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October 28, 2015
(9:05 a.m.)
CHAIRMAN:
Q. Good morning. We have no matters of procedural import. I think we can proceed directly to Madam Greene to continue her cross-examination.
GREENE, Q.C.:
Q. Good morning, Mr. Chair and Commissioners. Good morning, panel.
MR. MOORE:
A. Good morning.
MR. HENDERSON:
A. Good morning.
MR. LEDREW:
A. Good morning.
MR. HUMPHRIES:
A. Good morning.
MR. DARREN MOORE:
MR. ROB HENDERSON:
MR. TERRY LEDREW:
MR. PAUL HUMPHRIES:
CROSS-EXAMINATION BY GREENE, Q.C.:
Q. Before we carry on with talking about the Sunnyside replacement equipment project, there

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were a couple of issues I would like to clarify from yesterday. There are a couple relating to the black start project at Holyrood. When we were talking yesterday about that project, Mr. Humphries, you indicated that Hydro had finalized an application seeking approval for a new CT by December of 2013, by Christmas of 2013, is that correct?
MR. HUMPHRIES:
A. I said it was nearly completion.
GREENE, Q.C.:
Q. And at that point in time, the unit you were thinking about was a 60 megawatt?
MR. HUMPHRIES:
A. A 60 megawatt, yes.
GREENE, Q.C.:
Q. And what type of unit were you considering at that time?
MR. HUMPHRIES:
A. Well, we were considering a unit that most likely probably would have been an Aero derivative type unit similar to the units that we have at Hardwoods and Stephenville, and we were as well seeking to have synchronous

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condenser capability.
GREENE, Q.C.:
Q. And that would have been similar to a unit that Hydro would have asked the manufacturer to manufacture, or was it a gray market unit?
MR. HUMPHRIES:
A. No, at that time it would have been a new unit.
GREENE, Q.C.:
Q. I'm sorry, I didn't hear you.
MR. HUMPHRIES:
A. It would have been a new unit, I think, at that time.
GREENE, Q.C.:
Q. And that was in December of 2013?
MR. HUMPHRIES:
A. Yes.
MR. HENDERSON:
A. I'm just going to add to that. We would have publicly tendered for that project, so we would be looking for technically qualified bids on that, so we would have been specifying a 60 megawatt gas turbine and it would be - that would be basically it, but it would have a lot more technical details. So it's

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possible that a gray market type of unit might qualify if it met the specifications. I wouldn't say it would not. The assumption was that it wouldn't be in terms of the estimates that had been done.
GREENE, Q.C.:
Q. Okay, yesterday as well when we were talking about this, there was a question to Mr. LeDrew whether at any point in time prior to the fall of 2012, Hydro had considered placing temporary diesels at the Holyrood site to act as the black start capability for the Holyrood plant, and if you like, we can go to the transcript of yesterday at page 102. It started at page 102 and actually carried on to page 103, and at that time Mr. LeDrew confirmed, as manager of the plant, he was not involved in any discussions with respect to the temporary diesels during the period of 2010 when the stop work order was in place, and through 2011 when AMEC was doing the condition assessment. My question as a follow up clarification one is did Hydro at any time prior to when it filed the application before the Board in 2013, October, 2013, consider the

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use of temporary diesel units at the Holyrood plant for black start capability at the plant?

MR. LEDREW:

A. Not to my knowledge.

MR. HENDERSON:

A. I'll just - the diesels was one of the options that AMEC had brought forward, so it was considered. It would have been part of that review.

GREENE, Q.C.:

Q. In December of 2012?

MR. HENDERSON:

A. It would have been December, 2011, that that report was completed and presented to Hydro in January, 2012, and in that was options for diesel units. I think it was five 2 megawatt diesel units would have been presented as an option at that time, so that the option was known and would have been part of the consideration at that time.

GREENE, Q.C.:

Q. And none of those options were deemed acceptable, isn't that correct? Hydro did not accept any of the options put forward by AMEC?

MR. HENDERSON:

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A. Well, I'm not sure in terms of accepted. I think what Hydro did is it looked at the options that it had. Consideration of the new CT that was coming, the - so that there was an interim period in which there would be a solution coming in three years time, the diesel option that was presented by AMEC would not be in service until the late winter or early spring of 2013. So there was one year - it would basically be that current year and the following year that a diesel would not be available in accordance with what AMEC presented to us, so then that would have been part of the consideration in terms of going with Hardwoods as the interim solution until the new CT came in. So the diesels was there as an option for consideration, and the decision that was made at the time obviously did not choose to go with that. The choice that was made in consideration of everything was to go with the Hardwoods as interim and a new CT in 2015.

GREENE, Q.C.:

Q. Okay, so up to the AMEC Report in December of 2011, Hydro, I understand from Mr. LeDrew's evidence, did not consider the use of temporary diesels to be put in place while the stop work order was there through all of 2010 or through 2011 when there were problems with the unit, and it was available only for limited purposes?

MR. HENDERSON:

A. It was available for black start.

GREENE, Q.C.:

Q. And then when AMEC filed its report in December of 2011 with a - 2012, while AMEC had suggested the use of refurbish the units and actually get backup units while the existing unit was being refurbished, and came up with other options, was there serious consideration given by Hydro to the AMEC proposal, either one of the options that AMEC had considered?

MR. HENDERSON:

A. There would have been a - you're using the word "serious consideration". I mean, it would have been all serious consideration, recognizing the need for being able to black start Holyrood and the cost and reflecting the fact that there would be a new CT coming in a couple of years. There was a period of time

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that would have been an exposure, based on the information received from AMEC, that would have carried through 2012 into 2013. So the - again I wasn't part of the decision, but all I can say is that all those things were there for the people that made the decision to evaluate and there was a decision with regard to least cost would have been to use the interim solution, and that's where the obvious decision was, and that's the case.

GREENE, Q.C.:

Q. And as you indicated, you weren't involved in those discussions, were you, with respect to the final -

MR. HENDERSON:

A. No, other than I was aware that Hardwoods would have to be used as an interim solution.

GREENE, Q.C.:

Q. And from the record, the only information we have with respect to Hydro's consideration are the emails that we looked at yesterday?

MR. HENDERSON:

A. The only evidence is that, but we do have the evidence of the decision and the obvious consideration here was the cost of putting in

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a solution and it was - the choice was, I'll say the least cost solution was to go with an interim solution.

GREENE, Q.C.:

Q. Another issue from yesterday is with respect to the failure of Unit 1, and I wonder could you please bring up, Ms. Gray, the transcript from yesterday at page 135, and it deals with lines 2 to 18, and, Mr. LeDrew, I'd just like to bring your attention to line 8. We see you said, "We have two 600 volt diesels in the station as well and they did not start. In all things being equal, if the yard had went to a blackout state immediately, which it did three and a half minutes later, but if it had went to a blackout state, the emergency diesels would have started and your standby AC pump would have started and recovered that an adequate scenario with the DC pump on oil supply". I took from that answer you were saying that if we didn't have brown out, the diesel would have started immediately and we wouldn't have had a problem, is that the correct interpretation of that answer?

(9:15 a.m.)

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MR. LEDREW:

A. We would have recovered adequate voltage in the plant for the standby AC pump to start. Now there's a question - we now know that 28 seconds after inadequate supply, we started to tear up bearings on that machine, so we did go back and investigate how quickly can a loss of supply from our yard, and how quickly can our transfer schemes enact and a diesel come in service and energize that bus to allow that motor to restart to recover oil, and from what we've heard from diesel vendors and OEMs, that that is unlikely that that would happen in that 28 second window.

GREENE, Q.C.:

Q. Right, so if we could go to PR-PUB-126, page 1, lines 18 to 23. I think that's what you were just describing for us.

MR. LEDREW:

A. Could you just restate that one?

GREENE, Q.C.:

Q. If you look at lines 18 to 23, I'm told that that indicates that even if there had been an immediate blackout, there wasn't sufficient time for the diesels to have kicked in to have started the pump before the damage.

MR. LEDREW:

A. Yes, that was our conclusion.

GREENE, Q.C.:

Q. So I just wanted to clarify that even if there had been an immediate blackout, we still would have had a problem with the pump?

MR. LEDREW:

A. That's correct, yeah.

GREENE, Q.C.:

Q. Okay, and we'll talk a little bit more about that with Liberty when we come to the common mode failure problem. Coming back now to the air blast circuit breakers where we had left off yesterday with Mr. Moore. We were talking about the breaker, B1L03, at Sunnyside that didn't work properly on January 4th, and at that time you had indicated that Hydro's standard for preventative maintenance was to do it on a six year cycle, is that correct?

MR. MOORE:

A. That's correct, yeah, the six year maintenance program for air blast circuit breakers is what we - for major preventative maintenance inspections on a six year cycle for those

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breakers.

GREENE, Q.C.:

Q. Now Liberty, when they looked at it, made a recommendation that given the age of the air blast circuit breakers that Hydro had, and given the condition of those breakers and the problems Hydro had been experiencing, that the cycle be reduced to four years, is that correct?

MR. MOORE:

A. In Liberty's review, as well as our own root cause analysis when we analyzed the outages, we looked at the age of the air blast circuit breakers and our existing maintenance program and did determine going forward that there would be an opportunity to shorten up the outage time frame for those assets based on the age to four years from six years.

GREENE, Q.C.:

Q. And Hydro has now implemented that new standard, is that correct?

MR. MOORE:

A. Yes, that's correct, we have.

GREENE, Q.C.:

Q. And Hydro also has a plan to replace all of

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the current air blast circuit breakers that it has, is that correct?

MR. MOORE:

A. Yes, that's correct, we do have a plan by year 2020 to do a replacement program of all our air blast circuit breakers.

GREENE, Q.C.:

Q. And that plan was accelerated as a result - following the outages in 2014, is that correct?

MR. MOORE:

A. Through our root cause analysis of the outages of 2014, we made a determination as well as the six year to four year preventative maintenance cycle, we also made a considered decision to accelerate the replacement of our air blast circuit breaker program.

GREENE, Q.C.:

Q. Yesterday when you were talking about the decision to defer preventative maintenance, you described how you develop an annual work plan each year. When is the work plan actually developed for the upcoming year?

MR. MOORE:

A. When we develop our annual work plan, we start

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in the year previous to look at our preventative maintenance items that are coming up the next year. We also look at - we looked at our 2010 to 2015 recovery plan that we'd put in place back in 2009 for terminal station equipment. So when we develop our annual work plan, we start late in the year previous and then our goal is in the first quarter of the year of the execution plan to have our annual work plan finalized, which would include, like as we talked about yesterday, any maintenance that is still due in the PM recovery plan based on the most overdue maintenance and the available resources we have to execute the work. In the first quarter of the year, we finalize our annual work plan because it does take some time to make sure that we confirm delivery of any materials that are required through capital programs and to finalize out outage plan for the year. So by the end of first quarter of the year we have our annual work plan finalized and ready to start tracking against.

GREENE, Q.C.:

Q. Could we go to the transcript from yesterday,

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please, page 161 at lines 12 to 16, and here you're talking about the 2012 plan, but you say there, "So that's how it was developed, but that was based on the resources that we had at the time and the operating budget that we were managing too at the time". So when you do prepare your annual work plans, you base it on your available resources and the approved budget, is that how I read that answer?

MR. MOORE:

A. That's correct. When we develop our annual work plan, Hydro is very committed to execution of our preventative maintenance program, and we look at the most overdue, in particular, for terminal stations. As I indicated yesterday, our other assets like our transmission lines, distribution lines, diesel plants, we were doing very well with regard to tracking against our plan for those assets, but we recognized back in 2009 that we needed a very deliberate six year recovery plan for terminal station equipment, so when we developed the annual work plan as indicated there in the transcript, we looked at the most

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overdue maintenance that we had and the highest priority based on, for example, transformers that are associated with generating equipment and we develop our annual work plan based on our available resources which are tied to the approved operating budget for the upcoming year.

GREENE, Q.C.:

Q. Yes, so when you do your work plan, you do have to take into account the existing resources and your approved budget, is that how I take that, and that would be the same for each year?

MR. MOORE:

A. That's correct. Hydro is very committed to our preventative maintenance program, but we're also very committed to the appropriate balance of cost versus execution of work.

GREENE, Q.C.:

Q. Okay, and in doing your annual work plans, you included your preventative maintenance that you would normally have to do that year, you also included your overdue preventative maintenance from previous years, you made an allotment for corrective maintenance work, and

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you made an allotment for the impact your resources might - the impact of capital budget projects for your resources, is that how the plan was developed, as I understood your evidence?

MR. MOORE:

A. That's correct, but with respect to capital, it would be an allowance for our resources that would be allocated to any planned capital work for that year.

GREENE, Q.C.:

Q. And you also explained yesterday that one of the reasons you got further behind in your preventative maintenance cycles was the amount of corrective maintenance work, is that correct?

MR. MOORE:

A. It was the amount of corrective maintenance work, higher priority corrective maintenance work that was unknown when we developed our plan that was determined to be a higher priority for immediate reliability for our customers, but it's also the amount of unplanned capital work that we were faced with as well. Like, an example of an unplanned

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capital job that we were faced with in 2013 that took our resources away from some of our six year preventative maintenance activities would have been the replacement of the generator at the Hardwoods gas turbine.

GREENE, Q.C.:

Q. And we don't need to go through all your examples, but yesterday, again if we could go to the transcript of yesterday at page 157, you listed off your corrective maintenance work for 2013, and over to page 158, you said, that the estimate you came up with was a list of overtime work of 10,000 hours. Do you recall that?

MR. MOORE:

A. Yes, that's correct.

GREENE, Q.C.:

Q. Okay.

MR. MOORE:

A. I was just looking for the RFI that lists out the volume of work that we were faced with in 2013 and 2014, and it actually lists the person hours of work that was not accounted for in our annual work plan for 2013 and 2014.

GREENE, Q.C.:

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Q. And -

MR. MOORE:

A. I'm just looking for the actual RFI number now that lists that out for reference.

GREENE, Q.C.:

Q. That's fine if you want, I don't need it. My question was going to be - you were looking and we can go back to the table that showed the preventative maintenance cycle backlogs for the transformers and for the circuit breakers, and I'll start with 2013. You were in 2013, you had all of this work, why didn't you consider going and asking for additional resources?

MR. MOORE:

A. It was late in - well, as we progressed through the year in 2013, and the amount of - the hours of break in work, capital and corrective that we indicated in the RFI that we were faced with in 2013, and when we looked at it, we were four years into our six year recovery plan, and as I mentioned, the only reason we would actually re-prioritize any of our six year preventative maintenance activities would be higher priority corrective

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maintenance and capital work that were of a more immediate and urgent nature for reliability for our customers. It was late in 2013 and we did an evaluation of four years into our six year recovery plan as to the progress, and a decision was made then that we put forward in our amended GRA application what we would require for resources and the associated operating budget to finalize our six year recovery plan by the end of 2015, and that's well described in the amended GRA and the evidence as to what we felt would be the resources required to achieve our full recovery plan by the end of 2015, and I will say that we will be completed by the end of 2015.

GREENE, Q.C.:

Q. And I understand that that was the decision that was made and it was reflected in a GRA that was filed. My question is why didn't Hydro consider that earlier? You had said in our earlier answer you were limited by the amount of resources and your budget when you developed your work plan. Did you, as the manager, feel that you were restricted based

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on any parameters that were given to you with respect to cost of resources?

MR. MOORE:

A. As a manager managing our operating budget, which we've clearly explained in previous testimony and in evidence, that on an annual basis we develop an operating budget based on the operating budget guidelines that are distributed to the corporation by finance, and we're very committed to working to our operating budget, and as we indicated, you know, that's one of our most effective tools that we have as operations managers to ensure we keep the rural deficit manageable, which is very important to us as a corporation. So we were working towards our recovery plan and fully committed to our preventative maintenance program, and as I indicated, the only thing that would take us off or cause us to re-prioritize any of our six year maintenance would be any capital or corrective work that was unplanned for that would be of a higher priority for our customers and the reliability to our customers, so at the end of 2013, we were four years into a six year plan,

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we had realized that we weren't as far along as we would have liked to have been in this six year recovery plan, and so then we put forward in our 2014 and 2015 test year a plan to be fully recovered by the end of 2015.

GREENE, Q.C.:

Q. Yes, I understand what - and you're repeating your answer now several times, but perhaps if we go to PR-PUB-167 and talk about the question that I'm asking. PR-PUB-167, and my question was in prior years at any point in time, and we can do this for the breakers and we can do it for the transformers, when you were looking at it and seeing that you weren't completing the plan and you weren't even staying on target with your plan, why didn't you back in 2011, 2012, or even 2013, say, hang on here now, I need additional resources because I understood Hydro believes preventative maintenance is very important - I gathered that yesterday, and last week, that's why you do it.

MR. MOORE:

A. Uh-hm.

GREENE, Q.C.:

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Q. So you saw you weren't doing your cycles and I'm trying to understand why there wasn't a review of why you didn't look at additional resources in 2011, 2012, or even early in 2013, why you allowed them to get further behind?

(9:30 a.m.)

MR. MOORE:

A. As I indicated yesterday when we talked about this issue, I took the position that I'm currently in in 2011, and we looked at - well, that was two years then into our six year recovery plan. So we did have a plan put forward for 2012, an annual work plan, which included the most overdue maintenance in terminal stations for air blast circuit breakers and power transformers, as we talked about the numbers here in the RFI. So we did have a plan for 2012. There are a number of items that we documented in RFIs that were break in work that we've talked about that took us way from that plan. Then we put forward our 2013 annual work plan, and in 2013 we really wanted to focus on - the corporate target, as we talked about in a previous RFI,

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would have been 90 percent of PM in a given year, so that was the target at that time that as a manager we were accountable for. So we put forward a 2013 plan that included the most overdue maintenance, plus a portion of I'll call it the base maintenance that we do each year, so at that point we were four years into our six year recovery plan, realized that we were not as far along as we would have liked to have been in our six year plan, and it wasn't until we put forward the 2014/2015 test years that we formally requested additional budget and resources to achieve success by the end of 2015, which we will achieve by the end of this year.

GREENE, Q.C.:

Q. And one of the guidelines you've already indicated in looking at this is what your approved budget is for the year and your existing resources, is that correct?

MR. MOORE:

A. That's correct, we are very committed to the balance between work execution, reliability, and least cost supply for our customers.

GREENE, Q.C.:

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Q. And that was the prevailing factor versus the fact you weren't catching up on your preventative maintenance, was it?

MR. MOORE:

A. I wouldn't call it the prevailing factor. I would call it a balance between managing to least cost - to our budgets to ensure least cost service for our customers versus our targets to achieve execution of our preventative maintenance program, and we had a six year plan which was very considered to get us to where we wanted to be by the end of 2015, and based on what we've put forward in this 2014/2015 test years, we will achieve success by the end of this year.

GREENE, Q.C.:

Q. Right, but that's because of the accelerated effort in 2014, which was the fourth year of your six year plan?

MR. MOORE:

A. That's right, at the fourth year of our six year plan we made a very considered decision that an accelerated plan was required to complete our six year plan, which is, I think, clearly reflected in our two test years.

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GREENE, Q.C.:

Q. And, of course, it was after the outages in January of 2014. Now you mentioned that the delay preventative -

MR. MOORE:

A. I would say, yes, the timing was after the outages in 2014.

GREENE, Q.C.:

Q. Right.

MR. MOORE:

A. But, you know, in 2013, we were certainly tracking against our - actuals against our plan and we very clearly knew exactly where we were in 2013, and back at that time we would have been working towards thinking about a revised - because I think we did have a 2013 test year put forward, and Hydro realized at the time that, you know, we do need to put in a revised test year for 2014/2015, and we did make a very considered decision at that time to make sure that a full recovery plan was in place to the end of 2015.

GREENE, Q.C.:

Q. You also talked about your deferral preventative maintenance to do - the only

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reason you defer it is if you do more urgent work, and you talked about yesterday how that decision got made by the group, the long term asset managers, the work execution people, and your short term schedulers.

MR. MOORE:

A. That's correct, those are the people that are very experienced operational managers within our team that track our annual work plan on a regular basis and are very aware of any break in work that may come in, and very knowledge and experienced when it comes to prioritizing our work, and would through a consultative process as well with our systems operations group, when it comes to planning out outages to get the work executed would have made those decisions.

GREENE, Q.C.:

Q. So up until the acceleration of the plan, it was an accepted practice at Hydro to defer preventative maintenance to do corrective maintenance work?

MR. MOORE:

A. I would say that the way we manage our work at Hydro, we develop, as we talked about, an

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annual work plan each year which looks at any deferred maintenance of the highest priority that needs to be included in the annual work plan that year. We're very committed to our preventative maintenance program because that is - we talked about our key tool to ensure our assets are in a suitable condition to provide reliable service. The only reason we would re-prioritize any of our preventative maintenance activities would be for any unknown work, whether it be operating, corrective maintenance, or capital that is determined to be of a higher priority nature for immediate reliability supply to our customers, and that's the only reason we would in any way stretch out our plan to longer intervals because of anything that's of a higher priority, a more urgent nature for our customers supply.

GREENE, Q.C.:

Q. And if we go to the transcript from yesterday, please, at page 201. Here you were describing the process the individuals responsible would follow with respect to making a decision to defer preventative maintenance to do

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corrective maintenance work, and you had given evidence that at that time there were no guidelines that Hydro had issued to these people as to the factors they should take into account in making the decision to defer preventative maintenance. Do you recall that?

MR. MOORE:

A. We talked about it yesterday that with respect to any written documentation, but we do have a very - you know, our people are very knowledgeable about the priority of work, the different types of work, corrective maintenance, preventative maintenance, capital and operating work, very familiar with that, very familiar with our assets, the condition of our assets, the operational history, very familiar with the maintenance programs that are recommended by the original equipment manufacturers, so I'll say that through the positions and senior leadership roles that these people have accepted, and through their knowledge of the assets and operation of the assets over time, they are very familiar with what needs to be considered when making a decision of what would be higher priority work

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for our customers versus what would have been in our original plan.

GREENE, Q.C.:

Q. Okay, of course, we all accept that they are knowledgeable, they do know the equipment and they exercise judgment with respect to making that decision as to what is a higher priority?

MR. MOORE:

A. That's correct, it is a very -

GREENE, Q.C.:

Q. Judgment based decision?

MR. MOORE:

A. Any work that we would do with our resources that takes us away from our annual work plan would be a very considered knowledgeable decision by very knowledgeable experienced employees.

GREENE, Q.C.:

Q. Made by different individuals who may have different judgments?

MR. MOORE:

A. I would say that all our managers are certainly very well aligned with what would be the highest priority work for customer supply and to ensure our mandate of least cost

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reliable service. They may - obviously, every person brings something different to the table when they make a decision, but they are fully aligned on what our mandate is for our customers, definitely.

GREENE, Q.C.:

Q. And I wanted to take you to page 201, lines 22 to 25, and on down. If you begin there, you said, "It's a very considered extensive decision making process". You talked about how you have developed now guidelines that are in writing that you are giving to the people who make the decisions, pointing out what they should take into account and recording how they do assess it, and you go on to say, "They now use the form, we have a record", but then go on to say, "The rigor of the decision making is just as strong now as it was back then". I want to ask you about that and the basis for your ability to be able to say that statement?

MR. MOORE:

A. What I'll say is the people that make decisions about any work of a higher priority nature that would take us off our annual work

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plan is a very considered decision by very knowledgeable people taking into account, you know, reliability up to that time of the assets, the asset condition, any known operating issues with the assets, knowledge of what the manufacturer had recommended as maintenance for the assets and very considered decisions of anything that'll take you off plan. What we have in place now is a - we talked about it there yesterday, I'll call it a management of change form that is used now to document any of those decisions and an opportunity for every person involved with the decision to sign off. The amount of rigor that goes into the decision itself, I think, is still as strong and will continue to be as strong as it's always been. What we're doing now is ensuring that we have a documented record of that decision going forward.

GREENE, Q.C.:

Q. And in the past, we just talked about the fact there was no guidelines. There was no record kept of the decisions as well, was there, other than the change in the work plan?

MR. MOORE:

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A. That's right. The documentation at the time would have been reflected in our computerized maintenance management system where we would have, I guess, changed target dates and years for preventative maintenance activities, and our short term planning and scheduling people, the folks who develop our weekly work schedules and our annual work plan, would certainly keep track of any of those changes through their normal maintenance planning process, but the form that we have in place now would not have been obviously in place at that time.

GREENE, Q.C.:

Q. And with respect to the monitoring of the work plan, I understand from previous testimony that has changed as well. I understand that it was before a monthly verbal update, is that correct? I think, Mr. Henderson, you gave evidence to that effect before.

MR. MOORE:

A. That's correct. Rob, did you want to answer?

MR. HENDERSON:

A. I was just going to say, yes, it was a verbal monthly update that each of the managers would

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indicate how they are doing with respect to their plan and what they were dealing with in terms of that month's exceptional items, which in 2013 there were quite a few exceptional items that we were managing.

GREENE, Q.C.:

Q. And now it is a written weekly report, is that correct?

MR. MOORE:

A. That's correct. Our annual work plan now is tracked on a weekly basis and each of the managers who are accountable for a portion of their assets, like, for example, our regional manager in Central Newfoundland, they provide a weekly update on the annual work plan, so actual activities completed versus what was planned, and they prepare a weekly report indicating what was achieved that week, what may have not been achieved that week, for example, if an outage got cancelled for weather reasons and they indicate what time that activity will be rescheduled within that calendar year, such that we achieve our annual work plan that year and our winter readiness target date of December 1st.

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GREENE, Q.C.:

Q. And the target for completion of PMs is also changed from 90 percent to 100 percent, is that correct?

MR. MOORE:

A. That's correct. We work towards, and I'll say that in 2014, we were successful in completing 100 percent of what we had scheduled that year.

GREENE, Q.C.:

Q. So now if we move to the Western Avalon transformer T5 project, here as I understand it, that tap changer was damaged, the tap changer for T5 was damaged on January 5th and it had to be rewound and the transformer windings had to be cleaned. As I understand it, the cause of that was a breaker, B1L37 which did not operate properly, is that correct, Mr. Moore?

MR. MOORE:

A. Yes, when we did the root cause analysis to determine why we had a failure of the tap changer on T5, and we explained a little bit yesterday about the tap changer versus the main compartment, I guess, for the transformer

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itself, what we determined is that a failure - I can go to the exact RFI number that does explain the failure, but one of the air blast circuit breakers in the Western Avalon terminal station at that time, it was determined when we did our root cause analysis that it closed at three times without one of the three phases of the breaker closing, and we've since followed up with a consultant who actually prepared a report and did an investigation into that failure, and determined that, I'll say, voltage issues because of only two of the three phases of that breaker closing would have caused the - was the most probable cause of the tap changer failure that day.

GREENE, Q.C.:

Q. So again that breaker was B1L37, and it's another air blast circuit breaker, is that correct?

MR. MOORE:

A. That's correct, B1L37 is an air blast circuit breaker.

GREENE, Q.C.:

Q. So it was another one that didn't work right?

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MR. MOORE:
A. It is a breaker that didn't operate as it should have that day. I'll say that since that time we did a full investigation into operation of that breaker, and it worked properly since then, and in 2014 after we had the event, we did the full maintenance inspection on that breaker and testing and it did work properly, and then further follow up to that as part of our overhaul program, we did as an extra level of diligence, I'll say, we did an overhaul of that breaker in 2015 and never did find any evidence as to why that breaker didn't operate that day. We also had the same issue when we talked about yesterday, B1L03 in Sunnyside, we brought in ABB at that time who would have been the breaker manufacturer to help us with a full root cause analysis of why we had an air blast circuit breaker on that day not perform as it should, and we did an exhaustive investigation and we even tested all the auxiliary systems since, like, the DC system and the compressed air system that's required to operate that breaker and never did find any conclusive evidence as

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to why the breakers didn't operate. Now ABB did offer an opinion in our root cause analysis report that we submitted to the Board, I think, back in March, 2014, that on two occasions in the report they indicated that the cold weather events that day may affect the operation of air blast circuit breakers.
(9:45 a.m.)
GREENE, Q.C.:
Q. Well, I guess, we shouldn't have them in Newfoundland then, but to go back to the air blast circuit breakers, you have reduced the cycle to a four year cycle and you are replacing all of the breakers. We do know for whatever reason, while it may have worked on other days, it didn't work that day and that was the cause of the damage for that transformer, is that correct?
MR. MOORE:
A. We do know - we've concluded through our root cause analysis and bringing in a third party to do a root cause analysis of that failure that day in Western Avalon, that one phase did not close on that breaker that day, that three

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times, and that resulted in the failure of the tap changer on T5.
GREENE, Q.C.:
Q. Now that breaker, as I understand from the record, was installed in 1968, so it was 46 years old in 2014, is that correct?
MR. MOORE:
A. That sounds to be correct, yes.
GREENE, Q.C.:
Q. I also understand from the record that the last preventative maintenance done on that breaker was in 2005 prior to its failure, is that correct?
MR. MOORE:
A. That's correct, that's what our maintenance records indicate.
GREENE, Q.C.:
Q. So that by the time it didn't work properly in January of 2014, it was two and a half years beyond its preventative maintenance cycle, is that correct?
MR. MOORE:
A. That's right. That is another one of the assets that would have been in our six year recovery plan and we would have determined

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that that was an overdue air blast circuit breaker that needed to be completed by the end of 2015.
GREENE, Q.C.:
Q. Can we go back, please, to PR-PUB-NLH 167. We know that this breaker was supposed to have been done in 2011. It wasn't done the next year either, was it?
MR. MOORE:
A. No, as I indicated, that breaker was completed for PM in 2014.
GREENE, Q.C.:
Q. Now you indicated the most critical breakers are normally included in the following year annual work plan. The Western Avalon breaker didn't make it to the 2012 or 2013 plan, did it?
MR. MOORE:
A. No, that's correct. As I indicated, when we develop our annual work plan, and fully committed to achieving completion of our six year recovery plan by the end of 2015, and we prioritize based on the most overdue, but also taking into account the criticality of the breaker, such as associated with generating

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equipment, and when we looked at how many were overdue and based on a criticality assessment associated with - you know, with the most important breakers being associated with generating equipment, our plan to complete that breaker would have been in 2014.

GREENE, Q.C.:

Q. Like Sunnyside, all the breakers were to be done then?

MR. MOORE:

A. No, no, in Western Avalon.

MR. HENDERSON:

A. I just - Darren, I just want to add because I think my understanding is that it was in the 2013 work plan, but didn't get done because of the work, so in terms of - I can't say what was in the 2012 work plan, but I did look at what was in the 2013 work plan, and I know that the Sunnyside breaker, B1L03, and T1 at Sunnyside was not in the 2013 work plan, and I believe that B1L37 was in the work plan for 2013, but it got deferred because of all of the work going on in 2013. I just didn't want to leave the thought that it wasn't on the radar to be done. It just ended up being

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deferred through that decision making process that Darren explained.

GREENE, Q.C.:

Q. I also understand that this breaker was planned to be replaced in 2018, is that correct?

MR. MOORE:

A. That sounds to be correct as part of our long term capital program.

GREENE, Q.C.:

Q. Given the fact that it hadn't been done as preventative maintenance in 2014, and it was going to be replaced in 2018, was there any consideration at Hydro not to do the maintenance until it was replaced?

MR. MOORE:

A. No, we would not have looked at not completing our maintenance. As indicated, we are very committed to our six year maintenance program, you know, to ensure reliable supply for our customers. As Rob just indicated, it's believed that we had included that one in the 2013 annual work plan. It got deferred because of the high volume of break in work that we've explained in 2013, and we were

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fully committed to completing the preventative maintenance on that breaker. The fact it was due to be replaced in four years time would not have caused us to make a decision to not abide by our preventative maintenance program.

GREENE, Q.C.:

Q. The next breaker that I want to talk about that didn't work properly in January, 2014, is the Holyrood breaker, B1L17. On January 5th, this breaker at the Holyrood terminal station didn't work properly, is that correct?

MR. MOORE:

A. That's correct, that breaker failed to operate on one phase, it was determined as well, of the three phase breaker on that date.

GREENE, Q.C.:

Q. Now this had actually had its preventative maintenance done, isn't that correct?

MR. MOORE:

A. That's correct. When we looked at our maintenance records for that breaker, we had been adhering to our six year preventative maintenance program for that breaker.

GREENE, Q.C.:

Q. And that's because it had failed in 2013, is

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that right? It failed in 2013 and you had to repair it?

MR. MOORE:

A. In 2013, that was an event, as we talked about in the terminal station at Holyrood, where we had a severe weather event which caused, I'll say, flashovers of the insulators on the breaker due to high salt contamination and snow and water and high winds. At that time, I won't say that the breaker failed, but I will say that the breaker was associated with a failure in the switch yard due to severe contamination on the insulators on the breaker.

GREENE, Q.C.:

Q. And after that happened, what did you do with the breaker after the 2013 event?

MR. MOORE:

A. When we had that event in 2013, we made a decision that we would apply, and I know this is documented in another RFI as well, but I don't recall the exact number, what we decided to do was provide an RTV coating which is kind of a silicone rubberized coating on the insulators of the breaker, and the intention

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of that coating is to further prevent or allow the breaker to, I guess, go through any further severe weather events to help prevent any of the flashover incidents that we seen in the winter of 2013. So we made a decision that we should apply that protective coating to the insulators on that breaker to try to further prevent a similar event happening through the following winters in that station.

GREENE, Q.C.:

Q. So Hydro did this themselves, they took the bushing out of service. Can you explain how you did the repair work?

MR. MOORE:

A. Yes, the way that is done is typically when you apply this coating, the prudent way to do it would be in a shop environment inside as opposed to outside, so what we do then we dismantle the - we remove the insulators from the breaker and take the insulators back into the shop environment, apply the coating, and then we would put the parts back on the breaker in the switch yard and then we would run the breaker right through a full complete test, an operational test, to ensure that the

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breaker is working properly. Now while we have the parts removed, we actually ensure that the breaker is secured with a weather tight, I'll call it cover in the switch yard and our very experienced terminal station employees, these are employees that have been working in our stations for many years, professional journeypersons, safely secure the breaker with a weather tight cover to ensure that any snow, wind type thing does not get involved or into the breaker while we have the parts removed for the coating. When we put the parts back on the breaker, we go through a full test, like I just indicated, and the idea of the test, I guess, is two-fold. One is to confirm that the breaker operates as designed when we do our test. The other, I guess, goal of doing the test is that air blast circuit breakers operate on compressed air and we have a very extensive program to ensure that the compressed air supplied to the station is clean dry air, so that no moisture gets into the compressed air and into the breaker. So in doing the test of the breaker after we do maintenance work, once we go through the

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complete test, all air, I guess, is purged or replaced in the breaker such that any air that remains for the maintenance would be replaced with clean dry air from the compressed air system, and the last time I was in Holyrood was last Friday, actually, and did a walk through of the station with our frontline supervisor just to talk about our compressed air system, and what the folks do to make sure that it operates as it should, and I think the dew point at that time when I was there was - 95 degrees C, so unless we hit -95 degrees C, we should not see any moisture in our compressed air system in that station.

GREENE, Q.C.:

Q. And then we come up to January of 2014, that breaker that had been repaired the previous year by Hydro didn't operate properly, is that correct?

MR. MOORE:

A. What we discovered - that's right, the breaker, as I indicate, did not operate properly on one phase, and when we did the root cause analysis with the manufacturer on site, we found evidence of corrosion in one of

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the phases of that breaker, the components in the phase of that breaker would indicate somehow that at some point in time moisture did get into the air system in that breaker.

GREENE, Q.C.:

Q. And it did cause it to freeze?

MR. MOORE:

A. We think it may be a combination of corrosion plus freezing due to the very severe cold weather that we experienced up to that period.

GREENE, Q.C.:

Q. Could we go to PR-PUB-NLH-066, please. As I understand it, it's a no-no to have moisture in the bushing and you should do all you can to ensure they're properly covered, that's my way of describing it?

MR. MOORE:

A. I will say that, yes, we're very - like I just described about our compressed air system, there's a very huge amount of effort, maintenance, and oversight required to ensure that the air system is completely full, for lack of a better word, of clean dry air so that no moisture gets into the breaker itself, and our experienced employees that work in

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these stations, many stations, many years, are certainly well aware of this requirement and very committed to do work in a very considered fashion to ensure that that is the case.

GREENE, Q.C.:

Q. And ideally the time period involved in having it disassembled to do the repair should be as short as possible, is that correct?

MR. MOORE:

A. We strive to - when we remove the insulators for coating of RTV, which was for all the reasons we talked about to ensure the integrity of those insulators going into the future winter seasons, we would strive to have the breaker in that condition for, I'll say, the least amount of time as possible, but having said that, the crews that were involved, journeypersons, electricians working in the station and have been for many years and very committed to this, did have a very secure water tight cover over the components of the breaker that were left in the yard while the other parts were being recoated.

GREENE, Q.C.:

Q. If we could go to page 2 of the RFI that's on

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the screen, and we see how long it did take for the work, and at lines 4 to 6, we see that we had other work again come up that prevented Hydro from completing the procedure longer than the period indicated from February to April, so over a month.

MR. MOORE:

A. That's right, the RFI does indicate the - if you go down through the bullets there, the higher priority work that our crews that were working on recoating the insulators on that breaker had to tend with for immediate needs for customer supply.

GREENE, Q.C.:

Q. So the breaker took longer to repair because the crews were busy doing other work, is that how I - that's how I read that answer.

MR. MOORE:

A. The breaker took longer to repair than we would have liked due to higher priority work taking those crews away from that job that were of more urgent nature at that time for our customers. That's what the four bullets actually indicate in the RFI.

GREENE, Q.C.:

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Q. And you've indicated that in Hydro's opinion the bushing was properly secured, that there was a cover over that, is that correct?

MR. MOORE:

A. That's correct. I have no reason to believe that our crews would not have secured that breaker in a very deliberate water proof secure fashion.GREENE, Q.C.:

GREENE, Q.C.:

Q. And we don't know where the moisture came from, but we do know that that was the cause of the breaker failure?

MR. MOORE:

A. We do know - it is a fact that there was evidence of moisture in that phase of the breaker due to the - we found evidence of corrosion, and we do know there must have been freezing as well on that day when the breaker failed to operate, but we don't have any 100 percent conclusive evidence as to the source of the moisture in that breaker.

GREENE, Q.C.:

Q. And did Hydro test for moisture before putting the bushing back into service?

MR. MOORE:

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A. Our test, as I indicated there that we've been doing for many years, I'll say many decades, to ensure that the breaker contains clean dry air when it goes back in service is that full function test of the breaker, and during that test the breaker is replaced completely with - it was our understanding from the original manufacturer that that would always ensure that the breaker would be completely purged with clean dry air, and what we've done as an opportunity or - we always look for continual improvement when we do root cause analysis and failure analysis of our assets. So what we've done moving forward to ensure that that possibility doesn't exist any more, or could exist any more, that there may be moisture in that breaker is that before the breaker goes back in service on the power system now, we have a drain valve at the bottom of the compressed air tank on each phase and the crews will actually open the drain valve just as an additional check to make sure that there is no moisture present in the air system of that breaker. So that's an improvement that we've made based on our root cause analysis of

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this failure. We still don't conclusive know how moisture got into that breaker, but as an extra diligence - we are a learning organization, we always look for opportunities for improvement when we do a root cause analysis. We've added that step now before we put our air blast circuit breakers back in service after maintenance.

(10:00 a.m.)

GREENE, Q.C.:

Q. Now the failure of that breaker caused Unit 1 to be unavailable from January 5th to January 8th, 2014, is that correct?

MR. MOORE:

A. That's correct.

GREENE, Q.C.:

Q. And if we look at that period, can we go now please to Table 3.1 on page 17 of Liberty's July 6th prudence report, July 6th, 2015? And this table indicates during the period from January 1 to 12 the units that were unavailable at that time, and it goes to Liberty's review of the additional supply costs that Hydro incurred in that January period. Liberty, as you know, found that the

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actions that Hydro did take to enter into the capacity assistance agreements and its use of gas turbines was prudent and that the supply cost Hydro was seeking to recover were appropriate with the exception of that period of January 5th to 8th when unit one was not available to the system to supply load because of the failure of the breaker.

And I guess the question, and probably will be pursued more with the other panel, is if Hydro had to pay more for capacity to replace unit one and if unit one did fail because of an imprudent maintenance procedure, which is an issue for the Commissioners to decide after all of the evidence, how do we calculate the amount that Hydro paid for additional capacity related to the failure of unit one?

So if we look at that table, we see it is shaded from January 5th to the 8th for the period the unit was unavailable as a result of that breaker. And I know, I understand that I'm to ask questions about numbers and calculations to the next panel, but there were just a few questions on this I thought might

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be more appropriate for the operations people.

Hydro has suggested -- Liberty was unable to determine, and they'll explain, it's in their report, how they didn't have specific information to be able to calculate a specific amount of cost and they were looking at a way of estimating it and one of the things is what period is relevant to consider. Liberty looked at the period January 9th to 12th. Hydro has suggested you could look at the period January 1 to 4 as representative or even take an average of January, the first four days and the last four days. If you look at the period January 1 to January 4th, that's the period when there were rotating outages. Is that correct, Mr. Henderson?

MR. HENDERSON:

A. Yes, that's correct.

GREENE, Q.C.:

Q. Okay. Also, if you look at PR-PUB-NLH-132, Attachment 1, and if you look at the attachments, and I'm not going to go through them, but they give for -- I just wanted to show you as an example, it gives the capacity, what was unavailable. It gives the

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temperature for the day. It gives the peak. It gives -- so it gives the daily record for the load, the temperature, capacity assistance, so for each day. So subject to check, if we look at the first four days that Hydro is suggesting we should look at, I'd ask you to take, subject to check, that the average temperature for those days was -16.7 degrees Celsius. And if we look at the period January 5th to the 8th, which was the period unit one was unavailable, again subject to check, but the average temperature was -9.3. And then for the period January 9th to 12th that the average temperature then was -6.8. And again, it's just taking those numbers and coming up with calculations of the average temperature for the periods.

MR. HENDERSON:

A. That's the average low temperature.

GREENE, Q.C.:

Q. Yes, yeah. And I wanted -- from the operations perspective, if you look at the period of January 5th to 8th, we look at the temperature and we look at the fact there was no rotating outages and then we look at -- so

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that's one scenario, and then you look at January 1st to the 4th where we had much lower temperatures and we have a lot of rotating outages. In Liberty's reply of September 17th, and I'd like to go here now, please, Ms. Gray, Liberty's reply September 17th, page 27, lines 9 to 12, and the statement there saying "the first four days of January 2014 were particularly chaotic, characterized by extreme temperatures, supply shortages and manual load shedding" and then in the next line Liberty explains that for that reason, they're using the last four days because they think it's more representative.

And I wanted, from an operations perspective your view of the first four days of the month. It must have been very challenging for Hydro at that time trying to manage with the rotating outages and the lack of capacity and then the additional problems of the Sunnyside failures. I don't know if you would agree that January 1 to -- the first four days was chaotic.

MR. HENDERSON:

A. I'm not sure that I would call it chaotic, but

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I would say that there was a lot of things going on to manage the situation that was evolved there. So there was -- you know, chaotic is a matter of how you look at things, I guess, but in particular those days, they were quite busy. There was a lot of activity going on managing the situation with the very cold weather and the equipment issues that we had. So, it was very, very busy.

GREENE, Q.C.:

Q. And would you agree that they were also very challenging for Hydro?

MR. HENDERSON:

A. It was very challenging. It was a situation that we had never experienced before and it was indeed very challenging for all of our employees in trying to sustain as much power as we could to our customers.

GREENE, Q.C.:

Q. Any other questions relating to the calculation I assume should be with the other panel? Is that correct?

MR. HENDERSON:

A. That's correct.

GREENE, Q.C.:

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Q. And we may see you again for that, but it is the next panel, isn't it? Yeah.

MR. HENDERSON:

A. No rest for the weary.

GREENE, Q.C.:

Q. No. I guess we all might feel weary at this point, Mr. Henderson. Thank you very much. That concludes my questions.

CHAIRMAN:

Q. Okay. I guess we're over to Newfoundland Power, Mr. O'Brien.

CROSS-EXAMINATION BY MR. LIAM O'BRIEN

MR. O'BRIEN:

Q. Yes, thank you, Mr. Chair. Yes, gentlemen, I think what I'd do today is probably start where Ms. Greene started and talk about the Sunnyside replacement equipment. I do have some questions about black start and CT, but I think I'll put them at the end, just where we've talked about the Sunnyside replacement.

I just wanted, just for the record, just to confirm, in terms of the ultimate accountability for preventative maintenance, that lies with you, Mr. Henderson? Is that right?

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MR. HENDERSON:

A. Ultimately, yes.

MR. O'BRIEN:

Q. Yeah, okay. And Mr. Moore, in terms of where you fall into the mix, I've listened to your testimony yesterday and today, just in terms of who makes the call on what maintenance gets done each year and what's your involvement with that call personally?

MR. MOORE:

A. My accountability would be for our asset management program for our -- for Newfoundland and Labrador Hydro's transmission assets, our distribution assets, our network services/communications assets, our isolated diesel systems, as well as we're accountable for our vegetation management program, our fleet and our warehousing services. That's some of the highlights as to what would be under my realm of accountability and the senior managers that report directly to me, as we indicated, develop the annual work plan each year based on our asset management program for those assets, and ultimately I would see the final product that's prepared

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for the year and receive weekly reports now of progress against that plan each year and, you know, hold my direct reports accountable for developing any necessary recovery plans for any of the work that may take us off plan or may need to be rescheduled for various reasons, such as outage changes or weather-related changes. But my accountability is achieving our asset management program for the assets that I just explained.

MR. O'BRIEN:

Q. Okay. And I guess it was more of a simplistic question in terms of the groups that you talk about who make these decisions for the annual plan, the short term planning and scheduling, the long term asset planning and the work execution and operations, these all report into you. Is that right?

MR. MOORE:

A. That's correct.

MR. O'BRIEN:

Q. Okay. And I'm going to ask that we turn to the Liberty report at page 24, the initial one, and if we can scroll up, there's a -- actually, sorry, page 25. There's a heading

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"maintenance practices there" and I just wanted to confirm I guess with the panel, the first few sentences under that paragraph to see if you would agree with those sentences. The first one "good utility practice requires a structured and comprehensive approach to maintenance." Is there any issue with that sentence?

MR. MOORE:

A. No. I would agree that any utility should certainly have a very structured and comprehensive maintenance program for their assets to ensure reliable supply.

MR. O'BRIEN:

Q. Okay. So we're -- all right. There's no disagreement with that. And that "such an approach identifies and provides for regular performance of inspection and repair activities designed to keep equipment in good working order, prolong its life, protect against service failures with material consequences." There's no issue with that sentence, is there?

(10:15 a.m.)

MR. MOORE:

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A. No, that would be certainly the goals of any good asset management program.

MR. O'BRIEN:

Q. Okay. And that "those consequences can include either or both avoidable damage to equipment and disruption to service to customers." There's no disagreement with that?

MR. MOORE:

A. That would be the goal of your asset management maintenance program, to ensure that you do prevent damage to equipment and provide reliable service to customers.

MR. O'BRIEN:

Q. And the next sentence there, "good practice calls for the identification of appropriate cycles for the performance of recurring maintenance activities." You don't take issue with that?

MR. MOORE:

A. No, that sounds to be a fair statement with respect to maintenance programs.

MR. O'BRIEN:

Q. And I guess based on your testimony, that's sort of where you've come to grounds on your

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six-year cycle for maintenance? Is that right?

MR. MOORE:

A. That's correct.

MR. O'BRIEN:

Q. That's the idea behind it is that good utility practice requires those types of cycles?

MR. MOORE:

A. That's right. When you plan your maintenance, they're the things that you certainly would consider.

MR. O'BRIEN:

Q. And when you came to the idea of a six-year cycle for maintenance, I believe you testified that you also did a review of some other jurisdictions at some point and saw that there was some had four-year, some had eight-year, but Hydro concluded that six-year was the appropriate cycle for you?

MR. MOORE:

A. That's right. We would have compared -- like our original maintenance program, or the maintenance program that we've had in place for many years is largely based upon any recommendations that the original equipment

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manufacturer would have supplied at the time. But we obviously communicate and consult with other utilities with respect to the duration of their maintenance program and compare against our own to do a validation of the cycles and we did that back in around 2002, 2003. We did a reliability centred maintenance view of our maintenance program, just to test to see, you know, where we were to with respect to our cycles, and we did another review back in the 2012 timeframe, which, as you stated, would have consulted with other utilities and we determined that typically between four and eight years would be what other utilities are using, kind of to test against what we had in place for our assets.

MR. O'BRIEN:

Q. And in terms of what you have in place though, that six years, you've got built into that what your recommendation cycles would be for the manufacturer's recommended cycles, that kind of thing? That's built into your six years, right?

MR. MOORE:

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A. That's correct. But we've also indicated that, you know, since the outages of 2014, we did a very extensive root cause analysis of the failures and have adjusted the cycle for air blast circuit breakers to four years from six years, based on our exhaustive and extensive root cause failure analysis of those outages.

MR. O'BRIEN:

Q. And is that based on recommended maintenance from the manufacturers or is that based on root cause analysis?

MR. MOORE:

A. It's more on the root cause analysis and a comparison to what other utilities are doing for maybe some of the aging assets that the other utilities in Canada are also facing, and also the knowledge of the condition of the assets and the operational history of our very experienced employees and managers and engineers.

MR. O'BRIEN:

Q. Okay.

MR. MOORE:

A. So a combination really of all that would have

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led to that decision.

MR. O'BRIEN:

Q. And that decision arose after 2014?

MR. MOORE:

A. As part of our root cause analysis of the outages.

MR. O'BRIEN:

Q. Okay. Let's just talk about transformers again. So I believe you indicated you've got 105 transformers. Is that right? Was that the figure?

MR. MOORE:

A. Power transformers on the high voltage power system.

MR. O'BRIEN:

Q. Power transformers I should say, yeah. And before -- so let's say before 2010 when you talked about this, what I'll call an accelerated plan to try to get back on track with your six-year plan, before that, did you have a goal as to how many of those you wanted to get done for preventative maintenance on an annual basis? Was it one-sixth? I presume it must have been.

MR. MOORE:

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A. The way it would have been, that's right, through a six-year program, if you take all your power transformers and each shop, like you know, there's a crew in Whitbourne, for example, that looks after the Avalon Peninsula and there's a crew in Bishop Falls that would look after central, but the way it would be done, that's right, of the 105 power transformers, typically one-sixth of those would be required each year to be completed on a six-year cycle, if you do the rough math, right.

MR. O'BRIEN:

Q. Yes, because there'd be no sense having a six-year cycle unless you were going to do one-sixth of them every year or something along that line on an average. So you're looking at 17 or 18 transformers looked at per year, something in that range?

MR. MOORE:

A. Yeah, if you do the -- that's right, the rough math, that's what you would see.

MR. O'BRIEN:

Q. Okay. And can we pull up the Liberty report there, page 26, Table 5.1? And we looked at

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this yesterday. So clearly, in terms of the number of overdue transformers in those timeframes, clearly at the end of each year, you weren't getting the 17 or 18. Is that a fair assessment on an annual basis?

MR. MOORE:

A. That's a fair assessment based on those numbers and, you know, as I indicated, in 2009, if you look at the number there, that's when it was realized at the time that we needed to put in place a very considered plan to achieve or to get back on track and be fully covered on our preventative maintenance on those assets, and when we looked at the number of transformers at the time, the number that were overdue, our decision making process led us to a six-year plan to be fully recovered by the end of 2015.

MR. O'BRIEN:

Q. Okay. And let's scroll down a little bit there for 5.2 there, the overdue breaker maintenance. It's the same deal I guess there with those. You're seeing -- well, let me ask you first, and I just had trouble from calculating, but is it 65 in that range of air

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blast circuit breakers you've got?

MR. MOORE:

A. In 2009, the number would have been 63.

MR. O'BRIEN:

Q. Okay.

MR. MOORE:

A. That's somewhat less as of -

MR. O'BRIEN:

Q. As of today, I understand there's been a change.

MR. MOORE:

A. - I'll say today because we've been going through a replacement program.

MR. O'BRIEN:

Q. Yeah. But if we use say 2014 as a cutoff, would have been 63-65 range?

MR. MOORE:

A. Right. That's a good number to use.

MR. O'BRIEN:

Q. Okay. And so you're looking at doing one-sixth of those on an annual basis as well that would have been the -- in order to fit into that cycle.

MR. MOORE:

A. That's right.

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MR. O'BRIEN:

Q. So 10 or 11 a year.

MR. MOORE:

A. Same commentary as we just talked about for transformers.

MR. O'BRIEN:

Q. Right, so you got 10 or 11 a year you're looking at those. Prior to this plan to accelerate, I guess, or to catch up in 2010, just give me the lay of the land in terms of how it was -- was there a change in 2010 as to how your group decided to look at maintenance and put together its annual plan? Was there an annual plan say prior to 2010 that was done in the same way as it was done after 2010?

MR. MOORE:

A. I would say back prior to that time, there would have been annual work plans and we would have a very, I'll say, extensive maintenance program that would have been documented in our computerized maintenance management system. But around the 2008, I think, '09 timeframe is when we -- when Hydro repositioned itself and restructured itself to be more focused on asset management, and back at that time, we

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would have put in place people who would have been fully accountable for long term asset planning, work execution, operations and short term planning and scheduling, such that any site that you would go visit in Hydro, if you walked into that site, the same structure and focus would exist for asset management.

So, back around that timeframe, 2008-2009, there would have been a dedicated team looking at long term asset planning and one of the functions of the long term asset planning group is to determine and set the preventative maintenance schedule. So that team, at that time, did an analysis of where we were in terminal stations with respect to our preventative maintenance program and I indicated the other assets, such as I'll speak to TRO, like our transmission lines, our distribution systems, we were doing very well achieving our preventative maintenance goals and objectives each year. But because we were more refocused and restructured to have a better focus on asset management, the team actually dug into where we were to with respect to our terminal station PMs,

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recognized that we weren't achieving our objectives and determined that a very considered plan was required to be fully recovered on our preventative maintenance program for these assets and embarked upon a six-year recovery plan in 2010 to achieve that objective and get fully recovered in terminal stations.

MR. O'BRIEN:

Q. Okay.

MR. MOORE:

A. And as I indicated, we will be -- we will have that done now at the end of 2015, which is quickly nearing.

MR. O'BRIEN:

Q. Okay. Well, can you tell me what the process was prior to 2010, in terms of determining what maintenance was going to be done on an annual basis? So, was there an annual plan set say in 2007-2008 in terms of what work was going to be done each year, similar to the way it's done now? Was there an annual plan put together by a group?

MR. MOORE:

A. There would have been, but back at that time,

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there certainly would have been an annual work plan and back at that time, our -- I'll call them our maintenance planning or our planning and scheduling group, would have been managing our preventative maintenance program through our computerized maintenance management system and would have been looking at the schedules for preventative maintenance activities, would have been looking what was in our corrective maintenance and our preventative maintenance backlog and developing a plan that year to achieve completion of the annual work plan. But it wasn't until around 2008-2009 where we -- like I said, we had the additional focus on key aspects of asset management and established a long term asset planning group who really, you know, involved additional management oversight, I'll say, in development of these plans to ensure that we were certainly better committed and more oversight in completion of what we had planned to do and from there, when they dug into the details, they developed a six-year recovery plan, as we just talked about.

MR. O'BRIEN:

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Q. Okay. No, I understand that.

MR. MOORE:

A. But it would have been more in the hands of the -- I'll say the maintenance planning group at that time to ensure that all maintenance activities were on a schedule and then between the work execution group or the frontline supervisors and the work execution managers would have been working towards achieving what was in the plan that year.

MR. O'BRIEN:

Q. No, I understand that, I guess, and in terms of the recovery plan, I'm not -- I will ask you to talk about the recovery plan. What I'm trying to focus on is prior to the recovery plan.

MR. MOORE:

A. Right.

MR. O'BRIEN:

Q. What was the plan? How did Hydro focus on what maintenance was going to be done on an annual basis? Was there a group that sat down in the first quarter that said "now, we need to get 10 or 11 of these transformers done in this year. We need air blast circuit breakers

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done in this year. We need 17 or 18 transformers done in this year. We need these other assets done in this year. How are we going to prioritize all this work?" Was there a group that did that in order to meet with that six-year plan or try to?

MR. MOORE:

A. Prior to 2010, the group that would have been doing that would have been our, I'll say, our planning and scheduling or our maintenance planning group and they would be managing that through the computerized maintenance management system.

MR. O'BRIEN:

Q. And who would they report in to?

MR. MOORE:

A. They would have reported in to the regional manager at the time.

MR. O'BRIEN:

Q. Okay. So that was where you had three separate regional managers as opposed to somebody like yourself, prior to your position? Is that right?

MR. MOORE:

A. That's correct.

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MR. O'BRIEN:
Q. Okay. And those regional managers, would they oversee this throughout the year that the plan is being done, followed through with?
MR. MOORE:
A. Part of their accountability at that time would have been to oversee execution of the annual work plan and at that time, the target corporately for achieving preventative maintenance activities would have been 90 percent each year.
MR. O'BRIEN:
Q. So in terms of a six-year cycle, the target was not to meet a six-year cycle, it was to be 90 percent of a six-year cycle?
MR. MOORE:
A. Our goal was to achieve the six-year recovery plan, 100 percent. But corporately, we did set a target of achieving at least 90 percent of our PMs in a given year, taking into account any possible corrective maintenance or breaking work that may happen.
MR. O'BRIEN:
Q. Okay.
MR. MOORE:

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A. We also looked at some additional -- like I mentioned in evidence there yesterday, I took the position back in I'll say mid-2011 and started digging into and where we were to along the ways for our recovery plan, and beginning in 2013, we enhanced the accountability of completion of PMs by -- actually we talked about this during the GRA as well that preventative maintenance targets are actually in performance contracts now for key managers. So that actual documentation of the target for preventative maintenance started in 2013.
MR. O'BRIEN:
Q. In 2013. So, and when was that communicated, end of 2012 or was it for -
MR. MOORE:
A. That's right, late 2012 we would have been developing the performance contracts.
MR. O'BRIEN:
Q. Okay. So as of the start of 2013, it was that 90 percent had changed to 100 percent was now in a management -
MR. MOORE:
A. In 2013, it was -- the 90 percent target that

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was in the corporation at that time for completion of preventative maintenance activities would have been documented as a target in the -
MR. O'BRIEN:
Q. Okay. So it didn't change to 100 until after?
MR. MOORE:
A. But it was documented as 100 percent as a -- the way the performance contracts are developed, there's threshold target and opportunity.
MR. O'BRIEN:
Q. Okay.
MR. MOORE:
A. So the 100 percent would have been documented as an opportunity at that time.
MR. O'BRIEN:
Q. Oh, I see, okay.
MR. MOORE:
A. And then in 2014, we changed to a target of 100 percent and as we indicated, we now track preventative maintenance activities on the annual work plan on a weekly basis with reporting from all the key managers and that tracking goes right up to the CEO level on a

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weekly basis now.
(10:30 a.m.)
MR. O'BRIEN:
Q. Okay. And that's since 2014?
MR. MOORE:
A. That's correct.
MR. O'BRIEN:
Q. Okay. Back prior to the 2010 accelerated plan, did that tracking go up to the CEO?
MR. MOORE:
A. At that time, it didn't go up to the CEO. It would have been, as Rob indicated, a monthly verbal report at that time.
MR. O'BRIEN:
Q. Okay. So it would have gone to Mr. Haynes in 2008? Is that correct?
MR. MOORE:
A. That's right. He would have been aware of -
MR. O'BRIEN:
Q. On a verbal basis?
MR. MOORE:
A. Right.
MR. O'BRIEN:
Q. Okay. And what would he have been aware of? I mean, how would that reach him sort of?

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Would it say on a monthly basis, "here we are with preventative maintenance. Here we are with corrective maintenance. Here we are with other work done, capital work"? How did that get to Mr. Haynes?

MR. MOORE:

A. There would have been a monthly update to him through the monthly reporting process, but it would have been more of a, I guess, verbal discussion to Mr. Haynes at that time as to how we were tracking against our preventative maintenance and corrective maintenance and capital program. So, there were, I'll say, reporting mechanisms in place, but not to the level of weekly detail that we see now since 2014.

MR. O'BRIEN:

Q. And prior to 2010, had Hydro met the 90 percent target at any point?

MR. MOORE:

A. I can't speak to the full Hydro numbers. I do have some numbers here for the TRO group.

MR. O'BRIEN:

Q. Okay.

MR. MOORE:

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A. Like I mentioned, I took on the position in mid-2011.

MR. O'BRIEN:

Q. But prior to 2010 now was my question.

MR. MOORE:

A. I only have the numbers here for 2010 and beyond.

MR. O'BRIEN:

Q. Okay.

MR. MOORE:

A. I don't have the numbers here for prior to that.

MR. O'BRIEN:

Q. Can Mr. Henderson answer that question? Do you know?

MR. HENDERSON:

Q. Whether there's -

MR. O'BRIEN:

Q. Prior to 2010, did Hydro meet the 90 percent target for preventative maintenance at any point?

MR. HENDERSON:

A. I couldn't say for sure at this point.

MR. O'BRIEN:

Q. Can you undertake to provide that?

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MR. HENDERSON:

A. Because I haven't gone looking to see what that -- what happened back in those days.

MR. O'BRIEN:

Q. Okay. Can you undertake to provide that information?

MR. HENDERSON:

A. We'll have a look to see what we can provide. I know the measurement and I'll say rigour to measurement is evolved over that time, so I'm not sure what detail -

MR. O'BRIEN:

Q. Can you explain that?

MR. HENDERSON:

A. What I mean is in terms of going through the process of implementing a more focused asset management process, part of that was looking at how we measure our performance and so as I -- when I came into the position, I was able to see that there was evolution happening in terms of the -- what we call the asset owners were meeting regularly to talk about how they're measuring because each area was doing things a little differently and we were getting to a more standardized approach to

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measuring performance. So, it did evolve over that period of time. So I'm not sure what the detail -- you know, we may have it in one form at one point and earlier it was a different form. So that's all I'm saying is it changed.

MR. O'BRIEN:

Q. Okay.

MR. HENDERSON:

A. And I -- to Terry here, I don't know if you can -- sorry to bring you into the discussion.

MR. LEDREW:

A. Help.

MR. O'BRIEN:

Q. Bring him in.

MR. HENDERSON:

A. But you would have been looking after it at Holyrood, so you would be able to talk a bit about what was happening.

MR. O'BRIEN:

Q. So it's separate areas would deal with the preventative maintenance? Is there any way that it was brought together for say Mr. Haynes to look at?

MR. LEDREW:

A. Well, it is now.

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MR. O'BRIEN:
Q. Okay.
MR. LEDREW:
A. With the asset owner and the reorganization that happened in '09, there was accepted definition and rigour around breaking work, preventative maintenance targets, and so those things got compiled.
MR. O'BRIEN:
Q. In 2009?
MR. LEDREW:
Q. And would roll up to Jim Haynes, yeah.
MR. O'BRIEN:
Q. Okay. But prior to 2009 then, it was each area, each manager dealt with that themselves?
MR. LEDREW:
A. Yeah. We would use the same tool that Darren spoke, that was used at the Holyrood facility as well and we would have PMs in the register that would get executed by our planning group and we would track our own performance locally at the operational regions.
MR. O'BRIEN:
Q. Okay. And would you have your own planning group then at each area that dealt with that?

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MR. LEDREW:
A. Yes, we do, yeah.
MR. O'BRIEN:
Q. Okay. And now that's not the case? It's a separate planning group or a combined planning group? Is that how it works?
MR. LEDREW:
A. No. There are still separate planning groups around, dispersed around the major centres, but there is an asset -- a technical council now that provides oversight to those groups so that everybody is managing the data sets consistently -
MR. O'BRIEN:
Q. In the same way.
MR. LEDREW:
A. - and the definitions are consistent.
MR. O'BRIEN:
Q. Okay. So in 2011, you came into the picture then, Mr. Moore, was it, or mid-2011? Is that what you said?
MR. MOORE:
A. That's correct.
MR. O'BRIEN:
Q. Would you have been involved, Mr. Henderson,

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from say 2010 forward when there was a decision made to accelerate and catch up on the preventative maintenance?
MR. HENDERSON:
A. No, I wasn't -- I wasn't aware of this issue until we started to look at it in -- well, it probably came most to my attention in 2014 that we were in the middle of a catch-up phase.
MR. O'BRIEN:
Q. Okay. And who can speak to then the 2010 plan itself, where did this arise, whose idea was it?
MR. MOORE:
A. I can speak to it. It was prior to when I went into the position, but I do know how it was evolved.
MR. O'BRIEN:
Q. Okay.
MR. MOORE:
A. Like I mentioned, back in I'll say 2008- 2009 timeframe when we restructured and implemented the long term asset planning groups throughout the organization, that team then would have been accountable for developing and setting,

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I'll say, the preventative maintenance program and they were the group that would then look at how we were progressing with our plan and whether we're meeting our objectives. So led by the long term asset planning manager for terminal stations, that person took the lead back at that time to do a real good analysis of where we were to with respect to PMs in terminal stations and made a very considered decision that a six-year recovery plan was the best way forward to get to a place where we were fully recovered and fully compliant with our preventative maintenance program in terminal stations.
MR. O'BRIEN:
Q. So the long term asset manager for terminal stations, who was that?
MR. MOORE:
A. At that time, and still is the case, it would be a gentleman named Hughie Ireland.
MR. O'BRIEN:
Q. Okay. And do you know whether he took instruction from Mr. Haynes to develop this plan? How did that work?
MR. MOORE:

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A. That wouldn't have been, I'll say, a direct instruction from Mr. Haynes, but by virtue of the fact that he's the manager accountable for implementing a preventative maintenance program, you know, he took it upon himself as a senior leader within Hydro to determine that where we were with respect to preventative maintenance in terminal stations was not meeting our targets and that a very considered long term plan was required to get us back to a place, back to square one I'll call it, by the end of 2015. So, I won't say it was a direct instruction from Mr. Haynes, but by virtue of the senior role that Hughie accepted accountability for, you know, he fully understood that that was his role to ensure that we had a plan in place to be compliant with our preventative maintenance program.

MR. O'BRIEN:

Q. And was there a change at all at that stage in terms of reporting to Mr. Haynes? Was it still a monthly basis as to whether or not this plan was being followed up on?

MR. MOORE:

A. When the plan was first put in place in 2010,

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the reporting would have been the same as we talked about, on a monthly basis.

MR. O'BRIEN:

Q. Okay. And I understand it's different now.

MR. MOORE:

A. Back at that time.

MR. O'BRIEN:

Q. Was there a written document in terms of this plan?

MR. MOORE:

A. It wouldn't have been a written document, but it would have been -- I'll say documented, for lack of a better word, and implemented in our computerized maintenance management system. So when we developed our annual work plans and looking at the most overdue and most critical maintenance that was in place or required say in terminal stations, it would have been documented in the annual work plan each year and it would have been managed through our computerized maintenance management system, based on the last date that the preventative maintenance was done, would have been documented in the maintenance system and the planners would have been managing based on

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that?

MR. O'BRIEN:

Q. So was there a computer program that captured this plan, that sort of told you each year what you had to do? How did that work?

MR. MOORE:

A. Yeah, there is a program, but again, it's documented in our computerized maintenance management system. It wouldn't be, I'll say, a separate documented report as such.

MR. LEDREW:

A. The JD Edwards triggers. Preventative maintenance is triggered at -- anything scheduled to be executed in the upcoming year, there's a trigger happens and that produces a report: this is all due for this year.

MR. O'BRIEN:

Q. Okay. So you get that full report then?

MR. MOORE:

A. Correct.

MR. O'BRIEN:

Q. And it's a summary, I guess, at the beginning of the year and you work from that? Is that how that -- the group would then work from that summary report?

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MR. MOORE:

A. That's correct.

MR. O'BRIEN:

Q. Okay. And so in 2010 then, I just want to get an idea as to what the plan was in terms of how you were going to catch up. Was the plan then to say, okay, the computer system was going to generate, say, with respect to breakers, if you're going to do 10 or 11 in the normal scheme of things, we're going to do 13 or 14 this year. How would that -- how does that work?

MR. MOORE:

A. That would have been communicated from the long term asset planning team and long term asset planning manager at that time to determine that a six-year plan was required and the instructions would have been given to the short term planning and scheduling group who manage the computerized maintenance management system, as Terry just talked about in JD Edwards, and they would have been given instructions as to "when you develop the annual work plan each year, we need to include the most overdue maintenance in terminal

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stations first for each shop." And that's how the plan would have been developed. Also consideration to criticality such as we talked about transformers and circuit breakers that may be associated with our generating facilities. So the short term planning and scheduling group, on a yearly basis, 2010, '11, '12, you know, as they worked through this plan, would have been know that when they look at the last time the maintenance was done in the computerized maintenance management system, and given that criteria or that criticality criteria, they would have developed the plan each year based on that in the computerized maintenance management system.

MR. O'BRIEN:

Q. Okay. And that criticality criteria, that wasn't part of the computer summary printout, was it?

MR. MOORE:

A. No, but that would have been an understanding of -

MR. O'BRIEN:

Q. That was a judgment call.

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MR. MOORE:

A. - the people that were developing the schedule that, you know, the focus would be on our generating facilities first, and in 2014, we documented a much more formal asset criticality ranking for our air blast circuit breakers and power transformers.

MR. O'BRIEN:

Q. Yeah, I understand that, yeah.

MR. MOORE:

A. But prior to then, the understanding would have been -

MR. O'BRIEN:

Q. You didn't have that documentation.

MR. MOORE:

A. - the generating facilities would have been the highest priority.

MR. O'BRIEN:

Q. And who would have communicated that to this group as to what the actual criteria are, the criticality, the generating -- can you explain to me how that would have gotten communicated to these individuals?

MR. MOORE:

A. That would have been done by communication

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between the long term asset planning manager with the short term planning and scheduling team and also the work execution managers and the regional managers. So there would have been communication and discussion about that criteria each year when we developed our annual work plan. All these people work in the same office and communicate on a daily basis and there's continuous communication with respect to execution of our plan and development of our plans. So that would have been communication between those teams and well understood that this is how we were going to proceed forward to implement annual work plans and additional work to ensure that we complete the recovery plan by the end of 2015. So that would have been a fair amount of communication and discussion among those teams as we develop our plans and manage our assets.

MR. O'BRIEN:

Q. And would Mr. Haynes have been involved in that process, in terms of communicating to those individuals what needs to be done for determining when preventative maintenance could be deferred or done or what got done

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each year?

MR. MOORE:

A. Mr. Haynes, at that time, my understanding would be that he wouldn't be involved with those direct day-to-day discussions of management of assets, but he would have been provided with the monthly updates of how we were progressing.

MR. O'BRIEN:

Q. The updates, okay.

MR. MOORE:

A. And you know, he would have fully understood all the positions that are in place in each operating region that are accountable for making these decisions and developing these plans and working toward the plans.

MR. O'BRIEN:

Q. So, in say 2010 or say at the end of 2010, there's 18 transformers that are still outstanding and there's 11 overdue breaker left from the overdue breaker maintenance, would that have been communicated to Mr. Haynes at the end of the year?

MR. MOORE:

A. I'm not sure if he would have had those exact

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numbers at the end of the year at that time.
MR. O'BRIEN:
Q. I'm trying to get an idea as to how this would have been followed at the higher level.
MR. MOORE:
A. I will -
MR. O'BRIEN:
Q. Would you have been -- obviously you didn't come in until 2011.
MR. MOORE:
A. Right.
MR. O'BRIEN:
Q. But the manager would know?
MR. MOORE:
A. The regional managers would have certainly been well aware of how they were progressing on this plan each year, at that time, and Mr. Haynes would have -- my understanding would be he would have, you know, through a performance management system, would have had those discussions in general as to how we were progressing with our maintenance program with his regional managers. But, I can't say for sure as to what exact numbers may have been communicated to him or even how often he would

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be aware of those numbers at that time.
MR. O'BRIEN:
Q. And Mr. Henderson, you wouldn't have been involved at that point?
MR. HENDERSON:
A. No, I wasn't involved with that, no.
MR. O'BRIEN:
Q. In terms of going forward then, who else might have been given updates? Would this have gone up further through to Mr. Martin at all in terms of how the plan was progressing?
MR. HENDERSON:
A. I can speak in my time.
MR. MOORE:
A. Yes, okay.
MR. O'BRIEN:
Q. Yeah.
MR. HENDERSON:
A. I did not have that kind of discussion with Mr. Martin.
MR. O'BRIEN:
Q. Okay.
MR. HENDERSON:
A. The reporting, we changed the reporting.
MR. O'BRIEN:

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Q. That's helpful, yeah.
MR. HENDERSON:
A. In 2014 for -- you know, when I started to be aware of what was happening here, that's when -- you know, when I was aware of this issue, we -- in 2014, we said we need to be watching this and you know, having more frequent reporting. That's when we introduced the weekly reporting on progress of the annual work plan.
MR. O'BRIEN:
Q. Okay.
(10:45 a.m.)
MR. HENDERSON:
A. Prior to that, we were talking more high level on performance and exceptions, I'll say, in terms of if there was something that was not happening as it should, it would be reported up and that would be addressed. And so in my experience, it was dealing with a lot of the exceptional items, rather than dealing with the day-to-day maintenance activities.
MR. O'BRIEN:
Q. Okay. And I guess one of the reasons I ask that is just based on Mr. Moore's testimony

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earlier about there being a change in target at the end of 2012 and now being reflected preventative maintenance in 2013. I'm just wondering -- clearly at some point in 2012, there was an issue that was brought up further above you, Mr. Moore, in terms of there needing to be more focus on preventative maintenance. Is that fair to say?
MR. MOORE:
A. I think it's fair to say that in 2012, when I was into the second year of this position, I was aware of where we were progressing, you know, against our 90 percent target for preventative maintenance and felt at that time that there needed to be additional focus -- I'll say focus or additional detail placed into the performance contracts of our regional managers in 2013 so that it was very clear what was expected. It was always well understood what was expected for preventative maintenance, but we were three years then into a six-year plan for terminal stations and we felt that it was very -- the appropriate time to enhance the accountability for completion of preventative maintenance at that time and

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that's when we wanted to clearly document it in performance contracts moving, you know, from 2013 onward.

MR. O'BRIEN:

Q. So did you have a concern at that time that you weren't going to meet this six-year catch-up goal?

MR. MOORE:

A. I wouldn't say it was a concern at that time. We were three years into a six-year plan, but it was recognized that very clear instruction as an opportunity improvement should be included in performance contracts. So, as an opportunity to further clarify expectations, we felt that we would put it -- the prudent thing to do would be put it into the performance contracts in 2013 moving forward. So, I wouldn't call it a concern, but an opportunity to further clarify expectations.

MR. O'BRIEN:

Q. So you changed the performance contract to include it now as a target, to change the target, and it wasn't because you had any concern over whether or not you were going to catch up with this plan or follow through with

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this plan? That had nothing to do with it?

MR. MOORE:

A. No, it was more of a -- as continual improvement as being one of our focuses of our management philosophy, I guess, in Hydro, we felt that an opportunity to further clarify expectations around preventative maintenance and to bring more attention to it was the prudent thing to do starting in 2013.

MR. O'BRIEN:

Q. And was this your decision to include that or was this a decision made above you?

MR. MOORE:

A. That would have been a decision that, you know, I would have been involved with, but at the time, you know, would have been a discussion as well between myself and Mr. Henderson about not necessarily where we were tracking against preventative maintenance, but an opportunity to further clarify the accountabilities of our managers moving forward.

MR. O'BRIEN:

Q. Mr. Henderson wasn't in the role he's in now in 2012. Would he have been involved in a

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discussion in changing targets in 2013 -- for 2013?

MR. HENDERSON:

A. Maybe I can just -

MR. O'BRIEN:

Q. Yeah.

MR. HENDERSON:

A. These performance contract measures were finalized when I got into the position. So I was the one that finally signed off on these particular PM targets to ensure that -- you know, that was highly visible in terms of the managers' accountability and so that was -- Darren and I had that discussion when we were looking to finalize those performance contracts in early 2013.

MR. O'BRIEN:

Q. Okay. And so is it fair to say then it's something you -- it was your idea, Mr. Moore, but it was finalized through discussions with Mr. Henderson? Is that a fair way to characterize it?

MR. HENDERSON:

A. I'm trying to recall, but I know that we had that discussion and said that this was a very

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important measure that we needed to have and we had to help make sure that that accountability was there. I'm trying to recall now how that started because you're trying to say well, whose idea it was.

MR. O'BRIEN:

Q. Well, I'm just trying to get a flavour, yeah.

MR. HENDERSON:

A. And it could have come through a discussion recognizing that this is a critical aspect of the jobs of the regional managers to get their PMs done and we had discussions around ensuring that that gets done, because we wanted to ensure that we were positioning the system to be as reliable as possible and had that high focus on the managers.

MR. O'BRIEN:

Q. And the reason I'm asking it is that you are three years into a plan at this point and this thing -- and this discussion, by the sounds of it, didn't happen in 2010 or 2011, and I'm wondering why it's happening and why the change is happening in 2012 into 2013, and not early on. Because wouldn't it have been a key part of these roles earlier on as well?

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You're making a change in the plan now to try to catch up. I would have thought that would have been the time to do it.

MR. HENDERSON:

A. I just would like to say that in the discussion in 2013 when we went through this, we were talking about overall PMs. We weren't -- this is not the catch up. This is overall PM completion. There wasn't a specific discussion on the terminal station maintenance on the transformers as part of that. You know, we did not highlight as a separate item in the performance contract. We were talking about PM completion overall.

MR. O'BRIEN:

Q. I understand that, yeah.

MR. HENDERSON:

A. So I just wanted to -- I wasn't sure with your question whether you were thinking that this was the catch up was in the performance contract.

MR. O'BRIEN:

Q. Well, I would have thought that the catch up was not just for transformers. It would have been -- or sorry, for -- was it just for

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transformers, just for overdue breaker maintenance or was it for all PM?

MR. MOORE:

A. No, it was -- the six-year program starting in 2010 was for terminal station equipment.

MR. O'BRIEN:

Q. Just for terminal station equipment?

MR. MOORE:

A. That's correct, yes.

MR. O'BRIEN:

Q. Okay. And so that's a separate program from your whole PM?

MR. MOORE:

A. Well, it's part of the overall PM program, I'll say.

MR. O'BRIEN:

Q. Part of the overall, okay. Just take me back now through the criteria that the -- so when there's an annual plan that's put in place each year, I want to get a bit more detail on the criteria as to how you decide what work takes priority. You mentioned in terms of which of these assets might be further out in terms of the last time it underwent maintenance, most overdue, that kind of thing.

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You also mentioned those associated with generating stations. Just tell me the generation part of it. Just give me a little bit more detail on that. What are you talking about there?

MR. MOORE:

A. Yeah, I guess I can use a little bit of -- maybe a bit of an example to try to further clarify it.

MR. O'BRIEN:

Q. Yeah.

MR. MOORE:

A. Like our maintenance planning group are the group or our short term planning and scheduling group are the group that will always be looking at our computerized maintenance management system and keeping track of what's in backlog and the last completed date of PMs and that's all documented within our computerized maintenance management system. So when they go to develop an annual work plan for a year, you know, they're given direction and through consultation with our work execution managers, our long term asset planning manager and even

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the regional manager to look at, you know, what the most overdue and critical backlog work is required to be put in the annual work plan that year, plus any other maintenance that's due based on the schedule for that year.

So that group then would take that and develop the annual work plan for that year and the different types of work that would be included would be our preventative maintenance program, an allotment for corrective maintenance, whether it be work from -- critical work from backlog that needs to be done because we're waiting on or need to plan outages to complete that work, and also an allotment for any corrective maintenance that we may find as we do our preventative maintenance throughout the year or things that may happen on the power system throughout that year, and there will also be an allotment for operating project work and capital work.

But all that would be based on the resources that we have available in each region and the resources certainly are very reflective of the operating budget that's

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approved for that region each year. So you look at your available resources, the work that's required that year, the most critical backlog preventative maintenance work and overdue maintenance work, recognize that there was a six-year plan for terminal stations, and also any corrective maintenance backlog that's awaiting outages, for example, to be scheduled and then they would develop an annual work plan based on the available resources that year, recognizing that there would be some contractor type work for some of our capital program work and our internal resources do work on some capital, but not all capital. So that's how the plan would be laid out for that year.

MR. O'BRIEN:

Q. And when you say critical backlog, you're talking corrective maintenance there, are you, not preventative maintenance?

MR. MOORE:

A. Backlog really applies to both because any -

MR. O'BRIEN:

Q. If you put aside the -

MR. MOORE:

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A. - any preventative maintenance that wasn't completed at the time when it was specified to be completed would be considered part of the backlog. So, if there was a preventative maintenance activity that was due say the previous year on a power transformer that -- we talked about the reasons why some of this work does get deferred to later years.

MR. O'BRIEN:

Q. Yeah, something got deferred from the year before.

MR. MOORE:

A. That would be considered a preventative maintenance item that's in backlog.

MR. O'BRIEN:

Q. Yeah.

MR. MOORE:

A. But there's also corrective maintenance activities that come up because when you do a thorough preventative maintenance program, I mean, you do find things on your assets that do need to be corrected, but they often get placed in work order backlog because, you know, they require outages normally to get that work complete, planned outages.

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MR. O'BRIEN:

Q. So this is when a preventative maintenance issue has led to a corrective issue?

MR. MOORE:

A. Right.

MR. O'BRIEN:

Q. Yeah, okay. But put aside that, if some -- if a preventative maintenance had been planned for say 2011 and never got done, then -

MR. MOORE:

A. That would become part of the backlog. That's correct.

MR. O'BRIEN:

Q. Yeah, that's part of the backlog, but it's not a critical issue? You don't deem that critical. You deem that that's another year past when it was supposed to be done? Is that right?

MR. MOORE:

A. No, well I can't say it wouldn't be a critical issue. That probably wouldn't be the best way to look at it. What we would look at is all the preventative maintenance activities that may be in backlog and we would develop our plans going forward to address the most

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critical first, which may be a transformer associated with a generating station would be done at the highest priority.

MR. O'BRIEN:

Q. Okay. And in terms of say prioritizing transformers, apart from generating station -- when you're talking generating stations, what are you talking about exactly?

MR. MOORE:

A. Well, I would look at, say, a transformer that's associated with maybe unit two in Bay D'Espoir, a 75 megawatt hydro generating unit, only has one transformer to transform the energy produced by that unit up to the transmission voltage. So if anything happened to cause that transformer to be out of service, it would result in that generating unit not being available for service for the power system. So of all our 105 power transformers, the ones that are directly associated with generation would be considered our highest asset, critical power transformers.

MR. O'BRIEN:

Q. And the Sunnyside -

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MR. MOORE:
A. Just as an example, using Bay D'Espoir.
MR. O'BRIEN:
Q. What about the Sunnyside transformer? Is there any criticality to that?
MR. MOORE:
A. Since 2014, and in the June 2nd 2014 reports to the Board, we've gone through and ranked all of our 105 power transformers using a very rigorous criteria and Sunnyside T1 would be documented in that report. I can't remember off the top of my head where it falls in the list of 105, but it certainly wouldn't have had the same critical ranking or criteria as a, say, T1 for unit two in Bay D'Espoir, for example.
MR. O'BRIEN:
Q. Okay.
MR. MOORE:
A. Because if you look at the design of the Sunnyside system, there's two transformers in the Sunnyside yard, T1 and T4, and either one of those transformers can supply full load at any given time. So there's redundancy in that station. Whereas a T2 in Bay D'Espoir, there

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is no redundancy for that generating unit.
MR. O'BRIEN:
Q. Without the right redundancy. But in terms of how you analyze -- let's say you had -- you're talking about Bay D'Espoir and the unit two in Bay D'Espoir and that had been done three years ago.
MR. MOORE:
A. Right.
MR. O'BRIEN:
Q. And Sunnyside is due now at six, right, so it's past it's six years, is there -- and there's no corrective maintenance that's in the plan, how do you prioritize those two?
MR. MOORE:
A. The way we would look at it, if I use maybe the Whitbourne crew as an example, we talk about say 105 power transformers. So of that we said we'd do -- with the rough math we talked about a little bit earlier, we'd say 17 or 18 transformers per year. Now across the Island Interconnected system for these power transformers, there's really four crews that do that work. There'd be a crew in Whitbourne. There'd be a crew in Bishop

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Falls, a crew in Stephenville and a crew on the Northern Peninsula. So if we want to continue on with the rough math, each of those shops would be accountable to get, if we wanted to maintain our preventative maintenance schedule, they would have to do maybe five power transformers per year each from a preventative maintenance perspective to keep up with our -- and be on track with our six-year program.
MR. O'BRIEN:
Q. To go beyond, yeah.
(11:00 a.m.)
MR. MOORE:
A. So what we would look at, if we look at the Whitbourne crew, we would look at all the transformers in the eastern terminal stations that they're accountable for doing maintenance on and we would look at the last date that those transformers were done. And from there, we would start with the most overdue for that year or at that time and develop our annual work plan such that they would have I'll say five, maybe six power transformers in their plan that year to ensure that we're also, at

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that time, would have been keeping up with our 2010 to 2015 recovery plan. So that shop would have five or six power transformers that year and we would determine what would be an annual work plan that year based on the most overdue transformers, but bearing in mind any transformers that at that time we talked about the criticality would be based on generating sources and those type things.
But since 2014, the criteria is certainly -- and criticality is much more rigorous now. We went through a more extensive process to establish criticality, but back in 2010, we would have looked at the five or six most overdue transformers that were in -
MR. O'BRIEN:
Q. In each area?
MR. MOORE:
A. - in the realm of the Whitbourne shop and that's what would have been in their annual work plan.
MR. O'BRIEN:
Q. So if you had ones in another area that were much more overdue and ones in Whitbourne area that were all under six years, you wouldn't

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have Whitbourne crew do some of the other ones?
MR. MOORE:
A. We might do some of that in a given year.
MR. O'BRIEN:
Q. Okay.
MR. MOORE:
A. We do move crews around the island to help out other crews, as warranted, but the base plan would start off with typically what each crew would do in each year based on the most overdue and what were most critical.
MR. O'BRIEN:
Q. Okay. I think we're at 11 there, Mr. Chair.
CHAIRMAN:
Q. I think we'll take a preventative maintenance break.
(BREAK - 11:02 a.m.)
(RESUME - 11:35 a.m.)
CHAIRMAN:
Q. So we're back to Mr. O'Brien I believe.
MR. O'BRIEN:
Q. Thank you, Mr. Chair.
CHAIRMAN:
Q. In Mr. Moore's words, we're all fully

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recovered, sir.
MR. MOORE:
A. Yes, we are, sir.
MR. O'BRIEN:
Q. Mr. Moore, we were talking about, I guess, the criteria when we left off in terms of the annual plan and how you prioritize. I did have a question -- you had mentioned in terms of transformers connected to generating stations as being more -- having more priority, I guess, in terms of work. Is that right?
MR. MOORE:
A. That's what we talked about, yes, before the break.
MR. O'BRIEN:
Q. And does the same apply to air blast breakers?
MR. MOORE:
A. Yes. We would look at prioritizing our air blast circuit breakers based on anything associated with a generating facility.
MR. O'BRIEN:
Q. So there wouldn't be sort of -- 230 kV breakers across the system wouldn't have high priority, like equal priority?

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MR. MOORE:
A. They would be obviously of a high priority, and depending on the redundancy that may be built into the power system, you know, others may take precedence over a circuit breaker that may have a redundant configuration type thing, but we would look at the highest priority being the generating facilities first and then some of our terminal stations are built with, I'll say a ring bus configuration so that there's, you know, two alternate sources of electricity to flow. So any circuit breaker in that type of configuration may not take as high a priority for if you just have a single circuit breaker say supplying customers rather than two sources of electricity. So they're some of the things that we would use to -- or would have used at that time to prioritize the execution of our annual work plan. And again, in 2014, we formalized that criteria much fuller.
MR. O'BRIEN:
Q. In terms of a list of criticalization, I guess, is that what it was?
MR. MOORE:

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A. Yes, that's right, and the criteria that we used as documented in the June 2nd, 2014 reports.
MR. O'BRIEN:
Q. And I think I had asked the question earlier, in terms of, I guess, prior to 2014 and prioritizing, if you had say one asset that was three years out from its last preventative maintenance but you had another one that was six, but the three-year would fall ahead prioritizing, would you do the three-year first even though another one's been six, seven years out, maybe even past its cycle?
MR. MOORE:
A. I would say we would have included both in the annual work plan, but if the three-year was very critical to a generating facility and the six-year may have redundancy built into the configuration of the power system, the three-year may take higher priority, but the goal would be to achieve both.
MR. O'BRIEN:
Q. And when you say -- is there separate like cycle for those assets that are attached to a generating unit?

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MR. MOORE:
A. No, the six-year cycle -- or at that time, the six-year cycle would have applied to all air blast circuit breakers.
MR. O'BRIEN:
Q. To all of them, yeah.
MR. MOORE:
A. Which we've since changed to four years.
MR. O'BRIEN:
Q. And now it's a four-year but it's still to all?
MR. MOORE:
A. Yes.
MR. O'BRIEN:
Q. Okay. And I'm just trying to get a sense of sort of how you would move up -- if one of those assets was say three years out, how it would move up in priority from another asset that was six or seven years out and was outside its cycle. If there wasn't corrective maintenance involved with that particular three-year -- the asset that had been three years out, how would you move it up ahead of one that's six or seven years out?
MR. MOORE:

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A. Essentially what we would do is the short term planning and scheduling group would build the annual work plan that year and decide which breakers would be included in the annual work plan. So you know, it actually wouldn't move ahead in priority as such, but the instructions were given to the short term planning and scheduling group to look at the most overdue, but also look at the criticality associated with generating stations and from there you need to make decisions as to which breakers need to be included in that year's annual work plan, which ones would have been the highest priority to include in the plan. But they all would have still remained documented with the last due date in the computerized maintenance management system for that group to manage the scheduling of.
MR. O'BRIEN:
Q. I guess I understand that. The summary report would sort of spit out in terms of the timeline, I take it?
MR. MOORE:
A. Yes, that's right.
MR. O'BRIEN:

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Q. And so I'm just struggling with how one would get moved up in a timeline if it's already -- it's only been three years since it got last done. Like is there -
MR. MOORE:
A. No, that wouldn't happen. We would start with -- like I explained about the Whitbourne shop, I guess, the most overdue would be the first one and then the second most overdue would be the second one, until you've reached the allotment that could be done that year with those resources in that shop.
MR. O'BRIEN:
Q. Okay.
MR. MOORE:
A. But I guess all we're saying is that, you know, for example, if there was five -- if the five most overdue breakers were required that year in that shop, but let's say number six was associated with a key piece of generating equipment, then that number six may make the list and number five we may look at scheduling for the subsequent year, based on that criteria. But that's just an example of a decision that could be made.

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MR. O'BRIEN:
Q. Okay.
MR. MOORE:
A. The other thing we look at too as well is like when we look at the power transformers and air blast circuit breakers, there's a -- if we look at PUB-NLH-174, there's a very extensive list of all the maintenance that we do in terminal stations. We do monthly air system checks. We do quarterly inspections in the terminal stations. We'll do an annual inspection, physical -- well, a visual inspection of power transformers, for example, and you know, there's oil sampling that takes place on different frequencies for different assets.
So there's a significant amount of maintenance that happens on an annual basis in a terminal station that the numbers that we're talking about here that we put in the six-year plan for is our six-year PM, but there is a fair amount of other inspection and maintenance that takes place on these assets in these stations. So we would also have knowledge and the people involved with the

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decision making to build that annual work plan would have knowledge of what we have been finding say through our oil analysis or our visual inspections and those type things and that would also help prioritize what six-year PMs we would include in that annual work plan.

MR. O'BRIEN:

Q. In terms of resources, you had mentioned earlier, Ms. Greene had asked you about, I guess, how resources fit into this and the following of your operating budget and you've mentioned this a couple of times. You mentioned the rural deficit. Is that something that's actually in the forefront of the minds of these people who are planning the preventative maintenance on an annual basis that we got to keep the rural deficit down?

MR. MOORE:

A. It's very much in the minds of the managers in our team who are accountable for ensuring that there's an annual work plan put in place. But what I will say is that all people in a role of accountability, I guess, that are putting together this annual work plan are certainly very well aware of the operating budget that

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we have and the expectation that we work to and meet our operating budget as our means of providing least cost service, and whether everybody would be fully knowledgeable about the rural deficit, but I just wanted to use that as an example that, you know, that is our key tool to ensure that the rural deficit is managed is working to our operating budget. So, everybody is every clear and understand fully when we're developing our annual work plan and allocating our resources that managing to our budget is a balanced priority along with completing our maintenance program.

MR. O'BRIEN:

Q. And where does reliability fit into that analysis?

MR. MOORE:

A. We have extensive, I guess, reliability data that we report to the PUB on say a quarterly basis and we watch on a regular basis of -- I'll use like our SAIDI/SAIFI numbers, for example, for the power system. So that's a measure of the duration of outages and the frequency of outages. So we do look at reliability numbers and I'll use an example.

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If we look at the reliability numbers say for our distribution systems, for example. If we have distribution feeders that for certain reasons, if the performance of that feeder say is not meeting our targets and then we do a root cause to determine what's happening, let's say that we determine that vegetation management is causing some outages on a distribution feeder, then when we develop our annual work plan and if we know vegetation management is affecting a certain feeder's reliability, then we would ensure that vegetation management would be addressed in that area, based on the reliability of that feeder, as an example.

But reliability is very much in the forefront of how our assets are performing and the root cause analysis of when the assets don't perform to our reliability standards and what may need to be incorporated into our plan to improve that reliability going forward.

MR. O'BRIEN:

Q. And I guess the background to that is I would have thought reliability would be the forefront and would have been the main focus

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of a preventative maintenance program. Is that right?

MR. MOORE:

A. That is right. The main reason you do preventative maintenance is to ensure reliable supply to our customers and that's why the program is extensively documented and managed in a computerized maintenance management system such that we ensure that the highest priority work is addressed in a given year in the annual work plan.

MR. O'BRIEN:

Q. Yeah, I understand in terms of documentation, but in terms of being followed, wouldn't reliability be the main reason why a preventative maintenance program would be followed and kept up to date?

MR. MOORE:

A. That's right.

MR. O'BRIEN:

Q. Okay.

MR. MOORE:

A. That's the focus of our preventative maintenance program is to ensure reliability.

MR. O'BRIEN:

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Q. And one of the questions Ms. Greene had for you is why you didn't consider more resources, putting more resources on the issue, consider whether you should contract out in 2010, 2011, 2012 to try to catch up with this work. Why wasn't that considered?

MR. MOORE:

A. I'll say that it was -- at the point in which we considered that we realized -- because it was basically the six-year PMs in terminal stations that we had a recovery plan in place for and all our other major asset classes, we were doing a very good job meeting our preventative maintenance targets. So, in 2013, and we talked about some of the large breaking work in 2013 and 2012. We did an analysis in 2013 and realized that, you know, we're four years into our six-year recovery program for terminal stations, not as far along as we would have liked to have been four years in and at that time, through the amended GRA, we put forward to the Board, the requirement for additional resources in 2014 and 2015 to ensure that we were going to achieve our six-year recovery plan in 2015.

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(11:45 a.m.)

MR. O'BRIEN:

Q. So four years in, in 2013, you weren't as far along -- do you know if you were actually as far along as you should have been just with a regular six-year plan, the plan you had in place before 2010, before the catch-up idea? You had a six-year cycle then. Do you know if you were tracking for a regular six-year cycle?

MR. MOORE:

A. I don't have the numbers in front of me right now, but I think I'll say that we were completing on an annual basis typically what would have been in our annual plan, but we weren't getting to the point with -- I think the RFIs actually show the numbers that were overdue each year.

MR. O'BRIEN:

Q. I've looked at the numbers that were overdue each year, but -

MR. MOORE:

A. Now 2013 -

MR. O'BRIEN:

Q. - I think you were a few behind in each one.

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MR. MOORE:

A. There was.

MR. O'BRIEN:

Q. On a regular six-year cycle, not just a catch-up, but a regular six-year cycle.

MR. MOORE:

A. And 2013 ended up being the most exceptional year where we documented that there was 10,000 hours of regular -- or 10,000 person hours of breaking work on a regular basis and then 10,000 hours worth of overtime on a breaking basis, which really definitely put us in a position in 2013 that we were not where we wanted to be with our six-year recovery plan in terminal stations.

MR. O'BRIEN:

Q. And that's the year you changed the target.

MR. MOORE:

A. And that's -- 2013 is when we documented the target in performance contracts to raise visibility, I guess, of that target and accountability with our regional managers. But it was in 2013, late in 2013 when we did the analysis of where we were with respect to our recovery program and what we would need to

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do to make sure that we completed it by the end of 2015 that we put forward in the two test years for 2014 and 2015 to record resources to get to achieve success.

MR. O'BRIEN:

Q. Can I ask you why it was a six-year plan for recovery from 2010 forward, why not a two or a three-year plan if you're -- prior to 2010, you were on six-year cycle anyway. In six years, you should get all of these things done anyway, shouldn't you?

MR. MOORE:

A. It's a good question. Like I was not obviously in the position that made that decision back in 2009. From what I understand, talking to the people who did develop the six-year recovery plan, was based on what was overdue in 2009 and looking at the available resources and our budget requirements -- because least cost is a high focus when you're a running a -- you know, in Hydro. So the people that made the decision to put together a six-year recovery plan felt that was a reasonable plan to get to the end of 2015 and be fully recovered in terminal

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stations, bearing in mind their knowledge of how the assets had been performing up to that time, where some of the known issues may or may not have been with the assets, the health of the asset, age, like very intimately familiar with how well the assets had been performing, and looked at what was overdue based on the resources available moving forward and all that decision making evolved into a six-year plan to be completed by the end of 2015.

MR. O'BRIEN:

Q. But I understood that Hydro had come to the conclusion prior to that that six years was an appropriate cycle and now -

MR. MOORE:

A. Yeah, that's right, the six-year cycle was established for -

MR. O'BRIEN:

Q. Right, so six-year cycle was appropriate, and you hadn't been meeting it.

MR. MOORE:

A. - for that particular maintenance tactic for those assets, yes.

MR. O'BRIEN:

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Q. So why not accelerate it for the catch-up plan?

MR. MOORE:

A. I'll say that a six-year plan is actually an accelerated program because it's in those six years, we're still planning on completing all maintenance that becomes due that year, plus a portion of what was required from backlog. So I would say that the six-year program was an accelerated program.

MR. O'BRIEN:

Q. But if you did every one of those -

MR. MOORE:

A. That was reasonable to accomplish with the resources that we have available.

MR. O'BRIEN:

Q. If you did every one of those in that six-year plan, you'd only do one of them in each -- in that plan, wouldn't you? It's not extra generators you're doing, or sorry, extra transformers you're doing or extra breakers you're doing.

MR. MOORE:

A. Yeah. What we have to look at, in 2009, there was a portion that was in backlog. So we

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wanted to make sure that we completed what was in backlog plus anything that may become due over that six-year period as well.

MR. O'BRIEN:

Q. You couldn't do the portion that was in backlog in the first year and then catch up by just -- I don't get it, why you wouldn't have done a shorter period.

MR. MOORE:

A. I guess the volume of work in 2009 required that it was going to take six years to -- I guess what probably causes the confusion, when you look at it and say of all the power transformers, some are overdue, some are not, and that's probably what's causing the confusion. What we said we'd do over a six-year period, based on like we just talked about, this is a six-year maintenance tactic, what we said we'd do starting in 2010, we'd look at the most overdue and what can be accomplished in each shop and that's how we would tackle the 2010 maintenance program and then in 2011, you look at it the same way. So by tackling the most overdue and the most critical assets first, by the end of 2015, we

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would be back to a position where we wouldn't have any overdue maintenance any more on those assets. So it's really a focus each year of tackling the most overdue, most critical, as opposed to we got two that are overdue and six not overdue and that's how we're going to plan. The focus is looking at the most critical, most overdue and through a six-year period get to a point where we're fully recovered.

MR. O'BRIEN:

Q. I guess I'm just not getting it. In terms of implementing that plan then and going forward was there an actual number given to each group to say here's how many extra you need to do each year in order to get to that point?

MR. MOORE:

A. That's right. Each group were well aware of what was in the annual work plan and what transformers were required, if we use transformers for an example, that the Whitbourne shop were accountable to get done each year or on an annual work planning basis, but a plan was mapped out as to the numbers that would be required in each shop to get to

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the point where we're fully recovered in 2015.
MR. O'BRIEN:
Q. Is there any point during the year when you're doing -- when you've already come to your actual plan at the beginning of the year, is there any point during the year that preventative maintenance schedule is reconsidered? Say one item that was not supposed to be done until the next year is moved up?
MR. MOORE:
A. There are things that -- there's multiple things, I guess, that may cause us to -- you know, we talked about capital breaking work and corrective breaking work that may need to come into the annual work plan and result in an item that is in the plan -
MR. O'BRIEN:
Q. Being moved back.
MR. MOORE:
A. - may reprioritize to a later date. Some of those could be -- I'm just trying to think of a good example now to give.
MR. O'BRIEN:
Q. If there was say a minor issue that needed

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corrective work, would you move something up that's supposed to be there next year, move it up to this year?
MR. MOORE:
A. I'll use an example, I guess, if we want to just illustrate by an example. In 2013, when we had the failure in the Holyrood terminal station with respect to the salt spray and the weather and contamination in the yard, at that time, we had tracking on the air blast circuit breaker that was associated with unit one. So in that year, the transformer, Holyrood T1, was not in the annual work plan that year because it wasn't due. But because of the fact that we had a fault in the terminal station and we knew that that fault transferred through the transformer to the generator, which was what we would call a through fault, we felt it would be prudent at that time to do a preventative -- our six-year preventative maintenance inspection on that transformer because it seen a fault that year because of a weather related issue. So that's an example.
MR. O'BRIEN:

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Q. That's the type of thing I'm asking, okay. All right. And is there -- are there any guidelines for how that gets done or is it just a judgment call?
MR. MOORE:
A. I wouldn't say there's specific guidelines, but, you know, the knowledgeable people who are certainly operating and managing the power system make those decisions as issues arise throughout the year through operation of the power system.
MR. O'BRIEN:
Q. I just want to touch again on the resources in terms of what you had available in terms of doing your preventative maintenance program and I guess your regular maintenance program from 2010 to say 2014. Was there a shortage of resources at that time?
MR. MOORE:
A. I wouldn't characterize as a shortage of resources. There's normal turnover that we would see that we address through recruitment and retention in any given year. But at the time, we had -- our resources were based on our operating budget that we had that year and

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the resources that we felt we need through our annual work planning process to achieve execution of the annual work plan.
MR. O'BRIEN:
Q. Did you have any resources that were seconded out to any other areas in Nalcor, the Lower Churchill Project or anything like that?
MR. MOORE:
A. In what year?
MR. O'BRIEN:
Q. In any of those years, 2010 to 2014, who could have been doing -
MR. MOORE:
A. Not from my division, no.
MR. O'BRIEN:
Q. No.
MR. MOORE:
A. What I'll say, some of the -- 2013 was the most exceptional year that our resources ended up having to be focused on higher priority work as we talked about in Holyrood.
MR. O'BRIEN:
Q. But that's within Hydro, is it?
MR. MOORE:
A. That's right, yes.

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MR. O'BRIEN:
Q. Yeah, okay.
MR. MOORE:
A. But not to other divisions, no.
MR. O'BRIEN:
Q. All right. I just want to ask some specific questions now on the maintenance on the Sunnyside T1. You've mentioned the cause of the failure in earlier testimony, and that was due for maintenance in September 2013. Is that right?
MR. MOORE:
A. The six-year cycle would have been up in September 2013 for the six-year maintenance tactic.
MR. O'BRIEN:
Q. All right. And can you tell me any reason why that wasn't prioritized for that particular year? Was there any particular maintenance that was prioritized ahead of it?
MR. MOORE:
A. In the 2013 annual work plan, the Sunnyside transformer would have fell under the terminals crew in Whitbourne and the transformers that were on their plan this year

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would have been based on that criteria I talked about in 2013 of the most overdue transformers for that year. I don't have the exact transformer names and numbers in front of me here now from that annual work plan, but I do know that it would have been 2014 when we were going to do -- that transformer would have been in the annual work plan, and that would have been considered based on looking at the -- you know, all the other maintenance tactics that were done in Sunnyside up to that point in time as well, like on a quarterly and annual basis as well, right.
MR. O'BRIEN:
Q. I wonder if we could bring up PUB-NLH-170, Revision 1?
MS. GRAY:
Q. In the GRA?
MR. O'BRIEN:
Q. PR, sorry. And if we can -- so there's an attachment here - is it 170?
MS. GRAY:
Q. Oh, I'm sorry.
MR. O'BRIEN:
Q. Sorry, Revision 1. So that would have been --

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that transformer would have been last done -- this is an attachment here. Those are all the terminal station power transformers. Is that right?
MR. MOORE:
A. That's correct. That's all 105 of them.
MR. O'BRIEN:
Q. 105 then at least.
MR. MOORE:
A. In the last two years that preventative -- the six-year preventative maintenance tactic was completed.
MR. O'BRIEN:
Q. Yes, you can see there's a number with the 2014 date on it.
MR. MOORE:
A. That's correct.
MR. O'BRIEN:
Q. But I'm interested in the 2013 ones. So the transformer at Sunnyside would have been, which one? T1 -
MR. MOORE:
A. It's in alphabetical order there.
MR. O'BRIEN:
Q. Yeah.

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MR. MOORE:
A. Sunnyside T1.
MR. O'BRIEN:
Q. So it would have been the T1. So that is on the next page there. It was last done September of 2007. Is that right?
MR. MOORE:
A. Yes, that's correct.
MR. O'BRIEN:
Q. All right. Okay. So if we go back to the first page and at the top, the Bay D'Espoir one is the second one in line there.
MR. MOORE:
A. Right.
MR. O'BRIEN:
Q. Right, so that was done prior to Sunnyside anyway, so that would have been in priority to Sunnyside. Is that right? That was last done in -
MR. MOORE:
A. It would be if you look at the numbers.
MR. O'BRIEN:
Q. Yeah.
MR. MOORE:
A. But as I described earlier, there's four

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shops, I'll call them, that do maintenance on our power transformers. So there's the Whitbourne shop and there's the Bishop Falls shop, a Stephenville shop and a crew on the Northern Peninsula. So the Bay D'Espoir transformer would have been done by the crew in Bishop Falls.

MR. O'BRIEN:

Q. In Bishop Falls, and in fact -

MR. MOORE:

A. And the Sunnyside transformer would have been done by the crew in Whitbourne.

MR. O'BRIEN:

Q. And that's what I wanted to get through, I guess. There's four transformers, if you go down the list done in 2013, in the Bay D'Espoir group.

MR. MOORE:

A. Right.

MR. O'BRIEN:

Q. Is that right?

MR. MOORE:

A. Just looking at the numbers now, just to -

MR. O'BRIEN:

Q. Just have a look.

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MR. MOORE:

A. Yeah, you're right.

MR. O'BRIEN:

Q. Yeah, okay. And if we come down to Hinds Lake, the transformer there that was done in 2013 but had been previously done in 2010, the T1 -

MR. MOORE:

A. Right.

MR. O'BRIEN:

Q. - who would have been doing that? Which crew would have done that?

MR. MOORE:

A. Stephenville.

MR. O'BRIEN:

Q. Stephenville, all right. And Holyrood here, we've got one there at the T1 was done in 2011 and done again in 2013.

MR. MOORE:

A. That's correct. Actually that's the example that I just used.

MR. O'BRIEN:

Q. Yeah.

MR. MOORE:

A. Because in 2013, we had the failure in the

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yard in Holyrood.

MR. O'BRIEN:

Q. Right, so that would be a corrective maintenance issue, would it?

(12:00 p.m.)

MR. MOORE:

A. Well, it would be -- it's still the same preventative maintenance check and tactic, but it would be in response to a situation that we seen on the power system that wasn't planned for or accounted for going into the year, right.

MR. O'BRIEN:

Q. Okay. And if we turn over to the next page, we've got Peter's Barron and Plum Point. There's three of them there that are done in 2013.

MR. MOORE:

A. And they would be done by our TRO Northern crew.

MR. O'BRIEN:

Q. Northern crew, right.

MR. MOORE:

A. On the Northern Peninsula.

MR. O'BRIEN:

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Q. And would they hold any priority over the Sunnyside one or it's just that they're done by a different crew?

MR. MOORE:

A. Typically when we develop our annual work plan, we look at the most overdue as priority, but then we develop the annual work plan based on the shop. So normally we wouldn't take say a transformer that is in Sunnyside that's overdue and ask the crew up on TRO Northern to go do that one instead of one that they're accountable for in their shop.

MR. O'BRIEN:

Q. Okay.

MR. MOORE:

A. So the annual work plan would have been developed and prioritized really by the crew that normally does that work in that work area.

MR. O'BRIEN:

Q. And the west -- there's one down here, Western Avalon T1.

MR. MOORE:

A. That's right. That would be part of the Whitbourne team.

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MR. O'BRIEN:
Q. And that seems to be the only one done by the Whitbourne team that year.
MR. MOORE:
A. Well, except for Holyrood T1 that you'd mentioned.
MR. O'BRIEN:
Q. That's what I'm wondering. So that -- but that was a corrective maintenance one, right?
MR. MOORE:
A. That's right, but those two transformers -
MR. O'BRIEN:
Q. Is this a corrective maintenance too?
MR. MOORE:
A. - were done that year by the Whitbourne crew.
MR. O'BRIEN:
Q. Was any preventative maintenance on transformers done by the Whitbourne crew that year?
MR. MOORE:
A. They were the only two that were done by the Whitbourne crew that year, and the main reason for it is all the huge volume of work that took that crew off plan that year because all the main issues that we talked about that

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would have took them off plan with respect to the January 2013 failure in the Holyrood terminal station and the connection of the Newfoundland Power mobile generation, the RTV coating on the circuit breaker components themselves, and the installation of the new generator at Hardwoods, all would have involved the Whitbourne crew. So, the Whitbourne crew, I'll say was the most affected, if that's the right way to put it, by some of the larger events that we had happen in 2013.
MR. O'BRIEN:
Q. So with all of those things going on, why not consider more resources or contract out to get the Whitbourne stuff, that crew stuff done that year?
MR. MOORE:
A. And I'll say that we did that and it became part of the 2014 and '15 test year to get to a place where we were fully completed by the end of 2015, which we will be.
MR. O'BRIEN:
Q. When you say you did that, you actually contracted out resources in 2013?

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MR. MOORE:
A. No, we put forward a plan to the Public Utilities Board and which is part of our 2014 and '15 test years to include additional resources to complete the remainder of the recovery program by the end of 2015.
MR. O'BRIEN:
Q. No, that wasn't my question. My question, in 2013, why not consider resources or additional resources to do the 2013 year when Whitbourne was obviously tied up, that crew was tied up with other things.
MR. MOORE:
A. I'll say the reason we didn't go with additional resources because maybe the breaking work that we were experiencing at that time would have been more of a -- the progress through the year, looking back through the year and realizing what we weren't accomplishing as part of our plan. So our only real opportunity to address that with extra resources was into the next year.
MR. O'BRIEN:
Q. And are you surmising that or is that your answer that that's what happened?

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MR. MOORE:
A. That's what happened.
MR. O'BRIEN:
Q. Okay. And was there any opportunity in 2013 to have any of the other crews do some of the preventative maintenance on the transformers?
MR. MOORE:
A. No, because they were fully focused on I'll say the recovery program in their areas itself and there was other additional breaking work that was happening on other parts of the system. The Stephenville crew, for example, were tied up with the rewind of the generator on the Stephenville gas turbine, as another example. And in the RFI itself, there's also a breaker in Bay D'Espoir that the Bishop Falls crew ended up working on that was a failure that happened throughout the year. So the highest volume, I guess, affected the Whitbourne crew.
MR. O'BRIEN:
Q. The Whitbourne crew.
MR. MOORE:
A. But there were other things that were happening which we documented in RFIs that

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were happening to other crews, so the opportunity for them to be taken off their recovery plan and the work that needed their attention for our customers was not there to go out and I'll say do a full blitz on the east coast of the additional PM work. The opportunity to get to a point where we were going to be fully recovered with our PMs was to look forward into 2014 and '15 and add the additional resources and put forward an application and a report to the Public Utilities Board for the 2014 and '15 test year to fully recover.

MR. O'BRIEN:

Q. Well, let me ask you, I mean, you're at a stage in 2010 where you're not performing, I would assume, in accordance with your six-year cycle. That was a reason for you to put forward a catch-up.

MR. MOORE:

A. That's right, yes.

MR. O'BRIEN:

Q. So you're not performing at that point.

MR. MOORE:

A. That's right. In 2009, we knew in terminal

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stations we had to implement a plan to make sure that we were fully on track with our preventative maintenance program.

MR. O'BRIEN:

Q. And I'm going to put to you that by four years in, you're still not even on a plan of doing one-sixth of these transformers and circuit breakers on an annual basis. Do you take issue with that?

MR. MOORE:

A. I agree that the numbers shown in the RFI show that four years into our six-year plan, we were not where we would have liked to be with respect to recovering on these PMs in our terminal stations.

MR. O'BRIEN:

Q. Why not consider in that year, in 2013, consider "look, we need more resources now"?

MR. MOORE:

A. The ability to bring in extra resources -- the other thing you have to think about in terminal stations too is, you know, resources fully capable to come in and just start doing work in our terminal stations, I mean, it's a highly specialized field of expertise. So the

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resources are just not sitting there fully available like you may see say in a construction union shop, for example, where you can draw upon that type of a shop to bring in resources. You either have to take the time to develop a very detailed request for proposals to go out and engage external resources and even to try to hire say additional, I'll say temporary or term employees to come in, I mean, they're not always readily available off the street to come in and do that work.

So by the time we did the analysis moving through 2013 and realized exactly where we were to with our PM recovery program, the best course of action that we made a decision to look at would be what can we do in 2014 and 2015 to achieve our objective of being fully recovered at the end of 2015, and that's when we put forward the plan that we submitted on June 2nd and with our test year to get the additional resources to do that. For those reasons, with respect to the availability of specialized resources, the time it would take to develop requests for proposals to look for

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contract resources, and managing the items that we were dealing with in 2013 at the same time, the opportunity to look for the extra resources was moving into 2014 and 2015 in a planned fashion.

MR. O'BRIEN:

Q. And that was after the events of 2013, 2014 winter?

MR. MOORE:

A. The report went to the Board after the events of 2014, but -

MR. O'BRIEN:

Q. Was it prepared prior to that, prior to 2013? When was it prepared?

MR. MOORE:

A. No, it was late 2013 moving into -- well, it would have been the winter of 2014 when the plan, shall we say, that went forward to the Board would have been prepared and it was submitted on June 2nd. But we recognized late in 2013 that moving -- if we're going to achieve our two-year recovery plan, we're going to have to make a decision to do something to make sure that we complete our PMs that we set out to do for our customers

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and the opportunity to do that for us was to submit with our 2014-15 test year the resources and budget we would need to achieve that.

MR. O'BRIEN:

Q. And in 2013, would you have been made aware that the Whitbourne crew was going to be tied up and that there may be preventative maintenance decisions that needed to be deferred? Would you have been part of that?

MR. MOORE:

A. I was well aware of what the Whitbourne crew had been diverted to work on because of the high priority work that came up for our customers and certainly would have been fully abreast of what they were doing, but it was late in 2013 when I would have become fully aware of the actual detail of what -- of where we were to, I'd say, in our six-year plan at the end -- close to the end of year four. And at that time, we also made a decision to bring in a third party, AMEC, to have a look at our high voltage system from Bay D'Espoir right out to the Avalon Peninsula, just to do a good review and ensure we mitigate any risk moving

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into that winter of 2013 and '14, recognizing that we needed a plan going into '14 and '15 to fully recover.

MR. O'BRIEN:

Q. And in the 2013 year and any other years, I suppose, in terms of using other crews, is that ever part of the plan at the beginning of the year, "well we need this much done in this area. We don't need as much done in that area. So, let's try to have one crew help out in another area"? Is that ever discussed?

MR. MOORE:

A. We do that many times throughout, you know, our work planning and work execution, whether it be with our line crews or distribution crews or terminals crews. There's lots of times that we move our crews throughout the province to assist with other crews, you know, as the opportunities and requirements permit. Typically when we do our annual work plan, like our first and foremost focus with our own internal crews is to complete our maintenance program.

Like there's really three buckets of work, if you want to call it that, that we put

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in an annual work plan for our crews. One would be our maintenance program, which is the first priority always. The second piece of work that our crews work on would be to support capital programs, you know, like safely isolating and putting in work protection which safely isolates zones for people to work on the electricity system, you know, and providing permit holders and doing commissioning and those type things associated with capital work. And then the third piece of work that our crews may work on would be any capital programs. But normally, most of the capital work would be contracted resources.

So when we look at our annual work planning efforts and the use of contractors, what we have been doing mostly up to this point in time was if there's more work than our crews can handle internally, then contractors would be brought in to work on capital work, as opposed to our core operation and maintenance work.

MR. O'BRIEN:

Q. So your annual 2013 plan, by January 1st you

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knew there were issues with the unit one at Holyrood. Is that right? January 2013.

MR. LEDREW:

A. 11th.

MR. O'BRIEN:

Q. Was there work needed to be done?

MR. MOORE:

A. Well, it wasn't January 1st. Terry?

MR. O'BRIEN:

Q. No, no, sorry, January.

MR. LEDREW:

A. It was January 11th.

MR. O'BRIEN:

Q. Yeah, so January 2013, sorry. Was the Whitbourne crew to be doing work on that? Did you know that from the start?

MR. MOORE:

A. In 2013, we obviously very quickly knew that our Whitbourne crew would be required to respond to the outages in January 2013 in the station, and then subsequently when the decision was made that the Newfoundland Power mobile generation would be required to help support the power system, our Whitbourne crew was involved with putting together or

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implementing and installing the infrastructure required for that mobile generation. So that was all happening throughout the winter of 2013.

They did have preventative maintenance on their schedule for that year, and I'll say as we worked through the first part of that year and we were tracking -- and we still knew -- because normally your preventative maintenance season starts in the spring of the year and through to the fall of the year. So the crew was working on installation of that infrastructure in the winter of 2013 and the plan would have been for them to be fully focused then on the preventative maintenance starting that spring and in through the maintenance season.

So that would have been the case, but then shortly after we had the issue in 2013 in the yard in Holyrood and the crew was also working on coating the insulator, so that we were well prepared going into winter of 2013, the issue also came up with the alternator in Hardwoods.

MR. O'BRIEN:

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Q. When did that happen?

MR. MOORE:

A. So from there then, the -- what happened was we were -

MR. O'BRIEN:

Q. No, when did that happen?

MR. MOORE:

A. Oh, when did that happen?

MR. O'BRIEN:

Q. Yeah.

MR. MOORE:

A. What happened was we were doing a rewind on our Stephenville gas turbine generator out on the west coast and the original equipment manufacturer discovered a problem with their retaining rings on the rotor, which is the rotating component in the generator, and that unit is the exact same design and vintage as the Hardwoods unit. I think this was well explained in the capital budget application for Hardwoods alternator. So a decision was made that we knew that we had that issue with cracking on the retaining rings in Stephenville, so Hardwoods then would have to be done because of the issue that the

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recommendation from the manufacturer said we'll need to address the alternator in Hardwoods because it probably has a similar issue and possible failure that we've seen in Stephenville. So a decision was made to go forward with an unbudgeted capital budget proposal to do the Hardwoods alternator.

So before the crews really got a chance to get very much of their maintenance program done that year, they were then focusing their attention on getting that Hardwoods unit, which is very critical to winter operation, with the generator replaced and back in service for the winter of 2013-14. So it was -- I'll say we were well into the maintenance season in 2013 when we did the analysis and realized that -- and the numbers that are shown in the RFI, that we were not where we wanted to be four years into our recovery program, and that's when we started doing the analysis and planning and say well, what can we do now to achieve our 2015 objective and the 2014 year ended up being the -- by the time the formal plan was put forward as to what we were going to do to recover.

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MR. O'BRIEN:

Q. I think what I'm getting at here, Mr. Moore, really is, is that you know in January there's a major issue that the Whitbourne crew was going to have to deal with?

MR. MOORE:

A. That's correct.

MR. O'BRIEN:

Q. Right, and I believe what you said earlier was that it wasn't very long into the maintenance schedule that the Hardwoods issue comes up?

MR. MOORE:

A. Right.

MR. O'BRIEN:

Q. Okay so at that point in time were you informed the Whitbourne crew was going to have difficulty now meeting its schedule for preventative maintenance, did you know that, and did you understand that to be the case?

(12:15 p.m.)

MR. MOORE:

A. At that time, I would have been aware of it and knowing that we were going to have issues achieving our preventative maintenance that year, but at that time we didn't have the

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weekly tracking tool that we have in place now that looks at our annual work plan with the level of detail that we are reporting on now on a weekly basis, so I'll say that I didn't have all the detailed knowledge half way 2013 in the midst of while we were dealing with all the issues that were coming before us in 2013 as well that, you know, everybody's attention was focused on these failures and unbudgeted capital proposals that were needed to focus on for our customers that year. So I'll say it was well into 2013 before I was informed to the detail where we needed - where it was known that we would need a detailed plan moving into 2014 and 2015 to achieve our objective of being recovered on these terminal station PMs.

MR. O'BRIEN:

Q. Did you make any inquiries, and the reason I'm asking this is because I see so many transformers which are done in other areas which have - in my mind, would have less priority by the basis of having done - a couple had been done a few years prior, and this transformer at Sunnyside is over its six

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year period, and the Whitbourne crew is going to be the one doing this transformer at Sunnyside, and I presume other transformers in its area. Did you make any inquiries to say is this Whitbourne crew going to be able to do its preventative maintenance for the rest of the year, and if not, are there other crews that we can take off certain areas or other resources we can get to try to make sure that we keep on plan?

MR. MOORE:

A. I will say that the level of reporting at that time is no where near what we put in place for 2014 for tracking our annual work plan that came to me, so I was aware that there was a plan for the Whitbourne crew, and certainly well aware of all the issues that would have taken them off plan, but it wasn't until late in 2013 that I became fully aware of the detail of what we weren't going to complete and what we would need to do additionally in 2014 and 2015 to achieve our plan.

MR. O'BRIEN:

Q. So is the answer, no, you didn't make inquiries?

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MR. MOORE:

A. I would say that I was aware of what was happening at that time, but I do know that the priorities for the other crews were certainly in place and they were doing work that was necessary for other parts of the power system, and that we really couldn't take them off the work that they had on their plan as part of recovery to go to another area to work on another recovery plan when they already had a full recovery plan on their plate that year.

MR. O'BRIEN:

Q. But how did you know their recovery plan had more priority than what was done for the Whitbourne area? If the Whitbourne area is not going to even get at it or barely get at it, wouldn't there have been a reason for you to at least inquire to say what can we re-prioritize across these groups and see if we can get at least some done in Whitbourne area, and re-prioritize, or get some more resources, wouldn't that have been an appropriate step to take?

MR. MOORE:

A. That would have been a step to take if - like

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I say, if we had all that detail as we're working through the year because the level of reporting, like I indicated, in 2014 is far more detailed than what we had in place prior to 2014, but I will say that the priorities that the other crews were working on in that year for the recovery program was just as high a priority as what would have been on the Whitbourne crews plate for that year. So their attention was completing the recovery program in their shop for that year, and the opportunity to move those crews away from the priorities that they were focused on to focus on what the Whitbourne crew had on their plate that we needed to defer into 2014, that opportunity wasn't there, and it wasn't until we put forward our plan in 2014 and 2015 to the Board to look for additional cost and resources to fully execute that plan, that was our opportunity to achieve our objective by the end of 2015. The opportunity to take crews from other areas away from priority work to work on priority work, just didn't exist at that time.

MR. O'BRIEN:

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Q. I'm just not getting a sense that you actually asked to see what work was more prioritized?
MR. MOORE:
A. I would have understood and consulted with my managers at that time to know what was on each person's plate, and what wasn't getting done throughout the year, and fully understood what each crew was working on and what the priorities were, and known that the opportunity just wasn't there to move a crew off one piece of work to another piece of work of equal priority, basically.
MR. O'BRIEN:
Q. So when you say you would have, did you actually do that?
MR. MOORE:
A. Yes, I would have talked to my managers on a regular basis with monthly reporting, as we talked about earlier, that obviously doesn't have the rigor of our weekly reporting that we have in place now, but there would have been monthly reports provided to me from each of the regional managers of where we were with our PMs and the opportunity to take existing resources in another area off a piece of

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priority work in that area to move to another area didn't exist at that time. It wasn't until moving into 2014 that we could get to a point of seeking additional resources to get caught up on our six year program by the end of 2015.
MR. HENDERSON:
A. I just would like to add a couple of comments, Mr. O'Brien. Part way through 2013, I'll say I was asking the questions as to whether we're going to get the PM work done, and I was being reassured that we're going to get it done. One of the things that came about was the volume of work that was involved with the Hardwoods generator turned out to be a lot more than what was anticipated at that point. So in the fall of 2013, there was an impact on the maintenance in the fall because before we went into the fall, the questions I was asking as to are we going to get the maintenance required done this year, and I was assured we were, but then as the Hardwoods piece came through, it was after that that it became aware to me that a lot of work had been shifted in order to accommodate the work that

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needed to be done at Hardwoods to ensure that unit was getting completed and ready for that winter. It was in the fall where things shifted. I just wanted to indicate part of the element here is the volume of work was underestimated in terms of the amount that the Whitbourne crew, so there was a point that it would have been, you know, I'll say, close to impossible at that point with the other work that was already scheduled and the priority put on that to shift the crews over, but that part of it, I'll say, I'm saying that just as a likely scenario because it wasn't directly said to me because what I was told going into the fall is that we're on track to get the maintenance done for this winter, and the Hardwoods gas turbine and the volume of work in that was a major impact that fall.
MR. O'BRIEN:
Q. And who would you have been speaking with, Mr. Henderson?
MR. HENDERSON:
A. I would have spoken to Darren, but I also was talking to the people who were directly involved with the work execution, manager for

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that area. I spoke to him because we were at that time contemplating how we're going to get the Hardwoods work done, and my discussion with him was very direct, are we going to have this maintenance done before the end of the year, the maintenance that's required, and I was assured at that point that we were, but it was through that fall and the evolution of the work with the gas turbine that things changed. So it was at that point where we had a dramatic shift, at least in my mind, in terms of what we were going to get done that year.
MR. O'BRIEN:
Q. And you were following up on a monthly basis from the fall?
MR. HENDERSON:
A. I was following up on the - I wasn't getting into the detail of the maintenance program, that was left to the managers to be managing. I was in particular focusing on the Hardwoods work because the Hardwoods work was very critical coming into the winter, so that's where my attention was more. When I was assured that the PM work was being done, I didn't feel the necessity to keep following

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that. I was very interested in how well the work was going on at Hardwoods, knowing that that was a critical piece coming into the winter.

MR. O'BRIEN:

Q. So your -

MR. HENDERSON:

A. And I'll say also in parallel with that, we had initiated the discussion to have AMEC brought in to do a complete assessment of how we were positioned for the coming winter, so we had brought AMEC in and they started that work in the fall to review the - what we wanted them to do was look at all of the assets, as Darren has said, from Bay d'Espoir into the Avalon Peninsula because that was our critical area of concern, and have them have a look to be able to provide some assurance to the management that we are good for coming into the winter of 2013/2014, knowing the volume of work and the things that had happened during that year, and so we initiated that report. So they were the activities that we undertook to get ourselves to that level of comfort, that we were in a good shape, a

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reasonable shape going into the winter of 2014.

MR. O'BRIEN:

Q. And you say you spoke with Mr. Moore. You would have spoken with Mr. Moore in the fall and been assured that preventative maintenance was going to be completed?

MR. HENDERSON:

A. The conversation that I had in that regard was not with Mr. Moore. It was with one of the people that reports to Mr. Moore, who is actually the person who manages the crews.

MR. O'BRIEN:

Q. And so, Mr. Moore, would you have been or were you aware that, or was it your understanding that in the fall things were still on track to be finished by the end of the year?

MR. MOORE:

A. That's correct. All throughout the year, as always, I would have been getting monthly updates from my direct reports, my regional managers, as to how we were progressing with our preventative maintenance program and before Hardwoods really became on our plate in the fall, like Rob mentioned, we were looking

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like we were going to complete our preventative maintenance activities in the portion of our six year recovery plan in 2013 by the Whitbourne crew, but it was the Hardwoods unit that really took that crew off plan that fall, and was well into the fall when we realized that - you know, I was asking questions and I was getting regular updates from my managers that we realized that we were not going to be able to complete our preventative maintenance activities for the Whitbourne crew that year that we had in our plan, and there was no opportunity - because I have regular reporting, regular discussions with the regional managers in other areas. They were fully engaged in completing what was on their annual work plan that year, which was also of high priority for our customers in other areas.

MR. O'BRIEN:

Q. Let me ask you about the transformer, the Sunnyside transformer. Ms. Greene asked you a few questions about - just in terms of the issue that arose, I guess, around September about the gas leaking, I guess, from the tap

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changer area. That's what you're assuming was the cause, the acetylene gas that was found, or the increase in acetylene gas. That particular transformer, had it undergone preventative maintenance in that year, would there have been an opportunity to determine the cause of that increase in parts per million of the gas?

MR. MOORE:

A. On our six year preventative maintenance item that we would have done in September, 2013, we would not have done any kind of intrusive maintenance where we would have taken the cover off the transformer and drained the oil down and gone into do an inspection to see if there was any leakage actually happening between the tap changer compartment and the transformer compartment. What we have been doing, the action we took with respect to the acetylene gas, we consulted with the manufacturer on that transformer and others of a similar design, and their opinion that they provided to us and they were very confident that it was gas that was migrating from the tap changer compartment to the transformer

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compartment, and we've been monitoring that level well back into the 1990s and it's been very stable within a consistent band along that time. So that's the action we took, we've been doing continuous monitoring, we consulted with the manufacturer, and then in 2015 we had the opportunity to go in in a planned fashion and do an inspection of a similar transformer, same design, same vintage, to validate the opinion of the manufacturer and just validate that that is actually happening.

MR. O'BRIEN:

Q. And that's the Stony Brook one you were talking about, is that correct?

MR. MOORE:

A. Yes, that's correct, yes.

MR. O'BRIEN:

Q. I wonder can you tell me whether or not it's possible that these findings could have been related to a bushing defect?

MR. MOORE:

A. No. We consulted with the manufacturer who came in and assisted with a failure analysis on that transformer, and the most probable

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cause of the failure of that transformer was a bushing failure, but the bushing failure would not have been the cause of the levels of acetylene gas that we have been seeing back to the 1990s.

MR. O'BRIEN:

Q. Let me ask you, could you have - that particular transformer, how old was it?

MR. MOORE:

A. The age of that transformer?

MR. O'BRIEN:

Q. Yeah.

MR. MOORE:

A. That one was 40 plus years old at that time.

(12:30 p.m.)

MR. O'BRIEN:

Q. Yeah, 40 plus, okay. Would it have been possible to - I understand what you did with it was to move up testing, is that right, to do further testing of the levels of gas at that point?

MR. MOORE:

A. We would have done follow up testing on the gas levels and oil sampling in that transformer in early 2014 had it not failed.

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MR. O'BRIEN:

Q. And do you normally do an annual one, how does that go?

MR. MOORE:

A. Yeah, we take an annual oil sample for transformers that are free breathing, as we call it, there is an exposure to the atmosphere in part of the transformer, anything that's sealed, we do it every three years, and those tactics are outlined in PUB-NLH-174.

MR. O'BRIEN:

Q. Yes, and I just want to clarify in terms of what steps you would have taken is to do another test on the gas, but not an annual one, to do one in early 2014, was that your plan?

MR. MOORE:

A. We would have, yes.

MR. O'BRIEN:

Q. Is it possible to have isolated that unit and done some testing, just follow up testing just to make sure there's no issues with it?

MR. MOORE:

A. The follow up testing that we would have had

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to do, I guess, to go in and do that test, an internal inspection on that transformer, would have required a significant amount of time and person hours of labour to get that work done, and for other reasons that we just talked about with respect to Hardwoods, that opportunity didn't exist in 2013, but our plan was to do the six year preventative maintenance check on that transformer would have been in our 2014 annual work plan.

MR. O'BRIEN:

Q. But the testing of that - I mean, if you were going to follow up in early 2014, you could have done testing, say, in November or December and isolated the unit and done a follow up test earlier, could you?

MR. MOORE:

A. It wasn't until 2014 that we would have had the opportunity to have the resources to be able to do that.

MR. O'BRIEN:

Q. Okay. When you consider deferring maintenance to another year in terms of the risk analysis, is there a specific analysis of impact to the customer that you undertake?

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MR. MOORE:
A. That would be a large part of the discussion that the people who are making that decision would have as to the criticality of that asset in the power system and its effect that it may have on customers for reliability with respect to, you know, which assets can be re-prioritized to a later year because of break in work.
MR. O'BRIEN:
Q. Right, and how do you value that?
MR. MOORE:
A. That certainly would be a big part of the discussion, yes.
MR. O'BRIEN:
Q. And how do you value that? Is that just a reliability thing, is there any focused discussion over how this is going to impact customers in one area over another, how is it dealt with?
MR. MOORE:
A. It would be a discussion as to where that asset sits in the power system and what impact it could have on customers if there was a failure. You know, we would look at things as

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is there a redundant transformer. In the case of Sunnyside T1, there was a redundant transformer, T4, that could fully supply all customers if T1 was out of service. Those type of things would enter into the discussion. On the distribution feeder, for example, is it just a radial feeder or is there a second feed to customers, and what are the number of customers, and is it a remote area where crews would have difficulty to access, and there's a large amount of discussions that is highly customer focused when we look at execution of our program and when higher priority work affects our plan and we need to re-prioritize, customer focus is very much highly on the radar in the discussion.
MR. O'BRIEN:
Q. And when you decide to defer a maintenance into another year, there's no set date on when that maintenance is going to be done, is it? It just comes out of that computer in terms of which one has priority in time line, and then you restart the prioritizing process in the beginning of the year, don't you?

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MR. MOORE:
A. I'll say that it is tracked in the computerized maintenance management system, but people that are accountable for the maintenance set the dates in the system.
MR. O'BRIEN:
Q. Right.
MR. LEDREW:
A. It would be by month.
MR. MOORE:
A. Yes, oh, yes.
MR. LEDREW:
A. If there was PM scheduled for 2014, it would flag the month it's expected to be executed.
MR. O'BRIEN:
Q. But based on other criteria that you talked about in terms of criticality and that kind of stuff, attachments to generators, all that kind of stuff, it could be moved out of that as well, is that right?
MR. LEDREW:
A. Oh, yeah.
MR. MOORE:
A. That's correct, yes.
MR. O'BRIEN:

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Q. So now it's gone outside of the year it was supposed to be done into a new year?
MR. MOORE:
A. That's right.
MR. O'BRIEN:
Q. And could be moved again?
MR. MOORE:
A. That's right, but very knowledgeable people make those decisions and it's just tracked in a computerized maintenance management system.
MR. LEDREW:
A. I would, though, first outside the month, so if it's scheduled to be done in June and it's coming up on its six year in June, it would still be intended to be executed in that year, but we may not get June because of coordination of outages and other activities. It would a later iteration to move it out of the year, I would suggest.
MR. O'BRIEN:
Q. Or you could have corrective work that comes up or capital work that comes up.
MR. MOORE:
A. Right.
MR. O'BRIEN:

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Q. And it could move anywhere at that point, it could move into the next year. How do you value customer impact when you're deciding to move, knowing that you don't have a set date for the next year when you're going to do that corrective maintenance?

MR. MOORE:

A. We would look at, like I just explained, how that asset is in the power system, for lack of a better way to put it, and the effect that a failure of that asset, or if that asset wasn't available for service, what impact that would have on customers, so that would be a big part of the discussion when we look at re-prioritizing how an asset would be changed or deferred for preventative maintenance.

MR. O'BRIEN:

Q. And knowing -

MR. MOORE:

A. So it's very much a strong consideration and very much part of the discussion.

MR. O'BRIEN:

Q. But knowing that - let's suppose it's already been moved from one year to another, is that taken into consideration as well?

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MR. MOORE:

A. Yes, we would definitely consider what impact that may have on customers when we're making those decisions, and to minimize the risk of outages to customers would be a big part of the decision making process.

MR. O'BRIEN:

Q. The B1L03 air blast circuit breaker, I have asked earlier just in terms of sort of how critical these breakers are, and I believe you indicated still that these breakers that are near a generating station are more critical than other breakers on the line?

MR. MOORE:

A. That's right.

MR. O'BRIEN:

Q. I'm going to ask if we can pull up PR-PUB-NLH 168, and those are the air blast circuit breakers, to just get an idea if we can go through those as well the same way we did with the transformers. I have them broken down myself just in terms of what was done in 2013.

MR. MOORE:

A. Okay.

MR. O'BRIEN:

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Q. And maybe I can point them to you. If we go down to BDE TS1 is the location, Bay d'Espoir TS1, and that's the B2T4.

MR. MOORE:

A. Right.

MR. O'BRIEN:

Q. So that one was done - again that's done two years after it was last done. Would that have had any priority or again are we just talking the fact that this is in Bay d'Espoir versus Whitbourne?

MR. MOORE:

A. No, that breaker actually misoperated in 2013, which is documented in one of our RFIs.

MR. O'BRIEN:

Q. All right.

MR. MOORE:

A. And that was actually - we did the full preventative maintenance check because the breaker misoperated, but that would have been actually break in work that year because of the misoperation of the breaker.

MR. O'BRIEN:

Q. In the Whitbourne area, what would the Whitbourne area cover in terms of the breakers

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that we're looking at here?

MR. MOORE:

A. If we wanted to look at the breakers that fall under the Whitbourne area -

MR. O'BRIEN:

Q. Yeah.

MR. MOORE:

A. It would be - if we want to move down through the list.

MR. O'BRIEN:

Q. Sure.

MR. MOORE:

A. Holyrood would be the first station.

MR. O'BRIEN:

Q. The Holyrood ones, yeah.

MR. MOORE:

A. HRD.

MR. O'BRIEN:

Q. Yeah.

MR. MOORE:

A. And then further down the list would be Hardwoods, HWD.

MR. O'BRIEN:

Q. Right.

MR. MOORE:

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A. And Oxen Pond, OPD.
MR. O'BRIEN:
Q. Right.
MR. MOORE:
A. Sunnyside, SSD. That would be it on that page for Whitbourne. Go to the next page, the next page would be Western Avalon, WAV, and further up should have been Come by Chance, CBC, further up the list.
MR. O'BRIEN:
Q. Okay, those are all the ones covered there.
MR. MOORE:
A. It's not on that list for some reason.
MR. O'BRIEN:
Q. They don't get coverage, do they?
MR. MOORE:
A. No, I just can't explain right now why it's not on that particular list there.
MR. O'BRIEN:
Q. Okay, but those are the ones there -
MR. MOORE:
A. They're not air blast circuit breakers, I expect, is probably the reason.
MR. LEDREW:
A. There's only one breaker.

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MR. MOORE:
A. Right, and that's what it would be.
MR. O'BRIEN:
Q. So when I look at the list myself, the ones that were done in 2013, I broke them out, there was four done in Hardwoods - actually, five done in Hardwoods. Does that make sense given the work that was done in Hardwoods? Would you have done a lot of circuit breakers?
MR. MOORE:
A. It does, yes, because there was a major project happening that year with the generating station or the Hardwoods gas turbine.
MR. O'BRIEN:
Q. All right.
MR. MOORE:
A. So it would make sense that we would focus on the air blast circuit breakers there as well.
MR. O'BRIEN:
Q. Okay, and there's a bunch in Bay d'Espoir. Other than that, there doesn't seem to be any breakers - there's one done at Holyrood, sorry, that's the only other one. So there seems to be six in total that were done that

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year.
MR. MOORE:
A. Right.
MR. O'BRIEN:
Q. By the Whitbourne crew, based on what you're saying?
MR. MOORE:
A. Right.
MR. O'BRIEN:
Q. And again in terms of extra resources, that wasn't on your radar until later on that year?
MR. MOORE:
A. Yeah, because of what we talked about with respect to the Hardwoods gas turbine, it was - I was receiving regular communication and having regular conversations and updates with the regional managers, but it wasn't until late into 2013 when we realized we needed to put forward a plan and implement a plan into 2014 and 2015 to get where we need to be with our preventative maintenance program on these assets.
MR. O'BRIEN:
Q. And let me ask you about that. The 2013, there had been - you mentioned that the 2013,

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late 2013, there was an idea that we need to move forward with another plan to get more resources, I guess, to do this, and that was built into the amended GRA?
MR. MOORE:
A. That's right.
MR. O'BRIEN:
Q. Which was filed in November, 2014. That wasn't a driving force for the amended GRA, I take it?
MR. MOORE:
A. No.
MR. O'BRIEN:
Q. That was just -
MR. MOORE:
A. But it was part of the amended GRA.
MR. O'BRIEN:
Q. I see it as part of it, but it certainly wasn't a driving force?
MR. MOORE:
A. No, it wasn't the only reason that we put forward an amended GRA, but it was part of the application.
MR. O'BRIEN:
Q. Yeah, but you're saying at that point in late

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2013, you saw that as a need. Did you consider making any separate application at that time?

MR. MOORE:

A. Not at that time because it was late into 2013 when we saw that need, and going into late 2013 and then into 2014 when we experienced the issues that we did experience, I'll say, with the power system, no, the ability to put together an application for additional budget and additional resources at that time was - everybody's attention was focused on the immediate needs of the power system and customers at that time.

MR. O'BRIEN:

Q. And, I guess, my thought process is that you've indicated that reliability is at the forefront of preventative maintenance?

MR. MOORE:

A. Right.

MR. O'BRIEN:

Q. And I'm wondering why you'd wait to go through this process and why not just make an immediate application to say, look, we're not getting this preventative maintenance done, we

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need to get it done now, and put it in front of the Board as a separate application?

MR. MOORE:

A. I'll say that our opportunity to fully develop that application to the Board and put forward a strong case was well into 2014, and in particular, after we went through the outages of 2014, but through 2014, we did make efforts to bring in additional resources to begin completion of that recovery program in 2014. We did proceed to work on the recovery programs for those PMs, realizing that they were a foundational tool for customer reliability. So we did proceed to work towards achieving that objective in 2014, but the application to the Public Utilities Board to include that in 2014/2015 test year became part of the application that was submitted in 2014.

MR. O'BRIEN:

Q. So you decided to proceed anyway, because I do see in 2014, you got a lot of breakers done, there was, I think, over half of the breakers were done in 2014.

MR. MOORE:

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A. Yeah, because -

MR. O'BRIEN:

Q. So it seems to have been a concerted effort at that point in time?

MR. MOORE:

A. It was, and I'll say that the dollar amount that's required to get that work done was submitted to the Board on June 2nd in 2014, and I'll say it became part of the test year for 2014/2015, but the actual report to the Public Utilities Board -

MR. O'BRIEN:

Q. Was in June.

MR. MOORE:

A. Was a very considered plan to do the 2014/2015 catch up program was June 2nd, and after that report went to the Board would have been when we entered into our maintenance season and made that very concerted effort to achieve our preventative maintenance, recognizing that that is our tool to ensure customer reliability.

MR. O'BRIEN:

Q. And your remedy, I guess, in terms of some of the issues you had with deferral of

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preventative maintenance system moved to this one week reporting system and to have that in writing and to flow through right up to the CEO, is that right?

MR. MOORE:

A. I'll say, yeah, that was the main tool that was put in place in 2014 and onward to ensure that we were very focused on completing our annual work plan and very considered recovery plans were in place to ensure that we struck to the plan and that the reporting and visibility was at all levels within the organization.

(12:45 a.m.)

MR. O'BRIEN:

Q. In Liberty's reply evidence, they appear to take the position that there's no evidence of any form of structured or significant analysis of the risks of deferring maintenance. Do you take issue with that?

MR. MOORE:

A. I'll say that there was very strong discussion and analysis completed, but to the point where it's actually documented on a form that could be submitted for review, that wasn't taking

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place, but there was very strong consideration and decision making made at the time.

MR. O'BRIEN:

Q. So in terms of -

MR. MOORE:

A. By very knowledgeable people who knew the condition and health of the assets.

MR. O'BRIEN:

Q. So in terms of evidence of that, it's on the basis of your testimony as to what you understood was going on?

MR. MOORE:

A. That's correct.

MR. O'BRIEN:

Q. Okay. Let me ask you about the Western Avalon terminal station, and that was the B1L37 that tripped after trying to energize, is that right? What was the issue with that again?

MR. MOORE:

A. The breaker, B1L37, what we determined through our root cause failure analysis is that on three occasions when that breaker was closed and tripped again, that it wasn't closing on one phase. So it was only energizing on two phases.

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MR. O'BRIEN:

Q. Right, and you end up having to replace a tap changer and clean transformer windings, is that what was required?

MR. MOORE:

A. That's correct, we ended up having to replace the tap changer and do a complete oil cleansing, shall we say, of that transformer before it went back in service.

MR. O'BRIEN:

Q. And as Ms. Greene had asked you earlier today, that one was two and a half years outside of its six year cycle, is that right?

MR. MOORE:

A. That's right, the air blast circuit breaker was two and a half years outside that cycle.

MR. O'BRIEN:

Q. And can you give us any reason why it would have gone that long outside of its cycle?

MR. MOORE:

A. Looking back in time now and thinking about how we developed the annual work plan, and how we would have looked at the most overdue that would have been in the plan as a priority going into that year, and that breaker itself

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would have been, based on that criteria - we indicated earlier that it looks like it may have been in the 2013 annual work plan, but for sure definitely it would have been in the 2014 annual work plan based on that criteria of being the most overdue in looking at our generating facilities. I'm thinking that that breaker as well, I would need to validate this, may have been more difficult, for lack of a better word, to schedule an outage because of the configuration of the power system, but we definitely had it planned for 2014 to get that maintenance done on that breaker.

MR. O'BRIEN:

Q. I guess, in terms of a response, I'm more looking for as much detail if you can give me because this has been subject to a couple of investigations and I'm wondering how far you've gotten into this and investigating it to determine what exactly the reason was for this going that far beyond its - I know you're indicating, well, that might have been it, that would have been it -

MR. MOORE:

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A. No, I - I know what you're saying, yes.

MR. O'BRIEN:

Q. But what is the - what's the reason that it went two and a half years?

MR. MOORE:

A. The reason is we would have been in our, as we indicated, our six year recovery plan, and we prioritized our most overdue maintenance going into a year for each crew to focus on for the annual work plan, and based on that criteria, that breaker was on the list, I think, for 2014 in the annual work plan, and also, like, when that breaker didn't operate as it should have back in 2014 or the winter of 2014, we have since done a full maintenance inspection and an overhaul on that breaker, and never did find any conclusive evidence as to why that breaker didn't operate on that day. So there would have been a number of other inspections, as I indicated, like, an annual visual inspection in terminal stations and that breaker would have been operated successfully in the past, but that day it didn't operate. We didn't find any conclusive reason to determine why it didn't operate through out

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successful preventative maintenance checks and the overhaul of that breaker. So in developing the annual work plan, that breaker would have been scheduled in 2014 based on the criteria that we had talked about.

MR. O'BRIEN:

Q. So it should have been done in July of 2011, is that right?

MR. MOORE:

A. If we look at the six year cycle, that's right.

MR. O'BRIEN:

Q. And it wasn't scheduled for 2012, is that right?

MR. MOORE:

A. That's correct.

MR. O'BRIEN:

Q. And who would have been responsible for doing that? That would have been the Whitbourne crew, would it?

MR. MOORE:

A. Yes.

MR. O'BRIEN:

Q. What we've got up here, the 168, look at WAV TS B1L08.

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MR. MOORE:

A. Okay.

MR. O'BRIEN:

Q. There's a two year period in between when that one was done. It's done in 2012.

MR. MOORE:

A. Yeah, I would have to -

MR. O'BRIEN:

Q. Any priority associated with that one over this one?

MR. HENDERSON:

A. I can guess why that one was done. That was the year that we brought into service the Vale terminal station and that breaker supplies the line down to Vale.

MR. O'BRIEN:

Q. Okay.

MR. HENDERSON:

A. So I think in terms of - there would have been a fair bit of work done on that line that year, which would have included a PM because there would have been protection changes and everything else associated with bringing into service that station that year.

MR. O'BRIEN:

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Q. Okay. There were a couple done in Sunnyside that year, if you go to B3T4 in 2012.

MR. MOORE:

A. That's right, that one would have been - if you look at that, that was overdue as well, so that was done in 2012 as part of the recovery program.

MR. O'BRIEN:

Q. So was there anything holding back the Whitbourne crew from doing its preventative maintenance in 2012?

MR. MOORE:

A. In 2012, we have documented some of the break in work that occurred that year, and one of them Mr. Henderson just mentioned, we were putting the new terminal station in place in Vale for Long Harbour for the nickel processing plant, and that work of putting that station in service and commissioning did take longer than anticipated - than the original plan anticipated, so that did take our Whitbourne crew away from some of the preventative maintenance that we had scheduled that year.

MR. O'BRIEN:

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Q. Did you meet your preventative maintenance criteria for that year, the numbers you were supposed to meet?

MR. MOORE:

A. The overall level that we completed in 2012 didn't meet the 90 percent that we had planned that year overall for TRO.

MR. O'BRIEN:

Q. And so 90 percent, that's 90 percent of 1/6th, is that right?

MR. MOORE:

A. It's 90 percent of what's planned for that year. It was the corporate target -

MR. O'BRIEN:

Q. Or was it 90 percent of -

MR. MOORE:

A. At that time.

MR. O'BRIEN:

Q. So it's 1/6th plus the extra that you were going to do to catch up?

MR. MOORE:

A. That's right, which we have since changed to 100 percent as our target.

MR. O'BRIEN:

Q. The Holyrood B1L17 breaker is a different type

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of breaker, was it?
MR. MOORE:
A. That's correct, a different type of breaker than -
MR. O'BRIEN:
Q. Than the ones that we've been talking about already at Sunnyside?
MR. MOORE:
A. They're all air blast circuit breakers, but the B1L17 breaker in Holyrood is a different design than the Sunnyside B1L03 breaker.
MR. O'BRIEN:
Q. I have a couple of questions about that one. There's no issue obviously with that one in terms of the six year plan or deferral of maintenance on that one, I don't believe, and there was a question raised by Liberty Consulting Group about the maintenance procedure with this particular breaker about the temporary covers to remain in place and exposed to the weather. I wonder if we could bring up PUB-NLH-067. I just want to get some clarification there.
MR. MOORE:
A. Okay.

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MR. O'BRIEN:
Q. And if we move to the next page of 067 - maybe it's 066, is it?
MS. GRAY:
Q. O66?
MR. O'BRIEN:
Q. Yeah, okay, the second page there, I guess. So in that table there, it appears that the delay in reinstalling the columns interpreting the heads--the interrupting heads, sorry, that there was a delay between performing the work, February 27th to 28th and then transporting them to the site, was the work completed, the coating completed the 27th to the 28th? I'm just trying to get a sense of why it took so long for it to be then transported to be reinstalled. It seems to be a few weeks there.
MR. MOORE:
A. Yeah, the actual RTV coating occurred in the Whitbourne shop on the 27th and 28th of February, as indicated in the table and they were brought back to the Holyrood switch yard on the 18thof March. If you scroll down to the bullets, I guess that are down further in

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the RFI, they're the pieces of work that that crew were required to complete while the parts that were being re-insulated in the shop remained in the shop before they had the opportunity to bring those parts back to the switch yard to reinstall on the breaker.
MR. O'BRIEN:
Q. And I guess that's what I was trying to get clarification on, that work, those bullets there, that all was completed between February 28th and March 18th, was it?
MR. MOORE:
A. That's correct, yes.
MR. O'BRIEN:
Q. And on February 28th, the way I read the table, I just want to make sure I didn't read it wrong, the work in the shop had been completed, had it?
MR. MOORE:
A. The parts were recoated in the shop on February 27th and 28th, yes.
MR. O'BRIEN:
Q. And was there any further work necessary in the shop at that point?
MR. MOORE:

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A. No.
MR. O'BRIEN:
Q. Is there any reason another crew couldn't have taken, if the Whitbourne crew was tied up, taken on that role and picked them up and reinstalled them?
MR. MOORE:
A. It's possible if there was another crew available, but all other crews were focussed on other priority work in their particular areas.
MR. O'BRIEN:
Q. And you know that or was there an inquiry made or -
MR. MOORE:
A. Yes, I would have known that at the time, I would have been well aware of and getting regular verbal updates on progress of our work plan knowing that the parts were in the shop and I would have been well aware of, through, you know, discussions and reporting from other regional managers as to the focus of the work by other crews on other priority work in their areas for our customers. So the ability to take -

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MR. O'BRIEN:
Q. You would have been kept in the loop on this particular issue, would you?
MR. MOORE:
A. - a crew off one job and move to another job, sometimes you have to evaluate the priority that that crew was working on at the time, right?
MR. O'BRIEN:
Q. I understand that, yeah, I understand that. I guess my question is would you have had particular knowledge of this issue as it was occurring or is it something that the managers in that area would have been dealing with and then later let you know, "here's what I did"?
MR. MOORE:
A. In all likelihood, I'm going back by memory now, but I would have been aware of that job and what was happening and would have been getting verbal updates from my managers, but the managers who are accountable for the execution of that work in that area, would have been fully in tune with that job basically on a daily basis because they are accountable to execute that work and would

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have been fully aware that the crews installed a suitable waterproof cover over the breaker while those parts were removed to protect it from the weather elements and would have been certainly involved in the decisionmaking that would have taken that crew away from bringing those parts back to the Holyrood switch yard to deal with these higher priority items, so the accountability to make those decisions on a daily basis certainly would be with the, I'll say the work execution manager for that area and I would get regular updating, but to say I'd get daily updating as the work progressed, we'd leave that to the accountability of the manager who is doing that work, right?
MR. O'BRIEN:
Q. I assume that to be the case, yeah. I assumed that to be the case. I guess my question is more than, for that particular manager, would that manager have known that this is something we don't want to have go too long?
MR. MOORE:
A. That would have been their focus that they wouldn't have wanted to leave -

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MR. O'BRIEN:
Q. Temporary covers there -
MR. MOORE:
A. That dismantling with suitable covers, I'll say, in the yard any longer than need be, but realizing that things can and did happen that took the crew to higher priority work while that was in place and they would have made a decision at the time that what was in place in the yard to secure those assets while we were doing the RTV coating was certainly a very good practice to ensure that those assets were protected from the elements.
MR. O'BRIEN:
Q. Is there a standard that's required to be followed for, in that scenario in terms of the coating or the coverings, sorry.
MR. MOORE:
A. Yeah, we would have, we supplied a copy of the work method, I think, one of the RFIs that talks about, you know, that a suitable cover needs to be in place but we don't actually have a standard that, a specification for the cover shall we say, because any time you dismantle a breaker, depending upon the amount

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of dismantling -
MR. O'BRIEN:
Q. Different type of cover, yeah.
MR. MOORE:
A. You know, the asset could be in different configurations, so what we do is we rely on our very experienced terminal station journeyperson employees and their supervisor in consultation with their manager to ensure that a suitable weather-tight cover would be in place and well secured to protect against any of the elements that we could see in a switch yard in Newfoundland and Labrador.
MR. O'BRIEN:
Q. And it wasn't clear in your response to Ms. Greene as to whether or not Hydro was satisfied that the delay here resulted in a problem or that this problem was really as a result of freezing that would have happened anyway.
MR. MOORE:
A. No, the only thing that we can say with one hundred percent certainty is that there was moisture at some point or another that got into that air blast circuit breaker. We know

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that the breaker was dismantled. We know that there was a weather-proof cover put in place. We know that it was in place a little longer maybe than we would have had hoped because of higher priority work, but we had no reason to believe that that resulted in moisture getting into the breaker, there's nothing conclusive at all. The only thing that we're a hundred percent sure on is that moisture at some point in time got into that breaker.

MR. O'BRIEN:

Q. Yeah, we know moisture got in, yeah.

(1:00 p.m.)

MR. MOORE:

A. Yeah, that's the only thing that we can say with any certainty.

MR. O'BRIEN:

Q. And you're not prepared to accept that it's more likely than not the moisture got in during the period when there was a temporary cover on?

MR. MOORE:

A. No, we had no reason to believe that with any certainty at all.

MR. O'BRIEN:

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Q. I wonder if I could ask you, just in terms of the 1.2 million dollars to be amortized over five years and that relates, I guess Mr. Henderson, in terms of recovery for this plan, stepping up the plan to get back in line. Now is that to get in line with a four-year plan or get back in line with your six-year plan?

MR. HENDERSON:

A. Well that is to get in line with the long term plan and I guess just to go into the four-year plan for a moment, the cost--well first of all, let me say the cost was to get everything back in line for the end of 2015 at which point we would begin the four-year cycle, but we were also doing the breaker replacements and the review of the breaker replacements that we're doing, will, in effect, have very few that are going to be done in a four-year cycle because we'll have all of the breakers replaced before any of them sort of fall into a four-year cycle.

MR. O'BRIEN:

Q. Yes.

MR. HENDERSON:

A. So it's going to be very few maintained at a

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four-year cycle because they'll be replaced before it comes up.

MR. O'BRIEN:

Q. And they won't need to be maintained in the four-year cycle?

MR. HENDERSON:

A. So the new breakers are a different design type and they would fall into the six-year cycle.

MR. O'BRIEN:

Q. Six-year plan, okay. So I take it that Hydro certainly doesn't take issue with the fact that this work needs to be done, needs to be stepped up and be brought in line with your six-year plan anyway, that that was a requirement.

MR. HENDERSON:

A. Absolutely, yes.

MR. O'BRIEN:

Q. Now, is Hydro seeking this as a, what I would call an extraordinary cost?

MR. HENDERSON:

A. When, in putting forward that cost and we asked for it to be amortized over that period of time, it was because we did not see this as

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a requirement that would be required every year, so it's extraordinary over this period of time -

MR. O'BRIEN:

Q. In that fashion, yes.

MR. HENDERSON:

A. - so in consideration of establishing rates based on 2015 costs, this would be an element that we would say is not indicative -

MR. O'BRIEN:

Q. It's a one-time thing.

MR. HENDERSON:

A. - that it would be carried forward in the future, so our proposal is -

MR. O'BRIEN:

Q. To amortize it then.

MR. HENDERSON:

A. - let's amortize it over a period of time to take care of that cost.

MR. O'BRIEN:

Q. When Hydro was last in for a GRA in 2007, your last GRA, would you have built into your revenue requirement the idea that you were going to be doing the operating costs associated with and whatever other costs

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associated with doing maintenance on a six-year plan?

MR. HENDERSON:

A. It would have been based on whatever was our standard plan at that time, so my understanding is we were doing this particular equipment on a six-year cycle at that time, so it would have carried forward a--that assumption would have been carried forward. The only thing over that period of time, there was a review, as Darren mentioned, of the maintenance tactics and the period between and it confirmed a six-year cycle, but what I would say to you, I'm not sure if there could have been changes made in the actual PM tactics that may result in them being done in a different manner or for longer periods of time. I just would, you know, we're only talking about the six-year cycle and I just--I don't know, but just that there could be other things that we're doing that could be changing costs with respect to maintaining breakers and transformers.

MR. O'BRIEN:

Q. But I guess my question is back in 2007 there

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was a six-year cycle for breakers and transformers, is that right?

MR. HENDERSON:

A. That's right.

MR. O'BRIEN:

Q. And so I presume in terms of when you presented your rate case, you would have built in the cost of doing those on a six-year basis, would you not?

MR. HENDERSON:

A. We would have, my only thing is I can't say for sure the tactics that were done on a six-year cycle back in 2007 were the exact same tactics that we came up when we did a review in 2009. Where I'm going with that is that the cost of the tactic could be higher if it had changed or it could be different.

MR. O'BRIEN:

Q. Okay, and I guess my concern is is that it appears if it was built in over a six-year period and Hydro hasn't performed in accordance with that six-year cycle, what would the regulatory principle be for Hydro to recover the cost now of catching up in another test year?

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MR. HENDERSON:

A. The principle is that this is work that's required to be done. It's as a result of a reprioritization of work and getting work done, so it was work that has to be done and from our view, is that's the cost of looking after the power system that is required during that test year and therefore, putting forward the full cost of what's required in that test year, this should be included, but again recognizing that it's not something that you would do every year because it was the culmination of that catch up that it would appropriate for it to be deferred.

MR. O'BRIEN:

Q. No, I understand that and I don't disagree that it's work that needs to be done and I get your point. I guess my question is wasn't it work that needed to be done in 2007 and wasn't it built into the rates in 2007 for Hydro to do this work?

MR. HENDERSON:

A. As I said, in 2007 there would have been a particular tactic on this that we were doing. That may have changed, which would change the

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amount of time it would take to do tactics. There's also, this is only one element of a complete program of terminal station maintenance, so there's a lot of things that would have changed and priorities would have been applied to all of that work, so in isolation, the six-year, yes, it's the same, but there are other things that come into play that may have changed over that period of time.

MR. O'BRIEN:

Q. And you're not able to tell me right now what types of things they would be?

MR. HENDERSON:

A. No, I don't have that kind of detail. I'm just saying theoretically that those things, those types of things have changed and we did do a review in 2009, I think that Darren mentioned and I would expect that things didn't remain exactly the same as they were in 2007 through to today.

MR. O'BRIEN:

Q. Okay, I'm going to move to another line of questioning. I want to talk about the 100 megawatt CT. I just want to talk a little bit

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about the purchase of the asset right now and I understood from Mr. Martin's testimony and I believe, Mr. Henderson, you had confirmed this, that you were the one to make the CT happen, but that Mr. MacIsaac was responsible for the bid package and for the construction and procurement, that sort of thing, is that correct?

MR. HENDERSON:

A. That's correct. The recommendation that came to me for the project and, of course, it got approved and so Mr. MacIsaac, as the vice-president for project execution, was responsible for completing that project.

MR. O'BRIEN:

Q. Okay, and Mr. Humphries, I understood from your testimony you would have been involved in terms of the details of what's required for the system, is that right?

MR. HUMPHRIES:

A. Yes, and actually preparing the application, we would have prepared.

MR. O'BRIEN:

Q. Okay, and I wanted to ask you a little bit about that, I'll get into that a bit later

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too, but your shop prepares the application for that, is that right?

MR. HUMPHRIES:

A. That's correct.

MR. O'BRIEN:

Q. And I think, Mr. Martin had indicated that you would be responsible for developing the recommendation as to what type of generation is required as well?

MR. HUMPHRIES:

A. Well we would evaluate alternatives in general, you know, combustion turbines, hydro electric alternatives, wind and do an analysis and come up with a preferred technology type, yes.

MR. O'BRIEN:

Q. And I'll ask you, I assume Mr. Martin would have had final approval on what's being purchased or was that left to you, Mr. Henderson?

MR. HENDERSON:

A. Mr. Martin was part of that.

MR. O'BRIEN:

Q. In terms of the time line, I understood that you made your application to the Board in

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April of 2014, does that sound about right, the formal application was filled out?

MR. HENDERSON:

A. Yes.

MR. O'BRIEN:

Q. And you received approval and we can bring up the Board, the subject to check May 7th, does that sound about right?

MR. HENDERSON:

A. That sounds about right, yes.

MR. O'BRIEN:

Q. Okay. Now when you made your initial application, you had already done a site assessment as to where you're going to put the CT, is that right?

MR. HENDERSON:

A. That's correct.

MR. O'BRIEN:

Q. Okay. In fact, that was done sometime prior?

MR. HENDERSON:

A. It had been done actually in 2012, I think we discussed yesterday.

MR. O'BRIEN:

Q. Yeah, and that's the assessment.

MR. HENDERSON:

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A. And that's part of the--the assessment that was done.

MR. O'BRIEN:

Q. And that was, you mentioned about a risk workshop and I went through some documents and noted that there was something run by WorleyParsons, is that right?

MR. HENDERSON:

A. That's correct.

MR. O'BRIEN:

Q. Okay, and that was in March of 2012, does that sound right?

MR. HENDERSON:

A. I'm not sure of the time, but it was during 2012 certainly.

MR. O'BRIEN:

Q. Okay, and Ms. Greene had taken you through some emails as well, one of which I think was from Mr. Haynes to you, Mr. Henderson, that really seemed to, around April of 2010 that you were focussed on Holyrood as the site, does that sound about right?

MR. HENDERSON:

A. That would be right.

MR. O'BRIEN:

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Q. Okay. Were you involved with that process, Mr. Humphries?
MR. HUMPHRIES:
A. Process for?
MR. O'BRIEN:
Q. Of the site assessment.
MR. HUMPHRIES:
A. Yes, I was for portions of it.
MR. O'BRIEN:
Q. Okay. And Mr. LeDrew, were you involved with that?
MR. LEDREW:
A. Yes, I was.
MR. O'BRIEN:
Q. Okay, and just take me through sort of how that site assessment took place? I mean, how long did it take, where did it take place, that kind of stuff, other details on it, the risk workshop, I guess and -
MR. LEDREW:
A. There was a day and a half session with a number of folks that was held at the Holyrood centre, plus there was some meetings at head office as well and it was lead on a template that WorleyParsons had that guided us through

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that process.
MR. O'BRIEN:
Q. And WorleyParsons was retained to assist you with this, is that right?
MR. LEDREW:
A. Yes, there was an individual working inside of PETS that had a lot of background in risk assessment and was an employee on contract with us and he was assigned to bring us through that process.
MR. O'BRIEN:
Q. Okay, and when were they retained? When did this whole process start?
MR. LEDREW:
A. Well that individual was on for other activities that PETS were executing, so--and was reassigned to lead this initiative to do the risk assessment.
MR. O'BRIEN:
Q. Okay, so if we're talking a day and a half, say, in March of 2012, would this have been contemplated earlier than that or did this just start in March in terms of now we're going to start looking at a site assessment? How did that come to pass?

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MR. HENDERSON:
A. I'm not sure what prompted the timing of it. I take it that's your question?
MR. O'BRIEN:
Q. That's my question, yes, I'm trying to -
MR. HENDERSON:
A. And I'm aware during that time there was considerable work being done on estimates for the new combustion turbine in preparation knowing that there would be a capital application being put to the Public Utilities Board for a combustion turbine, so I was aware that there was an engineering group assigned to do a thorough capital cost estimate for that and it would have been part of that process, but why in March I couldn't say, but it was after the January 2013 incident and we were looking at because of--I'm sorry, it wasn't, I'm confused -
MR. LEDREW:
A. Wrong year.
MR. HENDERSON:
A. Wrong year. yes, I was kind of thinking we had that--there was something that happened at the beginning of that year which was the black

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start, so it may have been part of that discussion as to have a look at it right then after that came up.
MR. HUMPHRIES:
A. I can add a little more.
MR. O'BRIEN:
Q. Sure, go ahead.
MR. HUMPHRIES:
A. And I think Mr. Henderson is right, it was at that time that the black start at Holyrood became an issue and we started to consider the option of putting a combustion turbine there to cover it off, and as well I think through the initial assessments for the combustion turbine, the whole question of the ability to be able to establish a second unit at Hardwoods for, because of the residential and environmental concerns was an issue, so the decision was made to do a complete assessment of both the Hardwoods Holyrood and alternate sites.
(1:15 p.m.)
MR. O'BRIEN:
Q. And I understood from your testimony yesterday, Mr. Henderson, that you had thought

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maybe it's a good idea to have a second site near the St. John's area but that didn't seem to go much further than that after the assessment, is that right, and everybody focussed on Holyrood?

MR. HENDERSON:

A. Yes, and once the assessment was done, I guess the risks and costs related to going to another site was abandoned and the Holyrood option was the area of focus.

MR. O'BRIEN:

Q. Right, and is it fair to say it didn't take very long in terms of timeframe for the assessment to be done and come to a conclusion Holyrood was the right answer here for this?

MR. HENDERSON:

A. Yes, I think that's correct.

MR. O'BRIEN:

Q. Yeah, it was a short period of time. And, Mr. Humphries, your recollection is that it might have been associated with the black start?

MR. HUMPHRIES:

A. I think that was a portion of it, yes.

MR. O'BRIEN:

Q. And how about you, Mr. LeDrew, do you have the

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same sort of recollection?

MR. LEDREW:

A. Yeah, in hindsight I would say that's what triggered it, yeah.

MR. O'BRIEN:

Q. Okay. And at the time, in terms of a site assessment, we know right now that there's a 100 megawatt or 123 megawatt CT, the site assessment, did that--at that time you were looking at a 50 megawatt CT, is that right?

MR. HUMPHRIES:

A. A 60, I believe.

MR. O'BRIEN:

Q. 60, was it? Would it have mattered one way or another, 60 or 100, in terms of the site assessment?

MR. HUMPHRIES:

A. No, I don't think so.

MR. LEDREW:

A. Just to add one point.

MR. O'BRIEN:

Q. Yes, go ahead.

MR. LEDREW:

A. The assessment was beyond just physical space, it looked at all the environmental

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considerations, refueling options, community involvement, you know, all of those factors.

MR. O'BRIEN:

Q. Yes, I guess my point was more that, look, you looked at all of this stuff and it didn't take you very long to do it and you came to a conclusion that Holyrood is the right spot, that's a fair assessment?

MR. LEDREW:

A. In a couple of weeks, probably, it was all done.

MR. O'BRIEN:

Q. In terms of, I wonder if we could bring up the application, the April 10th, 2014 application and we may not need it, there's a quote in there that Hydro had learned that suppliers could provide combustion turbines in a 100 megawatt range and have them installed and commissioned at the Holyrood site within 8 months of making the commitment. Does that sound about right?

MR. HUMPHRIES:

A. Yes.

MR. O'BRIEN:

Q. And that would have been in the application?

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MR. HUMPHRIES:

A. Subject to check, yes, I think.

MR. O'BRIEN:

Q. Can you give me some basis for that statement, how did Holyrood come to that--sorry, Hydro come to that conclusion?

MR. HUMPHRIES:

A. Well based on the work that project execution had been doing on looking at the procurement for to get combustion turbine, looking at opportunities that were available in the market, at the grey market, and with discussion with those owners, it was determined that that would be achievable.

MR. O'BRIEN:

Q. Okay. And the CT itself, from the RFIs there's a title transfer release there from September 18th, 2014, is that about the time when it was purchased, is that fair to say?

MR. HENDERSON:

A. That would be--that's what I would say, yes.

MR. O'BRIEN:

Q. And how about when it was transferred, when you took possession of it, what sort of timeframe in 2014?

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MR. HENDERSON:
A. You're probably going to have to ask Mr. MacIsaac when he's on the stand on that.
MR. O'BRIEN:
Q. I can do that.
MR. HENDERSON:
A. But there is a schedule of payments on certain milestones being met and I believe one of them for those assets was when they were located on site, so that there's payment made regarding-- we had them in our possession on site.
MR. O'BRIEN:
Q. Okay. When did you start site preparations, do you know or is this something I should bring up with Mr. MacIsaac?
MR. HENDERSON:
A. I can recall that it was, you know, I'll say early in the summer, probably in June.
MR. O'BRIEN:
Q. Okay, and it would have been after the approval, obviously?
MR. HENDERSON:
A. Yes, yeah.
MR. O'BRIEN:
Q. Okay. Was there anything done prior to the

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approval to get ready for installation?
MR. LEDREW:
A. Well this facility was going to be built next to an operating facility, so we had to segregate space, we had to get different traffic flows because this was, the construction area was going to be right in the normal access route in and out of the facility for both normal traffic and emergency traffic, so there was a whole new route created to, around the construction site and new parking lots. There was a lot of thought went into sharing synergies with what we had based at Holyrood to help the project, as well as making sure that Holyrood could operate autonomous from a major construction project and wouldn't impact the delivery of reliable power to the customers.
MR. O'BRIEN:
Q. Okay, and in terms of when the unit was in service, we're looking at the end of February, early March, is that right?
MR. HENDERSON:
A. The unit produced first power at the end of January and then it was closer to the end of

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February, I think, I'm going to say February 21st is the date that I recall in which all of the equipment was proven, the last component being the emissions controls that were required for the water injection.
MR. O'BRIEN:
Q. All right, okay. So in terms of when you applied, it's less than a year after you applied to when you're in service, 11 months?
MR. HENDERSON:
A. Yes, it was tremendous effort to accomplish that, that's what we did.
MR. O'BRIEN:
Q. Yeah, but it was done within 11 months, right?
MR. HENDERSON:
A. Yes.
GREENE, Q.C.:
Q. Excuse me for a moment, Mr. O'Brien, I wouldn't want Ms. Glynn upset with me for abandoning her responsibilities, but Ms. Gray brought the application up on the screen and I just wondered, we don't need to mark it as an information -
MR. O'BRIEN:
Q. No, that's fine, I don't think I'll need it at

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this point and if I do, I think we can mark it then. Thank you, Ms. Greene. I do want to get into an area we've had some discussion on this before, Mr. Humphries, and Ms. Greene has a few questions for you as well just on generation planning criteria and I do want to go back with respect to that. And I'll try not to go over too much of it, but there are some areas which weren't covered before, I want to get you to cover for us. When you were here last week, there was a fair discussion on planning criteria and loss of load expectation target of 2.8 hours a year and that was Hydro's criteria prior to 2014, is that right?
MR. HUMPHRIES:
A. That's correct.
MR. O'BRIEN:
Q. And it's still the criteria?
MR. HUMPHRIES:
A. It's still a part of our criteria, yes.
MR. O'BRIEN:
Q. Part of your criteria, right. And I'm wondering whether you can tell me where forced outage rates would enter into the equation of

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the loss of load target of 2.8, how does that work?
MR. HUMPHRIES:
A. Yeah, well the 2.8 is, as I said last week, is a probabilistic assessment, so that looks at load forecast, it looks at the generation and it also looks at the availability of that generation and it goes through and it determines a LOLH which would correlate to a level of reserve to meet the criteria, and so as the study periods increase, the probability of unavailability is increasing, so that would affect, have the affect of driving the LOLH higher.
MR. O'BRIEN:
Q. All right, okay, and these are assumptions, I guess, that Hydro uses in its planning model, is it, in terms of figuring out whether there's additional generation needed in the future, that sort of thing?
MR. HUMPHRIES:
A. Yes, that's correct.
MR. O'BRIEN:
Q. Okay. And for the LOLH forecasts, right now Hydro uses an assumption for forced outage

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assumptions based on data from 2000 to 2024, is that right? Do you know that?
MR. HUMPHRIES:
A. The forced outages are based on historic performance.
MR. O'BRIEN:
Q. Yeah, it's for each unit, right?
MR. HUMPHRIES:
A. Yes.
MR. O'BRIEN:
Q. And I know and perhaps we can bring up the Ventyx Report. Maybe you can give us a little background on this.
GREENE, Q.C.:
Q. And here, Mr. O'Brien, this does need to be marked as an Information item. I believe the number is Information No. 27.
MR. O'BRIEN:
Q. 27, so it will be under the generation, I think it's called generation reserve planning, March 2014, this is part of--no, here we go, maybe if we can scroll up just to the first page first, and this was a report done in 2014 for Newfoundland and Labrador Hydro, a planning process review by Ventyx. Are you

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familiar with that report, Mr. Humphries?
MR. HUMPHRIES:
A. Yes, I am.
MR. O'BRIEN:
Q. Okay, can you just give me an overview as to what you retained Ventyx for?
MR. HUMPHRIES:
A. Well this review was initiated following the 2014 outage and we retained Ventyx to complete a review of both generation planning methodologies and assumptions, as well as our load forecasting methodology consumptions.
MR. O'BRIEN:
Q. Okay. And if we could turn to page 5, there's a discussion here in the first full paragraph and I want to go down to the second line there, "The assumptions and strategist"-- that's your planning model, is it, your computer, planning model.
MR. HUMPHRIES:
A. Yes.
MR. O'BRIEN:
Q. "The assumptions and strategist are based on data collected between 2000 and 2004. The generation forced outages assumption for

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Holyrood and Bay d'Espoir are 9.64 percent and .91 percent respectively. And they contributed to the forecast 2015 LOLH of 3. 98 hours a year. Recent data from NLH operating data from 2008 to 2012 indicates that the historical performance for Bay d'Espoir has improved to .41 percent and worsened for Holyrood to 10.69 percent. These figures are relatively consistent with the current performance, however if the generation forced outage assumptions were improved for Bay d'Espoir, the 2015 LOLH would drop to 3. 69 hours a year. If the generation forced outage assumptions were changed for Holyrood, the contribution to the 2015 LOLH would increase to 4.49 hours a year." I'm just trying to get a sense as to, first of all, whether or not Newfoundland and Labrador Hydro is using more recent data now when they input generation outages, forced outages into the strategist model.
MR. HUMPHRIES:
A. Well we continue to monitor our performance on an annual basis and starting in September of this year, we report that, actually we

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reported to the Board on a quarterly basis I believe it is now, but we also in our annual update, we include that 12 months review and what the implications of any changes are from a generation reserve or LOLH perspective.

MR. O'BRIEN:

Q. Right, okay. And I guess to answer my question then, is it fair to say that the data that you use now is still the 2000 to 2004 data for their generating units or -

MR. HUMPHRIES:

A. We use that as a base assumption and then we do a sensitivity on that where we have actually increased the Holyrood forced outage rates by 2 percent to 11.64 and we've taken the forced or the UFOP for the combustion turbines and effectively doubled that from ten to twenty percent.

MR. O'BRIEN:

Q. Right.

MR. HUMPHRIES:

A. And we complete a sensitivity on that.

MR. O'BRIEN:

Q. And have you always done it in that fashion?

MR. HUMPHRIES:

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A. No, that's only something we started to do since the Ventyx review.

MR. O'BRIEN:

Q. Okay, so since 2014.

MR. HUMPHRIES:

A. Yes.

MR. O'BRIEN:

Q. In terms of the, so is it fair to say then if you used more recent data, you may have--if you had of used that, say in 2009, 2010 into 2012, then your load forecast--sorry, your LOLH figures might be off or understated?

MR. HUMPHRIES:

A. They could vary, yes, possibly, yes, based on that.

MR. O'BRIEN:

Q. Did you track those forced outage rates per unit back in 2008 to 2012 for planing purposes?

MR. HUMPHRIES:

A. Yes, for planning purposes they would be reviewed and the averages looked at every time we did a generation expansion.

MR. O'BRIEN:

Q. Okay, and why wouldn't you have included more

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recent data when you did that?

MR. HUMPHRIES:

A. Well, when we look at the averages, you know, they were still representative within--in the range of the assumptions, like Hydro's were lower in the case that they quoted there, and Holyrood slightly higher.

MR. O'BRIEN:

Q. Well Holyrood would have gone from 3.98 to 4.49, right?

MR. HUMPHRIES:

A. No, but their forced outage percentage would have gone from 9.64 to 10.69.

MR. O'BRIEN:

Q. Right, okay.

MR. HUMPHRIES:

A. So what we've done since that, now by incorporating that, the sensitivity, we put a wider range on that.

MR. O'BRIEN:

Q. And we're at 1:30 there, Mr. Chair. I think maybe it is a good time.

CHAIRMAN:

Q. Your timing is exemplary. We will adjourn.

Upon conclusion at 1:30 p.m.

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CERTIFICATE

I, Judy Moss, hereby certify that the foregoing is a true and correct transcript of a hearing in the matter of Newfoundland and Labrador Hydro's General Rate Application heard on the 28th day of October, A.D., 2015 before the Commissioners of the Public Utilities Board, St. John's, Newfoundland and Labrador and was transcribed by me to the best of my ability by means of a sound apparatus.

Dated at St. John's, Newfoundland and Labrador this 28th day of October, A.D., 2015

Judy Moss

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