <p>16 MR. HUMPHRIES:</p> <p>17 A. From the perspective of the basic philosophies</p> <p>18 of our criterias, again, they are very</p> <p>19 similar. The major differences are how we</p> <p>20 respond to contingency situations and in</p> <p>21 certain scenarios, the level of redundancy</p> <p>22 when they have internal stations and those</p> <p>23 types of things, like backup power supplies</p> <p>24 and redundant systems. Those are the bigger</p> <p>25 differences, but from the perspective of how</p>	<p>1 source of supply for the city. If we were to</p> <p>2 lose one of those stations, it has an impact</p> <p>3 to us internally, but it's not likely that it</p> <p>4 was affect anything beyond our borders. So</p> <p>5 the requirement to make NERC compliance</p> <p>6 applicable to Hardwoods or Oxen Pond Terminal</p> <p>7 Station would be our own decision which we</p> <p>8 would make based on an economic decision at</p> <p>9 the time. It wouldn't be required to be</p> <p>10 complaint to interface with the rest of the</p> <p>11 network.</p> <p>12 (12:45 p.m.)</p> <p>13 GREENE, Q.C.:</p> <p>14 Q. And can you explain, just so people</p> <p>15 understand, if something were to happen at</p> <p>16 Oxen Pond or Hardwoods, in your example, for</p> <p>17 the terminal station there was less power</p> <p>18 available to Newfoundland, are you saying that</p> <p>19 you wouldn't reduce your exports to Nova</p> <p>20 Scotia, it would be Newfoundland you would</p> <p>21 take it from?</p> <p>22 MR. HUMPHRIES:</p> <p>23 A. There's nothing that would happen at Hardwoods</p> <p>24 and Oxen Pond that would make less power</p> <p>25 available, it would make less power available</p>
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<p>1 they will affect our requirements to the NERC</p> <p>2 complaint, the biggest factor is do these</p> <p>3 deficiencies, could they have an impact on the</p> <p>4 reliability of our neighbouring systems. And</p> <p>5 as I said earlier, because of the DC link</p> <p>6 connections, the likelihood of any of these</p> <p>7 events causing issues is low and if we go</p> <p>8 through a process and demonstrate this to the</p> <p>9 regulatory councils, there's no reason to</p> <p>10 expect that these deficiencies cannot be</p> <p>11 grandfathered in because they're of no problem</p> <p>12 to anyone, other than ourselves.</p> <p>13 GREENE, Q.C.:</p> <p>14 Q. Just to follow up on that, my understanding of</p> <p>15 what you just said is if we can shut off</p> <p>16 Newfoundland so that it does not impact the</p> <p>17 supply, going to Nova Scotia is not an issue</p> <p>18 because as long as you can firewall Nova</p> <p>19 Scotia, Newfoundland won't have to be</p> <p>20 compliant with NERC Standards?</p> <p>21 MR. HUMPHRIES:</p> <p>22 A. No, that's not what I said, I said like for,</p> <p>23 let's take an example of our Hardwoods</p> <p>24 Terminal Station or our Oxen Pond Terminal</p> <p>25 Station here in the city, they are the largest</p>	<p>1 to a pocket of customers in the St. John's</p> <p>2 area, but it would not affect our interfaces</p> <p>3 with either Quebec through Labrador, or Nova</p> <p>4 Scotia via the Maritime Link.</p> <p>5 GREENE, Q.C.:</p> <p>6 Q. I just wanted to make sure that was</p> <p>7 understood. The other--in your planning</p> <p>8 criteria one of the differences with NERC is</p> <p>9 on the generation, whether you have backup</p> <p>10 generation. The Newfoundland standard is, the</p> <p>11 two, the loss of load hour expectation, how</p> <p>12 does that compare to a NERC Standard?</p> <p>13 MR. HUMPHRIES:</p> <p>14 A. Well again, our LOLH, loss of load hours, I</p> <p>15 guess that's what you're speaking of, for the</p> <p>16 Island is--right now it's 2.8 hours and that,</p> <p>17 to take it back in, it means, it represents an</p> <p>18 issue of an outage of one in five years, a</p> <p>19 probability of one in five years of not being</p> <p>20 able to serve their load.</p> <p>21 GREENE, Q.C.:</p> <p>22 Q. So that means the Newfoundland system is built</p> <p>23 to that standard -</p> <p>24 MR. HUMPHRIES:</p> <p>25 A. It's built to that--that's the standard in</p>

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1 which we progress to before we would initiate
 2 additional additions of capacity or grant
 3 capacity 'because it's a capacity factor. In
 4 the North American Standard, it's double that,
 5 one in ten years. By virtue of the fact that
 6 we will have an interconnection to the North
 7 American grid and we're part of that network
 8 and could enter into reserve sharing
 9 agreements with our neighbours, to comply with
 10 a one in ten year is not a large issue, it
 11 happens naturally. The reserves are there and
 12 it would not bring any additional -
 13 GREENE, Q.C.:
 14 Q. So you would address it by dealing with
 15 interconnection agreements with -
 16 MR. HUMPHRIES:
 17 A. Reserve sharing agreements with our neighbours
 18 and things like that.
 19 GREENE, Q.C.:
 20 Q. But through the interconnection.
 21 MR. HUMPHRIES:
 22 A. Yes, through the interconnection.
 23 GREENE, Q.C.:
 24 Q. I want now to turn to the fuel price forecast.
 25 I guess we've seen that one of the critical

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1 factors is fuel price and that the fuel costs
 2 make up about 70 percent of the cost for the
 3 Isolated Island Option. So in order to swing
 4 the preference, it's pretty hard without some
 5 impact on the fuel. So on of the key
 6 assumptions you used in doing the CPW analysis
 7 is the forecast price of fuel for the forecast
 8 period. And we talked a little bit about that
 9 yesterday. So how long was the period that
 10 you forecasted fuel prices for, Mr. Goudie?
 11 MR. GOUDIE:
 12 A. Steve Goudie. The PIRA based forecast goes
 13 from 2010 to 2025 and then we extend that out,
 14 we hold the 2025 price constant in real terms,
 15 and then we just extend that out by the
 16 general inflation rate of two percent.
 17 GREENE, Q.C.:
 18 Q. So you forecast the price of oil out to 2067,
 19 which is the length of the forecast period?
 20 MR. GOUDIE:
 21 A. We do.
 22 GREENE, Q.C.:
 23 Q. And just to give people an appreciation for
 24 the prices that you're talking about
 25 throughout that period, perhaps if we could go

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1 to Nalcor's submission, page 38?
 2 MR. MCNIVEN:
 3 GREENE, Q.C.:
 4 Q. Is that the book Volume 1?
 5 GREENE, Q.C.:
 6 Q. Yes, sorry, Volume 1. So if you could bring
 7 it up a little bit higher on the screen to
 8 see. So can you just take us through some of
 9 the key--the time periods here and what you
 10 have used in the base case at relevant
 11 periods, because this is the forecast you
 12 used, as I understand it, in the analysis for
 13 the price of fuel in your analysis.
 14 MR. GOUDIE:
 15 A. The columns labelled Reference Forecast at
 16 January 2010 are the prices that entered into
 17 the CPW analysis.
 18 GREENE, Q.C.:
 19 Q. And if you scroll to the bottom, so in 2025,
 20 the forecast would have been 145 dollars and
 21 can you explain the difference between when
 22 you used .7 percent fuel and 2.2 percent fuel,
 23 why you are showing both columns on the page?
 24 MR. GOUDIE:
 25 A. Under the Isolated Island Strategist run, we

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1 used 0.7 percent low sulphur fuel until the
 2 scrubbers are in service and then we -
 3 GREENE, Q.C.:
 4 Q. Which is when? 2020?
 5 MR. GOUDIE:
 6 A. 2015, around 2015, and then we revert to a
 7 higher sulphur fuel of 2.2 percent and then we
 8 utilize that fuel out to the end of the
 9 service life in the Holyrood units.
 10 GREENE, Q.C.:
 11 Q. So in this particular reference you stopped at
 12 2025, can you give some indication what the
 13 numbers were past that? Say, 2040, what would
 14 you have used for number 2.2 fuel then?
 15 MR. GOUDIE:
 16 A. All forecasts beyond the 2025 planning horizon
 17 here would have been escalated at a two
 18 percent inflation rate.
 19 GREENE, Q.C.:
 20 Q. So if I did that, what would I have for 2.2
 21 percent fuel in 2067?
 22 MR. GOUDIE:
 23 A. In 2067? I don't have that now right here in
 24 front of me, but I think our point would be
 25 that they are constant in real terms. We are

1 not escalating above the rate of inflation.
 2 GREENE, Q.C.:
 3 Q. And so when you looked at the fuel price, we
 4 saw already that it is one of the biggest
 5 movers in the CPW analysis, can we look at RFI
 6 MHI-Nalcor 41, Rev1 for sensitivity please?
 7 Page 2. And one of the ones that Mr. Johnson
 8 talked about yesterday in looking at the
 9 sensitivities, was where there was a decrease
 10 of fuel cost by 44 percent and I just wanted
 11 you to explain what is that 44 percent from?
 12 Is it from those fuel prices we just talked
 13 about?
 14 MR. GOUDIE:
 15 A. It's 44 percent across the board decrease in
 16 the reference prices that were in the
 17 Strategist run.
 18 GREENE, Q.C.:
 19 Q. Right, so the forecast that we just looked at,
 20 all of the prices would be 44 percent lower?
 21 MR. GOUDIE:
 22 A. Yes, that's correct.
 23 GREENE, Q.C.:
 24 Q. In terms of looking at that, I think you
 25 already indicated that fuel is about 70

1 MR. GOUDIE:
 2 A. Well we handle it by going in with a reputable
 3 company that produces a comprehensive analysis
 4 behind their fuel price projections. We do
 5 sensitivity analysis to understand the
 6 leverage that alternative price projections to
 7 our reference case would have on our base case
 8 results. I mean, the uncertainty is
 9 prevailing and one of the reasons why we
 10 analyze and ultimately recommend an
 11 Interconnected Island Option is exactly to
 12 get rid of that uncertainty because if that
 13 uncertainty ever comes home to roost on the
 14 wrong side, electricity will be very un-
 15 affordable on the Island of Newfoundland.
 16 GREENE, Q.C.:
 17 Q. So that's the uncertainty--the probability
 18 that it will probably go higher, rather than
 19 lower in your base case.
 20 MR. GOUDIE:
 21 A. Well I mean, based on PIRA's, you know,
 22 professional assessment, they have the high
 23 and low and pretty well even odds, but they
 24 are based on specific analysis that they do.
 25 GREENE, Q.C.:

1 percent of the cost in the Isolated Island of
 2 the 8.8 billion?
 3 MR. GOUDIE:
 4 A. It is 70 percent of the CPW, yes, that's
 5 correct.
 6 GREENE, Q.C.:
 7 Q. And as these sensitivities illustrate that
 8 changes in the fuel price have a significant
 9 impact on the preference?
 10 MR. GOUDIE:
 11 A. It does.
 12 GREENE, Q.C.:
 13 Q. One of the, again the public issues that
 14 there's been comment about is the difficulty
 15 in forecasting fuel prices. We don't know
 16 next week, because if we did, I guess we may--
 17 if we had that ability to actually determine
 18 fuel price, we'd probably all be somewhere
 19 else, but because there's so much uncertainty
 20 around it, we don't know what it would be, as
 21 evidenced by fuel by fuel price variability in
 22 the last few years. How does Nalcor take that
 23 into account, the difficulty in forecasting
 24 fuel prices over the 57 year analysis period?
 25 What weight do you place on that risk?

1 Q. And we've heard that PIRA is a provider of
 2 fuel price forecast, have you considered or
 3 reviewed getting forecasts from other known
 4 fuel price forecasters?
 5 MR. GOUDIE:
 6 A. Not -
 7 GREENE, Q.C.:
 8 Q. How did you select PIRA for example, and have
 9 you considered others?
 10 MR. GOUDIE:
 11 A. Well we selected PIRA back in the late 1990s
 12 because we were all in need of a reputable
 13 company that could assist Hydro in putting
 14 forward projections for its bunker fuel cost
 15 at Holyrood from a company that would be
 16 basically accepted by the PUB and by the
 17 Intervenors. When we considered them
 18 initially, we looked at their client list and
 19 their reputation and I mean, today PIRA has an
 20 excess of 500 clients around the world, all of
 21 the major oil and gas companies subscribe to
 22 PIRA services, all of energy marketers,
 23 petroleum refineries, all major world
 24 commercial banks, so they are well respected
 25 in the energy market analysis field.

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<p>1 GREENE, Q.C.:</p> <p>2 Q. Have you considered using any other provider</p> <p>3 of that forecast--in recent years?</p> <p>4 MR. GOUDIE:</p> <p>5 A. In this review, we have not explicitly</p> <p>6 considered anybody else, but we have been</p> <p>7 mindful of where other projections are that</p> <p>8 are publicly available, such as EIA or NEB.</p> <p>9 GREENE, Q.C.:</p> <p>10 Q. And as we heard yesterday, Nalcor's evidence</p> <p>11 is that those costs, their projections are</p> <p>12 consistent when you look at the fact that they</p> <p>13 are--how you have done the forecast, one is in</p> <p>14 constant dollars and one is not?</p> <p>15 MR. GOUDIE:</p> <p>16 A. Yes, that's correct, yes. Our projections are</p> <p>17 all in nominal dollars.</p> <p>18 GREENE, Q.C.:</p> <p>19 Q. Thank you, Mr. Chair, that is a convenient</p> <p>20 place to break, in terms of the flow if it's</p> <p>21 convenient -</p> <p>22 CHAIRMAN:</p> <p>23 Q. Okay, we'll break for lunch. I just got one</p> <p>24 quick request arising from this navigant issue</p> <p>25 here and I'd just like you to run the numbers,</p>	<p>1 morning there may have been some difficulty in</p> <p>2 hearing me.</p> <p>3 O'REILLY, Q.C.:</p> <p>4 Q. Much better.</p> <p>5 GREENE, Q.C.:</p> <p>6 Q. Okay, good. I was going to say if at the back</p> <p>7 of the room, if you can just wave your hand</p> <p>8 and I'll know that you want me to speak up</p> <p>9 louder or over on the panel as well if you</p> <p>10 can't hear me, please let me know. I do have</p> <p>11 a few follow-up questions to the topics that</p> <p>12 we had talked about before lunch. And first,</p> <p>13 I'd like to talk about the Probabilistic</p> <p>14 Reliability Assessment, and Mr. Humphries, you</p> <p>15 indicated that you would be following up,</p> <p>16 Nalcor would, and would be completing a</p> <p>17 Probabilistic Reliability Assessment and spoke</p> <p>18 specifically with respect to key finding No.</p> <p>19 5. I'd like, please, Mr. McNiven, if you</p> <p>20 could bring up the MHI report, volume 1, page</p> <p>21 9. And there was some uncertainty among my</p> <p>22 colleagues as to whether your answer included</p> <p>23 that key finding which is No. 6 and if the</p> <p>24 Probabilistic Reliability Assessment Study to</p> <p>25 be undertaken is in the process, as I</p>
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<p>1 assuming the carbon pricing comes in effect in</p> <p>2 2017, what would that mean in terms of a</p> <p>3 carbon charge per domestic rate payer in</p> <p>4 Newfoundland? Because I mean I see you got</p> <p>5 2.65 million, it's driven up, it rises to 2.65</p> <p>6 million because of the incidents of carbon</p> <p>7 pricing. And what would interest me is from a</p> <p>8 domestic rate payer, what would that mean if</p> <p>9 this should come to pass?</p> <p>10 MR. GOUDIE:</p> <p>11 A. Okay, we'll take that one.</p> <p>12 CHAIRMAN:</p> <p>13 Q. Thank you.</p> <p>14 GREENE, Q.C.:</p> <p>15 Q. We'll reconvene at 2:00 Mr. Chair?</p> <p>16 CHAIRMAN:</p> <p>17 Q. Yes, sorry, 2:00 we'll start again.</p> <p>18 (12:30 p.m.)</p> <p>19 (Adjourned for Lunch)</p> <p>20 (2:03 p.m.)</p> <p>21 CHAIRMAN:</p> <p>22 Q. So I think we're--are there any preliminary</p> <p>23 matters? So I think we're back to</p> <p>24 GREENE, Q.C.:</p> <p>25 Q. Thank you, Mr. Chair. I understand this</p>	<p>1 understand it right now, by Nalcor, will</p> <p>2 address the full extent of those studies that</p> <p>3 are described in key finding No. 6.</p> <p>4 MR. HUMPHRIES:</p> <p>5 A. Okay, with respect to the studies identified</p> <p>6 in Section 6, the ongoing work, no, it does</p> <p>7 not address those level of studies. Nalcor is</p> <p>8 aware, I guess, that these types of studies</p> <p>9 have been done and are done in other</p> <p>10 jurisdictions, but to date they have not been</p> <p>11 adopted as part of our normal decision-making</p> <p>12 process in the least cost analysis process.</p> <p>13 GREENE, Q.C.:</p> <p>14 Q. So before lunch when you said that Nalcor was</p> <p>15 updating the PTI report and was completing a</p> <p>16 Probabilistic Reliability Assessment, you were</p> <p>17 talking about only the type of work PTI had</p> <p>18 done in the 80s, which goes back to key</p> <p>19 finding No. 5, the forced outage rate update?</p> <p>20 MR. HUMPHRIES:</p> <p>21 A. That's correct.</p> <p>22 GREENE, Q.C.:</p> <p>23 Q. Well I guess I should ask you a few more</p> <p>24 questions then.</p> <p>25 MR. HUMPHRIES:</p>

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1 A. Sure.

2 GREENE, Q.C.:

3 Q. Because I had taken your answer to be that you

4 were addressing both of those key findings and

5 were accepting both of the recommendations.

6 Are you familiar with the Probabilistic

7 Reliability Assessments as discussed in the

8 MHI report and as recommended by MHI?

9 MR. HUMPHRIES:

10 A. Yes, I am familiar.

11 GREENE, Q.C.:

12 Q. Are you aware that other major utilities use

13 those type of assessments for major projects?

14 MR. HUMPHRIES:

15 A. Yes, I am.

16 GREENE, Q.C.:

17 Q. Would Hydro normally follow the practices of

18 other major utilities with respect to larger

19 Hydro projects?

20 MR. HUMPHRIES:

21 A. With respect--can we go back to your previous

22 question first please? Could you just repeat

23 that question again?

24 GREENE, Q.C.:

25 Q. Was Hydro aware that other major Canadian

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1 utilities do perform these type of

2 Probabilistic Reliability Assessment Studies

3 and in fact, if you look at key finding No. 6,

4 it's stated there that Manitoba Hydro, BC

5 Hydro, Hydro Quebec and Hydro One in Ontario

6 have completed--would complete these types of

7 Probabilistic Reliability Assessment Studies

8 for major projects, such as the Muskrat Falls

9 infeed option?

10 MR. HUMPHRIES:

11 A. Item 6 says for major projects such as--yes, I

12 am aware that they do that, yes.

13 GREENE, Q.C.:

14 Q. Would normally Nalcor consider that practices

15 of those types of major utilities, offer major

16 projects, would be a practice you would

17 normally review and consider adopting?

18 MR. HUMPHRIES:

19 A. We would normally review and consider adopting

20 those, yes.

21 GREENE, Q.C.:

22 Q. Have you looked at MHI's recommendation and

23 made a decision not to accept it then?

24 MR. HUMPHRIES:

25 A. No, we have not--yes, I have looked at it and

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1 now, we have not made a decision, not to

2 accept it, but from the perspective of

3 starting to incorporate this kind of analysis

4 into our traditional base cost decision making

5 process, is a significant deviation from our

6 norm. And it's our view that before we would

7 commit to doing such a, taking on such a task,

8 that we would really need to assess, not only

9 with ourselves, but also with stakeholders,

10 customers and the Board, the implications of

11 including such an analysis and what impact it

12 may have on the overall lease cost decisions.

13 GREENE, Q.C.:

14 Q. Did you do any analysis before your DG2

15 decision with respect to whether you would

16 adopt or not adopt Probabilistic Reliability

17 Assessment Studies as done by other major

18 Canadian utilities for large projects?

19 MR. HUMPHRIES:

20 A. Not directly related to this project, no, we

21 did not. We have been reviewing and keeping

22 abreast of developments in the industry, I

23 guess, but we have not, as an organization,

24 adopted those yet.

25 GREENE, Q.C.:

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1 Q. Do you plan to consider it now in light of

2 MHI's recommendation?

3 MR. HUMPHRIES:

4 A. We will consider it, but as I discussed, it's

5 not as simple as Nalcor making a decision to

6 incorporate this level of evaluation in our

7 decision-making process because it could have

8 significant implications and we feel it needs

9 to be addressed with the stakeholders, the

10 regulator and customers.

11 GREENE, Q.C.:

12 Q. And do you plan to address it with the

13 stakeholders prior to DG3?

14 MR. HUMPHRIES:

15 A. I do not think the time is fair to do that

16 prior to DG3.

17 GREENE, Q.C.:

18 Q. So just to, again, for the sake of

19 completeness, you are not accepting that

20 recommendation or finding by MHI, nor do you

21 plan to do any assessment of the

22 recommendation prior to DG3?

23 MR. HUMPHRIES:

24 A. I doubt that we will be doing that assessment

25 prior to DG3, yes, that's correct.

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1 GREENE, Q.C.:
 2 Q. I'd like now to turn to Mr. Kean or Mr.
 3 Harrington with respect to the difference
 4 between DG2 and DG3 again, just a couple of
 5 follow-up questions. With respect to decision
 6 gate 2, or DG2, we talked this morning about
 7 the project definition and that at DG2, one
 8 would typically see a project definition of
 9 five to ten percent, is that correct?
 10 MR. KEAN:
 11 A. Jason Kean. Yes, that's what we indicated
 12 this morning.
 13 GREENE, Q.C.:
 14 Q. And in looking at DG 2 at that point in time
 15 you were looking at what is before the Board
 16 are two options: the indeed option and the
 17 Isolated Island option. How would you
 18 characterize both of those options in terms of
 19 project definition? Let's talk about Muskrat
 20 Falls, that was at DG2, in your view, was that
 21 project definition in the range of five to ten
 22 percent at DG2?
 23 MR. KEAN:
 24 A. Jason Kean. Yes, it was.
 25 GREENE, Q.C.:

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1 Q. Let's look at the Isolated Island option, the
 2 documentation before the Board is that the
 3 level of analysis with respect to the
 4 components of the Isolated-Island option may
 5 not have been advanced in terms of analysis
 6 and review as was the documentation for the
 7 infed option, would you agree with that
 8 statement?
 9 MR. HUMPHRIES:
 10 A. Could you repeat that question please?
 11 GREENE, Q.C.:
 12 Q. In the Isolate-Island option where there were
 13 components, including the pollution control
 14 upgrades at Holyrood, the eventual replacement
 15 of Holyrood, the small hydros, the wind, and
 16 the other components of the Isolated-Island
 17 option, in responses to RFI's Nalcor advised
 18 that that analysis had not been brought to the
 19 same level as the analysis on the infed
 20 option.
 21 MR. HUMPHRIES:
 22 A. That's correct, yes.
 23 GREENE, Q.C.:
 24 Q. And that if you did so, it was most likely
 25 that the cost of the Isolated-Island option

1 would increase, as opposed to decrease?
 2 MR. HUMPHRIES:
 3 A. That's correct.
 4 GREENE, Q.C.:
 5 Q. So the question is in terms of the Isolate-
 6 Island option, how would you characterize the
 7 project definition for the Isolated-Island
 8 option at DG2? We just heard that Muskrat
 9 Falls was in the range of five to ten percent,
 10 what is your view for the Isolated-Island
 11 option at DG2?
 12 MR. HUMPHRIES:
 13 A. At DG 2 it would be less than five percent.
 14 GREENE, Q.C.:
 15 Q. Now, we just talked about project definition
 16 at the DG2 stage and we know your next key
 17 decision point is called DG3, what do you
 18 expect the project definition to be normally
 19 at a DG3? I think we talked a little bit
 20 about this yesterday or you did with Mr.
 21 Johnson, so what's the normal range for
 22 project definition at DG3?
 23 MR. KEAN:
 24 A. Yes, it's Jason Kean. The normal--our target
 25 is to be on the upper side of the definition

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1 for a completion of a gateway phase 3 work,
 2 such as to provide an estimate with the
 3 greatest accuracy as possible.
 4 GREENE, Q.C.:
 5 Q. And that would be, what is the normal project
 6 definition range at DG3? It's five to ten
 7 percent at DG2; at DG3 it's?
 8 MR. HUMPHRIES:
 9 A. It would be somewhere in the range of 20 to 40
 10 percent.
 11 GREENE, Q.C.:
 12 Q. Okay. Mr. Bennett, this morning you gave us
 13 an update as to where you are with the
 14 environmental assessment process. I had a
 15 follow-up question on that, is it possible
 16 that in giving approval from an environmental
 17 perspective to proceed with Muskrat Falls,
 18 that there could be conditions attached to the
 19 project going forward arising from that green
 20 light for the generation facility?
 21 MR. BENNETT:
 22 A. Yes, it's possible that the Federal and/or
 23 Provincial Governments may attach condition to
 24 the release of environmental assessment,
 25 assuming that such release were granted.

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<p>1 GREENE, Q.C.:</p> <p>2 Q. Has there been any costs associated with</p> <p>3 compliance with conditions included in the CPW</p> <p>4 analysis at DG2 for that?</p> <p>5 MR. BENNETT:</p> <p>6 A. There were a number of costs associated with</p> <p>7 environmental issues and mitigation included</p> <p>8 in that capital cost estimate, yes.</p> <p>9 GREENE, Q.C.:</p> <p>10 Q. But were those issues that had already been</p> <p>11 identified by Nalcor as required or was there</p> <p>12 like a contingency in the event that there was</p> <p>13 new or additional conditions imposed?</p> <p>14 MR. BENNETT:</p> <p>15 A. We had identified issues that we thought were</p> <p>16 going to be included as conditions in the</p> <p>17 release at DG2.</p> <p>18 GREENE, Q.C.:</p> <p>19 Q. Do you have a level of confidence that there</p> <p>20 are sufficient funds in the CPW to cover any</p> <p>21 conditions that may be attached to the</p> <p>22 approval by the government?</p> <p>23 MR. BENNETT:</p> <p>24 A. We look at the proceeding that was carried out</p> <p>25 for the generation environmental assessment</p>	<p>1 to the transcript unless you'd like me to, Mr.</p> <p>2 Humphries, but you talked a bit about--the</p> <p>3 question was in your view is Nalcor complying</p> <p>4 with the standard? And your answer</p> <p>5 essentially was well it depends on your</p> <p>6 interpretation of the standard, is that</p> <p>7 correct?</p> <p>8 (2:15 p.m)</p> <p>9 MR. HUMPHRIES:</p> <p>10 A. Yes, that's correct.</p> <p>11 GREENE, Q.C.:</p> <p>12 Q. So I wanted to go through the standard with</p> <p>13 you to get your interpretation and then we'll</p> <p>14 see how it may differ from MHI's as to whether</p> <p>15 there is in fact compliance with the standard.</p> <p>16 So if we look at the MHI report, it was just</p> <p>17 the simplest way on the record to find</p> <p>18 references to the standard and if there's</p> <p>19 other sections that--I believe they have</p> <p>20 quoted the whole standard in their report, so</p> <p>21 that's why I say it's the easiest place to</p> <p>22 find it, but--so that's why I've chosen to use</p> <p>23 that as the reference point. So they do begin</p> <p>24 and do you agree that the appropriate standard</p> <p>25 as you have in Exhibit 106 is the design</p>
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<p>1 looking back on the, you know, our proposed</p> <p>2 mitigation strategies at the time. Those are</p> <p>3 generally in conformance with what we saw in</p> <p>4 the capital cost estimate. The final</p> <p>5 disposition of recommendations made by the</p> <p>6 panel is something that is yet to be</p> <p>7 considered.</p> <p>8 GREENE, Q.C.:</p> <p>9 Q. Okay, similarly for the transmission line?</p> <p>10 MR. BENNETT:</p> <p>11 A. I think that's a fair statement there as well.</p> <p>12 GREENE, Q.C.:</p> <p>13 Q. I'd like now to move to a different topic</p> <p>14 which is the design for the transmission line</p> <p>15 and there has been some discussion already</p> <p>16 with you with respect to the appropriate</p> <p>17 design for the HVDC transmission line, and</p> <p>18 we've talked a bit about the standard used or</p> <p>19 the appropriate return period to be used and</p> <p>20 I'd like to refer to the MHR report, volume 1,</p> <p>21 page 61. One of MHI's findings is that the</p> <p>22 return period chosen or used by Hydro of one</p> <p>23 in fifty years doesn't meet the appropriate</p> <p>24 standard that's recognized for transmission</p> <p>25 line designs, and yesterday--I won't take you</p>	<p>1 criteria of overhead transmission lines, the</p> <p>2 CEI/IEC standard that's referenced there on</p> <p>3 page 61 of the MHI report?</p> <p>4 MR. HUMPHRIES:</p> <p>5 A. Yes.</p> <p>6 GREENE, Q.C.:</p> <p>7 Q. And that is the standard you referred to in</p> <p>8 the document you filed in Exhibit 106 using</p> <p>9 your--setting out your design criteria for the</p> <p>10 line?</p> <p>11 MR. HUMPHRIES:</p> <p>12 A. Yes, it is.</p> <p>13 GREENE, Q.C.:</p> <p>14 Q. If you go to the top of the next page, page</p> <p>15 62, I'm reading from the top of the page</p> <p>16 there. "In all cases lines should at least</p> <p>17 meet the requirements of a reliability level</p> <p>18 characterized by a return period of loads</p> <p>19 fifty years, level one." So the one in fifty</p> <p>20 year return period is considered to be the</p> <p>21 minimum, is that the way I would read that</p> <p>22 first paragraph, Mr. Humphries?</p> <p>23 MR. HUMPHRIES:</p> <p>24 A. That's our interpretation, yes.</p> <p>25 GREENE, Q.C.:</p>

1 Q. Jumping down to the next paragraph, it is
 2 suggested--this is a direct quote from the
 3 Standard, "It is suggested to use a
 4 reliability level characterized by return
 5 periods of 150 years for lines above 230 kV."
 6 What is the rating for the HVDC line?
 7 MR. HUMPHRIES:
 8 A. It is 320 kV.
 9 GREENE, Q.C.:
 10 Q. The next sentence states, "So if we took that
 11 sentence as stated, it would be that one in
 12 150 years would apply because the HVDC line is
 13 320 kV."
 14 MR. HUMPHRIES:
 15 A. It suggests it should be.
 16 GREENE, Q.C.:
 17 Q. So it is--the word suggestion is used, right.
 18 MR. HUMPHRIES:
 19 A. Yes, that's correct.
 20 MR. BENNETT:
 21 A. Just for clarification, if I may, just for
 22 clarification on that point, I think the word
 23 "suggested" is important, it puts context
 24 around the decision, it's not a mandatory
 25 requirement and there are other sections of

1 A. Yes, that's correct.
 2 GREENE, Q.C.:
 3 Q. And then the next paragraph, because we've had
 4 some discussion around the one in 500 years
 5 and I'm going to go through with you what the
 6 implications are for the Newfoundland system
 7 of these different return periods, but I first
 8 wanted to make sure we were on the same page
 9 as to what the Standard was saying and what it
 10 meant. So then we get to the next paragraph,
 11 "Boys--or girls, I should say people, in
 12 certain circumstances you should even go to a
 13 higher return period which is a reliability
 14 level characterized by return periods of 500
 15 years for lines above 230 where the line is
 16 the principle of the only--or perhaps the only
 17 source of supply to a particular load, and
 18 there failure would have serious consequences
 19 of power supply." So that's again from the
 20 Standard perspective is there should be a
 21 higher reliability depending on the
 22 criticality of the line.
 23 MR. HUMPHRIES:
 24 A. That's correct.
 25 GREENE, Q.C.:

1 the code where there are mandatory
 2 requirements.
 3 GREENE, Q.C.:
 4 Q. And that is what you meant by interpretation
 5 was because the word "suggestion" is used
 6 here.
 7 MR. HUMPHRIES:
 8 A. Yes.
 9 GREENE, Q.C.:
 10 Q. So the next line goes on to say that for lines
 11 below 230--so they're saying if it's above
 12 230, we think you should use one in a hundred
 13 and fifty, that's how, as a layperson, not
 14 having any engineering background and not
 15 designing transmission lines, I would read
 16 that, or as you better look at it and say
 17 normally if it's above 230 you do one and one
 18 fifty. So then they go on to say even if the
 19 voltage is lower on the line, so if it's lower
 20 than 230, if that line is a principle or only
 21 source of power to a load, you should also
 22 consider designing it to a higher standard, is
 23 that how I should take the second sentence,
 24 Paul?
 25 MR. HUMPHRIES:

1 Q. And I believe you mentioned yesterday that
 2 after the ice storm in Quebec, Hydro Quebec
 3 changed and enhanced their design to 1 in 500
 4 years, is that correct?
 5 MR. HUMPHRIES:
 6 A. As far as I'm aware, yes, that's correct.
 7 GREENE, Q.C.:
 8 Q. And those lines that they enhanced were not
 9 all just for only source of supply, were they?
 10 MR. HUMPHRIES:
 11 A. I suspect not, but I'm not sure.
 12 GREENE, Q.C.:
 13 Q. Would you like to check or undertake to check,
 14 or do you feel comfortable enough in going
 15 with the assumption that not all the lines
 16 they upgraded were sole source bringing in
 17 generation from a sole source?
 18 MR. HUMPHRIES:
 19 A. I'm comfortable with that for now, yes.
 20 GREENE, Q.C.:
 21 Q. So they decided to go to the higher return
 22 period as a result of the consequence of the
 23 impact of the ice storm on the residents of
 24 Quebec, even though it was a higher cost.
 25 MR. HUMPHRIES:

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<p>1 A. Yes.</p> <p>2 GREENE, Q.C.:</p> <p>3 Q. From an engineering perspective, maybe not</p> <p>4 considering the societal costs of the failure.</p> <p>5 MR. HUMPHRIES:</p> <p>6 A. It was a higher cost, but it also they had a</p> <p>7 much larger customer base to spread that cost</p> <p>8 over as well, compared to Newfoundland.</p> <p>9 GREENE, Q.C.:</p> <p>10 Q. So, you're concerned about the cost of the</p> <p>11 rate payer of--and we're going to come to that</p> <p>12 in the combustion turbines and the costs and -</p> <p>13 MR. HUMPHRIES:</p> <p>14 A. Yes.</p> <p>15 GREENE, Q.C.:</p> <p>16 Q. So, we will get to the impact on the rate</p> <p>17 payers because that will be one concern. You</p> <p>18 wouldn't do it because it's just too expensive</p> <p>19 and we're only a small island, two little rate</p> <p>20 payers. So, we can be in the dark more than</p> <p>21 they can in Quebec because they can afford to</p> <p>22 pay for it.</p> <p>23 MR. HUMPHRIES:</p> <p>24 A. No, you're reading words into my thoughts</p> <p>25 there I think.</p>	<p>1 changed to 150 years just before decision gate</p> <p>2 2. Can you confirm that for me, please?</p> <p>3 MR. HUMPHRIES:</p> <p>4 A. It was changed prior to decision gate 2, I</p> <p>5 think. If we go back to the scenario prior to</p> <p>6 the Muskrat Falls, when we were looking at the</p> <p>7 1600 megawatt bi-pole multi-terminal tie to</p> <p>8 New Brunswick and Soldiers Pond, we were</p> <p>9 considering a 1 in 150 year design, in that</p> <p>10 case. Because in that case it would have been</p> <p>11 an only supply to the Island. It was a much</p> <p>12 larger line and we did consider a 1 in 150 in</p> <p>13 that scenario. It was carrying 1600 megawatts</p> <p>14 of capacity, a portion to Newfoundland and a</p> <p>15 portion to New Brunswick.</p> <p>16 GREENE, Q.C.:</p> <p>17 Q. Sorry, I'm not sure. I thought you had agreed</p> <p>18 that it had been at 1 in 150 and that decision</p> <p>19 -</p> <p>20 MR. HUMPHRIES:</p> <p>21 A. It was -</p> <p>22 GREENE, Q.C.:</p> <p>23 Q. It was, okay.</p> <p>24 MR. HUMPHRIES:</p> <p>25 A. - in that stage. When we converted to the</p>
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<p>1 GREENE, Q.C.:</p> <p>2 Q. Anyway, so we'll come to it in terms of the</p> <p>3 return period. Actually, I really should get</p> <p>4 you to clarify, you raised the statement</p> <p>5 before lunch where we could have an outage at</p> <p>6 Hardwoods or at Oxen Pond so that the power</p> <p>7 would be out here in the Avalon but the power</p> <p>8 would still be going to the Maritimes?</p> <p>9 MR. HUMPHRIES:</p> <p>10 A. Yes, the power could be going to everyone</p> <p>11 expect the immediate customers served by that</p> <p>12 station.</p> <p>13 GREENE, Q.C.:</p> <p>14 Q. And that is just the fact that the power</p> <p>15 system is not a conscious choice if they would</p> <p>16 be given preferential treatment or--just</p> <p>17 wanted to make sure -</p> <p>18 MR. HUMPHRIES:</p> <p>19 A. My no means, no.</p> <p>20 GREENE, Q.C.:</p> <p>21 Q. One of the reasons you've given--before I get</p> <p>22 to that, I guess, my understanding from</p> <p>23 looking at the documentation is that the</p> <p>24 design period for the line, in fact, had been</p> <p>25 at more than 150 years and that that--it was</p>	<p>1 current scheme and was Muskrat Falls and the</p> <p>2 320 kV bi-pole to Soldiers Pond with the</p> <p>3 potential add-on for the Maritime link, that</p> <p>4 is when we changed the design to 1 in 50.</p> <p>5 That was not just prior to DG2. That was</p> <p>6 early in the evolution of this concept.</p> <p>7 GREENE, Q.C.:</p> <p>8 Q. Perhaps over the break, I'll show your counsel</p> <p>9 the exhibit that I am referring to and the</p> <p>10 date that's referenced in it. I can't bring</p> <p>11 it up on the screen because it's a</p> <p>12 confidential exhibit.</p> <p>13 O'REILLY, Q.C.:</p> <p>14 Q. I'm sorry, the question is?</p> <p>15 GREENE, Q.C.:</p> <p>16 Q. The timing when they changed the design return</p> <p>17 period from 1 in 150 to 1 in 150.</p> <p>18 O'REILLY, Q.C.:</p> <p>19 Q. The date?</p> <p>20 GREENE, Q.C.:</p> <p>21 Q. Yes. We can come back to that after the</p> <p>22 break.</p> <p>23 MR. HUMPHRIES:</p> <p>24 A. Sure.</p> <p>25 GREENE, Q.C.:</p>

1 Q. Just to make sure we're talking about the same
2 and that I understand I your answer to me. I
3 just wanted to have that discussion.
4 You mention the size of the line coming
5 in, the HVDC line that's coming in is going to
6 be sized for 900 megawatts, 2 poles, 450 a
7 pole.
8 MR. HUMPHRIES:
9 A. 450 a pole, yes, with an overload capability
10 on each pole.
11 GREENE, Q.C.:
12 Q. Or you could do--you can take the total load
13 on one pole for ten minutes and then 150
14 percent of the load on that same--if you lose
15 a pole, you can carry the full load for ten
16 minutes on one pole and then 150 percent
17 continuous after that, correct?
18 MR. HUMPHRIES:
19 A. That's correct, yes.
20 GREENE, Q.C.:
21 Q. So, that's a large load coming in from
22 Labrador to the Island. Do we have any--
23 what's the next largest load on the Island?
24 This is a 900 megawatt line you're going to be
25 bringing in.

1 period you will be looking to the line to
2 bring in the full amount of Muskrat Falls
3 energy to the Island?
4 MR. HUMPHRIES:
5 A. I think about the time we would be at this
6 stage where we would be using the full
7 capacity for the Island, there would be
8 additional backup added on the Island. We may
9 be bringing it in, but the fact there would be
10 sufficient reserve on the Island to compensate
11 for a significant portion of that capacity.
12 GREENE, Q.C.:
13 Q. Okay. So, you've gone to the next point that
14 you're going to have backup, but I guess it's
15 during periods of the forecast period, the
16 full amount will be coming over the line and
17 you will have reserve backed up--you will be
18 adding generation on the Island. So, yes, you
19 may have additional backup and you'll be
20 adding, et cetera, but at some stages, you
21 will be bringing the full amount of capacity
22 energy over that line to the Island.
23 MR. HUMPHRIES:
24 A. At some stage, we will, yes.
25 GREENE, Q.C.:

1 MR. HUMPHRIES:
2 A. Just back up here for a second. It's a large
3 capacity, yes, it is a large capacity, but
4 from the perspective of the load on the
5 Island, is that all that capacity needed on
6 the Island in 2017, 2021, 2022? No, it's not.
7 Effectively we are using that line to replace
8 the Holyrood plant which has a capacity of 500
9 megawatts. So, from the perspective of what's
10 coming out of the system and what's coming in,
11 we're not talking about 900 megawatts. We're
12 talking about 500 megawatts.
13 GREENE, Q.C.:
14 Q. When Holyrood closes and the load forecast
15 that you filed before the Board shows you
16 using all of Muskrat Falls energy over your
17 forecast period, doesn't it?
18 MR. HUMPHRIES:
19 A. Yes, it does, over the forecast period. It
20 also shows that we add additional generation
21 for capacity addition on the Island during
22 that forecast period in excess of 250
23 megawatts.
24 GREENE, Q.C.:
25 Q. Yes, but at the points during the forecast

1 Q. Throughout the forecast period--and we're
2 going to come actually and look at the energy
3 balances. We'll talk a little bit more about
4 when you're going to start using all of the
5 energy from Muskrat. Because that's one of
6 the concerns, that you don't start using the
7 energy until later in the period, and we're
8 going to come to that.
9 So, at some stage and we can go back, if
10 you like and look at the energy tables for how
11 long and when you'll be bringing in, but
12 you'll be bringing in the full amount over the
13 infeed. So, 900 megawatts is pretty darn big
14 load, isn't it?
15 MR. HUMPHRIES:
16 A. It's significant, yes.
17 GREENE, Q.C.:
18 Q. So, when you come back to the CSA standard
19 which is that there is a suggestion that it is
20 1 in 150 for lines above 230. You say that's
21 only a suggestion, it's not mandatory. So,
22 that's why you believe you're complying with
23 CSA even though they suggested it should be a
24 higher standard. How would you deal with the
25 qualification, the concern they raised where

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<p>1 it is--in that case it's not a principle, but 2 it's--I call it where it's a critical line 3 that's bringing in a large source of 4 generation. Does that play into it at all for 5 you 6 MR. HUMPHRIES: 7 A. Well, from the perspective of critical, I 8 think, we need to go back and look at, in 9 relation to what the total peak load is on the 10 Island and the actual energy requirements. 11 And to use some round numbers, let's assume 12 the peak is 2000 megawatts and we have an 13 energy requirement of, let's say for round 14 numbers, let's say 10 gigawatt hours. It 15 could be a little bit less than that, but for 16 round numbers. So, when we look at, from the 17 capacity perspective, 2000 megawatts, the 900 18 megawatts at the time when we do reach it's 19 maximum requirement, it's coming close to 50 20 percent, yes. But when we look at the 21 periods, we also have to--when we do that, 22 look at the other generating additions that 23 are being made on the Island from, as load 24 grows and on average it's around, it's more 25 like 20 to 25 percent of the capacity of that</p>	<p>1 (2:30 p.m.) 2 MR. HUMPHRIES: 3 A. And we also--the duration of the outage has to 4 be factored into this as well. That is the 5 significant part, particularly from the energy 6 perspective. And, you know, statements that 7 this line could be out for considerable 8 periods of time, we don't believe, from the 9 perspective, that the normal, if we had a 10 failure, the normal restoration time would be 11 in the two week timeframe. We don't 12 anticipate a situation where this line is 13 going to be down for half the year. 14 GREENE, Q.C.: 15 Q. Let's go there to the two-week window for 16 repair time which I had planned to--you led me 17 there earlier than I had planned, but I will 18 just circle back. 19 The two-week window that you've used in 20 Exhibit 106 as the maximum repair time, where 21 did that come from? Is it a metric accepted 22 in the utility industry? 23 MR. HUMPHRIES: 24 A. No, it's based on our historic information, an 25 average of what it's taken us to restore 230</p>
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<p>1 line that would be critical in the event of a 2 loss. Because we would be carrying reserve 3 which, for the most part, would be on the 4 Island. So, whether that's significant, it's 5 definitely not the full capacity and we feel 6 it's not half the capacity. 7 So, our view is that it is a manageable 8 number. From the energy perspective, if we 9 fully utilize Muskrat Falls which is 5 10 terawatt hours, again, we're looking at a load 11 of 10, in the end, it is 50 percent, but it 12 takes a long time to get to that 50 percent. 13 And as we're getting there, we are adding 14 additional generating capacity on the Island 15 system that would compensate for the loss of 16 that line. 17 GREENE, Q.C.: 18 Q. Even though it is a 900 megawatts, you said, 19 out of 2000, it is, in your views, that isn't 20 significant enough to cause you, by itself, to 21 consider, leaving apart the idea it's only a 22 suggestion that you go to 1 in 150, if it's 23 above 230, You're saying that even that the 24 face that it's almost 50 percent of your load, 25 is not enough to -</p>	<p>1 kV transmission on the Island as a result of a 2 number of ice storms we've had in the past 30 3 years. 4 GREENE, Q.C.: 5 Q. So, you're basing it on your experience with 6 the current 230 kV system. 7 MR. HUMPHRIES: 8 A. Yes. 9 GREENE, Q.C.: 10 Q. I think yesterday Mr. Harrington referred to 11 the Long Range Mountains as one of the areas 12 of risk for the HVDC infeed in talking about 13 what the identified risks are. And we can go 14 to the transcript, if we like, but that was 15 one of the areas. It has been commonly 16 accepted that coming over the Long Range 17 Mountains in Newfoundland is one of the 18 riskiest areas. Do you have any current lines 19 in those condition? 20 MR. HUMPHRIES: 21 A. No, we don't. 22 GREENE, Q.C.: 23 Q. So, when you're talking about the two-week 24 window, I'd like to explore with you the 25 operational plan that Nalcor has in place to</p>

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1 address outages in the Long Range Mountains.
 2 And I think MHI has raised this in terms of
 3 the type of plan they had expected to see,
 4 having developed a plan for available
 5 inventory of steel structures or anything that
 6 would available in the event of an outage.
 7 MR. HUMPHRIES:
 8 A. Does somebody in the Project want to address
 9 that?
 10 MR. KEAN:
 11 A. Yes, it's Jason Kean. One of the activities
 12 that the Project team has been engaged in
 13 throughout the design of the line is looking
 14 at the types of structures and, of course, the
 15 number of structures that would be required in
 16 consideration of the type of line outage we
 17 could have. Further design of the structures
 18 includes considerable number of dead ends to
 19 avoid cascading events. So, that is part of
 20 the work that we are doing presently.
 21 GREENE, Q.C.:
 22 Q. That is, in terms of what the actual structure
 23 is and I think you mentioned yesterday that
 24 you had advanced in terms of what information
 25 had been provided to the Board for the DG2

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1 analysis that you had looked at design
 2 loadings in some of the structures. My
 3 question was, have you developed an
 4 operational plan with respect to available
 5 inventories and whether they would be required
 6 to be stored anywhere along so that they could
 7 be ready access which is one of the
 8 operational risks that are involved with an
 9 outage in these types of environment. I
 10 appreciate your answer which was dealing with
 11 your looking at the design of the line which
 12 is one risk. And by the way, you mentioned
 13 yesterday you were gone to tender for
 14 structural steel. The only thing that was on
 15 your website was for the AC line, would that
 16 be the same for the DC line?
 17 MR. KEAN:
 18 A. The RFP that's been issued is for the AC line
 19 only.
 20 GREENE, Q.C.:
 21 Q. So, in terms of how you would deal with the
 22 operation--I'm just trying to explore and get
 23 you to explain how you chose the two week
 24 window from your experience in the current 230
 25 system would be applicable for the HVDC system

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1 and how you've made that determination in
 2 light of the different nature of the terrain
 3 and the climactic conditionals along the
 4 terrain? So, Mr. Humphries, you were saying,
 5 based on your experience with the 230 system,
 6 have you done any analysis to show whether the
 7 same conditions would apply? And if so, I'd
 8 like you to talk about the Alpine regions and
 9 the analysis that you've done to show that it
 10 is the same sort of experience you'd expect to
 11 see in what you've described as the Alpine
 12 regions which includes part of the Long Range
 13 Mountains?
 14 MR. HUMPHRIES:
 15 A. I am not familiar with the level of analysis
 16 that has been done, but to get back to Mr.
 17 Kean's point, I guess, on some of the things
 18 that are being incorporated in the design to
 19 limit the -- in the event that we have an
 20 outage, to limit the impact by limiting the
 21 number of spans because of anti-cascading
 22 structures. Coming from that, we will be able
 23 to have a more realistic handle on the level -
 24 - the amounts of materials we would need to
 25 have on hand to react to an event, should it

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1 happen and also, based on our history, I
 2 guess, the events we have had have been more
 3 significant because we haven't had that level
 4 of reenforcement. We haven't had the anti-
 5 cascading structures. We've been in
 6 situations where we've had larger numbers and
 7 spans unavailable and we have been successful
 8 in restoring transmission in these time
 9 frames.
 10 With respect to the Long Range Mountains
 11 and those areas, no, we don't have any
 12 experience because we haven't been operating
 13 in those areas, but I think it's safe to say
 14 that if there's any extra reenforcement
 15 incorporated in the design, it will be in that
 16 area and we will be looking at things to
 17 further mitigate the probability of a complete
 18 failure, possibly even to the extent of
 19 separating the conductors on separate
 20 structures in the high risk areas, so that if
 21 there were a failure, the probability of
 22 losing both poles would be reduced again.
 23 GREENE, Q.C.:
 24 Q. One of the findings in the MHI report was with
 25 respect to the lack of information that was

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1 available on the HVDC transmission line,
 2 including the design loadings, the root, et
 3 cetera. I know you've mentioned there's been
 4 a significant amount of work done since. Is
 5 any of that information available now?

6 MR. HUMPHRIES:
 7 A. I don't have it. I don't know if anyone in
 8 the project would want to comment on that.

9 MR. BENNETT:
 10 A. It's Gilbert Bennett. That work is not yet
 11 complete.

12 GREENE, Q.C.:
 13 Q. Okay. So, and just I know you explained
 14 yesterday and so that people are following us,
 15 you've talked about how you would beef up.
 16 You would add the anti-cascading. You would
 17 put in more towers. Just to explain again,
 18 that does not affect the return period?
 19 That's something you would do. It doesn't
 20 relate to having more of that just because
 21 you're going to the higher return period?
 22 Maybe you could just refresh people's memory
 23 about that.

24 MR. BENNETT:
 25 A. It's Gilbert Bennett. Maybe I'll put some

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1 context around that. The whole evaluation of
 2 the return period and the discussion that
 3 we've had to date about the establishment of
 4 the return period, I think maybe has not
 5 considered some of the significant work that
 6 has been done, both by Hydro and Nalcor, over
 7 the past number of years in respect of the
 8 Avalon Peninsula, and I think in Exhibit 106,
 9 I think Mr. Thomas made a note that if you
 10 refer explicitly to the numbers and ice
 11 loading information that's provided by CSA in
 12 the standard, that the numbers that we're
 13 seeing on the Avalon Peninsula system in
 14 particular go well beyond what are expected in
 15 the standard. So when we look at the
 16 methodology that was described in Exhibit 97,
 17 there's a comprehensive approach to
 18 establishing those return periods and
 19 certainly from Hydro's historical perspective,
 20 there have been a number of activities
 21 undertaken over the years to improve the
 22 performance of the AC system, particularly on
 23 the Avalon Peninsula and so there's a learning
 24 process that has been undertaken over a number
 25 of years. Those learnings have been built in

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1 to the current design. So, for example, on
 2 the Avalon Peninsula, our designed ice loading
 3 is 75 millimetres of ice, which based on the
 4 history that we've seen over the operating
 5 period of this transmission facility
 6 corresponds to the maximum loading that we've
 7 seen over approximately a 50-year period.

8 So the anti-cascade structures, they help
 9 reduce the extent of an outage. The ice
 10 loading and the meteorological information is
 11 what takes us to the return period. So, all
 12 of those learnings, both in respect of
 13 analysis of meteorological conditions, has
 14 helped inform the design and certainly all of
 15 the operational considerations that we've
 16 learned over the years have also been
 17 incorporated into this design as well.

18 GREENE, Q.C.:
 19 Q. And in looking at the upgrade of the 230 kV
 20 transmission system, which the Commissioners
 21 are familiar with, because it was upgrade
 22 program that was brought forward and approved
 23 by the Board specifically as a capital
 24 project, with the improved design criteria, I
 25 guess one of the questions is how do you take

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1 that data that you have for your Avalon
 2 Peninsula 230 kV and whether that's
 3 appropriate for bringing in, acknowledging
 4 that it's an HVDC line at a higher voltage and
 5 is bringing in a major source of power over
 6 very difficult terrain conditions, and that's
 7 only these types of issues that we're trying
 8 to explore with you in terms of your decision
 9 on the 1 in 50, given that our independent
 10 expert has said that's not good enough, it
 11 should be at least 1 in 150 if you have an
 12 alternative supply available. So we will
 13 explore some of those issues further.

14 I guess one of the -- talking about your
 15 AC system, and yes, it has been upgraded and
 16 there's been significant dollars spent to do
 17 that in the last period of time. One of the
 18 reasons you advance for not building the DC
 19 line to a higher standard is what's the point.
 20 Your AC system is at 1 in 150, so if that's
 21 going to be down, there's no point in having
 22 your DC system still standing. I'd like to
 23 talk to you a little bit about that because as
 24 a layperson, I found that kind of troubling or
 25 hard to understand why and what that meant.

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1 So, first, and I can take you to the RFI,
 2 if you'd like, but I gather, Mr. Humphries,
 3 that was one of the rationales put forward for
 4 it?
 5 MR. HUMPHRIES:
 6 A. It was and it is applicable and I think still
 7 will be applicable on the Avalon Peninsula, as
 8 an example, you know, which still the ice
 9 design on the Avalon Peninsula is not 1 in 50
 10 even. It's 1 in 25 and if there were an icing
 11 event in excess of, let's say in excess of 1
 12 in 50 years or at the 1 in 50 year level,
 13 there is a high likelihood that the link will
 14 still be standing and the supporting 230 kV
 15 lines coming out of the converter station at
 16 Soldier's Pond and serving the local load will
 17 have failed. So you know, that's -- yeah, we
 18 can take a level of comfort in the increased
 19 reliability of the link, but we still have a
 20 lesser of a design on our underlying bulk 230
 21 kV transmission system which is, at the end of
 22 the day, what serves the load in the province.
 23 GREENE, Q.C.:
 24 Q. And I can understand that when you're talking
 25 about the same -- the storm hitting the Avalon

1 most robust criterion for any line on the
 2 Avalon and the same is true when we look at
 3 the other loading areas. That the comparable
 4 loading for other lines in those regions is
 5 still lighter than anything we've done on the
 6 DC system.
 7 GREENE, Q.C.:
 8 Q. You're talking again about the ice loading
 9 which goes to how you can beef up within a
 10 return period, I guess, is what you're
 11 bringing me to. You're talking about the ice
 12 loadings when you talk about the 75
 13 millimetres?
 14 MR. BENNETT:
 15 A. Well, the ice loading, of course is -
 16 GREENE, Q.C.:
 17 Q. That's what you're talking about, isn't it,
 18 the -
 19 MR. BENNETT:
 20 A. Well, that's targeted from the return period.
 21 So we look at wind, ice, the line wind and
 22 ice.
 23 GREENE, Q.C.:
 24 Q. Ambient temperature, all of that goes into
 25 your design loading, right, okay. So that was

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1 Peninsula, taking out your AC and your DC.
 2 MR. HUMPHRIES:
 3 A. That's right.
 4 GREENE, Q.C.:
 5 Q. You're saying that because that happens and
 6 your AC system, the converter is not working,
 7 you can't take power, so there's no point in
 8 having your line up, and I guess sitting at
 9 home with the lights out, I was just wondering
 10 if the AC system was down, boy, and if I was
 11 at Nalcor, I wouldn't want my DC system down
 12 too. I get the AC system back and that's
 13 running, but boy, the DC system is down too,
 14 so I would rather have at least one of them up
 15 and standing if you lost the other system.
 16 That's my layman's interpretation. I don't
 17 want both lines flattened as my crews go out
 18 to repair them.
 19 MR. BENNETT:
 20 A. It's Gilbert Bennett. I think it's important
 21 to clarify that the design criteria that we're
 22 using for the DC system are the most robust
 23 and stringent criteria for any transmission
 24 line in the province. So, the 75 millimetre
 25 criteria that we're using on the Avalon is the

1 part of what I was -- when you say there's no
 2 point in having one part of your system better
 3 than the other, but the response would be, Mr.
 4 Humphries, if you were doing that, you know,
 5 both lines are down, it's no different than
 6 one line being down, whether it's your AC or
 7 your DC?
 8 MR. BENNETT:
 9 A. Well -
 10 GREENE, Q.C.:
 11 Q. If it hits the Avalon?
 12 MR. BENNETT:
 13 A. It's Gilbert again. I guess the other way of
 14 considering that is if you're going to make an
 15 investment in reliability improvement, the
 16 question that begs itself is where is the most
 17 opportune place to make that investment that
 18 provides the most increase in reliability for
 19 customers.
 20 GREENE, Q.C.:
 21 Q. Okay. So we want to go to the combustion
 22 turbines?
 23 MR. BENNETT:
 24 A. Well, even in transmission lines.
 25 GREENE, Q.C.:

1 Q. Okay.
 2 MR. BENNETT:
 3 A. I think Mr. Thomas pointed out in Exhibit 106
 4 that an improvement -- you would get a greater
 5 improvement in overall reliability by
 6 investing in the AC system, as opposed to
 7 continued investment in the DC side.
 8 GREENE, Q.C.:
 9 Q. So if we can go with that, so your AC system
 10 would be up, your DC system could be down and
 11 you wouldn't have, at some points, depending
 12 on when it happened, without your backup here,
 13 you would lose all of the in-feed, which could
 14 be as much as 900 megawatts, and depending on
 15 when it happens, it depends on your available
 16 backup.
 17 MR. BENNETT:
 18 A. I'm not sure I follow that.
 19 GREENE, Q.C.:
 20 Q. You said that you would rather invest in the
 21 AC system rather than the DC system. Is that
 22 what -- that's the way I took the answer.
 23 MR. HUMPHRIES:
 24 A. I think that's only to the point that you
 25 would bring the lines to a comparable level of

1 reliability. We wouldn't invest to bring the
 2 230 kV lines on the Avalon Peninsula to a 1 in
 3 150 year design when we only have 1 in 50
 4 years on the link. We wouldn't do that.
 5 GREENE, Q.C.:
 6 Q. We've only talked about storms on the Avalon
 7 Peninsula which could also affect both. If
 8 you had a storm on the AC system outside of
 9 the Avalon that could impact only that one
 10 small area of the province and wouldn't impact
 11 the DC line, would it? I'm just trying to
 12 understand the thing where you said it's
 13 better to have a strong AC system and we can
 14 have the same storm affecting only a very
 15 small part of your AC system if it's at 1 in
 16 50 and if you have 1 in 150 for your DC line,
 17 your DC line is still standing right
 18 throughout the province.
 19 MR. HUMPHRIES:
 20 A. Yes, it would have to depend on the -- it is
 21 specific to the location of the line. There's
 22 no question about that.
 23 GREENE, Q.C.:
 24 Q. And it is more of a concern if the big storm
 25 happens to hit on the Avalon for both lines?

1 MR. HUMPHRIES:
 2 A. Yeah, but again, that's where our load -- our
 3 load centre is on the Avalon Peninsula.
 4 GREENE, Q.C.:
 5 Q. Now we've talked about the difference between
 6 the 1 in 50 and the 1 in 150 for the return
 7 period. There's also reference in the MHI
 8 report to that criteria is where there is an
 9 alternate supply available and if there's no
 10 alternate supply, it should be 500, the return
 11 period should be 1 in 500 and I believe you
 12 gave some indication of cost this morning as
 13 to the cost for doing that which was 250
 14 million. Is Nalcor giving any consideration -
 15 - I assume the -- well, what is the
 16 consideration you're giving now to the return
 17 period design for the line, given MHI's
 18 recommendation?
 19 MR. HUMPHRIES:
 20 A. I guess based on my comments yesterday, we are
 21 still remaining at the 1 in 50.
 22 GREENE, Q.C.:
 23 Q. Okay.
 24 MR. HUMPHRIES:
 25 A. And it will be a balance between line design

1 and backup generation to provide a level of
 2 reliability that overall best suits the
 3 requirements of the customers.
 4 GREENE, Q.C.:
 5 Q. Before we get to the backup generation issue,
 6 the Alpine regions are mentioned in the MHI
 7 report as areas where there should be special
 8 consideration given, given the meteorological
 9 conditions that exist. What are the four
 10 Alpine regions that have been identified in
 11 your meteorological studies? For ease of
 12 reference, they are shown in MHI, Volume 1,
 13 page 62.
 14 MR. BENNETT:
 15 A. It's my recollection on those Alpine areas,
 16 there's a short section in Labrador on the
 17 coast. There's the Long Range Mountains
 18 crossing, and if my memory is correct, there's
 19 a short section in the western part of Central
 20 Newfoundland, and in those areas, in those
 21 Alpine loading areas, as we pointed out in
 22 Exhibit 97, we have not finalized the loading
 23 criteria in those regions.
 24 GREENE, Q.C.:
 25 Q. So you haven't addressed the issue of any

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1 additional cost if you were to add additional
 2 reliability enhancements to address the Alpine
 3 region?
 4 MR. BENNETT:
 5 A. We are expecting that the ice loading in those
 6 regions and the wind loading in those regions
 7 will be higher than in the eastern and Avalon
 8 sections of the project. They will be on 75
 9 millimetres of ice. They will be on 50
 10 millimetres that we use in most of the line.
 11 Those are extreme areas. We recognize that
 12 and they have been -- some provision for that
 13 has been included in our DG2 work.
 14 GREENE, Q.C.:
 15 Q. And what about the costs of doing those
 16 enhancements? Has there been any inclusion in
 17 the CPW for the -- to reflect additional costs
 18 for the Alpine region and the transmission
 19 line?
 20 MR. BENNETT:
 21 A. We have been expecting heavy loading in those
 22 areas for quite some time, so for the short
 23 distances that are involved in those areas,
 24 our structural estimates would have been
 25 higher on a per kilometre basis than you would

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1 look at elsewhere in the system.
 2 GREENE, Q.C.:
 3 Q. I wonder could you -- is it possible for you
 4 to give us an indication of the costs involved
 5 in adding the additional transmission line
 6 reliability enhancements in the Alpine
 7 regions?
 8 MR. BENNETT:
 9 A. We don't have that here with us, I'm afraid.
 10 GREENE, Q.C.:
 11 Q. Can I have it as an undertaking that you'll
 12 provide it?
 13 O'REILLY, Q.C.:
 14 Q. We have it, we can -
 15 GREENE, Q.C.:
 16 Q. Okay. Now if we go to the issue of the backup
 17 generation that we were talking about. I
 18 believe yesterday you mentioned, and Mr.
 19 Humphries mentioned it earlier this afternoon,
 20 well you could have backup generation so the
 21 level of unsupplied energy could be addressed
 22 in having backup generation instead of
 23 improving the design of the line. Can I take
 24 you to PUB-Nalcor-175, please, Mr. McNiven?
 25 So if we -- this question dealt with if

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1 there were a bi-pole outage, how would Nalcor
 2 deal with the outage. So if we scroll down,
 3 you get a -- and you refer to certain measures
 4 that would be taken and we talk about the
 5 Strait of Belle Isle, et cetera, and the
 6 additional risk, but if you keep going until
 7 it gets to the HVDC line, and I don't know
 8 here, Mr. Humphries, beginning there on
 9 Exhibit 106, I don't know, you might want to
 10 talk about how you've did the calculation,
 11 looking at the level of unsupplied energy in
 12 the in-feed option versus the Isolated island
 13 option for the two-week repair window you
 14 talked about.
 15 MR. HUMPHRIES:
 16 A. Yes, and again, the analysis done in Exhibit
 17 106 is a deterministic type analysis and it
 18 deals with identifying the worst case exposure
 19 and we felt that important that to identify
 20 that if this line failed at the worst possible
 21 time, what would the ultimate exposure to
 22 customers be and the levels of unserved
 23 energy, we went through and we looked at our
 24 load shave, our anticipated load shave and
 25 we've done calculations of the levels of

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1 unserved energy during this worse two-week
 2 period and it comes back to when we'd look at
 3 it from a probabilistic perspective, the
 4 probability of having the line fail in the
 5 peak week is not very significant. Normally
 6 icing doesn't happen at peak times. It's at
 7 the -- what we'd call the shoulder periods in
 8 the late fall or early spring and during those
 9 periods, the actual exposure or exposure to
 10 unserved load is lower again because the load
 11 is just not there. We're not at peak. So
 12 when we did this exercise in Exhibit 106, the
 13 intent was there to show, regardless of the
 14 probability, if this happened at the worst
 15 possible time, what would it look like and
 16 where would we be.
 17 GREENE, Q.C.:
 18 Q. And if your outage was for this minimum -- you
 19 said that the maximum outage would be a two-
 20 week period based on your experience with your
 21 current existing 230 system. We've already
 22 talked about whether that's a realistic metric
 23 or not, but that's how you derived -- you're
 24 taking two weeks. You get everything back and
 25 running in two weeks and this is the level of

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1 unsupplied energy that would be not met during
2 that two-week outage?
3 MR. HUMPHRIES:
4 A. That's right.
5 GREENE, Q.C.:
6 Q. Okay. So if you continue to scroll down, the
7 question was whether -- your answer was that
8 there would be periods that there was going to
9 be unsupplied energy and the question was what
10 would you have to install to ensure that the
11 level of unsupplied energy for the in-feed was
12 going to be the same as in the isolated
13 option? Do you recall how many combustion gas
14 turbines was going to be required?
15 MR. HUMPHRIES:
16 A. As I recall, I think it was 11 combustion gas
17 turbines.
18 GREENE, Q.C.:
19 Q. So for that -- and we'll come to the
20 difference in the level of unsupplied energy
21 between the in-feed and the Isolated, but in
22 order to ensure that in the in-feed option for
23 the level would be the same as the Isolated
24 option, it would require 11 combustion gas
25 turbines to be installed around the island to

1 A. That's correct.
2 GREENE, Q.C.:
3 Q. And that is not in the CPW analysis at
4 present, is it?
5 MR. HUMPHRIES:
6 A. No. That would -- actually, it would
7 represent an advancement of cost in the CPW
8 analysis. These gas turbines actually get
9 added but later in the analysis, so if you --
10 when we look at, 11 gas turbines costs a lot
11 more than 375 million dollars, but all we're
12 doing, we're advancing the cost and we would
13 bring them forward for transmission
14 reliability backup earlier than we would for
15 our LOLH requirement.
16 GREENE, Q.C.:
17 Q. But would -- it was the impact on the CPW, I
18 think the indication to the answer was 350
19 million dollars it would add to the in-feed as
20 a cost?
21 MR. HUMPHRIES:
22 A. That's correct.
23 GREENE, Q.C.:
24 Q. So it would decrease the preference by that
25 amount for the isolated?

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1 keep that level the same as the Isolated
2 island option?
3 MR. HUMPHRIES:
4 A. That's correct.
5 GREENE, Q.C.:
6 Q. And what was the cost of those 11 gas
7 turbines?
8 MR. HUMPHRIES:
9 A. I don't have the capital cost, the total
10 capital cost but I think the cumulative
11 present worth difference of the expansion
12 analysis was less than 400 million dollars.
13 (3:00 p.m.)
14 GREENE, Q.C.:
15 Q. Yes, if you go to -- it was 350 million
16 dollars I believe you answered the question
17 that that would be the impact on the CPW?
18 MR. HUMPHRIES:
19 A. Yes.
20 GREENE, Q.C.:
21 Q. So to put in the 11 gas turbines to provide
22 that same level of reliability as the isolated
23 island option, it would be 11 gas turbines at
24 a cost of 350 million dollars?
25 MR. HUMPHRIES:

1 MR. HUMPHRIES:
2 A. That's correct.
3 GREENE, Q.C.:
4 Q. Alright. Now just looking at the level of
5 unsupplied energy for using your same
6 analysis, the two-week window, your worst two-
7 week window, you're going to get all the lines
8 up in two weeks for the DC line coming across
9 the Long Range Mountains, comparing that, the
10 level of unsupplied energy in the in-feed
11 option versus the isolated option, can we go
12 to PUB-Nalcor-168, I believe it is?
13 And in looking at -- or we could have
14 gone to your Table 5, 106, if you'd prefer.
15 MR. HUMPHRIES:
16 A. Yes.
17 GREENE, Q.C.:
18 Q. It's just the same data. To me, it's just
19 what I was used to for getting the number.
20 But for me, Mr. McNiven, I need it back for
21 the numbers. It's in two pages. It's just --
22 when you did the table for the exhibit, you
23 demonstrated -- the question was the level of
24 unsupplied energy for your two-week window
25 based on your load and the way the question

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1 and you confirmed in the answer is that for --
 2 if you look at the isolated island option, the
 3 unsupplied varies from zero megawatt hours up
 4 to 19, almost 20,000 megawatt hours for the
 5 years 2017 to 2037. Is that correct, Mr.
 6 Humphries?
 7 MR. HUMPHRIES:
 8 A. Yes, that's correct.
 9 GREENE, Q.C.:
 10 Q. Okay. Now if we looked at the Interconnected
 11 option for the very same period using the very
 12 same repair outage, we see that the unsupplied
 13 energy now goes from 14 megawatt hours up to
 14 almost 94,000 megawatt hours over the same
 15 period. So to a layperson again reading that,
 16 to me there's more opportunity for unsupplied
 17 energy during the two-week outage in the in-
 18 feed option versus the isolated island option.
 19 Is that correct?
 20 MR. HUMPHRIES:
 21 A. Based on those numbers and during those
 22 periods, yes, that's correct.
 23 GREENE, Q.C.:
 24 Q. Now could I go to PUB-Nalcor-174? And this is
 25 -- I wanted to discuss with Nalcor what

1 would have to revert to load rotations and
 2 those types of things. For the most part,
 3 there would not be -- based on our load data,
 4 there would not be a full 24-hour period where
 5 we would resort to that. There would probably
 6 be a period of eight to ten, maybe even 12
 7 hours a day, where we would have no problem
 8 with serving the load, but to get over those
 9 peaks, we would either -- we would interrupt
 10 or rotate blocks of load amongst customers for
 11 those periods each day until we got the line
 12 back in service and repaired, and even within
 13 that two-week period, our peak doesn't last --
 14 our peak only lasts a day or two. So the
 15 worst exposure and the maximum amount of load
 16 rotation would take place probably over a 48-
 17 hour period and as we went either side of that
 18 in the two-week period, there would still be
 19 load rotations, but they would be less
 20 significant.
 21 GREENE, Q.C.:
 22 Q. Okay. I wonder if we could go to PUB-Nalcor-
 23 31, which talks a little bit more about under
 24 frequency load shedding, what it would mean.
 25 So, if we scroll down to the bottom of the

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1 happens if the bi-pole is down, we do have the
 2 level of unsupplied energy that we just talked
 3 about and we're not able to supply load, how
 4 will Nalcor provide that load? And in looking
 5 at this, we see about how you're going to do
 6 it and if you want, Mr. Humphries, you can
 7 either just tell us how you would do it and
 8 how you would deal with under frequency load
 9 shedding, et cetera, in that situation and
 10 what it would mean for the ratepayers?
 11 MR. HUMPHRIES:
 12 A. Could you just page down a little further, so
 13 it's -
 14 GREENE, Q.C.:
 15 Q. And you don't have to refer to that. It's
 16 just it's -- because I'm sure you know it by
 17 heart as to -
 18 MR. HUMPHRIES:
 19 A. Yeah, okay. Well, what would happen, in the
 20 event that we were in a situation where we did
 21 not have the capacity to serve the load, again
 22 based on the -- and if this were at the worst
 23 period of time, worst loading period, the peak
 24 period, there would be a number of hours
 25 during a day where we would be short and we

1 page, can you just -- it talks about there, if
 2 we could begin by reading at line 23, Mr.
 3 Humphries, where the sentence begins "in
 4 addition to tripping load centres," and if you
 5 want, you can just take a moment to get the
 6 context of the question and the answer. It
 7 just describes your under frequency load
 8 shedding scheme.
 9 MR. HUMPHRIES:
 10 A. Okay. From the perspective of the event, the
 11 transition and there's two issues going. When
 12 we look at -- from the -- in the context of
 13 the Labrador-Island link, there are two events
 14 that could happen, I guess. One is the loss
 15 of a pole and what happens there and the
 16 design at that stage is from the -- that would
 17 be transparent to the customer with the
 18 overload capabilities and the ten-minute
 19 continuous 150 percent overloads, that would
 20 be a transparent event and that is one of the
 21 integration studies which are ongoing. That
 22 is one of the contingencies that will be
 23 investigated and confirmed.
 24 From the perspective of when we lose that
 25 bi-pole, that is not going to be -- the actual

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<p>1 transition, the contingency when that happens, 2 that will not be a seamless event, you know. 3 There's going to be under frequency load 4 shedding. There will be -- we will have to 5 possibly segregate portions of the system and 6 then we will come back and recover and put the 7 system back together with the available 8 generation that we have and if there's enough 9 generation there, everything will continue on. 10 If there's not, we will enter into these load 11 rotations like I spoke of. 12 And that will be true at any stage for a 13 loss of the bi-pole, even if -- for argument 14 sake, even if we had the Maritime link and we 15 had a sudden loss of that full 800 megawatt or 16 900 megawatt supply to the island, it's not 17 going to be seamless. There would be special 18 protection plans in place to isolate areas of 19 load and we would go through an orderly 20 restoration. It's not going to turn around on 21 a dime. Even if the Maritime link was there, 22 you can't turn it around on a dime and pull 23 500 megawatts in. There would be a 24 restoration period involved. So when that 25 event happens, as we call transiently from the</p>	<p>1 We have an under frequency load shedding 2 scheme and it's our first line of approach 3 when we go through a generation loss. That is 4 definitely not a utility norm in North 5 America, you know. Under frequency load 6 shedding are three or four tiers down the 7 attack plan before it -- but it is priority 8 one in Newfoundland and when we -- if we lose 9 a unit at Holyrood, there's an under frequency 10 load shedding scheme in place where we trip 11 feeders to remove loads to protect the 12 integrity of the whole system. If we didn't 13 do that, the whole island would go black. So 14 this is -- we're talking about the same type 15 of arrangements for the loss of the bi-pole. 16 We would do the same thing. If we didn't have 17 these procedures in place, the whole province 18 would go black. And these are -- they're not 19 frequent events. These are events that are 20 probably going to occur once in ten years and 21 from an icing perspective, once in 50 years as 22 a minimum. But there will be other events 23 that will -- with the HVDC link, the equipment 24 problems, converter problems that could end up 25 in a trip of the system. It will be short in</p>
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<p>1 time the event happens until it settles out, 2 there will be special protections and 3 operations going on and service will not be 4 normal, but it will be comparable to any 5 emergency type event that you would have for a 6 major failure on a system. 7 GREENE, Q.C.: 8 Q. And just you were explaining that and then the 9 line, beginning at line 25, "it is expected 10 that the Avalon Peninsula and potentially the 11 Burin Peninsula, depending upon system load, 12 conditions and HVDC link load conditions will 13 need to be tripped to maintain an electrically 14 isolated island containing remaining hydro 15 electric resources." So again, to a layperson 16 reading that, it sounds like we're tripping 17 off the Avalon and the Burin, so we're going 18 to be isolated from the rest, so maybe should 19 we all move to the west coast or what are we 20 to take from that, as a layperson reading 21 that? 22 MR. HUMPHRIES: 23 A. Well, again, that is a short-term trip, no 24 differently than what happens on the system 25 today and it's happened for the past 40 years.</p>	<p>1 duration, but it will happen and when that 2 happens, we will have to -- if we lose both 3 poles and whether it's a line problem or a 4 converter problem, we will have to revert to 5 these special protections to preserve the 6 integrity of the system. It's no different 7 than -- we will not be doing -- now, we can be 8 doing that six or seven times a year. We have 9 done it as many as 12 or 13 times a year. 10 GREENE, Q.C.: 11 Q. Is there a target -- does Hydro have a target 12 that it uses for performance measures for the 13 number of under frequency trips? 14 MR. HUMPHRIES: 15 A. We've been trying to keep it to six, yes. 16 GREENE, Q.C.: 17 Q. And was that a reduced target and you had to 18 enter into arrangements with customers to 19 reduce the number of under frequency trips? 20 MR. HUMPHRIES: 21 A. Well, I mean, from the perspective of entering 22 into arrangements with customers, the actual 23 loads in our under frequency load shedding 24 scheme, there are some industrial loads there. 25 The paper mills were big contributors, where</p>

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<p>1 they would voluntarily -- we would trip non-essential equipment there and that made up a portion of the load, but there's also a number of Newfoundland Power feeders that your home and my home may be on and there are times that your lights go out and they're out for 20 minutes or half an hour and there's no obvious problem around your neighbourhood and that's quite likely what's happened because of the under frequency load shedding and through the luck of the draw, you're on one of those feeders that day and you get tripped. That's been a -- you know, a fact of life for Newfoundland for 40 years now and like I say, it's not the norm or even accepted in other jurisdictions, but it has been, in my view, one of the most significant contributors to our overall system reliability and performance in this province for the past 40 years.</p> <p>20 GREENE, Q.C.:</p> <p>21 Q. And one of the ways of dealing with that would be through interconnection agreements that other utilities can take advantage of?</p> <p>24 MR. HUMPHRIES:</p> <p>25 A. The under frequency trips for these normal</p>	<p>1 Exhibit 106 again, where we talk about these level of unserved energy? And our premise moving forward of maintaining reliability at least at levels consistent that we experienced today, and if you look at the first line in Table 5 -- it's page 23 of 34. If you look at the first line in that table, the Isolated island, and we look at the year 2012 and year 2012 is representative of where we've been for the past long time, number of years, 20 years, and you look at if we had a common mode failure, and that means that we lost both transmission lines TL202 and 206 from Bay D'Esprit to Sunnyside at the same time at the worst possible time, which has a probability of two percent right now, or two to four percent, which is higher than the probability of the loss of a Maritime link, even using the 1 and 50 year design, we would experience an unserved energy in the range of 80,000 megawatt hours. So when we look at then we move down into the second block there, the island interconnected bi-pole option and we look at the numbers that -- starting off at 14,000, peaking at 93 and then coming down,</p>
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<p>1 events, like something like the trip of a 150 megawatt generator, they will not exist in the Interconnection arrangement. It just won't happen.</p> <p>5 (3:15 p.m.)</p> <p>6 GREENE, Q.C.:</p> <p>7 Q. Because of the fact you have an interconnection?</p> <p>9 MR. HUMPHRIES:</p> <p>10 A. Yes, yes.</p> <p>11 GREENE, Q.C.:</p> <p>12 Q. Okay. There's two additional points on this issue. Can we just go -- well, I don't know if we need to, but in PUB-Nalcor-174, you stated that you would not be -- it is not your plan to install any of the additional combustion gas turbines to deal with reliability and I was a little confused based on some of your answers yesterday and today if it's still your current plan. Do you plan to either install any additional gas turbines to deal with this reliability issue or not?</p> <p>23 MR. HUMPHRIES:</p> <p>24 A. Take it back -- I'll back up. Let's go back to -- if we could go back to our Table 5 in</p>	<p>1 and they will moderate at that 50,000 level in the future because that's -- as we start to bring on generation, every couple of years we're bringing on additional combustion turbines, so those unserved energies would moderate in that area. So from the perspective of where we would be then compared to where we are today, that's -- they do offer a comparable level of service. The probability of the loss is lower. The magnitude -- the maximum magnitude of unserved energy, if that happened at the worst possible time, is comparable. So that, based on that, that's where we get to no generation. If that is not deemed appropriate, the right way to go about rectifying the problem in our view is to add additional CTs or advance the CTs that are already in the plan. Increasing our line design does nothing for that.</p> <p>20 GREENE, Q.C.:</p> <p>21 Q. So your position, as I understand it, is that your analysis compares the proposed new system with the current arrangement and it holds us indifferent. We will be no better off.</p> <p>25 MR. HUMPHRIES:</p>

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<p>1 A. But we will be no worse.</p> <p>2 GREENE, Q.C.:</p> <p>3 Q. Or no worse off, so -</p> <p>4 MR. HUMPHRIES:</p> <p>5 A. That's correct.</p> <p>6 GREENE, Q.C.:</p> <p>7 Q. So this idea of the interconnection and the</p> <p>8 idea that we may be a bit better off is not</p> <p>9 reflected in your analysis. In fact, your</p> <p>10 minimum standard is bring us at least -- the</p> <p>11 in-feed will keep us in the same place we now</p> <p>12 are?</p> <p>13 MR. HUMPHRIES:</p> <p>14 A. That's right. And that's based on the single</p> <p>15 -- I'll call it the single in-feed case and I</p> <p>16 know we're not supposed to be talking about</p> <p>17 the Maritime link, but it's out there and that</p> <p>18 will make a significant difference.</p> <p>19 GREENE, Q.C.:</p> <p>20 Q. Okay. Can we go to MHI-Nalcor-24, please?</p> <p>21 And I guess this goes to the Maritime link.</p> <p>22 The answer to the question was that the system</p> <p>23 is designed to obtain the required level of</p> <p>24 reliability with the island generation</p> <p>25 facilities. Any additional reliability as a</p>	<p>1 MR. BENNETT:</p> <p>2 A. I think in this context, just to outline our</p> <p>3 rationale, the availability of import capacity</p> <p>4 from the Maritime Provinces is a significant</p> <p>5 source of generation for the island.</p> <p>6 GREENE, Q.C.:</p> <p>7 Q. Maybe I'm not reading the answer correctly or</p> <p>8 the other RFIs I can bring you to. Our</p> <p>9 understanding was that from a reliability</p> <p>10 perspective, what you are designing the system</p> <p>11 for was to reach all reliability criteria</p> <p>12 without consideration of the Maritime link.</p> <p>13 Is that correct? The Maritime link, in fact I</p> <p>14 think the expression was, it's gravy. It's</p> <p>15 extra. We don't need it. It is not required</p> <p>16 to meet the required reliability for the</p> <p>17 island. Do you remember the gravy expression?</p> <p>18 MR. HUMPHRIES:</p> <p>19 A. Not directly, but it may have been used, but</p> <p>20 from the perspective of your point, yes, that</p> <p>21 is correct. It will not be required, but if</p> <p>22 it were there, it offers a benefit and if it</p> <p>23 were there, the whole question of 1 to 50 line</p> <p>24 design versus the 1 to 150 comes into</p> <p>25 question. In the event that it is not there</p>
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<p>1 result of the Maritime link has not been</p> <p>2 factored into the analysis. So let's deal</p> <p>3 just without the Maritime link, and in fact,</p> <p>4 has any information been provided by Nalcor in</p> <p>5 this reference question dealing with the</p> <p>6 Maritime link or the technical standards</p> <p>7 relating to it or how would it contribute to</p> <p>8 reliability in any way?</p> <p>9 MR. HUMPHRIES:</p> <p>10 A. Yes, there has.</p> <p>11 GREENE, Q.C.:</p> <p>12 Q. Information to this Board about the -</p> <p>13 MR. HUMPHRIES:</p> <p>14 A. Well, Exhibit 106 addresses the Maritime link.</p> <p>15 GREENE, Q.C.:</p> <p>16 Q. Have you provided any information as to what</p> <p>17 the technical requirements of the link would</p> <p>18 be to allow a technical assessment as to</p> <p>19 whether it would be available and meet the</p> <p>20 reliability requirements?</p> <p>21 MR. HUMPHRIES:</p> <p>22 A. No, we have not.</p> <p>23 GREENE, Q.C.:</p> <p>24 Q. No. So the only reference is your statement</p> <p>25 in Exhibit 106 relating to it?</p>	<p>1 and we still only have a 1 to 50 year design</p> <p>2 criteria, from our perspective, the best bang</p> <p>3 for your buck, if you look at it from that</p> <p>4 way, for reliability is to add combustion gas</p> <p>5 turbines on the island.</p> <p>6 GREENE, Q.C.:</p> <p>7 Q. And that's where I guess I was earlier -- just</p> <p>8 a moment ago that I wanted to be sure I</p> <p>9 understood your position because you referred</p> <p>10 to that just then and you did yesterday, but</p> <p>11 if we go to PUB-Nalcor-174, you say it is not</p> <p>12 part of your plan to install gas turbines. So</p> <p>13 are you saying you've changed that and that is</p> <p>14 what you will do or you're saying you -- if</p> <p>15 anybody wants you to, you will consider it?</p> <p>16 I'm not sure what you're saying.</p> <p>17 MR. HUMPHRIES:</p> <p>18 Q. We are open -- in the event that the Maritime</p> <p>19 link did not progress, we would be open to</p> <p>20 discussion, yes.</p> <p>21 GREENE, Q.C.:</p> <p>22 Q. So if the Maritime link, which is not required</p> <p>23 to design the reliability of the system and</p> <p>24 all the information you've given to the Board</p> <p>25 is based on without the Maritime link in terms</p>

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1 of reliability, you would not put in gas
 2 turbines either? If there is no Maritime
 3 link, will you consider adding gas turbines to
 4 address reliability?
 5 MR. BENNETT:
 6 A. Maybe I'll try the question another way, and I
 7 guess ultimately, this gets to the fundamental
 8 question. If Hydro were to bring forward a
 9 capital budget request for the combustion
 10 turbines within the existing criteria used by
 11 the Board, I guess the Board would have to
 12 consider whether it would approve that.
 13 GREENE, Q.C.:
 14 Q. But I guess before the Board even gets to
 15 consider it, Nalcor has to make a decision
 16 whether it thinks it's prudent and then they
 17 ask the Board to approve it. So, I'm asking
 18 you -
 19 MR. BENNETT:
 20 A. Okay, and we -
 21 GREENE, Q.C.:
 22 Q. - will Nalcor -- is Nalcor considering adding
 23 gas turbines?
 24 MR. BENNETT:
 25 A. So based on the information we have before us,

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1 based on the information that we presented in
 2 Exhibit 106, based on an assessment of the
 3 existing system, we do not see a basis for
 4 bringing forward additional combustion
 5 turbines. We think the path we're on is a
 6 prudent one and in the interest of our
 7 province's ratepayers.
 8 GREENE, Q.C.:
 9 Q. Thanks. I was just uncertain where you've
 10 referred to it a few times now, well, we can
 11 solve the problem with gas turbines, but that
 12 is not what you're proposing?
 13 MR. BENNETT:
 14 A. And you're right, that is a technical solution
 15 if it were deemed that a different standard of
 16 service were required on the Interconnected
 17 Island system, in the absence of the Maritime
 18 link, then our view is that the combustion
 19 turbine solution is a good solution.
 20 GREENE, Q.C.:
 21 Q. And I think you've answered the last question.
 22 If there is no Maritime link, you're still
 23 really comfortable at 1 in 50? Is that what
 24 you're telling us?
 25 MR. HUMPHRIES:

1 A. I can't hear you. Could you speak up?
 2 GREENE, Q.C.:
 3 Q. Oh, sorry. If there is no Maritime link, are
 4 you still comfortable with the return period
 5 of 1 in 50 years for the HVDC transmission
 6 line?
 7 MR. HUMPHRIES:
 8 A. Yes, we are.
 9 GREENE, Q.C.:
 10 Q. Okay. So, MHI's recommendation is not going
 11 to be considered at all by Nalcor as it moves
 12 forward to DG3 with respect to the return
 13 period?
 14 MR. HUMPHRIES:
 15 A. We've considered it, but we feel our solution
 16 is the best, in the best interest of the
 17 ratepayer.
 18 GREENE, Q.C.:
 19 Q. And you are aware of the other lines that are
 20 being built to the 1 and 50 -- and we'll hear
 21 more about that from MHI tomorrow, that their
 22 new bi-pole is and that the other lines in
 23 Ontario and Quebec are as well. They're being
 24 -- so is it because of cost, we can't afford
 25 it?

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1 MR. HUMPHRIES:
 2 A. It's a combination of cost and the relative
 3 improvement in reliability that that cost
 4 brings, overall reliability, just not trip to
 5 transmission, but overall ability to be able
 6 to serve the customers' load.
 7 GREENE, Q.C.:
 8 Q. The cost of enhancing to the 1 in 150 year
 9 return period, we've already heard, is about
 10 150 million dollars. That's about a three
 11 percent of your total cost of the project. So
 12 in light of the fact it's such a small
 13 percentage of your overall cost, you're that
 14 confident that your totally right on
 15 reliability, that as we sit here with a lower
 16 return period than in other provinces, as we
 17 sit here without gas turbines and as we sit
 18 here with the under frequency load shedding,
 19 I'm just -- you've made the decision on the
 20 basis it's too expensive for us to pay and
 21 that you're really right on reliability?
 22 MR. BENNETT:
 23 A. I think when you look at the efforts that have
 24 gone into meteorological modelling, the design
 25 limits that we're using, both on the Avalon

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<p>1 and elsewhere on the system, as well as the</p> <p>2 special consideration that's being given to</p> <p>3 the Alpine regions, the observation that our</p> <p>4 current design standards go well beyond the</p> <p>5 loading criteria that are outlined in the CSA</p> <p>6 standard for this part of Canada, the</p> <p>7 observation that we have the highest ice</p> <p>8 loading generally speaking in southern Canada,</p> <p>9 we think that we have an appropriate level of</p> <p>10 reliability designed into the system.</p> <p>11 MR. HUMPHRIES:</p> <p>12 A. Just further to that, I guess from the</p> <p>13 perspective of it's only 150 million dollars,</p> <p>14 it's only three percent, I look at it from the</p> <p>15 perspective of yes, it's only 150 million</p> <p>16 dollars, but looking at where we can achieve</p> <p>17 the maximum customer benefit for that 150</p> <p>18 million dollars.</p> <p>19 GREENE, Q.C.:</p> <p>20 Q. But obviously, I guess, it must be a judgment</p> <p>21 call and that's one of the issues for</p> <p>22 Newfoundlanders listening to this debate. We</p> <p>23 have an expert from outside the province</p> <p>24 coming in and saying the return period is not</p> <p>25 good enough. It's not high enough and when it</p>	<p>1 Yesterday in your presentation, you indicated</p> <p>2 that the full integration studies for the new</p> <p>3 configuration with Muskrat Falls proceeding</p> <p>4 first will be complete by DG3. Is that</p> <p>5 correct?</p> <p>6 MR. HUMPHRIES:</p> <p>7 A. Yes, that's correct.</p> <p>8 GREENE, Q.C.:</p> <p>9 Q. Previously you had advised the Board that they</p> <p>10 will be available in November past and then</p> <p>11 when the Board asked in December had they been</p> <p>12 completed, you advised that they would be</p> <p>13 completed in March 2012. Are you still on</p> <p>14 target for March 2012?</p> <p>15 MR. HUMPHRIES:</p> <p>16 A. We hope to be, yes.</p> <p>17 GREENE, Q.C.:</p> <p>18 Q. Can you explain why it's taking so long to do</p> <p>19 these integration studies? Obviously they've</p> <p>20 taken longer than you had anticipated.</p> <p>21 MR. HUMPHRIES:</p> <p>22 A. Yes, they've taken longer than we've</p> <p>23 anticipated and they have -- these are studies</p> <p>24 that are not being done by us. They are being</p> <p>25 done by SNC Lavalin as part of the overall</p>
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<p>1 comes to reliability and keeping the lights</p> <p>2 on, I guess, there's two things very near and</p> <p>3 dear to ratepayers' hearts. One is what</p> <p>4 they're going to pay for the power, but boy,</p> <p>5 even higher than that is making sure the</p> <p>6 lights come on and the lights stay on. So,</p> <p>7 thank you for your frank answer about where</p> <p>8 you are with the -- you do not agree with</p> <p>9 MHI's recommendation. I guess that's</p> <p>10 something that, and I understand from your</p> <p>11 answer, you're not even willing to consider it</p> <p>12 as you move forward to DG3. So that's -- I</p> <p>13 think we've probably covered the topic as far</p> <p>14 as we can and it may be a good time to break</p> <p>15 at this point.</p> <p>16 CHAIRMAN:</p> <p>17 Q. Okay. We'll take a break for a few minutes.</p> <p>18 (BREAK - 3:29 P.M.)</p> <p>19 (RESUME - 3:49 P.M.)</p> <p>20 CHAIRMAN:</p> <p>21 Q. And here we are. Now I understand you still</p> <p>22 got some -- we shall await you.</p> <p>23 GREENE, Q.C.:</p> <p>24 Q. Thank you, Mr. Chair. I'd like to move to</p> <p>25 another topic now, the AC Integration Studies.</p>	<p>1 EPCM contract and we were probably later</p> <p>2 getting these studies off the ground than we</p> <p>3 had anticipated and we have had involvement of</p> <p>4 some of our technical people in the process</p> <p>5 along the way. So it just hasn't moved as</p> <p>6 quickly as we had thought it would.</p> <p>7 GREENE, Q.C.:</p> <p>8 Q. You indicated yesterday as well that you had</p> <p>9 done previous studies on system integration.</p> <p>10 Some were done in 1998 when we had the</p> <p>11 proposed Gull Island development and Sales</p> <p>12 West, and in 2008 when you were looking at the</p> <p>13 1600 megawatt multi-terminal line with one</p> <p>14 terminal in New Brunswick and that had</p> <p>15 provided you a level of comfort that you had</p> <p>16 sufficient information for DG2 purposes. Is</p> <p>17 that a correct rephrasing of what you said?</p> <p>18 MR. HUMPHRIES:</p> <p>19 A. That's correct.</p> <p>20 GREENE, Q.C.:</p> <p>21 Q. When did you make that assessment that you had</p> <p>22 sufficient information available on system</p> <p>23 integration to allow you to proceed?</p> <p>24 MR. HUMPHRIES:</p> <p>25 A. Shortly after I would say that we finalized</p>

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<p>1 our focus on the Muskrat Falls Labrador-Island</p> <p>2 link scenario, and that would be late 2009,</p> <p>3 early 2010.</p> <p>4 GREENE, Q.C.:</p> <p>5 Q. When the Board asked you about the completion</p> <p>6 of the system integration studies, you didn't</p> <p>7 advise or provide information with respect to</p> <p>8 how the previous integration studies met your</p> <p>9 criteria for DC2 or with respect to the new</p> <p>10 Muskrat Falls configuration. I was just</p> <p>11 wondering why not.</p> <p>12 MR. HUMPHRIES:</p> <p>13 A. I don't know whether we advised. The studies</p> <p>14 were filed as exhibits and -</p> <p>15 GREENE, Q.C.:</p> <p>16 Q. But when the question was asked as to when the</p> <p>17 system integration studies would be completed</p> <p>18 for Muskrat Falls, there was no indication in</p> <p>19 the response that you had sufficient</p> <p>20 information, that you didn't need to do them</p> <p>21 or that -- and in fact, I'm going to come to</p> <p>22 you also suggested you do not anticipate</p> <p>23 anything material coming out of these studies</p> <p>24 that would affect the project definition from</p> <p>25 DG2 to DG3.</p>	<p>1 would be on the overall project layout moving</p> <p>2 to that new proposed configuration, apart from</p> <p>3 system integration?</p> <p>4 MR. HUMPHRIES:</p> <p>5 A. Well, apart from the system integration</p> <p>6 studies that -- you mean based on the previous</p> <p>7 studies or the studies that were being --</p> <p>8 anything we did to close the gap? Is that the</p> <p>9 question you're asking?</p> <p>10 GREENE, Q.C.:</p> <p>11 Q. No, I guess I'm trying to get a feel for how</p> <p>12 big a deal it was. You had all this previous</p> <p>13 work done where Gull was going to be developed</p> <p>14 before Muskrat, a couple of different</p> <p>15 scenarios. One was Sales West through Quebec,</p> <p>16 another was through this idea of going through</p> <p>17 New Brunswick. But then in the spring of</p> <p>18 2010, the focus changed and it was advanced</p> <p>19 Muskrat first, Gull second.</p> <p>20 MR. HUMPHRIES:</p> <p>21 A. Yes.</p> <p>22 GREENE, Q.C.:</p> <p>23 Q. And what did Nalcor do as a result of that</p> <p>24 decision of change in focus to look at the</p> <p>25 implications of moving to Muskrat ahead of</p>
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<p>1 MR. HUMPHRIES:</p> <p>2 A. I don't know if there was any particular</p> <p>3 reason why we didn't -- I guess we answered</p> <p>4 the question. The question was asked when</p> <p>5 would they be completed and we gave the</p> <p>6 answer. That's -</p> <p>7 GREENE, Q.C.:</p> <p>8 Q. Yeah, and you didn't go on to say "and we</p> <p>9 really don't need the answer because we</p> <p>10 already got the information"?</p> <p>11 MR. HUMPHRIES:</p> <p>12 A. No, we did not.</p> <p>13 GREENE, Q.C.:</p> <p>14 Q. Okay. You indicated that based on the</p> <p>15 previous work, you thought there was</p> <p>16 sufficient information available to move</p> <p>17 through DG2 with a new configuration, which is</p> <p>18 Muskrat going first. Is that correct?</p> <p>19 MR. HUMPHRIES:</p> <p>20 A. Yes, that's correct.</p> <p>21 GREENE, Q.C.:</p> <p>22 Q. In the change, which was a change when Muskrat</p> <p>23 was advanced to proceeding ahead of Gull</p> <p>24 Island, what additional work did you do to</p> <p>25 verify and to validate what the implications</p>	<p>1 Gull?</p> <p>2 MR. HUMPHRIES:</p> <p>3 A. From the perspective that -- just for a minute</p> <p>4 go back to the 1998 studies. The 1998 studies</p> <p>5 that were completed, while they were a</p> <p>6 Teshmont study, we did have four of our</p> <p>7 engineers seconded to Teshmont during that</p> <p>8 period and they actually did the computational</p> <p>9 work and were present during the assessment of</p> <p>10 the results. So we did have four people that</p> <p>11 were intimately familiar with the studies of</p> <p>12 1998 and in fact, two of those individuals are</p> <p>13 still working in the same area. So, they were</p> <p>14 familiar with the models to be able to do some</p> <p>15 preliminary analysis, to look at things like</p> <p>16 advancing Muskrat Falls, putting in the</p> <p>17 transmission connection and while not</p> <p>18 completing a full assessment, getting the feel</p> <p>19 of comfort that there were not significant.</p> <p>20 It was by no means a complete integration</p> <p>21 study, but it gave us that level of comfort to</p> <p>22 know that this looks very similar.</p> <p>23 GREENE, Q.C.:</p> <p>24 Q. So you're talking about system integration</p> <p>25 studies and I guess my question was a bit</p>

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1 broader. Apart from system integration, what
 2 types of things did Nalcor look at to reflect
 3 the change in the construction schedule from
 4 Gull, one, Muskrat, two, to the reverse?
 5 MR. HUMPHRIES:
 6 A. Okay. Mr. Kean, I think, would probably be
 7 better.
 8 MR. KEAN:
 9 A. Yes, it's Jason Kean. I'll refer you to PUB-
 10 Nalcor-9.
 11 GREENE, Q.C.:
 12 Q. Okay.
 13 MR. KEAN:
 14 A. Page -- actually the previous version, not the
 15 addendum. So pages two through five provides
 16 some clarity on some of the studies that were
 17 undertaken in the period of 2009 through 2010.
 18 Listed there beneath the subheading of Muskrat
 19 Falls reports, you see a review of variance
 20 from which the current configuration of
 21 Muskrat Falls was selected, the move of the
 22 facility to the south side of the river, given
 23 that the Black Rock Bridge across the
 24 Churchill River was in place. Further, there
 25 was some work done on spillway design review.

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1 So over the -- I guess in summary, the period
 2 of 2007 to '09, some critical areas were
 3 studied to facilitate better advanced
 4 knowledge of Muskrat.
 5 GREENE, Q.C.:
 6 Q. So there were -- because of the change in the
 7 configuration, Nalcor did have to study the
 8 implications of that on various aspects of the
 9 project and you needed those results before
 10 you moved through the Decision Gate 2?
 11 MR. KEAN:
 12 A. Yes, that is correct. One of the studies that
 13 was undertaken, as listed on page three, if
 14 you just go down, was to look at the review of
 15 impacts of earlier construction on Muskrat
 16 Falls -- of Muskrat Falls on Gull Island
 17 later. So we did understand, evaluate the
 18 implications in that regard.
 19 GREENE, Q.C.:
 20 Q. And another study, for example, you would have
 21 done was to optimize the generation from
 22 Muskrat with Muskrat being developed ahead, so
 23 that was additional studies with respect to
 24 the optimization for Muskrat being built
 25 first? That's just another example of

1 something you looked at?
 2 MR. BENNETT:
 3 A. Yes, they were looked at, but there was
 4 information available from previous studies
 5 that showed production from Muskrat Falls with
 6 and without Gull Island. So those studies had
 7 previously been completed.
 8 GREENE, Q.C.:
 9 Q. And then when you changed the configuration
 10 for Muskrat, you looked at it again, and I'm
 11 trying to understand if it was necessary to do
 12 that amount of work and to have those studies
 13 completed, even though you had the previous
 14 work done in '98 and 2010, system integration
 15 was different and you didn't need to have it
 16 done because the other previous studies, with
 17 the configuration, the earlier configuration
 18 was valid enough for you. I'm trying to
 19 understand the difference.
 20 MR. BENNETT:
 21 A. I just think from a global perspective, I
 22 don't think you can draw an engineered
 23 conclusion from one group of studies to
 24 compare to another group of studies. The
 25 specifics of each situation, the factors under

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1 consideration in each study had to be looked
 2 at individually and consideration has to be --
 3 a conclusion has to be drawn from the
 4 specifics.
 5 (4:00 p.m.)
 6 GREENE, Q.C.:
 7 Q. So it was that various aspects were deemed
 8 necessary to look at it because you changed
 9 the configuration. Mr. Kean was -- it was
 10 good enough of him to bring to all of these
 11 studies that you actually did do with the
 12 change in the configuration, but system
 13 integration wasn't deemed important enough to
 14 have that updated to reflect the previous
 15 configuration for DG2?
 16 MR. HUMPHRIES:
 17 A. As we said before, based on our previous
 18 studies and our familiarity with those and the
 19 fact that we had in-house people very familiar
 20 with those studies and the abilities to be
 21 able to represent the new configuration from
 22 an integration, system integration
 23 perspective, we did enough preliminary work,
 24 yes, to determine that we did not feel that
 25 that was critical to DG2.

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<p>1 GREENE, Q.C.:</p> <p>2 Q. But in any event, they will be complete for</p> <p>3 DG3 and any potential cost identified or</p> <p>4 changes in project definition as a result of</p> <p>5 those studies and therefore any changes in the</p> <p>6 project cost, all of that will be reflected in</p> <p>7 our new DG3 project definition, new project</p> <p>8 DG3 cost schedule and estimates, et cetera?</p> <p>9 Is that correct?</p> <p>10 MR. HUMPHRIES:</p> <p>11 A. Yes, that is correct.</p> <p>12 GREENE, Q.C.:</p> <p>13 Q. And we won't -- the full update on the AC</p> <p>14 integration studies are available in March,</p> <p>15 but the full impact on the cost estimate and</p> <p>16 the schedule, et cetera, will not be available</p> <p>17 until we go through DG3, which is anticipated</p> <p>18 to be midyear?</p> <p>19 MR. HUMPHRIES:</p> <p>20 A. Yes, that's my understanding. Jason can</p> <p>21 confirm that.</p> <p>22 MR. KEAN:</p> <p>23 A. Yes, Jason Kean. That is correct. It's an</p> <p>24 extensive process to pull together the cost</p> <p>25 estimate as we discussed yesterday.</p>	<p>1 A. It's just a generalized reference, the term</p> <p>2 PPA, power purchase agreement, with respect to</p> <p>3 the parameters that we used in our modelling</p> <p>4 for DG2.</p> <p>5 GREENE, Q.C.:</p> <p>6 Q. So it may -- at the end of the day, it may not</p> <p>7 reflect what you've used in your analysis? Is</p> <p>8 that what you're saying?</p> <p>9 MR. GOUDIE:</p> <p>10 A. Could you repeat that? Sorry, I'm having</p> <p>11 trouble hearing you.</p> <p>12 GREENE, Q.C.:</p> <p>13 Q. This is what you use for the analysis, for</p> <p>14 your financial analysis, and whatever the real</p> <p>15 terms are will be reflected when the power</p> <p>16 contract is actually put in place between</p> <p>17 Nalcor and Hydro? Is that correct?</p> <p>18 MR. GOUDIE:</p> <p>19 A. That's correct.</p> <p>20 GREENE, Q.C.:</p> <p>21 Q. Okay. So if I were to ask you, the</p> <p>22 anticipated term would be the term that you</p> <p>23 use for your financial analysis? Is that</p> <p>24 correct?</p> <p>25 MR. GOUDIE:</p>
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<p>1 GREENE, Q.C.:</p> <p>2 Q. Okay. Just moving to a new topic and it's the</p> <p>3 power purchase agreement which is Mr. Goudie.</p> <p>4 Just a few questions to explain the nature of</p> <p>5 that contract and I know Mr. Johnson has</p> <p>6 already asked a number of questions. I just</p> <p>7 have a few additional ones. That contract or</p> <p>8 the agreement between Hydro and Nalcor has not</p> <p>9 been finalized, has it?</p> <p>10 MR. GOUDIE:</p> <p>11 A. That's correct. The agreement is not</p> <p>12 finalized.</p> <p>13 GREENE, Q.C.:</p> <p>14 Q. So when we talk about these terms, these are</p> <p>15 anticipated terms. Is there even a term sheet</p> <p>16 for it?</p> <p>17 MR. GOUDIE:</p> <p>18 A. Not that I'm aware of.</p> <p>19 GREENE, Q.C.:</p> <p>20 Q. Okay. So when we talk about the terms of the</p> <p>21 PPA, it is what you use for your analysis or</p> <p>22 what you -- or what you anticipate is going to</p> <p>23 be reflected in an actual contract or where</p> <p>24 are you getting the terms from?</p> <p>25 MR. GOUDIE:</p>	<p>1 A. Yes. We used a 50 year term.</p> <p>2 GREENE, Q.C.:</p> <p>3 Q. Sorry, was it 50 or 60?</p> <p>4 MR. GOUDIE:</p> <p>5 A. We used a 50 year term for the analysis.</p> <p>6 GREENE, Q.C.:</p> <p>7 Q. And the term anticipated for the PPA to</p> <p>8 recover the cost?</p> <p>9 MR. GOUDIE:</p> <p>10 A. Was from 2017 to 2067.</p> <p>11 GREENE, Q.C.:</p> <p>12 Q. The price that we've talked about to recover</p> <p>13 the cost of the full analysis period, the 76</p> <p>14 dollars a megawatt hour escalating at the rate</p> <p>15 of two percent a year over the entire 50 year</p> <p>16 period, is that what was built into the</p> <p>17 financial analysis?</p> <p>18 MR. GOUDIE:</p> <p>19 A. Yes. Well, the 70 -- the reference to 76</p> <p>20 dollars per megawatt hour would be a 2010</p> <p>21 dollar figure and that would escalate from</p> <p>22 that base.</p> <p>23 GREENE, Q.C.:</p> <p>24 Q. And for the analysis purposes, two percent was</p> <p>25 used?</p>

1 MR. GOUDIE:

2 A. Two percent was used, yes, that's correct.

3 GREENE, Q.C.:

4 Q. Okay. You don't know what's going to be in
5 the actual PPA, but this -

6 MR. GOUDIE:

7 A. The two percent was chosen as the midpoint to
8 the Bank of Canada inflation target range,
9 between one and three. So it would be
10 expected to be two.

11 GREENE, Q.C.:

12 Q. But again, it was just used for financial
13 analysis to illustrate what it could look
14 like?

15 MR. GOUDIE:

16 A. Yes, that's correct.

17 GREENE, Q.C.:

18 Q. Okay. It's been referred to as a take or pay
19 contract. What does that mean?

20 MR. GOUDIE:

21 A. It would basically mean that regardless of the
22 amount of energy that Hydro would need, it
23 would still have to pay the contracted
24 revenue.

25 GREENE, Q.C.:

1 Q. So once the terms are agreed, regardless of
2 the amount of power that's taken, Hydro would
3 have to pay Nalcor a fixed amount?

4 MR. GOUDIE:

5 A. That's the way we've modelled it at this time.

6 MR. BENNETT:

7 A. Just to clarify, Ms. Greene, when you said
8 "when the terms are agreed." Are you asking
9 us to speculate on what the terms of the PPA
10 are or what we used for our analysis? Those
11 are two very different things.

12 GREENE, Q.C.:

13 Q. Yeah, and I should say, for the purposes of
14 the analysis, and I wanted to make the
15 distinction earlier that we're talking about
16 something that you created for the purpose of
17 the financial analysis. At the end of the
18 day, the PPA will be whatever the PPA is
19 negotiated and because it's done on a PPA
20 basis and not a cost of service basis, that
21 particular arrangement, the costs that go into
22 it will not be regulated by the Public
23 Utilities Board, will they?

24 MR. BENNETT:

25 A. No, that's right, they won't.

1 GREENE, Q.C.:

2 Q. Do you know if that will be the same
3 arrangement in Nova Scotia with respect to
4 regulation of the Emera project in Nova
5 Scotia?

6 MR. BENNETT:

7 A. I understand that a proceeding is contemplated
8 before their Utilities and Review Board. I
9 don't know the terms of reference of that
10 reference.

11 GREENE, Q.C.:

12 Q. But would it be on the basis that Nova Scotia
13 Power -- I believe one of the terms of the
14 term sheet was that they had to get approval
15 from the regulator.

16 O'REILLY, Q.C.:

17 Q. Mr. Chairman, I don't know how informative
18 this is going to be to inform the reference
19 question about what's going to take place and
20 what the reference question or whatever the
21 Public Utilities Board of Nova Scotia is going
22 to be doing. I mean, it's just that it's an
23 area of speculation and I don't think that --
24 I think it's putting too much on these
25 witnesses to expect them to respond to that.

1 GREENE, Q.C.:

2 Q. No, that's fair. It's only to -- I was trying
3 to explain what is the difference between a
4 PPA and the role of the regulator and the cost
5 of service. I don't have to go to Nova Scotia
6 where I understand they're doing it on a cost
7 of service basis, right.

8 O'REILLY, Q.C.:

9 Q. I think you probably have the answer to it.

10 GREENE, Q.C.:

11 Q. But so the terms that we're talking about, the
12 60 -- this was all used for the financial
13 analysis and I guess it draws me to another
14 point. Everything we've talked about
15 actually, DG2, the project definition and the
16 cost estimates, may not be the reality of
17 where we end up, are they, any more than the
18 power purchase that we just talked about is?
19 Because at the end of the day, we will have a
20 different project definition than we're
21 looking at. We will have a different cost
22 estimate than we will look at. We may or may
23 not have a Maritime link that may or may not
24 affect reliability. We may or may not have a
25 Maritime link where the revenue received gets

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1 applied to any of this as it applies to
 2 Newfoundland. So for the purposes of the
 3 reference before the Board and the information
 4 we have as of DG2, isn't that also correct as
 5 what you said about the PPA?

6 MR. BENNETT:

7 A. Well, I think it's fair to say that the
 8 Decision Gate process, the project definition
 9 that we have, the general concept, the notion
 10 that Muskrat Falls as a generation source and
 11 the Labrador-Island transmission link as being
 12 the preferred supply option are being
 13 evaluated in this proceeding and I guess, you
 14 know, those basic concepts are the ones that
 15 are moving forward in our continued work. So
 16 I think that -- you know, I think that those
 17 are -- that those fundamental constructs will
 18 remain through our project definition unless,
 19 you know, something changes fairly
 20 dramatically.

21 GREENE, Q.C.:

22 Q. But again, it's DG3 where we will see the
 23 project definition and full revised capital
 24 cost estimates, et cetera, but anyway -
 25 O'REILLY, Q.C.:

1 MR. GOUDIE:

2 A. If Hydro required less power than provided for
 3 in the supply arrangements, then Hydro and
 4 Nalcor would work to monetize that
 5 differential and supply requirement in order
 6 to minimize any ratepayer benefits.

7 GREENE, Q.C.:

8 Q. Remember I said earlier sometimes I ask a
 9 question and I expect two and two is four and
 10 I get three. You just did it to me, Mr.
 11 Goudie, so can you explain that a little bit
 12 more to me?

13 MR. GOUDIE:

14 A. Well I mean, if Hydro is contracted, say in
 15 the first year to take 2 terawatt hours, it
 16 only requires say 1500--oh I'm sorry, gigawatt
 17 hours, say 2 terawatt hours and it only takes
 18 one and a half, then you would expect and the
 19 assumption has been throughout that given that
 20 Hydro has the take or pay arrangement, that
 21 that 500 gigawatt hour differential, then
 22 Hydro would try to ensure that it disposes of
 23 that energy in a way to minimize the
 24 obligation of the ratepayer or to help to
 25 mitigate, I should say, yes.

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1 Q. We've been there.

2 MR. BENNETT:

3 A. I would characterize it as refined, as opposed
 4 to revised. It is a continuing evolution in
 5 our project planning, project definition
 6 preparation for project execution.

7 GREENE, Q.C.:

8 Q. And like that issue we just talked about
 9 that's outside of our purview, there's other
 10 issues that aren't before the Board because of
 11 the terms of bank which impact on where we end
 12 up.

13 MR. BENNETT:

14 A. I think that there are some other questions, I
 15 would agree.

16 GREENE, Q.C.:

17 Q. In the financial analysis that you did for the
 18 power purchase agreement, was there any
 19 contemplation of changing in price? It was
 20 just all you did was escalate it by two
 21 percent and you assumed there would be no off
 22 ramps. If there was any change in market
 23 conditions relating to pricing that Hydro
 24 would be locked in to paying this as a take or
 25 pay?

1 GREENE, Q.C.:

2 Q. But the first, as a normal take or pay, Hydro
 3 would still be committed for it?

4 MR. BENNETT:

5 A. Right, and maybe to build on my previous
 6 comment, I mean that's one of the things that
 7 could change once we actually get to a
 8 scenario where we have a PPA and then you can
 9 explore the terms of the PPA and understand
 10 how, you know, any surplus energy would be
 11 monetized. That would be a question to be
 12 resolved in the PPA. It's not one before us
 13 because our analysis is the terms of
 14 reference, all the costs for both Muskrat
 15 Falls and the Labrador-Island Transmission
 16 Link are recovered from the Domestic supply.
 17 That's one of those evolution things that I
 18 was thinking about earlier.

19 GREENE, Q.C.:

20 Q. And that was one of the things that I was
 21 referring to where I said what we're talking
 22 about may not end up being a reality.

23 MR. BENNETT:

24 A. But I think maybe to build on that, I think
 25 that what we're seeing here is what we expect

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<p>1 to be a very good definition of that reality</p> <p>2 is a fundamental question, you know, do we</p> <p>3 conclude that Muskrat Falls and the Labrador-</p> <p>4 Island Interconnection is a preferable option</p> <p>5 to one where we see dependence on fuel and the</p> <p>6 Isolated-Island scenario, I mean, that's the</p> <p>7 fundamental question that we have to</p> <p>8 reconcile. How we evolve that alternative in</p> <p>9 the future and how we refine it to continue to</p> <p>10 advance it, that will be reflected in our</p> <p>11 future work.</p> <p>12 GREENE, Q.C.:</p> <p>13 Q. Moving to another topic it's a follow-up to</p> <p>14 questions Mr. Johnson asked yesterday with</p> <p>15 respect to the environmental upgrades at the</p> <p>16 Holyrood Thermal Plant. There's approximately</p> <p>17 six hundred million dollars cost included in</p> <p>18 the Isolated-Island option to add scrubbers</p> <p>19 and precipitators and Low NOx burners to the</p> <p>20 Holyrood plant in the Isolated-Island option</p> <p>21 and I just wanted to explore with you what</p> <p>22 those upgrades were to address. My</p> <p>23 understanding is that with burning lower</p> <p>24 sulphur fuel, a .7 percent fuel, Holyrood will</p> <p>25 meet all environmental requirements with</p>	<p>1 there's no legislative or environmental</p> <p>2 legislative or regulatory requirement that</p> <p>3 would require the utility to put in those</p> <p>4 pollution control upgrades at this point in</p> <p>5 time prior to knowing what the environmental</p> <p>6 regulations would be for the future. For</p> <p>7 example, are you now complying with your</p> <p>8 Provincial Certificate of Approval?</p> <p>9 (4:15 p.m.)</p> <p>10 MR. BENNETT:</p> <p>11 A. We are complying with that certificate of</p> <p>12 approval today.</p> <p>13 GREENE, Q.C.:</p> <p>14 Q. And all environmental legislation and</p> <p>15 regulations that are known for the foreseeable</p> <p>16 future, we'll come back to what may happen -</p> <p>17 MR. BENNETT:</p> <p>18 A. Well I think there's a clear statement of</p> <p>19 policy by the Province of Newfoundland and</p> <p>20 Labrador and it is an environmental one, that</p> <p>21 there is a clear statement of policy that in</p> <p>22 the event that the system remains isolated and</p> <p>23 Holyrood continues to operate, that Nalcor</p> <p>24 and/or Hydro will be directed to install</p> <p>25 pollution controls on that facility, so I</p>
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<p>1 respect to SO 2 for the life of the plant at,</p> <p>2 even at full load, is that correct?</p> <p>3 MR. BENNETT:</p> <p>4 A. Yes, that's my understanding that SO 2</p> <p>5 emissions are addressed with low sulphur fuel</p> <p>6 based on the regulations we currently see.</p> <p>7 GREENE, Q.C.:</p> <p>8 Q. Okay. With respect to particulate, my</p> <p>9 understanding is of a low sulphur content</p> <p>10 fuel, burning that fuel for the life of the</p> <p>11 plant will address all of the targets Hydro</p> <p>12 had established for particulate?</p> <p>13 MR. BENNETT:</p> <p>14 A. While they may address Hydro's targets, they</p> <p>15 don't address the commitment made on the</p> <p>16 Province's energy plan and the commitment made</p> <p>17 to the residents in the area where</p> <p>18 particulates have been an ongoing concern and</p> <p>19 I guess that's where we get to the commitment</p> <p>20 to install additional pollution controls on</p> <p>21 that facility.</p> <p>22 GREENE, Q.C.:</p> <p>23 Q. And you jumped ahead of me, so in terms of</p> <p>24 that, I take from your answer--am I correct in</p> <p>25 stating that from a utility perspective,</p>	<p>1 mean, the energy plan is very clear, so on</p> <p>2 that point, I would look at that statement of</p> <p>3 policy and the direction provided there as</p> <p>4 being ultimately direction to us.</p> <p>5 GREENE, Q.C.:</p> <p>6 Q. So the reason that Nalcor is doing--putting in</p> <p>7 these upgrades for 600 million dollars is in</p> <p>8 response to a policy directive from</p> <p>9 government, which, of course, as government</p> <p>10 and as a shareholder they have every right to</p> <p>11 make.</p> <p>12 MR. BENNETT:</p> <p>13 A. Right.</p> <p>14 GREENE, Q.C.:</p> <p>15 Q. Now looking at what you're installing, what do</p> <p>16 precipitators and scrubbers actually address?</p> <p>17 MR. BENNETT:</p> <p>18 A. Those two pollution controls address</p> <p>19 particulate emissions as well as sulphur</p> <p>20 dioxide emissions and one thing that we do</p> <p>21 note is that with the installation of those</p> <p>22 pollution controls, we do have the ability to</p> <p>23 move back to higher sulphur content fuel for</p> <p>24 the Holyrood facility.</p> <p>25 GREENE, Q.C.:</p>

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<p>1 Q. On the issue of the fuel, a question I wanted</p> <p>2 to ask, again Mr. Johnson asked this yesterday</p> <p>3 and in reading the transcript I wasn't totally</p> <p>4 clear on the answer, but the question was had</p> <p>5 a cost benefit analysis been done to show</p> <p>6 whether it was cost effective to install the</p> <p>7 upgrades or to use the lower sulphur content</p> <p>8 fuel and it was Mr. Humphries who answered the</p> <p>9 question and my understanding from the answer</p> <p>10 is that it is not cost effective to install</p> <p>11 the pollution control upgrades, it is more</p> <p>12 cost effective to continue to use the lower</p> <p>13 sulphur content fuel which does address all</p> <p>14 current requirements. Did I state that</p> <p>15 correctly? I can take you to the transcript?</p> <p>16 MR. HUMPHRIES:</p> <p>17 A. No, you may have stated it--the intent of the</p> <p>18 question and I may not have addressed the</p> <p>19 question properly, but what I intended it to</p> <p>20 mean at that time from the perspective of the</p> <p>21 continued operation of Holyrood with the</p> <p>22 addition of the pollution abatement equipment</p> <p>23 as opposed to building a new facility today</p> <p>24 with a different fuel source, it was cost</p> <p>25 effective to continue to operate Holyrood to</p>	<p>1 shows the biggest driver is the fuel component</p> <p>2 at 70 percent.</p> <p>3 MR. BENNETT:</p> <p>4 A. That's right, yes.</p> <p>5 GREENE, Q.C.:</p> <p>6 Q. So barring significant change in the fuel</p> <p>7 component, there's very little that would draw</p> <p>8 the Isolated-Island option down in isolation</p> <p>9 if there was only one factor, is that correct?</p> <p>10 MR. BENNETT:</p> <p>11 A. I'm not sure I follow.</p> <p>12 GREENE, Q.C.:</p> <p>13 Q. The preference for the infeed over the</p> <p>14 isolated depends mostly on the fact that so</p> <p>15 much fuel is burned to the Isolated-Island</p> <p>16 option.</p> <p>17 MR. BENNETT:</p> <p>18 A. Fuel is the majority, the significant majority</p> <p>19 of the total CPW for the Isolated alternative,</p> <p>20 yes.</p> <p>21 GREENE, Q.C.:</p> <p>22 Q. So while we have--we've looked at a number of</p> <p>23 sensitivities and I won't go there now, but it</p> <p>24 does illustrate your analysis, in fact, it's</p> <p>25 one of the first times I've seen CPW analysis</p>
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<p>1 the end of its current life expectation with</p> <p>2 the additions, as opposed to putting in a new</p> <p>3 combined cycle facility that would burn No. 2</p> <p>4 fuel and have lower emissions.</p> <p>5 GREENE, Q.C.:</p> <p>6 Q. That's helpful, it helps clarify the comments</p> <p>7 which--in terms--have you done the other</p> <p>8 analysis then of looking at the .7 percent</p> <p>9 fuel because the intent is to put in the</p> <p>10 pollution control upgrades and to go to then</p> <p>11 the 2.2 percent sulphur. Have you done the</p> <p>12 analysis to show what is more economical?</p> <p>13 MR. BENNETT:</p> <p>14 A. Burning the low sulphur fuel doesn't address</p> <p>15 the policy direction from the province, so we</p> <p>16 have not studied the implications of continued</p> <p>17 use of low sulphur fuel as an alternative to</p> <p>18 the installation of pollution controls.</p> <p>19 GREENE, Q.C.:</p> <p>20 Q. So if you look at the CPW for the Isolated-</p> <p>21 Island option, there is 600 million dollars in</p> <p>22 there for the environmental upgrades, which is</p> <p>23 one of the capital cost components. There's</p> <p>24 the other cost components as well, but I</p> <p>25 believe you indicated from the analysis it</p>	<p>1 where it was all positive, because usually</p> <p>2 I've seen a range, some are negative and some</p> <p>3 are positive, but the ones that Nalcor filed</p> <p>4 all showed a preference for the infeed. If we</p> <p>5 look at one factor is isolation, there's not</p> <p>6 much you can do to shift that preference</p> <p>7 because of the huge fuel component in the</p> <p>8 Isolated-Island, is that correct?</p> <p>9 MR. BENNETT:</p> <p>10 A. Yes, you would have to do something with the</p> <p>11 fuel bill.</p> <p>12 GREENE, Q.C.:</p> <p>13 Q. Right.</p> <p>14 MR. BENNETT:</p> <p>15 A. Yes.</p> <p>16 GREENE, Q.C.:</p> <p>17 Q. And how do you use the sensitivities, we've</p> <p>18 had a little bit of discussion around it--the</p> <p>19 purpose of sensitivities is to illustrate the</p> <p>20 degree how--what are the key variables and</p> <p>21 what impact a change in a key variable can</p> <p>22 have on your outcome, so therefore, helps with</p> <p>23 your assessment of the risk, is that -</p> <p>24 MR. BENNETT:</p> <p>25 A. I'd generally agree with that, yes.</p>

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<p>1 GREENE, Q.C.: 2 Q. Okay. So in coming to looking at the 2.2 3 billion dollar difference on the basis of 4 what's in the CPW, analysis submitted in 5 support of the infeed option, when we look at 6 some of the sensitivities, we see that changes 7 in those--and key variables can significantly 8 impact the outcome and one of the biggest 9 variables is fuel, which is the uncertainty 10 that it's, we're trying to forecast out over 11 the 57 year period and we talked about that 12 earlier, another uncertainty is the 13 construction costs and we talked a little bit 14 of that yesterday where we looked at the 15 sensitivities for the 25 percent increase in 16 capital cost and we saw that if capital cost 17 for the infeed, including the Link, go up by 18 50 percent, then the preference is essentially 19 eliminated, right, so if we have a fifty 20 percent overrun, both options come back 21 roughly being equal. And we looked at--so 22 capital cost is one of the drivers that is 23 significant. We've looked at the load, we see 24 if there's a drop in the load of 880 gigawatt 25 hours as slight more, again it has a</p>	<p>1 Now there is--we would acknowledge that there 2 is variability in fuel pricing, but this may 3 be an area where a forecast, that fuel is 4 simply going to stay at the same price in real 5 terms over a very long forecasting term, that 6 maybe, you know, I'd be surprised if that 7 played out in the long term, in the absence of 8 a clearer trend, you know, we've elected to 9 use what we think is a reasonable number. But 10 if we look back over history, we have seen 11 fuel prices escalate, you know, at greater 12 than that rate over time and certainly in 13 PIRA's forecasting period out to the middle of 14 20's, they're seeing an escalation rate that's 15 approximately double that. So I guess we have 16 to trade off collectively, you know, do we 17 believe that fuel prices are going to moderate 18 from where they are today and that's the 19 fundamental question and the insight we're 20 getting from our, you know, from the industry 21 and from PIRA and from the other groups who 22 are forecasting energy prices, is that does 23 not appear to be the case. 24 GREENE, Q.C.: 25 Q. So, that's on fuel which is one of your big</p>
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<p>1 significant impact and we're down again to 2 they're almost equal. One of the questions 3 that I've heard and that I wanted to put to 4 you is we have some big key inputs. I just 5 mentioned three of the key ones we've talked 6 about here, we have load, fuel price, 7 construction costs and of those, I guess fuel 8 is the most risky that you don't have control 9 over. How do you weight that when you do this 10 analysis with this length of period and you 11 have such potential variability in some of the 12 key assumptions? 13 MR. BENNETT: 14 A. I think another way of stating that is if we 15 look at sort of--your comment about the 16 negative and positive sensitivities, and I 17 think his phrase has been used in our analysis 18 that the sensitivity analysis indicates a 19 preference for the Interconnected scenario 20 over a broad range of conditions and I think, 21 you know, one way to characterize that is the 22 Interconnected alternative as a robust 23 alternative, but when you look at, you know, a 24 broad cross section of sensitivities analyses, 25 there is still a preference for the project.</p>	<p>1 variables. So, the level of comfort that 2 you're making this decision given the 3 uncertainty over the length of the forecast 4 period, you test that through sensitivities to 5 give you a level of comfort as to whether 6 you're making your right assumptions. I 7 guess, one of the other factors, approaches, 8 and I wanted to give you the opportunity to 9 explain why Nalcor hasn't chosen it, is to 10 look at this incrementally. I mean, we've 11 heard comments and one of the--again, taking 12 page from Mr. Johnson, one of the issues in 13 the media is it's too rich, we can't afford to 14 pay for it, you will bankrupt the Province, 15 that type of thing. So, why don't you take an 16 incremental approach? Why don't you put in a 17 couple of little gas turbines or do another 18 170 cct's, buy us time, let's see what's 19 happening with the load in Corner Brook. 20 Let's see what's happening with the load down 21 in Labrador. Let's see what's going to happen 22 with natural gas and the impact of fuel 23 prices. So, even though it may be more 24 expensive in the long term with a higher CPW, 25 you're biting off smaller bites at a time and</p>

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1 you're buying time.

2 MR. BENNETT:

3 A. I guess the question is, buying time for what?

4 I mean, if you go down that road

5 incrementally, I think you will continue to go

6 down that road. And what we're effectively

7 doing by not making a decision is continuing

8 down the isolated path. Doing so will not

9 develop power for industrial development in

10 Labrador. We will have no surplus generation

11 for Muskrat Falls in that scenario. We will

12 have to do with what we have and we will

13 remain isolated. So, I think Mr. Martin has

14 pointed this out on a couple of occasions,

15 doing nothing and not making a decision,

16 effectively is a decision. It puts us on the

17 isolated path.

18 GREENE, Q.C.:

19 Q. So, Hydro has considered and rejected the

20 incremental approach. It's kind of a this is

21 the time to do it and now is the best time. If

22 we don't do it, the water will flow forever.

23 MR. BENNETT:

24 A. There are a lot of good things at this point

25 in time. Interest rates are attractive; the

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1 federal loan guarantee appears to be lined up;

2 we have the potential for demand in Labrador.

3 We've done a analysis comparing the cost of

4 Muskrat Falls to the Isolated alternative.

5 There is a CPW preference. There is a growing

6 concern about greenhouse gas emissions. There

7 is a fear that oil prices will continue to

8 escalate. So, those concerns are there and we

9 think this is a good answer.

10 GREENE, Q.C.:

11 Q. Switching hats, one of the other concerns is

12 your load forecast shows the capacity deficit

13 in 2015 with an energy deficient in 2021 or

14 so. We also know that you're not where you

15 had wanted to be with the decision to proceed

16 with construction. What is your backup plan

17 if you get further delayed? How will you

18 address the capacity and energy deficits that

19 you are now forecasting to meet, you

20 obligation to serve? What's your backup plan?

21 MR. HUMPHRIES:

22 A. We will, on a regular basis as we do all the

23 time, continue to evaluate and monitor the

24 situation and compare our requirement with our

25 capacity and energy. The 2015 deficit will be

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1 addressed with the combustion turbine. On an

2 annual basis, if we get through, for

3 argument's sake, some time later in 2012 or

4 into 2013 and we still not--have not

5 sanctioned Lower Churchill, that will be

6 reflected and updated every year in our

7 regular generation expansion issues report

8 that we file with the Board, and there will

9 come a point that if the schedule in service

10 for Muskrat Falls comes out of step with our

11 requirement, that we will have to do or

12 develop either one of the items in the

13 Isolated plan, or add a thermal source,

14 depending on what the prospects are at that

15 time for Muskrat Falls and the length of delay

16 we could be looking at.

17 GREENE, Q.C.:

18 Q. Have you looked at doing your wind you had

19 planned to do and advancing Portland Creek to

20 get you over the capacity and energy -- I'm

21 sorry, have you looked at advancing Portland

22 Creek and doing your wind and to see how far

23 that would take you, because you were going to

24 do Portland Creek anyway in the infed option.

25 MR. HUMPHRIES:

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1 A. We haven't looked at it, but in the event,

2 like we will be redoing the generation issues

3 report and the intent, as we didn't file a

4 report in 2011, as everyone knows, and the

5 intent was to file that with DG3, which is

6 still the case. If DG3 advances beyond our

7 normal 2013 capital budget exercise, there

8 will be an update of the issues report filed

9 at that time with the capital plan.

10 GREENE, Q.C.:

11 Q. I was going to say can we have an undertaking

12 that there will be an updated generation plan

13 and a load forecast plan filed with your

14 capital budget--Hydro's capital budget in the

15 summer of 2012, even if DG3 is not passed?

16 I'm only joking.

17 O'REILLY, Q.C.:

18 Q. Okay, I'm glad.

19 GREENE, Q.C.:

20 Q. Mr. Humphries just said it was, I was just -

21 O'REILLY, Q.C.:

22 Q. You know, this process is to inform, is to

23 reference question and not to get commitments

24 about required filings before the Public

25 Utilities Board on regulated activities.

1 GREENE, Q.C.:

2 Q. The issue is the Board's regulatory oversight
3 and one of the tools used is the generation
4 expansion issues in a load forecast which
5 wasn't filed with the Board in 2011 to allow
6 them to assess it, so that's--Mr. Humphries
7 took me there, so I couldn't resist.

8 MR. HUMPHRIES:

9 A. The intent is that we will do an update in
10 2021, if not at DG 3, with the capital budget
11 submission and that will address if there are
12 risks and concerns regarding the timing of any
13 of the alternatives, whether it's in the
14 Isolated or in the Interconnected, we will
15 address those and have a plan.

16 GREENE, Q.C.:

17 Q. That concludes all my questions except the one
18 with respect to the change in the return
19 period and I don't know--if you haven't had
20 time to review it, I will accept an
21 undertaking to file the response to that
22 question.

23 O'REILLY, Q.C.:

24 Q. In the change?

25 GREENE, Q.C.:

1 Q. My question, when the return--at one time my
2 understanding was that Hydro had been using a
3 return period of one in 150 years for the DC
4 line into the Island. My understanding was
5 that that was changed sometime in 2010 and -

6 O'REILLY, Q.C.:

7 Q. That may be contained in a confidential
8 exhibit, that information, but anyway, if
9 you're finished and the Commissioners have
10 questions of the panel, it probably would be a
11 good time to move on. I ordinarily would
12 probably have some questions just to clarify
13 some things, but what I would need to do, I
14 would rely upon getting the transcript and
15 what I want to make sure is that when I come
16 back, I will probably only be concerned to the
17 extent that the questions that were asked end
18 up in a summary of several questions for which
19 the panel are asked to either agree or
20 disagree, I want to make sure that--because
21 they had some difficulty in hearing some of
22 the things you were saying, I want to make
23 sure that what they've said, that they're
24 comfortable with agreeing with your summary of
25 the question. And I will review that

1 overnight and then we can decide.

2 GREENE, Q.C.:

3 Q. Well I can ask the question again, the return
4 period designed for the line, was it ever at
5 any time one in 150?

6 O'REILLY, Q.C.:

7 Q. No, that's not my point.

8 GREENE, Q.C.:

9 Q. That's the only answer, but anyway.

10 O'REILLY, Q.C.:

11 Q. Well do we have the answer or is it--it's in
12 an exhibit.

13 MR. BENNETT:

14 A. So if we can take that one away and bring it
15 back tomorrow morning, that would be great.

16 O'REILLY, Q.C.:

17 Q. Sure, they can bring it back.

18 CHAIRMAN:

19 Q. So you're finished, are you?

20 GREENE, Q.C.:

21 Q. Yes, I am, thank you Mr. Chair.

22 CHAIRMAN:

23 Q. So do you have anything you want to--
24 additional now or -

25 MR. JOHNSON:

1 Q. I don't know about now to be honest and
2 perhaps tomorrow morning I'll have a look at
3 it because it was quite an extensive and
4 thorough examination done, taken on board.

5 CHAIRMAN:

6 Q. Madam Newman, do you have any questions?

7 COMMISSIONER NEWMAN:

8 Q. Do we want to wait -

9 CHAIRMAN:

10 Q. I'm sorry.

11 GREENE, Q.C.:

12 Q. I understand that Nalcor may wish to have some
13 additional questions.

14 CHAIRMAN:

15 Q. Oh, okay.

16 O'REILLY, Q.C.:

17 Q. Just for clarification and what I've outlined,
18 I'm going to review the transcript, the area
19 where I am concerned with is the area where a
20 number of questions are summarized, at the end
21 there's a summary of the questions, what
22 counsel interprets the answers to be and I
23 want to make sure that the witnesses are
24 comfortable with that because there was some
25 difficulty in hearing, you know, so I just

<p style="text-align: right;">Page 241</p> <p>1 want to make sure that we're comfortable with</p> <p>2 that and that's it. So I will need a little</p> <p>3 bit of time tomorrow.</p> <p>4 CHAIRMAN:</p> <p>5 Q. So are you suggesting that we just postpone</p> <p>6 all questions until Mr. O'Reilly is finished</p> <p>7 or -</p> <p>8 O'REILLY, Q.C.:</p> <p>9 Q. No, I don't think so, I think if the Board has</p> <p>10 questions, we can proceed with that.</p> <p>11 CHAIRMAN:</p> <p>12 Q. Okay, do you have any questions?</p> <p>13 COMMISSIONER NEWMAN:</p> <p>14 Q. Not at this time, no.</p> <p>15 COMMISSIONER OXFORD:</p> <p>16 Q. Mr. Chairman (unintelligible - audio feedback)</p> <p>17 okay, whatever questions are left to be asked</p> <p>18 by the two parties.</p> <p>19 CHAIRMAN:</p> <p>20 Q. Okay, how about you?</p> <p>21 VICE-CHAIR WHALEN:</p> <p>22 Q. Is it the intent to reconvene the panel in the</p> <p>23 morning?</p> <p>24 CHAIRMAN:</p> <p>25 Q. Will you be reconvening your panel in the</p>	<p style="text-align: right;">Page 243</p> <p>1 Q. Well okay, well I had some questions but I</p> <p>2 think in the interest of sanity, we will save</p> <p>3 all the questions for tomorrow morning, how</p> <p>4 about that? Would you find that more</p> <p>5 acceptable or--because I could stay here for</p> <p>6 another hour if you want, but I don't think I</p> <p>7 would be very popular. So let's, Mr.</p> <p>8 O'Reilly, bring back the panel in the morning</p> <p>9 and we'll continue with the exercise.</p> <p>10 O'REILLY, Q.C.:</p> <p>11 Q. Fine, thank you.</p> <p>12 CHAIRMAN:</p> <p>13 Q. All right.</p> <p>14 Upon conclusion at 4:37 p.m.</p>
<p style="text-align: right;">Page 242</p> <p>1 morning was the question, Mr. O'Reilly, or</p> <p>2 will you just be making summary?</p> <p>3 O'REILLY, Q.C.:</p> <p>4 Q. Well I only intended to bring back--I only</p> <p>5 asked if there was witnesses whose answers</p> <p>6 were -</p> <p>7 CHAIRMAN:</p> <p>8 Q. Whose answers are--there's some ambiguity or</p> <p>9 lack of clarity, you will -</p> <p>10 O'REILLY, Q.C.:</p> <p>11 Q. Try to get some clarify on that, I didn't</p> <p>12 intend to come back, but I mean, these people,</p> <p>13 you know, are available. If the Board</p> <p>14 requires them to come back because they have</p> <p>15 questions of the panel, we will do that.</p> <p>16 GREENE, Q.C.:</p> <p>17 Q. Excuse me, I understood Mr. Johnson also may</p> <p>18 have questions of the panel.</p> <p>19 O'REILLY, Q.C.:</p> <p>20 Q. And Mr. Johnson may have some questions too,</p> <p>21 so that's fine.</p> <p>22 MR. JOHNSON:</p> <p>23 Q. I think that we should preserve the panel for</p> <p>24 tomorrow morning.</p> <p>25 CHAIRMAN:</p>	<p style="text-align: right;">Page 244</p> <p>1 CERTIFICATE</p> <p>2 I, Judy Moss, do hereby certify that the foregoing</p> <p>3 is a true and correct transcript of a hearing of the</p> <p>4 Muskrat Falls Review, heard before the Board of</p> <p>5 Commissioners of Public Utilities on the 14th day of</p> <p>6 February, A.D., 2012, in St. John's, Newfoundland and</p> <p>7 Labrador and was transcribed by me to the best of my</p> <p>8 ability by means of a sound apparatus.</p> <p>9 Dated at St. John's, NL this</p> <p>10 14th day of February, 2012</p> <p>11 Judy Moss</p> <p>12 Discoveries Unlimited Inc.</p>

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