Page 1

October 29, 2015
(9:06 a.m.)
CHAIRMAN:
Q. So I understand there are no preliminary matters. So I think, Mr. O'Brien, the puck is in your corner, I guess.
MR. DARREN MOORE, MR. ROBERT HENDERSON, MR. TERANCE LEDREW, MR. PAUL HUMPHRIES (RESUME STAND)
CROSS-EXAMINATION BY MR. LIAM O'BRIEN (CONT'D)
MR. O'BRIEN:
Q. Thank you, Mr. Chair. I'm not that much of a skater, Mr. Chair, but I'll go from here. I'd like to take you back, Panel, just to 2008 on this generation planning issue. I think when we left yesterday we were talking about forced outage rates, but I want to switch scope a little bit here to talk about some of the generation planning issues from a report that was put out in 2008. At that time, Mr. Henderson, you were Manager of Systems Operations and Integration Support? Is that right? What was your position at that time?
MR. HENDERSON:
A. At that time, I was Manager of System Operations and Customer Services.

Page 2

MR. O'BRIEN:
Q. Customer Service, okay. And Mr. Humphries, what was your position?
MR. HUMPHRIES:
A. I was Manager of System Planning.
MR. O'BRIEN:
Q. Okay. And who would you have reported into, Mr. Humphries, at that time?
MR. HUMPHRIES:
A. 2008, I reported to the Vice-President of Engineering Services at that time and that was Mr. John Mallam.
MR. O'BRIEN:
Q. And that was within Hydro, was it?
MR. HUMPHRIES:
A. I have to think.
MR. HENDERSON:
A. It was only Hydro then.
MR. HUMPHRIES:
A. It was only Hydro, yes.
MR. O'BRIEN:
Q. It was only Hydro in 2008, okay, good. I want to ask you about a report, and if we can bring up -- It's on the screen there. It's a generation planning issue 2008 midyear update.

Page 3

This is a systems planning report? Is that correct?
MR. HUMPHRIES:
A. Yes, that's correct.
MR. O'BRIEN:
Q. And the author of the report is Bradley Coady? Is that right?
MR. HUMPHRIES:
A. That's correct.
MR. O'BRIEN:
Q. Okay. And can we put that on the record, I wonder?
MS. GLYNN:
Q. Information 28.
MR. O'BRIEN:
Q. Sorry, what was that?
MS. GLYNN:
Q. Information No. 28.
MR. O'BRIEN:
Q. 28, thank you. Mr. Humphries, would you have received a copy of this report in your position at that time?
MR. HUMPHRIES:
A. Yes, I would have.
MR. O'BRIEN:

Page 4

Q. Would you have any involvement in its preparation?
MR. HUMPHRIES:
A. I would have reviewed it during its preparation and reviewed results, yes.
MR. O'BRIEN:
Q. Okay. And how about you, Mr. Henderson, would you have been involved at all with this report?
MR. HENDERSON:
A. Very limited involvement. I would have seen it after it was completed, but not involved with the preparation or anything like that.
MR. O'BRIEN:
Q. Okay. These types of reports, these generation planning issues reports, who do they get circulated to within Hydro? Who would this have been circulated to?
MR. HUMPHRIES:
A. It would have been circulated through the leadership team and as well, then tend to form a support document for capital budget applications and those types of things. So, if there were pending upgrades required coming from this report, obviously it would have

Page 5

probably gone further down the line. Then if there had not been, if people were -- if there were capital budget proposals coming from it and, you know, detailed estimates would have to be prepared and that. But normally, it would be at the leadership level.

MR. O'BRIEN:

Q. At the leadership level, okay. And I wonder if we could turn to the executive summary, page one. We haven't looked at this report before, but we've looked at some similar to it. And this particular report again looks at the two scenarios of an isolated island system and then an integrated system. Is that right?

MR. HUMPHRIES:

A. Yes, that's correct.

MR. O'BRIEN:

Q. Okay. And in the first -- sorry, in the second paragraph, if we start about halfway through, "based on an examination of the systems existing plus committed capability in light of the 2008 planning load forecast and the generation planning criteria, the system can expect capacity deficits starting in 2013 under both scenarios and firm energy

Page 6

capability deficits starting in 2013 for the HVDC scenario and 2014 for the isolated island scenario." Do you recall seeing that at that time?

MR. HUMPHRIES:

A. Yes, I do.

MR. O'BRIEN:

Q. Okay. So at that time, there's a concern in the short-term horizon? Is that right?

MR. HUMPHRIES:

A. That's correct.

MR. O'BRIEN:

Q. Okay. I wonder if we could turn to Table 5- 1 on page ten, and the load forecast compared to planning criteria, and we looked at one of these tables in -- I think it might have been a 2012 report before. But if we look at the loss of load hours column there, if you go down to 2013, you've got a forecast of 5. 28 under the HVDC link and a 4.57 under the isolated island. Are those significant concerns, those LOLH figures?

MR. HUMPHRIES:

A. Well, it is -- obviously it's a violation of our 2.8 criteria and it is reflecting a

Page 7

significant change year over from 2013 to -- 2012 to 2013.

MR. O'BRIEN:

Q. Right, okay. I guess that's my question, all right. So there is a significant change at that point that's being forecast?

MR. HUMPHRIES:

A. That's right.

MR. O'BRIEN:

Q. All right. And it's a violation of your -- it's a forecast violation of LOLH and that would result in potential capacity defects or sorry, deficits in 2013?

MR. HUMPHRIES:

A. It indicates that there would be a higher risk of that deficit, yes.

MR. O'BRIEN:

Q. Okay. And does that indicate possible outages to you?

MR. HUMPHRIES:

A. Possibly. Well, it's indicating that the risk of unserved energy is higher than normally planned for.

MR. O'BRIEN:

Q. Okay. And this is a -- and these, I guess the

Page 8

LOLH and this whole sort of planning issues analysis, this is used for generation planning?

MR. HUMPHRIES:

A. Yes, that's correct.

MR. O'BRIEN:

Q. For additions to the system?

MR. HUMPHRIES:

A. That's correct.

MR. O'BRIEN:

Q. Okay. And just take me through sort of what would have occurred when this report came out. Do you recall sort of having any meetings with anyone discussing the concerns that this report sort of has outlined?

MR. HUMPHRIES:

A. Well, I think at that point in time, looking from 2008 out to the 2012-2013 timeframe, it's showing a significant step change in something between 2012 and 2013. In this case, I think for the most part, it was driven by load and the expectation of the Vale load in particular at that time and it coming on. So, when you look back and I think if you go through the recommendations there that we were

Page 9

recommending additional capacity in advance of that 2013 change in load and that I think it reflected that if -- to meet that timeline, decisions would need to be made in the 2010 timeframe to move things forward. So that became a focus back then and as time progressed, there were significant changes in the following year, in 2009, that basically changed the outlook. So, any activities that may have been -- or preparations to start activities in 2008 would have been somewhat relaxed after the next year's review which we ended up with the closure of the Abitibi facility in Grand Falls in 2009 and that, at that point, moved the deficit out to the 2015 timeframe.

MR. O'BRIEN:

Q. Okay. I'll take you to that, I guess, but I want to get a flavour as to what was done in 2008 when this report came out and maybe I can take you through some of the sections there. In Section 6, there's -- just like we saw in the 2012 report, talks about near term resource options. I wonder if we could go to page 19, the middle of that page? And where

Page 10

it says "under the HVDC scenario after the third wind project in 2010, the next preferred source would be a 50 megawatt CT in 2012." So at that point in time, the recommendation, would that have been a systems planning recommendation to have a CT in place by 2012?

MR. HUMPHRIES:

A. At that time, yes, it would have been.

(9:15 a.m.)

MR. O'BRIEN:

Q. Okay. And that the HVDC link hoped to be in operation by late 2014?

MR. HUMPHRIES:

A. At that time, yes.

MR. O'BRIEN:

Q. And if we go back to page 17, under the heading combustion turbine units, we see that you're talking again about a 50 megawatt net CT at that time?

MR. HUMPHRIES:

A. That's right.

MR. O'BRIEN:

Q. Okay. And in terms of timing, in this report, there's a schedule of timing of -- or an indication that it would take 36 months to put

Page 11

this in place from project release date to the service date to get a CT in place. Do you recall any discussions about how that 36 months came about?

MR. HUMPHRIES:

A. 36 months was based on an estimate provided by our engineering services group at that time on the time it would take to design, put our tender procurement all a unit of that size.

MR. O'BRIEN:

Q. Okay. Because I didn't see necessarily a project schedule in there, but I wonder, in terms of the 36 months, would the engineering group have spoken with suppliers? How would that have worked?

MR. HUMPHRIES:

A. At that time, we would have -- for all of these alternatives that were evaluated, we would have asked for budget grade estimates on a comparable basis to do a comparison, and I would expect at that time that our engineering people would have checked with the market to determine what the delivery times would be.

MR. O'BRIEN:

Q. And would they have checked to see whether or

Page 12

not a 50 megawatt CT was available, how many were available, where, that kind of thing?

MR. HUMPHRIES:

A. No. Well, I mean, the 36 months obviously was based on a new design.

MR. O'BRIEN:

Q. Okay.

MR. HUMPHRIES:

A. There's no doubt about that.

MR. O'BRIEN:

Q. And I guess in terms of the 100 megawatt CT that you have now, that's not a new design. That's -- I guess we were talking more of a grey market type.

MR. HUMPHRIES:

A. It was an existing -

MR. O'BRIEN:

Q. Existing one.

MR. HUMPHRIES:

A. It had already been built.

MR. O'BRIEN:

Q. Do you know if anyone had looked into what the timeline at that point would have been for an existing CT?

MR. HUMPHRIES:

Page 13

A. I don't know. I can't say for sure if that had been looked at at that time or not.
MR. O'BRIEN:
Q. And the reason I ask is that, as you've indicated before, there was -- in terms of forecast, there's a significant jump from a year over year into 2013 to show that there's a forecast loss of load hours almost into the five range. So would anyone have looked at how soon we can get a CT, is there an existing one out there?
MR. HUMPHRIES:
A. I don't know if that -- I think when we were looking from 2008 to 2013, there was adequate time to follow the conventional methodology and procure a new unit. So I'm not sure if it was a big focus at that time or not.
MR. O'BRIEN:
Q. Well, why don't we look at page 23 of that document, under 8.2 decision timing, the third paragraph under that. "Hydro would have to initiate the generation expansion project in 2009 in order to meet the required in-service date for either a 50 megawatt combustion turbine under the HVDC scenario or the 23

Page 14

megawatt Portland Creek hydroelectric plant under the Isolated Island scenario."
And if we drop down again to the next paragraph, "in the past, it's been assumed that Hydro would initiate an RFP process to identify potentially non-utility alternatives to be included in the final portfolio of projects that would be evaluated to determine the optimum expansion plan. However, given the tight timelines associated with the HVDC link decision and the requirement for additional generation capacity by 2012, there may not be sufficient time to conduct an RFP process. The practicality of conducting an RFP process will be revisited in the year end review."
It seems to me there's some urgency that's expressed there. So why wouldn't Hydro have looked at existing CTs at that time?
MR. HUMPHRIES:
A. And I don't think the -- from the perspective of the urgency, the urgency, if there were any urgency, it's around the upfront process that might have been required to get through the regulatory process and an RFP process, not

Page 15

necessarily the ability to be able to deliver the product and the availability of the product. And as I said, you know, this talks about there was still uncertainty regarding the ultimate expansion plan, whether we were going to be isolated or interconnected, and the report talks about the hopes of a resolution of some sort on that by year end, which did not happen.
As we moved into the -- I'm not exactly sure the dates that we became aware of the Abitibi closure in Grand Falls, but that happened in the first half of 2009. So all of these things were in play at that time that were affecting the schedules and timing that were identified here, many of them in a positive way, as opposed to a negative.
MR. O'BRIEN:
Q. And did anyone at that time -- do you recall having discussions with say Mr. Haynes or anyone else at Hydro about prior to that knowledge of the Abitibi shutdown about having to move forward with this plan to at least be ready to have a CT available? What are your recollections of that?

Page 16

MR. HUMPHRIES:
A. You know, sitting in mid-2008 when this report was generated, you know, the discussions would be yes, we would have to start to move in early 2009 to meet the schedule. There was no -- you know, we had discussions of that and people were aware.
MR. O'BRIEN:
Q. And so Mr. Haynes would have been aware at that time?
MR. HUMPHRIES:
A. Yes, Mr. Haynes would have been aware.
MR. O'BRIEN:
Q. And who made the ultimate decision after this 2008 midyear report not to proceed with the purchase of a CT?
MR. HUMPHRIES:
A. Well, by the time we got to the point where we would have had to initiate actions to meet this schedule, the picture had changed.
MR. O'BRIEN:
Q. Okay. And just explain that to me.
MR. HUMPHRIES:
A. Well, the fact that Abitibi, we became aware of the fact that Abitibi was going off the

Page 17

system. The requirement for capacity had now moved from 2013 to 2015. So, there was no requirement to move the plan forward at that time.

MR. O'BRIEN:

Q. So when you say the requirement had moved from 2013 to 2015, there's still a concern of capacity in 2015?

MR. HUMPHRIES:

A. Yes, there was.

MR. O'BRIEN:

Q. Okay. So there's still a requirement to move?

MR. HUMPHRIES:

A. There was still a requirement to move, but the issues, we were still at a stage where we did not have clarity on the ultimate expansion plan for the island, whether it was going to be isolated or interconnected. The two alternatives had different expansion plans and there was an uncertainty on which path to take. So, because there was still time at -- the deficit had moved at least two years -- the decisions were made to hold the course and see how the ultimate future would pan out, from the perspective of -

Page 18

MR. O'BRIEN:

Q. So when you say hold the course, a decision was made not to proceed on either course?

MR. HUMPHRIES:

A. At that time, other than to continually monitor it obviously and identify what the new targets and timelines would need to be to meet the then 2015 deficit.

MR. O'BRIEN:

Q. And I'm struggling with that a bit, Mr. Humphries, just in terms of I understand what you're saying with respect to there being a load change, but the load change only moved you from 2013 out to 2015, in terms of concerns for capacity and you weren't sure what -- whether or not this was going to proceed with a fixed link or by way of an isolated island system. But under both systems, there were capacity concerns at that time. Why not proceed, be ready to go? It doesn't appear that there was an application for a CT ready. It doesn't appear that other steps were taken for alternatives at that time to deal with that.

MR. HUMPHRIES:

Page 19

A. No, there was not an application ready. We weren't -- we were preparing to start to prepare an application going into 2009, but it hadn't been and these changes came and when we looked at -- with the two expansion alternatives, they were different. They did involve different constructions and significant capital cost in both cases, and there was a concern of making the right least cost decision moving forward, in the right -- landing on the right expansion plan and making the right decisions.

MR. O'BRIEN:

Q. And in terms of making the right least cost decision, where did reliability fit into that analysis?

MR. HUMPHRIES:

A. Well, we were still tracking within our reliability criteria of 2.8 hours through that period and the studies were indicating and the reports were indicating that the decision timing, we had a larger window on the decision timing, post the end of 2008 than we thought we did mid-2008.

MR. O'BRIEN:

Page 20

Q. And Mr. Humphries, you said you were sort of planning to prepare for an application for a CT. Just explain that to me. What were you doing in terms of planning to prepare? What steps were you taking?

MR. HUMPHRIES:

A. Well, I think if you go back to -- from a work planning perspective, coming in to 2008, looking into 2009 from the system planning perspective, we would have identified that through 2008 we would initiate the process to start to prepare an application for filing with the Public Utilities Board and that would be -- this report would form the basis of the justification and we would move through and prepare that estimate or that application. Our engineering services people would be asked to develop capital budget grade estimates and schedules and we would move through with the intent, I would think, of getting that filed in the next capital budget application.

MR. O'BRIEN:

Q. So was that being done in terms of estimates and talking to vendors, seeing what was out there in 2008?

Page 21

MR. HUMPHRIES:
A. Other than what would have been done in preparation for this report, I'm not sure there would have been anything further. There would have been plans to do that in 2009, if the plan had held, but I don't know. I can't say to what level our engineering people were actually doing increased work on this file between June 2008 and early 2009 when the change in load forecast materialized.
(9:30 a.m.)
MR. O'BRIEN:
Q. Okay. In 2009, when there was a change in load forecast and you still saw capacity issues out to 2015, that's right?
MR. HUMPHRIES:
A. Yeah, that's correct.
MR. O'BRIEN:
Q. Okay. So what steps were being taken in 2009?
MR. HUMPHRIES:
A. Well, in 2009 then, we would have -- there was a further update of this generation planning outlook report.
MR. O'BRIEN:
Q. Okay. There's a 2009 report?

Page 22

MR. HUMPHRIES:
A. Yes, there is.
MR. O'BRIEN:
Q. Okay.
MR. HUMPHRIES:
A. Yeah, and that would have identified the change in the -- a change in timing and a requirement for the 2015 peak and again, if we look for a combustion turbine, the 36-month window on that, we would be back in2011 before you would -- you would have to have a budget proposal in for 2011 and approved to move forward through -- to gain that.
MR. O'BRIEN:
Q. And you were prepared to wait then at that point until the following year, I guess, to revisit?
MR. HUMPHRIES:
A. Yes.
MR. O'BRIEN:
Q. All right. In 2009, perhaps -- we've had discussion on the turbine, I guess, the 13 megawatt turbine at Holyrood which was used for Black Start and for some capacity peaking, I think, issues. Were there any concerns in

Page 23

2009 about the lifespan of that turbine? Mr. LeDrew, maybe you can help us out with that one.
MR. LEDREW:
A. No, not that I can recall. We were continuing to invest in it and maintain it.
MR. O'BRIEN:
Q. Okay. So there was no concern at that point that you wouldn't draw a connection to, well, we've got a capacity issue we've got to deal with and maybe Black Start issue, a more permanent resolution or a better resolution or solution, sorry, for the future? There was no drawing conclusion at that point?
MR. LEDREW:
A. No, the Black Start reality didn't happen until early in 2012 when we got the notice of a potential catastrophic failure in that unit.
MR. O'BRIEN:
Q. All right. And what about in 2010? Any issues with the Black -- with that unit in 2010?
MR. LEDREW:
A. We did have -- yes, we did have operational issues and we had folks involved trying to

Page 24

resolve the issues. We were having, I guess, mediocre success trying to address it and resolve it.
MR. O'BRIEN:
Q. And was there any concern at that point, in 2010, with respect to that unit, as to whether or not we should look for a better solution going forward into the future?
MR. LEDREW:
A. Not that I recall.
MR. O'BRIEN:
Q. No, okay. Now 2008, the move forward in 2008 to -- in terms of the decision not to proceed, was this a -- in 2008 -- with an application for a CT, whose decision was that? Was it Mr. Haynes' decision?
MR. HUMPHRIES:
A. Well, ultimately the recommendation would have come from system planning and Mr. Haynes would have -
MR. O'BRIEN:
Q. Accepted that?
MR. HUMPHRIES:
A. - accepted that, yes.
MR. O'BRIEN:

Page 25

Q. And do you recall having discussions about that?
MR. HUMPHRIES:
A. I can't recall having -- it would have came up through the normal budget process for the following year.
MR. O'BRIEN:
Q. And that would have been when in the year?
MR. HUMPHRIES:
A. Well, we would -
MR. O'BRIEN:
Q. Capital budget is later on in the year?
MR. HUMPHRIES:
A. Yeah. So in preparation, if we're into 2009, in preparation for the 2010 capital budget.
MR. O'BRIEN:
Q. And in 2010 then -- you mentioned there was a 2009 generation planning issue report, which we don't have, but we do have the 2010 one. I wonder if we could pull that up? It's IC-NLH-074. And I know we talked about this before. I'm not sure we actually reviewed it at the time.
MS. GRAY:
Q. Revision 1?

Page 26

MR. O'BRIEN:
Q. Revision 1, yes, please. So again, in this report, both scenarios are discussed, the isolated island and the fixed link scenario, and this would have been a systems planning report as well? Is that right, Mr. Humphries?
MR. HUMPHRIES:
A. Yes, that's right.
MR. O'BRIEN:
Q. Okay. And do you recall seeing this report when it came out?
MR. HUMPHRIES:
A. Yes, I do.
MR. O'BRIEN:
Q. Okay. And who would that have gone to? Who would have seen it?
MR. HUMPHRIES:
A. It would have gone to the same group. It would have gone to our leadership team.
MR. O'BRIEN:
Q. And under -- if we can go to page ten, Table 5-1? Okay. So that's the load forecast compared to planning criteria, and we see the shaded area under LOLH. So this is the capacity issues for 2015 that's forecast,

Page 27

right?
MR. HUMPHRIES:
A. That's correct.
MR. O'BRIEN:
Q. Under both scenarios?
MR. HUMPHRIES:
A. That's correct.
MR. O'BRIEN:
Q. Okay. And there's still -- those ones are in violation of your planning criteria?
MR. HUMPHRIES:
A. It is. It's not as a significant step change as we would have experienced back in 2008, but yes, it is in violation.
MR. O'BRIEN:
Q. It is, and you've already seen that change in load now that you said in 2009. So that's built into -
MR. HUMPHRIES:
A. The decrease in 2009 is built in.
MR. O'BRIEN:
Q. Yeah, is built into that.
MR. HUMPHRIES:
A. And the assumptions on the ramp up of Vale at that time would have been included in this as

Page 28

well.
MR. O'BRIEN:
Q. Okay. And we talked yesterday just about forced outage rates. You would have been using forced outage rate assumptions from 2000 to 2004 in that calculation?
MR. HUMPHRIES:
A. We would have been using the averages, yes, that were referred to of the roughly .9 percent for the hydro and 9.64 for the terminals.
MR. O'BRIEN:
Q. Right. And I believe you indicated that -- or agree with me that the Holyrood forced outage rates were increasing over time?
MR. HUMPHRIES:
A. If we look at the period that Ventyx analyzed, yes, the forced outage rates at Holyrood for the second period they evaluated were higher than our assumptions and the forced outage rates for the hydro were lower. So when we look at the numbers that we went through there yesterday of the impact on LOLH, that there would have been the effect of the Bay d'Espoir forced outage rates would have an improving

Page 29

effect and the Holyrood would be a increase in LOLH. The net difference was, I think, .22 hours.

MR. O'BRIEN:

Q. .22 hours?

MR. HUMPHRIES:

A. .22 hours or about 5.5 percent.

MR. O'BRIEN:

Q. Okay. So that -- but that would be an increase?

MR. HUMPHRIES:

A. A net increase of .22 hours, yes.

MR. O'BRIEN:

Q. In the LOLH, so -

MR. HUMPHRIES:

A. And yeah, well that's -- they were basing that on our 2012 analysis, so it probably would have been comparable.

MR. O'BRIEN:

Q. Okay. So you're looking at say a 3.41 of an increase in that LOLH to 3.6.

MR. HUMPHRIES:

A. 3.6, yes.

MR. O'BRIEN:

Q. Right, okay. Did you consider that as part of

Page 30

your analysis at that time?

MR. HUMPHRIES:

A. No, we did not. We considered at that time that when a review that again, the forced outage rates that we had been using were within a level of error consistent with what was happening in reality and we hadn't -- we did not change.

MR. O'BRIEN:

Q. And still fair to say though that these are in violation of your -

MR. HUMPHRIES:

A. Yes, they're in violation.

MR. O'BRIEN:

Q. In violation?

MR. HUMPHRIES:

A. Yes.

MR. O'BRIEN:

Q. And there's an increased possibility of outages as a result?

MR. HUMPHRIES:

A. Yes.

MR. O'BRIEN:

Q. More than what you would expect?

MR. HUMPHRIES:

Page 31

A. Yeah.

MR. O'BRIEN:

Q. And as a result of that, that fit within your planning criteria to consider further generation additions?

MR. HUMPHRIES:

A. Yes, it did.

MR. O'BRIEN:

Q. Okay. And in 2010, again the CT, 50 megawatt CT comes up again?

MR. HUMPHRIES:

A. That's correct.

MR. O'BRIEN:

Q. As one of those options, is that right?

MR. HUMPHRIES:

A. In the interconnected scenario, it does come up, yes.

MR. O'BRIEN:

Q. Right, in the interconnected scenario, sorry.

MR. HUMPHRIES:

A. Yes.

MR. O'BRIEN:

Q. And this particular report, who would that have gone to? The same people?

MR. HUMPHRIES:

Page 32

A. Same people, yes.

MR. O'BRIEN:

Q. And who was your -- who did you report into at that point in time, 2010?

MR. HUMPHRIES:

A. In July 2010, I would have still been reporting to Mr. Mallam.

MR. O'BRIEN:

Q. Okay. And when did you start reporting into Mr. MacIsaac?

MR. HUMPHRIES:

A. In October 2010.

MR. O'BRIEN:

Q. Okay. And would that have been around the same time that you would be looking at capital budgets and whether or not to proceed with any requests for additional generation units at that time?

MR. HUMPHRIES:

A. Yes, we would.

MR. O'BRIEN:

Q. Do you have any recollection of talking to Mr. MacIsaac about that in 2010?

MR. HUMPHRIES:

A. I would have -- when Mr. MacIsaac came on, I

Page 33

would have sat with him and briefed him on issues related to system planning and these reports.

MR. O'BRIEN:

Q. Okay. And what was the -- what's your recollection in terms of timing? Are you still dealing with a 36-month assessment? This report suggests you're still dealing with a 36-month time scenario.

MR. HUMPHRIES:

A. That's correct, yes.

MR. O'BRIEN:

Q. And do you know if somebody confirmed or updated that time scenario or was it just carried over from the 2008 report?

MR. HUMPHRIES:

A. No, we would have gone to our engineering people and asked for updates.

MR. O'BRIEN:

Q. And again, that's for a new unit?

MR. HUMPHRIES:

A. That would -- yes, that would look at a new unit.

MR. O'BRIEN:

Q. A new unit.

Page 34

MR. LEDREW:

A. And I guess the other thing is it was a greenfield option as well, so -

MR. O'BRIEN:

Q. Okay. Explain that to me.

MR. LEDREW:

A. - what played out in Holyrood, of course, was a site that had a lot of infrastructure available that aided the construction. This was -- the potential here was a brand new site meaning all new ground work, all new environmental permits, everything.

MR. O'BRIEN:

Q. That would have taken 36 months?

MR. LEDREW:

A. That would have taken the full calendar.

MR. O'BRIEN:

Q. Okay. So if we're looking at an assessment of what ultimately occurred, it's certainly not a 36-month window that you were looking at?

MR. HUMPHRIES:

A. That's true.

MR. O'BRIEN:

Q. Okay. And 2010, July of 2010, where were you with the turbine for Black Start at Holyrood?

Page 35

What concerns did you have at that point in time when this report came out? Was there a stop work order in place at that point in time?

MR. LEDREW:

A. Yes, I believe. I'd have to check the dates, but the stop work order had started somewhere in around that time, yes.

MR. O'BRIEN:

Q. Okay. And I believe, and maybe we can just confirm, we had a timeline we looked at in the Liberty report yesterday. I believe it was page 51. March 2010, does that sound right?

MR. LEDREW:

A. Yeah, that's correct.

MR. O'BRIEN:

Q. Okay. So at that point in time, were you aware of that, Mr. Humphries, that there was a stop work order with respect to that unit?

MR. HUMPHRIES:

A. I was aware, yes.

MR. O'BRIEN:

Q. Okay. And was there a concern at that point in time that perhaps we should look at proceeding with something that is more of a --

Page 36

is a better solution for Black Start going forward because of the stop work order and because we have a capacity issue that we're going to see now out into the future and not too far into the future, five years in the future? Was there any concern leaking those two together then? Any discussions about that?

MR. HUMPHRIES:

A. I don't recall any discussions at that time.

MR. O'BRIEN:

Q. In terms of the discussions with respect to generation planning and addition, Mr. Humphries, did Black Start ever come up?

MR. HUMPHRIES:

A. In 2010 you're asking?

MR. O'BRIEN:

Q. In 2010.

MR. HUMPHRIES:

A. I don't -- I'm not -- I don't recall. I don't remember any discussions in 2010.

MR. O'BRIEN:

Q. And when this report came out, the 2010 one, who would you have reviewed it with?

MR. HUMPHRIES:

A. In 2010, I would have reviewed it with Mr.

Page 37

Mallam and Mr. Haynes, you know, even though I -- through the period, I would have been reporting up through the engineering side which at some point along the way moved out of Hydro into Nalcor. The main focus of discussion and the ramifications and implications, I guess, of this report would have been discussed with Mr. Haynes predominantly.

MR. O'BRIEN:

Q. Okay. And would it -- was there a Hydro leadership team it would have been discussed with at that time?

MR. HUMPHRIES:

A. I would assume Mr. Haynes would have discussed it with the Hydro leadership team.

MR. O'BRIEN:

Q. Okay. And you wouldn't have been part of the leadership team at that time?

MR. HUMPHRIES:

A. No, I was not.

MR. O'BRIEN:

Q. Okay. Mr. LeDrew, did anyone discuss with you, in 2010, that Hydro was looking at potential capacity issues out into 2015 and a

Page 38

CT was one option to assist with that?

MR. LEDREW:

A. I was generally aware, but I had no involvement in that process.

MR. O'BRIEN:

Q. Okay. And Mr. Henderson, were you aware of any discussions to that effect?

MR. HENDERSON:

A. I was aware, yes, same as Mr. LeDrew. I was aware that the CT was as part of that interconnected option and that it would be required in the future.

MR. O'BRIEN:

Q. Okay.

MR. HENDERSON:

A. In terms of anything happening in 2010 specific, I can't recall anything that I was specifically involved in other than a general knowledge. And I will note though that I know that in 2010, the issues with the Black Start were there, but the full understanding was this was something that would be resolved and was being addressed at a somewhat of a urgent nature in terms of resolving the ability to Black Start.

Page 39

MR. O'BRIEN:

Q. How old was that unit at that time?

(9:45 a.m.)

MR. LEDREW:

A. It was 1966 vintage.

MR. O'BRIEN:

Q. Right. So was there a concern, even though it was going to be addressed at that time immediately, that perhaps a new unit might be necessary in the near future?

MR. LEDREW:

A. Well, we -- somewhere in around there, I'm just trying to think of the date here, but we did do a full comprehensive condition assessment on that unit as well and looked at the lifespan of it.

MR. O'BRIEN:

Q. Was it in 2010?

MR. LEDREW:

A. I think it was '11, I believe. I think the condition assessment was done in '11, a comprehensive one.

MR. O'BRIEN:

Q. Okay. And you spoke yesterday about January of 2012 and I got the -- and then into March

Page 40

when you did a site assessment for the CT, I got the impression from your testimony, Mr. LeDrew, that really the Black Start issues you had in January 2012 really kick started the site assessment early on in 2012. Is that right, for the CT?

MR. LEDREW:

A. Black Start? I'm not sure I'm following you.

MR. O'BRIEN:

Q. In January of 2012, you learn the unit at Holyrood that you're using for Black Start couldn't be operated.

MR. LEDREW:

A. Correct.

MR. O'BRIEN:

Q. All right. So at that point in time, it wasn't long before you had your discussions on the site assessment for the new CT. Is that right?

MR. LEDREW:

A. Correct, yes.

MR. O'BRIEN:

Q. And you came to a decision relatively soon after that that Holyrood was the proper option?

Page 41

MR. LEDREW:
A. It was because of timeline advantages, environmental permitting advantages and infrastructure advantages that Holyrood had a lot of positives in its favour, versus other sites or a greenfield site.
MR. O'BRIEN:
Q. Right. So you had gone away from the greenfield 36-month period now into a more condensed timeframe in order to get this project working?
MR. LEDREW;
A. Correct, and I do recall 24 months being something that engineering were suggesting. 22 to 24 months was the construction build then. That's sort of the timelines that were being talked about back then.
MR. O'BRIEN:
Q. And that was for a new unit?
MR. LEDREW:
A. New unit, yeah.
MR. O'BRIEN:
Q. New unit. Any discussions at that time -- where were you at that time in terms of talking to vendors, finding out what units

Page 42

were out there? Anybody discuss possible grey market units or existing units?
MR. LEDREW:
A. I did sit in on some presentations. Our engineering group were actively looking at what's available on the marketplace and we did have some vendors come in and present their capabilities, the size of units that they offer, yeah.
MR. O'BRIEN:
Q. Okay. And when was that?
MR. LEDREW:
A. That was subsequent to this reality. That was in 2012.
MR. O'BRIEN:
Q. Okay. And was that after the site assessment?
MR. LEDREW:
A. I would say they would in around -- it was in the spring/summer of '12 I can think.
MR. O'BRIEN:
Q. Okay, around that time?
MR. LEDREW:
A. Yeah.
MR. O'BRIEN:
Q. And I got the understanding that the Hardwoods

Page 43

-- the decision to use Hardwoods was an interim decision. Is that right?
MR. LEDREW:
A. That's correct, yeah.
MR. O'BRIEN:
Q. Okay. So the plan was for another CT. Why not start with an application process at that point in time?
MR. HUMPHRIES:
A. Well, the decision -- you mean the decision to use Hardwoods -
MR. O'BRIEN:
Q. Was an interim decision as Black Start. Why didn't you start with your application at that point in time? You knew you had a capacity issue coming up in 2015. You knew that the option here at Holyrood, the unit that was being used couldn't be operated. Why not start with the application at that point in time?
MR. HUMPHRIES:
A. Well, and I think that would have been in early 2012.
MR. O'BRIEN:
Q. Yeah.

Page 44

MR. HUMPHRIES:
A. Yeah, and were in the process of doing the preparatory work to go into an application at that time.
MR. O'BRIEN:
Q. And it took you from the early 2012 until when in 2013 to actually come in with an application?
MR. HUMPHRIES:
A. Well, actually, the application did not get in until April 2014.
MR. O'BRIEN:
Q. No, no, I mean for a Black Start. You didn't file anything for Black Start until -
MR. HUMPHRIES:
A. I think that was in -
MR. O'BRIEN:
Q. - the end of 2013?
MR. HUMPHRIES:
A. Late 2013.
MR. O'BRIEN:
Q. I mean, why wait this whole time to address the Black Start issue?
MR. HUMPHRIES:
A. Well, and I think it was all based on the fact

Page 45

that in the interim, Hardwoods had been accepted as a decision.

MR. O'BRIEN:

Q. Okay.

MR. HUMPHRIES:

A. As an alternative.

MR. O'BRIEN:

Q. Well, if that's the case, why not go forward with an application for a 50 megawatt CT in 2012?

MR. LEDREW:

A. I think I mentioned that the -- after the risk assessment was done, we were looking at a 22 to 24-month window from decision to build, so it wasn't a 36-month window that we had looked at previously, back in the '08-09 timeline.

MR. O'BRIEN:

Q. And there was no concern with a 24-month window at that point in time, that you were going to run into capacity issues in 2015? What if the load changed?

MR. HUMPHRIES:

A. If the load changed, we would have had capacity violations, yeah.

MR. O'BRIEN:

Page 46

Q. Right. And you already knew at that point in time that there was a potential for capacity violations. You knew you had an issue with the Black Start, the unit being used for Black Start. So my question is, why didn't you proceed with a 50 megawatt CT application in 2012?

MR. HUMPHRIES:

A. Well, if we had, I guess to Mr. LeDrew's point, and if we had 24 months period, we still would have been into 2014 before we had the combustion turbine in place. So from a Black Start perspective, it was really no great gain from the perspective of what we had originally been proposing, I guess. When we got -- we still had uncertainty through 2012 on where we going from an overall expansion plan. It was late 2012 before we had certainty that Muskrat Falls was going and the interconnection was happening and you go through the 2012 generation planning issues report, at that time -- at that time that report was completed, there's still -- the Lower Churchill still had not been sanctioned. There was still two alternatives. Obviously

Page 47

at this point there was -- it hadn't been -- the expansion plans in the near term were identical at that stage. The CT was now the preferred alternative in both plans.

MR. O'BRIEN:

Q. Right.

MR. HUMPHRIES:

A. And it was clear that the CT was the preferred alternative and following that period, in late 2012, that is when we started to advance the application process and went through a series of explanations, I think, earlier this week and last week on what transpired through 2013, the changes with respect to the ultimate application to add 16 megawatts of Black Start diesel and whether that had any impact or influence on the overall decision or magnitude of the CT application, and as well then, at the end of 2013, we got into the early 2014 outages and a reassessment of the criteria, reserve levels and all, and that resulted in an application for a larger CT that took time to prepare, analyze the alternatives, do the Strategist analysis that resulted in an application in April 2014.

Page 48

MR. O'BRIEN:

Q. So were you waiting for the sanction on Muskrat Falls to decide to proceed with this?

MR. HUMPHRIES:

A. Well, I think that would have been -- if an application had gone forward at that time, that would have been the first question, which future are we going, which road are we going down. So there was no clarity and at the time, the generation issues report was generated in 2012, we still did not -- it was pretty definite, but there was no clarity. It was later in 2012 that the actual sanction of the project was announced.

MR. O'BRIEN:

Q. And later in 2012, why not proceed with an accelerated application at that point in time? If you're talking a 24-month period was your -

MR. HUMPHRIES:

A. Yeah. Well, you know, I think we were doing -- internally, we were doing things to accelerate the schedule in the absence of the application and we were trying to prepare the application and assess the changes along the way and at points through 2013, when the -- in

Page 49

particular in the fall of 2013 when the issue came to -- when the application was made at the Board's suggestion, I guess, that we get a Black Start solution for Holyrood as quickly as possible, we identified the 8 2 megawatt diesels at that time. The obvious first question would have been what's the implication of that on the new CT application and so, we took the time to assess that before putting in the application, rather than have to do it after the fact.

MR. O'BRIEN:

Q. Could you have gotten an application in and had the CT in by the end of 2013 when you got the eight megawatt diesels in? You found out your -- end of 2012 that there was a -- or near the end of 2012, Muskrat Falls was sanctioned. We know you had a -- you got the 100 megawatt CT in within a year, less than a year.

MR. HUMPHRIES:

A. I don't think we had the information at hand back then to have a level of confidence that we could do that in the timeframe.

MR. O'BRIEN:

Page 50

Q. Well, explain that to me. What do you mean by that?

MR. HUMPHRIES:

A. Well, through 2013 and early 2014, there was considerable effort focused on this grey market opportunity and the ability to be able to -- how you could actually accelerate that schedule to get it in in the timeframe we did. I'm just -- back, going back to earlier in 2013, late 2012, we hadn't advanced our knowledge base to that. We didn't have enough data on what was out there and how it could actually be advanced to get it in at the same time we would have gotten these. I don't think that was -

MR. O'BRIEN:

Q. You weren't looking into that?

MR. HUMPHRIES:

A. We were looking into it, but we hadn't -- it hadn't progressed to the stage where we'd been able to focus in on a machine that would have been suitable and that we would have been able to deliver in that timeframe and we would have been -- through that whole period, we would have been looking at a smaller machine.

Page 51

There's no question about that. If we had done that, we'd been looking for a 50 to 60 megawatt machine and we would have ended up in 2013, 50 or 60 megawatts shy of where we determined, because of the events of 2014, we wanted to be. So we'd be out right now getting another machine if we had gone down that road.

MR. O'BRIEN:

Q. If you had gone down that road.

MR. HUMPHRIES:

A. If we had gone down that road.

MR. O'BRIEN:

Q. Now, looking back, if you had gone down that road.

MR. HUMPHRIES:

A. Yes.

MR. O'BRIEN:

Q. I'm just wondering at this point in time what your -- and you could have got a second machine?

MR. HUMPHRIES:

A. Whether we would have gotten a second grey market machine and get it in in an accelerated period, I don't know.

Page 52

MR. O'BRIEN:

Q. I'm just trying to get the thought process straight. And then 2013, your application, you say were preparing an application, and I believe the last time you indicated you had one functionally ready by Christmas of 2013. Is that right?

MR. HUMPHRIES:

A. Yeah. At a stage, we probably had it functionally ready.

MR. O'BRIEN:

Q. I'm using your words. I believe that's what you had indicated.

MR. HUMPHRIES:

A. Yeah, and you know, through the summer of 2013, we were -- we had landed on -- going through assessing all the alternatives. Then when we got into the fall of 2013 and the issue with the Black Start came up and the addition of these 8 2 megawatt units which had the potential capability of supplying 16 megawatts of capacity to the system, the assessment of that, we got into that in the late fall because we knew it would have implications on the application and it would

Page 53

be the first questions asked. So we took the time to assess that in advance.

MR. O'BRIEN:

Q. So you were doing two applications side by side at that point in time? One for Black Start, one for -

MR. HUMPHRIES:

A. No, it was always one application, but it was a changing application -- sorry, the Black Start application, yes.

MR. O'BRIEN:

Q. Yes, you were doing two of them side by side?

MR. HUMPHRIES:

A. Yes, that was being done side by side. And you know, and because we were doing the Black Start application, it caused us to pause and rethink are we -- is this application that we're doing for the CT now still correct.

MR. O'BRIEN:

Q. What do you mean by that?

MR. HUMPHRIES:

A. Well, we're out here, we have a solution that's adding 16 megawatts of generation to the system. It's being looked at as an interim solution, but in reality, should it be

Page 54

an interim solution, given the fact that we're going to spend the money to install these units. Does it make sense to look at, in the longer picture, keeping these units and making them a part of that next decision where it could be smaller or different. That was an analysis we were going through.

MR. O'BRIEN:

Q. Were you considering those at that time in your application as being an answer to your capacity issue?

MR. HUMPHRIES:

A. Possibly. We weren't considering them at all up until the fall of 2013. We had landed on Hardwoods as an alternative solution to -- interim solution to get us to the new gas turbine.

MR. O'BRIEN:

Q. To get you to it?

MR. HUMPHRIES:

A. Yes.

MR. O'BRIEN:

Q. So by that point in time, so even though -

MR. HUMPHRIES:

A. But then all of a sudden -

Page 55

MR. O'BRIEN:

Q. - the site assessment for the ST was kick-started there in 2012 for that CT.

MR. HUMPHRIES:

A. Yeah, and we landed in 2012 that -

MR. O'BRIEN:

Q. Hardwoods was the answer.

MR. HUMPHRIES:

A. No, Holyrood was the ultimate site for the new gas turbine and it could address the Black Start requirements. In the interim, from 2012 to the period we got the new gas turbine in, the decision was made that the interim Black Start solution for Holyrood would have been Hardwoods via the transmissions.

(10:00 a.m.)

MR. O'BRIEN:

Q. In your application, your 2013 application for the CT that you were preparing, were you looking at any existing CTs in that application?

MR. HUMPHRIES:

A. At a point through 2013, the possibility of existing and available was assessed through 2013. Again, the opportunities out there in

Page 56

the ranges that we were looking at at that time, 50 to 60 megawatts, were different than what was there in the 100 megawatt range. The focus at that time, as I said, was on the 50 to 60, so there is -- through the tendering process, I would expect that the tender would have been open to all opportunities of new and currently built unused. We were pretty rigid on this unused piece. You know, we didn't have a whole lot of -- the issue of going down and using -- getting a unit with prior use and no certainty on how it had been operated and maintained, we weren't big on that, I would say that.

MR. O'BRIEN:

Q. Was Mr. Haynes involved in - he was there until April, was it, of 2013?

MR. HUMPHRIES:

A. That's correct.

MR. O'BRIEN:

Q. And was he involved just prior to that in terms of the decision making on how to proceed with an application for CT?

MR. HUMPHRIES:

A. Mr. Haynes was fully aware of the process and

Page 57

all steps along the way up until the time he left, yes.

MR. O'BRIEN:

Q. And who was running the - who was looking for the CT, the CTs before, that was your -

MR. HUMPHRIES:

A. That was being done by a project execution group under Mr. MacIsaac at that time.

MR. O'BRIEN:

Q. Oh, Mr. MacIsaac, okay, and Mr. Henderson, what do you recall when you came on in April of 2013, the status of that?

MR. HENDERSON:

A. I was aware that the - I was certainly aware that we were looking at all these other options because of the problem that we had with the turbine at Holyrood with that capacity down. We were looking at what we may be able to get in of a short term nature, and I know in the course of that there was the gray market type of options became available, you know, apparent that there was options out there for those types of things, and I was aware that we were moving along and getting the application forward to the Public

Page 58

Utilities Board for the new CT, and Mr. Humphries and his group were going through that and we were looking at all of the options there to make sure that we had the least cost option for that capacity requirement, which would have included a number of things, including the interruptible arrangement that we ultimately had with Corner Brook Pulp and Paper, those types of things. All of those options were put on the table to say we need to make sure we understand all of the options that are available to us for capacity. So all of those things were part of the consideration that was being discussed in preparation of putting an application to the Board in the fall of 2013.

MR. O'BRIEN:

Q. And you were aware at that time that there was concerns for capacity in 2015?

MR. HENDERSON:

A. Yes.

MR. O'BRIEN:

Q. And was there any discussion about accelerating your application at that point?

MR. HENDERSON:

Page 59

A. The focus was that we had a deficit in 2015 and we had to have something in place for that time, and that was where the focus was is to make sure that we had something in prior to that deficit that was going to occur in 2015.

MR. O'BRIEN:

Q. And was there any discussion about accelerating your application when you came in?

MR. HENDERSON:

A. The discussion was that we got to get that application complete, we got to have a full analysis done. Knowing that the Board had not seen a capacity application from Hydro really at any time in the past, we had to make sure that we had all the options and that was part of the discussion is making sure that we had all of the options laid out, so that we were able to fully demonstrate the least cost. The CT was the base assumption, but we had to understand the other options, and there were discussions, I believe, that happened at that time to talk about what other options there were to provide the equivalent capacity on the system.

Page 60

MR. O'BRIEN:

Q. And what was done with respect to that?

MR. HENDERSON:

A. Well, maybe Mr. Humphries can talk about those.

MR. HUMPHRIES:

A. Okay, well, when we went through and we did - Mr. Henderson mentioned interruptible arrangements, and, you know, they were considered coming through the 2013 period and on paper - on paper, the interruptible arrangements bring you - can correct your LOLH and your deficit, but when we looked at the overall picture of the CT, the benefits it brings operationally, the fact that now the black start was a piece of it -

MR. O'BRIEN:

Q. It was a better option?

MR. HUMPHRIES:

A. It was a better option.

MR. O'BRIEN:

Q. Okay, and you knew that all along, though, I presume?

MR. HUMPHRIES:

A. Oh, yes.

Page 61

MR. O'BRIEN:
Q. So that wasn't something new to you?
MR. HUMPHRIES:
A. No.
MR. O'BRIEN:
Q. All right, in terms of that, was there ever - there was no discussion about accelerating the application. It was more of a discussion from what you just said, Mr. Henderson, of making sure you got everything together, is that right?
MR. HENDERSON:
A. It was to make sure that we had a proven least cost solution for the capacity that was required for 2015.
MR. O'BRIEN:
Q. Okay, so proven least cost solution. Where did reliability fit into that? You had a 2008 report that had raised concerns with capacity, a 2010 report, a 2012 report, you had issues with black start, where did reliability fit into all of this?
MR. HENDERSON:
A. Reliability was a critical piece and exactly why we wanted to make sure that we had this in

Page 62

before we reached the criteria -
MR. O'BRIEN:
Q. Before you reached the date?
MR. HENDERSON:
A. Make sure that we had capacity in place at the time, again making sure that we had the capacity in place for reliable service for when it was required.
MR. O'BRIEN:
Q. I mean, it looks as though you've had a seven year window to look at the application and put together the information, but by 2013 you still haven't got - mid 2013, you still haven't got the information together to do it?
MR. HENDERSON:
A. In mid 2013, when we were putting this together, we're at the - getting that application, we had to make sure all the questions that we anticipated would be asked in an application were answered and presented in that application.
MR. O'BRIEN:
Q. So how were the risks to the customers valued, risks to your customers in terms of outages valued all the way through that time frame?

Page 63

MR. HENDERSON:
A. The established criteria for capacity was the 2.8 hours and it was to have the capacity in place for that time, so that's where the focus was to have that in accordance with the agreed to criteria that we have for capacity, and that is all about reliable service. That's what that - criteria has been put forward to the Board in the past and its been reviewed and it was the accepted criteria, and it was the criteria we were working to.
MR. O'BRIEN:
Q. And ultimately the application got put in in April of 2014, four months after the issues for the winter of 2013 - sorry, 2013/2014, is that right?
MR. HENDERSON:
A. It was brought in after those issues, and what we experienced in January, 2014, with regard to capacity was quite unusual, but we were still working towards that criteria of 2.8 hours and we were not expecting something like January, 2014, to occur, but we were moving quickly to ensure that that application was being put in so that we would have something

Page 64

in place for when the criteria indicated it was required.
MR. O'BRIEN:
Q. But you were expecting outage issues possibly in 2015?
MR. HUMPHRIES:
A. Well, even at 2.8 hours, you could expect outage issues. 2.8 doesn't guarantee that there will not be outages.
MR. O'BRIEN:
Q. No, I understand that, and 3.4 doesn't guarantee that it won't be 5 hours.
MR. HUMPHRIES:
A. No, and, you know - and, I think, as Mr. Henderson said, that has been our criteria, it's been our criteria for a number of years, it's been approved, it's been reviewed, and as late as 2011/2012 it was reviewed and deemed to be acceptable. I think everyone will admit coming through the events of 2014, we've sat back and we've looked at the risks around operating at our criteria or close to our criteria and we've made changes moving forward to improve, but there was never prior to that, based on any of the reviews, any indication

Page 65

that what we were doing was not acceptable or prudent criteria.

MR. O'BRIEN:

Q. But this is not an issue where you were operating at 2.8 going outwards. This is an issue where you saw 5.28 and you saw 3.41 in the near future?

MR. HUMPHRIES:

A. You will always see that at a point in the future. You will always -

MR. O'BRIEN:

Q. But the near future, is that right?

MR. HUMPHRIES:

A. I guess, it's a matter of near and how much money you want to spend and how much you're going to expect the customer to pay in advance to not be close to that, so if we are going to establish a criteria of 2.8, and we're saying, well, really it's 1.5 because we're afraid to get up at 2.8, that's a different piece, or afraid of passing through 2.8. It's a level of how much money and how much the customer is willing to pay to avoid that criteria target, and the fact that through a normal progression you will always get close to that.

Page 66

MR. O'BRIEN:

Q. Were you concerned when you had the shutdown of the Holyrood Unit 1 in January of 2013 that maybe we should accelerate application for more capacity?

MR. HENDERSON:

A. I can say that we were looking at all of our options at that point, and it looked like where we would have Holyrood repaired quicker than we would get any other kind of capacity in on the system, so for that year the focus was going an expeditious repair of Unit 1 to get it back for the following winter, and at the same time we were advancing the combustion turbine application to have it in to meet the plan and criteria to ensure that we had it in in 2015.

MR. O'BRIEN:

Q. Just before I go to my last line of questioning, I did want to touch briefly on something we discussed yesterday just for some clarification from Mr. Moore, I think, you had indicated - and this is with respect to the preventative maintenance piece, and I believe you had indicated - we talked about the

Page 67

Whitbourne crew and their availability in 2013.

MR. MOORE:

A. That's correct.

MR. O'BRIEN:

Q. And I just wanted to get some clarification. I understood that there was obviously work being done on Unit 1 in January of 2013, and you would have been aware that the Whitbourne crew was tied up with that piece of work, is that right?

MR. MOORE:

A. That's right, they were dealing with the installation of the - I think it's listed on the time line there, where we installed the infrastructure for the Newfoundland Power mobiles.

MR. O'BRIEN:

Q. Right.

MR. MOORE:

A. So they were dealing with that through the winter of 2013.

MR. O'BRIEN:

Q. And into February, I believe, there was some other work. That's when the - I guess it was

Page 68

the coating for the -

MR. MOORE:

A. That's correct.

MR. O'BRIEN:

Q. That was in February and March, in that area?

MR. MOORE:

A. That's correct. We were dealing with that to ensure that the assets would be secure for future winters based on the failure we experienced in that January.

MR. O'BRIEN:

Q. And in terms of the work on Hardwoods, that was done in the fall. You would have been aware, though, in January, that work needed to be done, wouldn't you?

MR. MOORE:

A. The Hardwoods work?

MR. O'BRIEN:

Q. Yes.

MR. MOORE:

A. No, that wasn't decided in January. I can't remember the exact time frame.

MR. O'BRIEN:

Q. And just to be fair, I wanted to point you to an order, a supplemental order, it's Order PU-

Page 69

20,2013.
(10:15 a.m.)
MR. HENDERSON:
Q. I might be able to help.
MR. O'BRIEN:
Q. Sure.
MR. HENDERSON:
A. Yes, we had - the problem with the Hardwoods gas turbine was known, I'm going to say, around February or January.
MR. O'BRIEN:
Q. It's January, I think. In this order, it mentions it. If we scroll down, that might help you.
MR HENDERSON:
A. So in January, we were aware of the problem that was identified by the OEM of the unit in Stephenville, that we had this risk of failure on the generator at Hardwoods.
MR. O'BRIEN:
Q. Right.
MR. HENDERSON:
A. So at that time, we were looking at how we would deal with Hardwoods, and there were a number of different options that we looked at

Page 70

and the option that we had landed on, which was the one that could be done in a reliable manner to get it back as quickly as possible was to do with the generator - a new generator for Hardwoods that would be installed in the fall and put in service prior to the winter of 2013/2014. So that was the solution that was identified. It would not have been - at that point, the level of involvement of the Whitbourne crew, which ultimately got involved with this, was not known and it actually expanded quite a bit throughout that fall, that the amount of work that was required was much more than was anticipated, so the change occurred in the fall as to the amount of work that the Whitbourne crew was going to have to put into the project.
MR. O'BRIEN:
Q. I understood that's what you had said yesterday.
MR. HENDERSON:
A. Yes, and that's the way it was. As I said yesterday, when we went into the work on the Hardwoods unit, I wanted to make sure that we were on track to get our preventative

Page 71

maintenance done that fall, and I was assured that with the Whitbourne crew working on the Hardwoods unit, that we would be able to do that, so we went into that fall with that understanding. What did happen over that time period was that the Whitbourne crew were required a lot more to work on the unit and it ended up that in order to get that job done, they ended up deferring some of the maintenance that fall.
MR. O'BRIEN:
Q. I guess, my - I just wanted clarification, and I understood from Mr. Moore that some of this work sort of built up over time, but I got the impression from this order that in January you knew the Hardwoods work was going to be done. This application was filed in April, so in April - actually May 7th is the order date. So as of May, you know the Whitbourne crew is going to be tied up with some work in that fall, is that right?
MR. MOORE:
A. That's right, we knew they would have been -
MR. O'BRIEN:
Q. In the Hardwoods, right?

Page 72

MR. MOORE:
A. Somewhat involved with that project through the fall.
MR. O'BRIEN:
Q. And what I wanted to know is did you have a contingency plan at that point in time in terms of the preventative maintenance?
MR. MOORE:
A. At that time, we knew that the Whitbourne crew would have been involved with that project in the fall, but when we were doing our - looking at our annual work plan, and doing the analysis, and I know I was involved with these discussions as well with my managers, it still - you know, the numbers were - the planning was still showing us that we would still achieve the preventative maintenance that we wanted to get done that was on our schedule that year before December 1st, our winter critical date, but it wasn't until we actually got into the project in the fall and the demand on our resources far exceeded what we had planned, it was very late in the fall when we determined that we would need to re-prioritize some of our preventative

Page 73

maintenance into the next year.
MR. O'BRIEN:
Q. This work on the Hardwoods gas turbine, that's similar work to what was performed on the Stephenville turbine, is that right?
MR. MOORE:
A. Very similar. The Stephenville gas turbine was a rewind, the Hardwoods gas turbine was a complete generator replacement.
MR. O'BRIEN:
Q. And how long did the Stephenville one take?
MR. MOORE:
A. The Stephenville one took - I think it was around June, 2013 when that unit went back in service. It had failed the year before and through our engineering folks assigned a project manager to do the analysis of what was required to get that unit back in service, but that one was actually a rewind by the original equipment manufacturer on site as opposed to a complete alternator replacement.
MR. O'BRIEN:
Q. And how long did you figure the alternator replacement was going to take?
MR. MOORE:

Page 74

A. We knew that when that project started, the goal was to have it in service by December - December 1st would have been our target date for winter readiness for that generating asset.
MR. O'BRIEN:
Q. And when did you start it?
MR. MOORE:
A. I'm trying to remember the exact date when we started that.
MR. O'BRIEN:
Q. I think the application said for October.
MR. HENDERSON:
A. It was pretty close to the end of September.
MR. O'BRIEN:
Q. Okay.
MR. HENDERSON:
A. That the - at least the discussions that I had was late September regarding the work and making sure that we could do both through that fall.
MR. O'BRIEN:
Q. Yeah.
MR. HENDERSON:
A. Was in September, very late September in -

Page 75

MR. O'BRIEN:
Q. And your discussions, when did they occur, in the same time frame?
MR. HENDERSON:
A. My discussions?
MR. O'BRIEN:
Q. Yeah, in terms of whether or not you were going to get the preventative maintenance done?
MR. HENDERSON:
A. My discussion were then at the end of September or right - just as that job was about to start, there was discussions about what level of involvement the crew at Whitbourne was going to have in the project, and at that time we agreed to the level of involvement with the understanding that all of the PMs that were required to be done would be done.
MR. O'BRIEN:
Q. And was that Hardwoods gas turbine ready for December 1st?
MR. HENDERSON:
A. The Hardwoods unit ultimately was completed and put in service, I think, it was around the

Page 76

19th or 20th of December.
MR. O'BRIEN:
Q. Okay. Mr. Moore, you mentioned that in 2012, there were - and actually it got put in place, Mr. Henderson. You indicated the corporate - in terms of preventative maintenance targets, there was performance contract changes in 2013 for the regional managers, is that right?
MR. MOORE:
A. That's correct, yes.
MR. O'BRIEN:
Q. And was there any for executive? Like, say, Mr. Henderson, do you have a preventative maintenance target?
MR. HENDERSON:
A. I didn't at that time.
MR. O'BRIEN:
Q. And you've got one now?
MR. HENDERSON:
A. I do, yes.
MR. O'BRIEN:
Q. And that's the 100 percent target?
MR. HENDERSON:
A. It is the same across the company.
MR. O'BRIEN:

Page 77

Q. I wonder in terms of the regional managers then, is their target based on the preventative maintenance that's done in their area?
MR. MOORE:
A. That's correct. It would be based on the preventative maintenance steps required in their regional responsibility.
MR. O'BRIEN:
Q. In their particular area, okay, and do they have an overall corporate target for preventative maintenance as well, do they get a piece of that as part of their -
MR. HENDERSON:
A. They did not at that time.
MR. O'BRIEN:
Q. So at that time, would there be an incentive to them to assist with one of their crews doing work for the Whitbourne crew?
MR. MOORE:
A. It would not have been outlined, I would say, in their performance contract, but in the role of TRO, I mean, when we have the opportunity to move crews to different areas to assist with other crews for priority work, depending

Page 78

on the amount of work that's on their plate in their existing area and the priority of it, we do at times move crews from area to area to assist with jobs, and in particular, if we're doing a job and we want to try to shorten the outage to a customer, for example, we'll bring different crews in to blitz an outage type thing to help us reduce the outage time. Like, that might be an example when we would bring crews together, I guess, from different areas to work on projects.
MR. O'BRIEN:
Q. And is that your call to bring them in together or do the regional managers work that out?
MR. MOORE:
A. That's a decision I would be involved with. Certainly they're empowered to work with each other and work on the highest priority work for our customers, they're certainly empowered to do that, but I certainly would be involved with those discussions, depending on the project.
MR. HENDERSON:
A. I'll also mention in terms of the central

Page 79

region, that includes basically three offices. It would include the Whitbourne office, the Bishop Falls office, and the Stephenville office, so the manager responsible for that area had full flexibility -
MR. O'BRIEN:
Q. Had the ability to bring in those -
MR. HENDERSON:
A. He could move anybody around from any one of those areas. If you're focusing on the incentive, the incentive for him was his full region, which was the full of the central region which meant that to move crews around from Stephenville to whitbourne if necessary, which we have been doing. That would have been full - there would be incentives there for him to do that.
MR. O'BRIEN:
Q. For him to do that one way or another to get it done.
MR. HENDERSON:
A. Sure.
MR. O'BRIEN:
Q. It just wasn't done in this particular year, it wasn't priority to do it?

Page 80

MR. HENDERSON:
A. I think Mr. Moore went through the explanation of where the work was done in 2013.
MR. O'BRIEN:
Q. Mr. Moore, I asked yesterday about contractors. Does Hydro have any standing agreements with contractors to do certain work, is there anything like that, a contractor that can do work on a transformer or a breaker, are there any standing arrangements in place?
MR. MOORE:
A. At that time, there were no standing arrangements, not for maintenance work in terminal stations. We do have some other contracts that extend, like, say, for installing distribution poles. We have a contact that we renew year over year, so there are some examples. We contract out, for example, diving services.
MR. O'BRIEN:
Q. Sure.
MR. MOORE:
A. To do inspections, but at that time we did not have a standing contract in place for terminal

Page 81

station maintenance.
MR. O'BRIEN:
Q. Do you have one now?
MR. MOORE:
A. We don't have a standing contract right now, but we have utilized contractors in 2014, in particular, to assist with maintenance on transformers and air blast circuit breakers.
MR. O'BRIEN:
Q. And were those contractors -
MR. MOORE:
A. But not any longstanding agreements.
MR. O'BRIEN:
Q. Okay, were those contractors available in 2013?
MR. MOORE:
A. We were not aware if they were available in 2013, because as Mr. Henderson explained, as we worked through the Hardwoods gas turbine job and ensuring that we were going to be ready to have that unit in service in the winter, it was very late in 2013 when we did the analysis that we came to the conclusion that some of our preventative maintenance would have had to have been re-prioritized to

Page 82

the next year to take in account this higher priority work on our generation asset. So at that time, I'll say the time wasn't there to try to go to the market to see who may be available and actually get them in in time. There's also another solution when you have a shortage of resources could be to bring on contractor term employees, but that would have to go through a full recruitment process. They're not - I'll say they're not readily available to hire off the street when required.
MR. O'BRIEN:
Q. Had you ever hired contractors before for transmission work?
MR. MOORE:
A. We have hired contractors, but not that I'm aware of to come in and actually do maintenance in terminal stations.
MR. O'BRIEN:
Q. Okay.
MR. MOORE:
A. We've hired contractors to come in and help, for example, oversee maintenance in terminal stations. Like, we may bring in an original

Page 83

equipment manufacturer of an air blast circuit breaker to come in and work with our own internal crews to do an overhaul, for example, but we've never until 2014 that I'm aware of brought in contractors to do maintenance work in terminal stations.
MR. O'BRIEN:
Q. There's a document Mr. Johnson was going to put to you that I think I'm going to ask you a few questions on, and this is the Liberty Consulting Group Report of October 22nd, 2015.
MS. GLYNN:
Q. We'll enter that as Information 29.
MR. O'BRIEN:
Q. This is the October 22nd, 2015 report of Liberty Consulting regarding the March 4th, 2015, voltage collapse. I wonder, Mr. Henderson, if you could just give us a quick overview as to what had occurred on that day?
(10:30 a.m.)
MR. HENDERSON:
A. What occurred on March 4th really goes back to a problem that had been identified on Holyrood Unit 1 the previous week, in which there was a leak identified on the bearing that was - a

Page 84

bearing oil leak that appeared to be spraying oil onto the - it was on the number 5 bearing which is where the brush gear and everything for that unit is, so in monitoring that, it was identified that we needed to do an urgent repair on that. So at that time, the unit was taken offline to do that repair. It was planned to come off on the - it was a Friday, I'm not recalling the date, but basically with the unit to back on on March 3rd in the evening, so that was planned work to be done on that, have it back for that evening, and then what happened is it got delayed. Over the course of the evening of March 3rd going into the early morning hours of March 4th, the unit restoration was delayed and it did not get on in time for the morning peak of March 4th, and at the same time as part of our plan and looking at the capacity requirements on the Avalon Peninsula, the Holyrood combustion turbine, the 123 megawatt unit, was scheduled to be put on at 6 o'clock in the morning in anticipation of that morning peak to have it on so that we had that capacity, and that had been preplanned to be on for that time along

Page 85

with the Holyrood unit to meet full capacity requirements with reserve, but what happened is the Holyrood unit got unexpectedly delayed and then we had a starting failure on the combustion turbine which was the first failure that we had had on that unit. It had operated previously - on a number of occasions it had been brought on without an issue, but we experienced that and the crews there worked quickly to get the unit restored, but prior to it getting restored without the Holyrood unit 1 on and that combustion turbine, the voltages on the Avalon Peninsula declined rapidly and then, as I think Liberty has characterized it, it was a voltage collapse that occurred shortly after 7 o'clock on March 4th, which when the voltage collapsed, it dropped rapidly. We ended up having protection systems operate on the power system for low voltages, we had capacitor banks tripped at Come By Chance, and we had Unit 3 at Holyrood tripped off because of the low voltage. So with all of that coming off, we ended up with significant customer interruption that morning.

Page 86

MR. O'BRIEN:

Q. And I see at the bottom of page 3 of this report, there's a reliability analysis there, and Liberty has a number of points here. Liberty's discussions with systems planning and systems operations produced an understanding of the key conclusions that Hydro reached from these analysis, and it indicates - I'm wondering are these your conclusions, Hydro's conclusions, that it was well known the voltage was the issue of primary concern, that there was little concern for Monday or Tuesday even with Unit 1 off because the anticipated loads were not high enough to create the risk, is that fair to say?

MR. HENDERSON:

A. It is true that we understood there was a - voltage was a significant constraint on the Avalon Peninsula.

MR. O'BRIEN:

Q. And Hydro anticipated higher Wednesday loads, but had the assumption that Unit 1 would be back for the day's peak alleviated your concern?

Page 87

MR. HENDERSON:

A. Having that unit on as well as the combustion turbine, which would provide additional reserve on that day, would indicate that there was - we would be okay, and have significant reserve for that morning.

MR. O'BRIEN:

Q. And that the modelling - so this is systems planning and operations modelling indicated that a single contingency could have serious consequences should Unit 1 not return in time for the peak on Wednesday, is that fair that Hydro had come to that conclusion upfront?

MR. HENDERSON:

A. I'm a little hesitant because, I'll say, the serious consequences - I'll say it was understood that we would run into a low voltage scenario if we did not have the Holyrood unit on and also the combustion turbine start. That would have been known that we'd have low voltage. I would say that it was not widely understood the magnitude of significance that would have.

MR. O'BRIEN:

Q. When you say it was not widely understood, who

Page 88

would have understood it?

MR. HENDERSON:

A. Well, the system planning engineers who had done the load flow analysis would have understood where those limits were. In terms of identifying the level of customer impact and everything that happened that morning, I don't think was widely understood.

MR. O'BRIEN:

Q. Just the level -

MR. HENDERSON:

A. We certainly could have and should have made that more broadly known so that it was understood the criticalness of that morning.

MR. O'BRIEN:

Q. Okay, so the next comment underneath here, "The analytical techniques used by system planning and system operations appear to be adequate and to forecast correctly what figurations would and would not survive the forecast loads, therefore, system vulnerability in the event of Unit 1's non-return was known". That's fair to say?

MR. HENDERSON:

A. The vulnerability that if Unit 1 was not on,

Page 89

you were going to be - the CT was then the critical piece for sustaining reliable operation.

MR. O'BRIEN:

Q. And Liberty did not find any indication this vulnerability was effectively communicated. Who would have been responsible for communicating that?

MR. HENDERSON:

A. Well, that would have been communicated certainly from the system - well, I'll say it should have been communicated by the system planning engineers who had done that analysis to system operations and clearly identify the vulnerability of the system, so that it was understood the full vulnerability and then that would have then enabled a full response that we would put in place, such as that we do and have done with respect to system capacity issues.

MR. O'BRIEN:

Q. And Mr. Humphries, would you have been aware of that vulnerability?

MR. HUMPHRIES:

A. I was aware the analysis was carried out with

Page 90

both system planning and system operations, and I was aware that if we had - if these events had happened, we would have had a customer outage. Again to the extent of taking it down to a level of customers, those discussions were not had.

MR. O'BRIEN:

Q. With your group?

MR. HUMPHRIES:

A. Of the magnitude or significance, I think the limits were identified, people were made aware, and I think individuals both within system planning and system operations understood that, but the level of communications beyond that could have been more effective.

MR. O'BRIEN:

Q. And in terms of your involvement, were you aware that there was a vulnerability there yourself?

MR. HUMPHRIES:

A. I would have known if those events had have happened, there was a vulnerability, yes.

MR. O'BRIEN:

Q. So you knew that?

Page 91

MR. HUMPHRIES:

A. Yes.

MR. O'BRIEN:

Q. And you would have been aware that it was appropriate for systems operations to have been aware of that too?

MR. HUMPHRIES:

A. Yes.

MR. O'BRIEN:

Q. And the full extent of it?

MR. HUMPHRIES:

A. Yes.

MR. O'BRIEN:

Q. And are you satisfied that that was not the case?

MR. HUMPHRIES:

A. Well, I think from the perspective, it was not that - once these events started to materialize, obviously the level of communication should have been higher and the awareness should have been higher when we found ourselves in this situation that morning.

MR. O'BRIEN:

Q. And when you became initially aware of, I

Page 92

guess, the configuration which would have shown the vulnerability, what steps did you take to make Mr. Henderson aware of that?

MR. HUMPHRIES:

A. I think Mr. Henderson and myself and the planning people were aware of the importance of having these units back, both the Holyrood Unit and having the CT available, and I think from the perspective of when the events started to unfold through that night and morning, we were not aware of what was happening at the time.

MR. O'BRIEN:

Q. At the time.

MR. HUMPHRIES:

A. It wasn't communicated to us.

MR. O'BRIEN:

Q. It wasn't communicated to you?

MR. HUMPHRIES:

A. It wasn't communicated to me, no.

MR. O'BRIEN:

Q. How about you, Mr. Henderson?

MR. HENDERSON:

A. No, what happened, just to - I thought that evening is that I was concerned that we have

Page 93

Holyrood Unit 1 back and it was going to happen, so that evening I made a check to make sure that we were all on schedule to have Holyrood Unit 1 back on that evening before midnight, and that evening when I went to bed, I was told we're on track, we'll be on for midnight or thereabouts and that was good, so I - that was the last I heard until I got a call in the morning saying that we're having trouble getting the CT going.

MR. O'BRIEN:

Q. Okay.

MR. HENDERSON:

A. And at that time, what I did is I made sure that Mr. MacIsaac, because we had just come through the commissioning, to make sure that he had the right people out there to get that CT going, to find out what was going on, and then I proceeded to make additional calls, and actually from that point on, I wasn't off the phone until I got into work, you know, speaking to Newfoundland Power, speaking to others as that morning unfolded. That's sort of my time line from when I knew of the situation -

Page 94

MR. O'BRIEN:

Q. And in terms of your understanding of, I guess, your last discussion the night before, would you have been under the understanding that if this didn't get online, there was a risk of an outage and voltage drop?

MR. HENDERSON:

A. I was aware that in order to get ourselves into full capacity that we needed for the morning peak, and I'll say that my thinking at that time was primarily around the system capacity requirements. It wasn't - I wasn't thinking so much on the voltage issue as I was thinking about system capacity and having that unit on along with the - to ensure that we had sufficient reserve in the morning, you know, to stay out of any alerts and to make sure that we were in good shape for the next morning. I was generally aware of the voltage issue on the Avalon. I'll say from my years of experience, I knew that the Avalon voltage was a critical point that we had to ensure that we had generators on at certain levels, but I did not appreciate, and it wasn't conveyed to me that that morning's peak was

Page 95

one that would get us into a voltage collapse situation.

MR. O'BRIEN:

Q. It wasn't conveyed to you to that extent to that point?

MR. HENDERSON:

A. To that extent, no.

MR. O'BRIEN:

Q. Okay.

MR. HENDERSON:

A. And the focus was obviously getting the units on, and that's where my - it was my biggest, I'll say, having the full capability and reserves that we required for the morning peak.

MR. O'BRIEN:

Q. And was that conveyed to you, Mr. Humphries, would you have had the same understanding as Mr. Henderson?

MR. HUMPHRIES:

A. Yes, same understanding.

MR. O'BRIEN:

Q. Same understanding, okay. I wonder if we could turn to page 5 under the analysis and conclusion. I want to ask you a few questions

Page 96

about some comments here. Paragraph (a), "The primary root cause operating culture". Under that first paragraph, "There are many lessons to be learned from the March 4th events, but Liberty has determined one overriding root cause; the current operating culture at Hydro, which does not appear to have changed since our review of the January, 2014, events, continues to adversely influence Hydro's decision making and contributes to operational incidents". Now we've had a number of discussions about decision making throughout the course of this hearing. I wonder is it fair to say that there have been issues, continued issues, that have adversely affected Hydro's decision making?

MR. HENDERSON:

A. I would say to you that there's more work to be done by us to ensure that we are fully aware of situations and that the proper alerts and communications come out of the people who know the greatest knowledge of the technical issues of the system, fully communicate the impact that those issues that could have on customers, so that we're fully informed and

Page 97

ready to respond if there was an issue, and have the right resources in play to deal with those issues. So there is no doubt a lot of room here for us to improve that type of focus that we should have in the company.

MR. O'BRIEN:

Q. And Mr. Henderson, those are fairly strong words in terms of an overriding root cause being linked to an operating culture. What do you have to say about that?

(10:45 a.m.)

MR. HENDERSON:

A. Well, what I would say is that we have a very strong focus on reliability at Hydro. We have - our team, from everybody, I'll say, from the frontlines up are very focused on reliability, and reliability is a prime focus for us with respect to the work that we do each and every day, and our employees are committed to responding and bringing customers into service and avoiding or preventing customer outages. So to me, there's absolutely no doubt that we have a strong reliability culture, but I think there is certainly room to improve, so I want to emphasize to everyone here that Hydro and

Page 98

its team of dedicated people from lineworkers, electricians, P & C technologists, they are all absolutely committed to reliable service to our customers, but there are definite areas for us to improve, to be more aware of situations that can evolve so that we are in the best position to respond. We've made changes since January 2014. There's a number of things that we've done since then, and I think being aware of system capacity issues and risks are much more prevalent. There's daily discussions, we meet every morning looking at system capacity requirements, looking out seven days. This is a change that we implemented since January 2014 to ensure that there's full visibility of the urgency of different work that we're doing. There's been those types of changes. Since March 4th, we had a system peak that occurred, I'm going to say, somewhere around the 13th of March, and at that time we were - as a group, we were fully on top of the issue with a lot of communications people there just to ensure that everybody from - I'll say everybody working that day were fully aware of the

Page 99

situation and making sure that we're in the best position to respond to prevent any issues should they arise on that day of the peak. So we recognize the improvement that's required, agree with Liberty that improvement is required, and we're committed to doing that.

MR. O'BRIEN:

Q. Mr. Henderson, on March 4th, based on your testimony just a few minutes ago, and Mr. Humphries, I understood that neither or nor Mr. Humphries were aware of the significance of what could occur if this Unit 1 never got back up in time. Is that fair to say?

MR. HENDERSON:

A. That's fair to say that we were not aware of the significance that that could have that morning.

MR. O'BRIEN:

Q. Okay, and Mr. Martin in his testimony, and I want to ask you about this, Mr. Martin in his testimony talked about the importance of leadership and I asked him a question about whether leadership was important in a regulated utility and he said, "Leadership is important anywhere". That was his comments,

Page 100

and in general, it's important. I wonder whether or not you can comment on whether or not there was some oversight - there's still some issues with oversight in the operations department now. If you are not aware before you go to bed that night of the significance of what occurred, Mr. Humphries is not aware of the significance, is there an oversight or a leadership issue there?

MR. HENDERSON:

A. Well, I would say that I certainly needed to ask more questions that night to understand where we were. I should not have, in my view, accepted that everything would have happened and it was not clearly communicated back to the people at Holyrood that I need to know if anything is going off plan for that morning. There is also in terms of for me is asking the questions that I fully understand and it's clear to people that they need to inform, and that's my responsibility to ensure that people do know that they have that full accountability and responsibility to advise if there's vulnerabilities in the system where customer service can be impacted.

Page 101

MR. O'BRIEN:

Q. Okay, I wonder if we could stay on this page here, and the next paragraph, I want to talk you about this, "Liberty developed concerns about Hydro's operating culture early in its reviews of the January 2014 events. Initial conversations with Hydro personnel disclosed that Hydro did not view the need to shed load during the supply shortage as a particularly unusual event. Operators felt that they remained in sufficient control of the system and did not declare an emergency. Liberty's experience indicates the need to resort to rotating outages to compromise an exceedingly rare once in a career event. Many system operators never experience it. Further, when events begin to require special measures, caution dictates concern and a special preparedness for identifying contingencies that might take major sectors off or even the whole system down. Hydro's approach does not sufficiently consider such possibilities because the ability to shed even more load remains as the primary response". I want to ask you, and my question is really two parts;

Page 102

is Hydro's position at this stage that its customers should accept rotating outages and load shedding as part of Hydro's standard operating or planning practice; if so, can you tell me what other jurisdictions or utilities have that practice?

MR. HENDERSON:

A. I would say to you that that is not Hydro's practice, that is not Hydro's manner of operating. Having rotating outages is an exceptional event, one that I would never expect to have in my lifetime in my career. That type of thing was extremely unusual, and something that should - if you have it once, that should be the end of it. I agree with the rarity of it, and I disagree that that's something that we accept as being a normal practice. I think back in terms of the conversations that I had with Liberty at the start of the review, I think it came about from the under frequency load shedding which we experienced on our system, which is very unusual in the context of the greater North American grid, and that was something that we have accepted on our system. What we do is we

Page 103

work constantly and there's guidelines given to our operators to always maintain sufficient reserves to minimize the impact of an under frequency event, but the reality is operating an island system, you do have under frequency events and that's something that once we get interconnected, we look forward to that being something that would be a very rare event, but under frequency is something that every system has. It is used as a last ditch item to ensure that you save the system, if you like, don't cause a broader impact. So from that perspective, that would have been very unusual, I would agree, from Liberty's experience, and it's something that, I think, brought that conversation - because that conversation I had was around under frequency and that, but with respect to rotating outages, rotating outages is something that you avoid and you always do whatever you can to avoid that, and it's always been a focus and will continue to be a focus, but rotating outages is something that can happen if you get into very extreme unusual circumstances. What we had happen in January, 2014, should be

Page 104

an extreme circumstance that we should not see again.

MR. O'BRIEN:

Q. How about the load shedding we saw in March of 2015?

MR. HENDERSON:

A. So what happened in March, 2014, that one again from that standpoint, it was an event that the call was made to have rotating outages because we had lost so much generation on the Avalon, which was again an unusual circumstance from the standpoint that we got into a situation that, I'll say, we could have been much better prepared for, much more knowledgeable about, but once we got into the situation where you had so much happening, we had no choice that morning, but that's something that, I'll say, very much never want to see again.

MR. O'BRIEN:

Q. And in the context of - if we look back at planning for the purchase of the CT and the black start issue, we had a number of years there where you saw capacity issues creeping up on you, and do you see any concern there as

Page 105

being similar to having rotating outages, load shedding, and there being an operating culture at Hydro that outages are okay?

MR. HENDERSON:

A. Outages are not okay, and I don't think anybody is saying that we are saying outages are okay. I think what we're saying is the degree in which - of level of risk, if you like, in our system by the planning thresholds that we have established, the planning criteria we have, those by their very nature, there's no - in order to be a situation where you can have no outages, you have to add additional equipment to the system which comes at a cost, and what we have been doing over the years is establishing when to put in equipment, when our criteria - established planning criteria says when to do it. That's what we've been doing and that has been accepted within our jurisdiction as those are the planning criteria that we apply and we put in equipment when we get to the point that the criteria says you should have it, and it's done with - I'll say it has to be done with a level of urgency and making sure that you

Page 106

cover off risk and get those things in on time, and that's the manner in which our system has been operated. We can move the bar to a new level of having more reserve, having greater redundancy, and all those things, and we'd welcome that further discussion if that's where our customers would like to have those levels and improve them, we're for that, but we've been planning and using the guidelines that have been established and followed for many years for operating our system, and that's - to say that that's the ultimate, that's the best, we can always get better and we're certainly open to any discussions with our customers to look at what we might do to further improve, recognizing that there's a cost related to additional reliability improvements.

MR. O'BRIEN:

Q. And the last question I had, just in terms of leadership, we looked at the preventative maintenance piece over the last number of years and specifically, I guess, with respect to the transformers and the breakers, and for Mr. Moore testimony, it appeared to me that

Page 107

this catch-up program was something that was designed by a regional manager, it was something that had no direction from Mr. Haynes, and even from Mr. Moore's testimony there didn't seem to be an indication that Mr. Haynes was given an annual number as to where they were with their catch-up phase. Was there a leadership concern for you with respect to that maintenance piece, looking back on it now? To you, Mr. Henderson, yes.

MR. HENDERSON:

A. Oh, I'm sorry, you prefaced it with Mr. Moore, and I wasn't -

MR. O'BRIEN:

Q. I know, I'm sorry.

MR. HENDERSON:

A. Absolutely, there was -

MR. O'BRIEN:

Q. There's an oversight issue with that point, isn't there?

MR. HENDERSON:

A. There is an issue there of, I'll say, the operations folks making sure when they're aware of a situation, ensuring that anything that has that kind of reliability impact is

Page 108

well conveyed through the ranks to ensure that it has the right visibility. So each person in the company has a responsibility to ensure that, so communicating that, and that's precisely why we, I'll say, put in changes in terms of the level of monitoring that we do is to ensure that it has high visibility in terms of where we are in tracking our annual maintenance, and so it's -

MR. O'BRIEN:

Q. It goes up to the CEO now.

MR. HENDERSON:

A. It goes up to the CEO, and it's something that I have regular discussions on that progress because certainly it was a surprise in the sense that we were having as much difficulty in completing it, and once it was made aware, we made adjustments in our budgets and in our processes to ensure that we got that type of oversight going on.

MR. O'BRIEN:

Q. Okay, I have no further questions, Mr. Chair.

(11:00 a.m.)

CHAIRMAN:

Q. Okay, we will break.

Page 109

(RECESS)
(11:37 a.m.)
CHAIRMAN:
Q. Okay, we are back to continue.
JOHNSON, Q.C.:
Q. Thank you, Mr. Chairman, panellists, good morning.
MR. HENDERSON:
A. Good morning.
MR. HUMPHRIES:
A. Good morning.
MR. LEDREW:
A. Good morning.
MR. MOORE:
A. Good morning.
CROSS-EXAMINATION BY JOHNSON, Q.C.:
JOHNSON, Q.C.:
Q. I'm going to start off on the black start issue, and we've heard that essentially black start capability was established at Holyrood essentially from day one, would that be correct, when that facility got commissioned and underway?
MR. HENDERSON:
A. I don't know exactly when it went in, but I

Page 110

would expect that it went in when the plant went in, but I'm not sure.
JOHNSON, Q.C.:
Q. Yeah, early days?
MR. HENDERSON:
A. Early days.
MR. LEDREW:
A. Oh, yes, early days, yeah, in the 70s.
JOHNSON, Q.C.:
Q. And then we had it from those early, early days all the way up to March of 2010 when all of a sudden, or I won't prejudge it, but we've got a stop work order in March of 2010, is that right?
MR. LEDREW:
A. That's correct, yeah.
JOHNSON, Q.C.:
Q. And then as we've seen in the time line that Ms. Greene brought us through that was in the Liberty Report, it was under a stop work order from March, 2010, to February of 2011, when that gas turbine was ok'd for emergency use only, right?
MR. LEDREW:
A. Correct.

Page 111

JOHNSON, Q.C.:
Q. And then it became unavailable again January of 2012, is that right?
MR. LEDREW:
A. That's correct, yeah.
JOHNSON, Q.C.:
Q. And we've heard, and I guess you've confirmed, that the lack of Holyrood onsite black start capability actually, in fact, extended a power outage to a very significant number of customers by 11 hours by Hydro's calculations in January of 2013, that's correct?
MR. LEDREW:
A. That's correct as well, yes.
JOHNSON, Q.C.:
Q. And so this would have been in the height of winter in January, and in terms of the number of customers that were impacted by this, it's probably on the record, but do you know the number?
MR. HENDERSON:
A. I don't know the number. I can say that it was a significant number of customers, I can say that much, but I did go looking for it in the record and couldn't find it, and I asked

Page 112

some people and they did not have the numbers, they'd have to go to Newfoundland Power to get the numbers.
JOHNSON, Q.C.:
Q. Perhaps you could undertake to provide the numbers of customers who were impacted by that, is that okay?
MR. HENDERSON:
A. Sure.
MS. GLYNN:
Q. Noted on the record.
JOHNSON, Q.C.:
Q. Thank you. Now going back to this stop work order in March of 2010, who issued the stop work order?
MR. LEDREW:
A. It would be Provincial Department of Occupational Health and Safety.
JOHNSON, Q.C.:
Q. And how did they get involved to the point where they're issuing a stop work order?
MR. LEDREW:
A. Well, at the time we had oil leaks coming out of the gear box assembly on the unit and it was causing a smouldering condition on the

Page 113

back end when we would operate the machine.
JOHNSON, Q.C.:
Q. And how did it get to the point where Occupational Health and Safety became involved with that issue?
MR. LEDREW:
A. Well, we met with our local OHS Committee and went through the explanation of what we believed to be occurring with the machine and the various organizations we had in to try to alleviate it, but we could not successfully eliminate the - we could reduce it, but we couldn't eliminate the leakage that was occurring.
JOHNSON, Q.C.:
Q. So this is a worker committee at the Holyrood plant that's on this OHS Committee?
MR. LEDREW:
A. It's a cross-functional representation from the workers and the employer as well.
JOHNSON, Q.C.:
Q. So Mr. LeDrew, you would have been on that committee as the plant manager, I take it?
MR. LEDREW:
A. Yes, but I would be - I was a member on that

Page 114

committee, yes.
JOHNSON, Q.C.:
Q. And so for what period of time leading up to the stop work order of March, 2010, were these issues being brought forward for management?
MR. LEDREW:
A. We were going through a number of iterations and had brought in other third parties to assist us to diagnose the problem, and our own staff were working on trying to reduce the amount of leakage that was occurring there.
JOHNSON, Q.C.:
Q. But for what period of time had this been worked on?
MR. LEDREW:
A. Oh, I'd be guessing now. It would have to be - it would be a number of months, I'm quite sure.
JOHNSON, Q.C.:
Q. Would it have extended back into 2009, for instance?
MR. LEDREW:
A. No, I don't think.
JOHNSON, Q.C.:
Q. And so then was there a self-report to

Page 115

Occupational Health and Safety, the regulator, is that how it worked?
MR. LEDREW:
A. No. Well, in the main when you're trying to repair a piece of equipment, you're trying to repair it to put it back to a position that we've corrected the defect. We were unable to correct the defect through our own efforts and then we brought in external agencies to assist us, but we still were unable to correct the defect 100 percent, so the employees were expecting us to have it fully resolved and that turned out to be a much larger repair.
JOHNSON, Q.C.:
Q. Yes, so did the employees make a complaint to Occupational Health and Safety?
MR. LEDREW:
A. Well, there's two avenues. I mean, you can raise a concern to your committee member if an employee has a concern, so you can raise the concern with his co-worker who is a representative on the committee, and ask for resolve to the issue, or at any time you can call an outside inspector to come to the site and to do an impartial investigation.

Page 116

JOHNSON, Q.C.:
Q. So in this particular circumstance, what happened, how did the OHSA regulator come and get involved?
MR. LEDREW:
A. And I don't know if I can answer that because it's not a requirement for the inspector to tell me how they arrived on site, so they can show up at any time, called in or just wanting to do an ad hoc inspection, so I really don't have an answer for that.
JOHNSON, Q.C.:
Q. But do you know if you called them in?
MR. LEDREW:
A. No, I did not.
JOHNSON, Q.C.:
Q. And do you know if your management people at Holyrood facility called them in?
MR. LEDREW:
A. I would be doubtful that that would have occurred.
JOHNSON, Q.C.:
Q. And so, I take it, that it's likely that there was someone on staff, one of the employees, reached out, whether a member of the

Page 117

Occupational Health and Safety Committee, or another reached out to the Occupational Health and Safety regulator?

MR. LEDREW:

A. That or an ad hoc inspection as well.

JOHNSON, Q.C.:

Q. And, I take it, that the workers were actually concerned about safety issues, that's why it was brought to the table?

MR. LEDREW:

A. Yes, well, the concern was the smouldering that was occurring when we were running the unit and it would get worse as the unit was ran for an extended period of time, and we had done steps and trying to repair, as well as put emergency response techs on call and actually dispatched. So there was a number of corrective measures put in place to try to alleviate those concerns.

JOHNSON, Q.C.:

Q. When the stop work order came down, did Hydro have or you folks at Holyrood, management, did you have advance notice of the stop work order coming?

(11:45 a.m.)

Page 118

MR. LEDREW:

A. No, we would be - typically, they would come to site, do an investigation, speak to affected parties, and then normally come back and deliver - if it was a stop work order or a change request, they would normally hand deliver it to the more senior person at site on that day.

JOHNSON, Q.C.:

Q. And so what had transpired then in terms of them issuing that stop work order, had they come on site, did an inspection and then go back and come back with a letter, is that how it worked?

MR. LEDREW:

A. Yes, that's what happened, yeah.

JOHNSON, Q.C.:

Q. Okay, all right. Had this regulator issued stop work orders at Holyrood before?

MR. LEDREW:

A. Yes, there's been issues over the years in my tenure there managing the plant, there was occasions on various issues where those things would happen, yes.

JOHNSON, Q.C.:

Page 119

Q. Actually issue stop work orders?

MR. LEDREW:

A. There would be - well, it would be requesting - normally the activity that was causing the concern would be asked to be ceased. Other activities would continue, but that job would not proceed until various steps were put in place that was to the satisfaction of the department.

JOHNSON, Q.C.:

Q. So would it be true to say that these stop work orders, that would be a very rare event?

MR. LEDREW:

A. Oh, yes, I would - probably four or five in my 20 something years there.

JOHNSON, Q.C.:

Q. And then that stop work order, as we've heard, stayed in place for nearly a year up to, I think, February, 2011?

MR. LEDREW:

A. Correct, yeah.

JOHNSON, Q.C.:

Q. And then the AMEC Report, if we could turn to PR-PUB-002, and in particular - is there an attachment to this? Yes, Page III, up at the

Page 120

top. This report was issued in December 19th, 2011, and as we see it says up at the top there, "The existing GT generator should not be operated, started, operated, shutdown, except in an emergency situation, and in such emergency its operation should be", and I guess it should say, "should be observed remotely to ensure personnel safety. Fire from lube oil system gear box seals remains a possible safety issue. Catastrophic failure of the power turbine is a possibility". So even then when it got re-instituted and the Occupational Health and Safety regulator, basically they were saying you can do it only in emergencies, but you can't really test it and when you start it, stand back, is that pretty much it?

MR. LEDREW:

A. Yes, we wouldn't dispatch - you can start that gas turbine from the main control room in the power house, but our practice was to have an operator go out into the control room attached to the gas turbine itself, so this practice here now had us step back from the gas turbine itself and start from the main power house.

Page 121

JOHNSON, Q.C.:
Q. Okay, and so would you clear the yard and stuff like this when this was going on, or how would that work?
MR. LEDREW:
A. Well, it's a separate building from the main power house, if you've been to the site, so it's - we would have our emergency response techs outside the facility during that period of time when this condition was known.
JOHNSON, Q.C.:
Q. So that was a contingency that was put in place under the authority and say so of Occupational Health and Safety?
MR. LEDREW:
A. Yes, with the strength of that recommendation from AMEC that only in a very emergency situation we would run it, and that was generally thought to be a black start, not for a peaking purpose.
JOHNSON, Q.C.:
Q. I understand. So with this limitation that it should not be operated, started, operated, shutdown, except in emergency situation, were you allowed to still nevertheless test it for

Page 122

black start purposes?
MR. LEDREW:
A. No, we wouldn't test it. We'd only - at that point, it would only be operated if we actually required it for a black start.
JOHNSON, Q.C.:
Q. So that would be a departure then from the way that that gas turbine unit would have been open for testing, say, prior to the stop work order, you would have been able to test it, etc?
MR. LEDREW:
A. Correct, earlier in the process we were using it for both black start and peaking, and as the condition got known, that the availability of the machine was changing.
JOHNSON, Q.C.:
Q. Did you - have you ever seen in your years at Holyrood that type of limit put on equipment at the facility whereby, you know, it's a very carefully subscribed as to how you got to handle that piece of equipment in terms of only use it during emergencies, don't have anybody around?
MR. LEDREW:

Page 123

A. There are - our work permit system allows or provides for advisories on equipment and when you're starting equipment that has a known condition, so that happens on occasion, but I can't say it never happens, but it does happen on occasion where we would have somebody validate or verify the piece of equipment before you went ahead to start it.
JOHNSON, Q.C.:
Q. How did this gas turbine reach the point that you could only start it under these very carefully circumscribed conditions?
MR. LEDREW:
A. Well, the primary concern we were chasing was the presence of leaks coming out of the gear box, out of both ends of the gear box, and that was finding its way into hot surfaces that was smouldering the combustible product, so we were endeavouring to try to find a repair to the sealed arrangement on a gear box.
JOHNSON, Q.C.:
Q. Was this unit receiving regular preventative maintenance over the years?
MR. LEDREW:

Page 124

A. Yes, I think we filed in a previous RFI all the maintenance interventions that had happened over the years and the most recent history.
JOHNSON, Q.C.:
Q. But despite all the preventative maintenance, it arrived at that sort of sorry state?
MR. LEDREW:
A. Yes, the gear box itself was a very expensive and a difficult piece of equipment to remove. The building wasn't designed to take it out easily, so it meant dismantling the building to get the piece out, it had to be shipped to the US, and we were endeavouring to try to find a repair that was simpler to solve it.
JOHNSON, Q.C.:
Q. If I could go to page I of that AMEC report for a second. Scroll down a few more inches if you would, please. There you go, the assessment basis, and it indicates under assessment basis in the executive summary of AMEC, "A black start installation of 10 megawatts is required at the Holyrood thermal generating station site to ensure the capability of the Holyrood units to quickly

Page 125

return to service in the event of a major system failure", and Paragraph 2, "The black start capability must be maintained during any refurbishment or replacement. This particularly impacts the existing GTG refurbishment option since refurbishment of the existing unit may take an outage of months, during which another standby generation unit may be needed and its cost borne by the project", and then it goes on to talk about for the existing unit, the least cost, etc., and, I guess, these are actual statements of AMEC's observations, would that be correct?

MR. LEDREW:

A. Yes, that's their words, yeah.

JOHNSON, Q.C.:

Q. And these clearly appear to me to state that black start capability needs to be at the site, according to this assessment basis, would that be fair?

MR. LEDREW:

A. That's correct.

JOHNSON, Q.C.:

Q. And you're aware, I take it, that Liberty's

Page 126

reply evidence says that, "The decision to rely on the Hardwood CT as the black start resource was "plainly wrong". In other words, they're saying this is not even - this is not a close case, this is plainly wrong, and it would be your understanding that this is not something that's being judged in hindsight, right, this is saying, look, knowing what you knew about how black start is supposed to operate, it's not negotiable, it's got to be at Holyrood, is that right?

MR. LEDREW:

A. Well, you know, AMEC were brought in to look at the condition of the existing unit and it was their understanding - we did not ask AMEC to look at other potential options for black start other than looking at this unit and what we can do to restore it here at this site, so they didn't spend any time in that space to look at are there other black start models out there that we could entertain. That wasn't part of their scope of work.

JOHNSON, Q.C.:

Q. But they clearly say that a black start installation is required at the Holyrood

Page 127

thermal generating station site, right?

MR. LEDREW:

A. That's correct, yes.

MR. HENDERSON:

A. I would suggest that that's because we told them that what we require here is to have it at that site. That's part of what we would have given them in our direction to do this study is to establish black start capability at the site, so they were not asked - and it was no option given to them to say do it somewhere else, it was have it at the site and that's the manner in which the assessment was done.

JOHNSON, Q.C.:

Q. But would it be true to say that Holyrood during this period when there was reliance on Hardwoods, that Holyrood did not have the benefit of a black start resource or have black start capability when judged against standard definitions of black start, wouldn't that be true?

MR. HENDERSON:

A. We did not have black start at Holyrood, and that's - I agree that we did not have black

Page 128

start at Holyrood, but we did have an ability to and made sure we had an ability to start the Holyrood plant if we had a sustained transmission problem for the Avalon region so that we could get that plant up and running to supply customers in the Avalon region.

JOHNSON, Q.C.:

Q. But you didn't have black start at Holyrood, but you required black start at Holyrood, I put to you, would that be correct?

MR. HENDERSON:

A. Our intention was to have black start at Holyrood established, but we looked at an interim solution when we had this equipment problem, knowing that we had a combustion turbine coming - I think I went through this the other day, knowing that we had a combustion turbine coming, we looked at this and said that the least cost option was to go with bringing in the new CT and including with the new CT - putting it at the Holyrood site and including black start capability. So that was our intention was to reestablish black start capability at Holyrood with the new CT. We looked at it as an interim solution to have

Page 129

Hardwoods bridge the period of time to when the new CT was in. I think that's clear from our statements the other day.

JOHNSON, Q.C.:

Q. Well, while you're looking at interim solutions, as you call them, why didn't you look at the interim solution of putting some diesel units at Holyrood for black start?

MR. LEDREW:

A. The options that AMEC had put forward included a 10 megawatt diesel option, five 2 megawatt diesels, and at the time that was part of the consideration, and the consideration was that the - was the result of using Hardwoods as the bridge to when the new CT comes in.

JOHNSON, Q.C.:

Q. So using Hardwoods as the bridge, does that match up with how black start is actually supposed to work when you look at accepted definitions of black start? In this regard, could I turn you to page 54 of the Liberty Report. Liberty starts off at the top of page 54 saying, "Liberty found troubling the shift in definition of black start. Consider the North American Electric Reliability

Page 130

Corporation's definition of a black start resource, a generating unit or units and its associated set of equipment which has the ability to be started with", and they have underlined, "without support from the system", and then they go on to say, "The North Eastern Power Coordinating Council defines black start capability as the ability of a generating unit or station to go from a shutdown condition to an operating condition and start delivering power", and again emphasis added on these words, "without assistance from the electric system". So how do we square up using Hardwoods, even if it's interim, with meeting what's understood to be required for a black start resource?

MR. LEDREW:

A. I can repeat what I already said.

JOHNSON, Q.C.:

Q. It doesn't add up, it doesn't square.

MR. LEDREW:

A. No, what I'm saying is, is that what we had in place was the ability to restore customers on the Avalon Peninsula using Hardwoods and Holyrood as the interim measure until a new CT

Page 131

came in play. The AMEC report indicated that we could have other options in there in place in the spring, late winter, of 2013, and the decision made at that time was not to go with that solution, it was to go with one, which was to have Hardwoods bridge to 2015 and put in the new CT. Put the new CT in in 2015 to provide that onsite black start capability, which would fit this precise definition, but what we had done was looking at an interim solution. Given the fact that we had a facility that no longer could do the role, we looked at what are our options. The option was there to use Hardwoods, not giving the exact same capability of having an onsite one, I think we've been clear that we know that that's not the case, it didn't get the same ability, but it did provide a mechanism to deal with the types of situations that we had experienced which was sustained long term outages to the transmission system and being able to restore customer service. That was - you know, I don't think I can be any clearer. I think that that's what the case was the case here, we used Hardwoods in that manner to

Page 132

bridge that period of time until the new CT came in, and had it reestablish black start capability at Holyrood.

JOHNSON, Q.C.:

Q. Okay, so what you guys - I'm sorry, what you gentlemen settled on is a solution that, in fact, contrary to these definitions would have required support from the system, or would have required assistance from the electric system in terms of lines coming out from Hardwoods?

MR. HENDERSON:

A. I understand that, and -

JOHNSON, Q.C.:

Q. Right.

MR. HENDERSON:

A. What I'm saying - I'm saying we did not have it at the site, and I think that's clear, and we had intended to get it back at the site in 2015.

JOHNSON, Q.C.:

Q. So in your judgment, good utility practice would have permitted you on an interim basis to depart from accepted definitions of a black start resource?

Page 133

MR. HENDERSON:
A. We're not saying anything about the definition of black start. We made the decision that we would not have local black start at Holyrood for an interim basis until we had the new CT in place at Holyrood, and we were using Hardwoods as the interim solution to be able to restore the customers in the Avalon area for a sustained transmission outage.
JOHNSON, Q.C.:
Q. The discussion of crews that we've been having, just to put some meat around it for a few minutes, and I'm speaking now of the crews who were responsible for maintaining the 105 power transformers that we've been discussing, and the 60 odd air blast circuit breakers, and I take it there's four crews; there's one in Whitbourne, there's one in Bishop Falls, there's one in Stephenville, and there's one in St. Anthony?
MR. HENDERSON:
A. It's in Port Saunders, but it's -
JOHNSON, Q.C.:
Q. Port Saunders for the Northern Peninsula, that would make sense. How many power transformers

Page 134

would come under each crew in terms of responsibility for power transformers?
MR. MOORE:
A. Without going to the list, I guess, that we talked about there yesterday that we reviewed, I think there's a fairly equal allotment among the four crews.
JOHNSON, Q.C.:
Q. Okay, perhaps you could file that as an undertaking and I'd ask you, if you could, to file the same data as regards responsibility for air blast circuit breakers. Would that be possible?
MR. MOORE:
A. Yes, we could do that. We could define which air blast circuit breakers and which power transformers are assigned to which crews.
JOHNSON, Q.C.:
Q. Yeah, and show the numbers that each crew has.
MR. MOORE:
A. Yes, we can do that.
JOHNSON, Q.C.:
Q. Thank you.
MS. GLYNN:
A. Noted on the record.

Page 135

JOHNSON, Q.C.:
Q. Thank you, and how many individuals work on one of these crews?
MR. MOORE:
A. A typical crew, if I refer to, say, the Bishop Falls crew, normally you would have a frontline supervisor who's responsible for the electrical and mechanical crew, and that normally would be, I'll say, four journeyperson electricians, industrial electricians. There would be one, maybe two, what we call terminal maintenance "A", and they are responsible for operating some of the heavy equipment and assisting with the journeypersons. There may be one person with mechanical maintenance, say, journeyperson mechanic, and we would also have protection and control technologists in each area. So in Bishop Falls right now there's three to four protection control technologists, for example.
JOHNSON, Q.C.:
Q. Okay, so we'd be talking seven in total, plus the supervisor?
MR. MOORE:
A. That would be about right as an estimate.

Page 136

JOHNSON, Q.C.:
Q. And would each of the crews, no matter where they are around the island, would they have the same complement?
MR. MOORE:
A. Very close.
JOHNSON, Q.C.:
Q. So in that vicinity, okay, and when they're carrying out, for instance, this preventative maintenance, they're going as a unit, as a complete crew, right?
MR. MOORE:
A. Depending on the work order that they're assigned, some jobs require more person hours, shall we say, to complete than others. So depending on the job they're doing, there may be - the crew may be broke up and doing several different jobs in any given day, so it depends on the size and complexity of the job.
JOHNSON, Q.C.:
Q. Okay, so how about typically if they were going to do a six year planned preventative maintenance on a transformer, would they typically have the full crew complement for that?

Page 137

MR. MOORE:
A. You normally wouldn't need the full crew to do the six year PM on a power transformer.
JOHNSON, Q.C.:
Q. No?
MR. MOORE:
A. I can go look at the exact work order and get the exact details, but as a very close estimate, typically for a power transformer you would have two protection and control technologists, and two to three electricians, and the terminal maintenance "A" as I mentioned, which is the person who would operate, say, the truck and assist with the journeypersons to do that job. So you wouldn't need necessarily the full allotment or crew from that shop to do one transformer.
JOHNSON, Q.C.:
Q. And how about in relation to the six year planned maintenance - preventative maintenance on the air blast circuit breakers, the same?
MR. MOORE:
A. That would be roughly about the same size of a crew.
JOHNSON, Q.C.:

Page 138

Q. Okay. In addition to carrying out this preventative maintenance on the power transformers and air blast circuit breakers, I take it they'd also be responsible for doing the corrective maintenance?
MR. MOORE:
A. That's correct.
JOHNSON, Q.C.:
Q. And what other assets do they carry out preventative maintenance and corrective maintenance on?
MR. MOORE:
A. We're still just talking about the terminal's maintenance crew, right?
JOHNSON, Q.C.:
Q. Okay.
MR. MOORE:
A. Yes, okay.
JOHNSON, Q.C.:
Q. That would be it?
MR. MOORE:
A. They would be responsible for maintenance on all aspects within a terminal station, which would include in addition to air blast circuit breakers, there's other design breakers that

Page 139

we have. There's oil to operate circuit breakers, there's SF6 breakers, they work on disconnect switches in the station, they work on - they also do work at the Hardwoods gas turbine site, the Whitbourne crew would. So they'd do work on the gas turbine. Anything that's in the actual terminal station yard would be under their realm of responsibility for corrective and preventative maintenance.
JOHNSON, Q.C.:
Q. So whatever is in the fence, we'll say?
MR. MOORE:
A. Basically, yes.
JOHNSON, Q.C.:
Q. Okay, and do they have other duties? You mentioned Whitbourne crew would have some duties at Hardwoods. Would likewise the Stephenville crew have duties at the Stephenville turbine, is that right?
MR. MOORE:
A. That's right, they would do the operation and maintenance of the Stephenville gas turbine.
JOHNSON, Q.C.:
Q. Okay.
MR. MOORE:

Page 140

A. The Stephenville crew would do that.
JOHNSON, Q.C.:
Q. I just wanted to talk for a few minutes regarding this catch-up plan. If we could turn to page 39 of Liberty's Report, and Liberty has provided Table 8.1, and below is Table 8.2. We might not be able to get them both on the one time, that's okay - well, I guess we can. We're seeing there for 2010 right on through to 2015 the amount of projects planned, what was completed, etc, and just to give us a practical feel, how long in days on average does a six year transformer preventative maintenance regime take?
MR. MOORE:
A. To do the full six year PM on a power transformer, that would be on average anywhere from two to four days for the crew to do that work.
JOHNSON, Q.C.:
Q. Two to four, and how about the six year preventative maintenance on the air blast circuit breakers?
MR. MOORE:
A. That would be about the same, and subject to

Page 141

check if I wanted to go into our work order system and get the exact estimates.

JOHNSON, Q.C.:

Q. Okay, but in that vicinity.

MR. MOORE:

A. Yes.

JOHNSON, Q.C.:

Q. Okay, and if we were to look for the record as to the type of work that they would be doing on these six year preventative maintenance tasks, I think we would have to have regard to prudence, PR-PUB-20, Attachment 1, is that right, for the record, Mr. Moore?

(Gwen's first part)

MR. MOORE:

A. Yes, if we wanted to bring up the RFI, just to make sure?

JOHNSON, Q.C.:

Q. Yeah.

MR. MOORE:

A. Yes, that's correct.

JOHNSON, Q.C.:

Q. Attachment -

Page 142

MR. MOORE:

A. PUB-NLH-174 describes maintenance tactics that are completed in terminal stations.

JOHNSON, Q.C.:

Q. Yes, and that's in fact an attachment to PR-PUB-NLH-020?

MR. MOORE:

A. That's correct.

JOHNSON, Q.C.:

Q. Okay. So if we just go to page five of eight of Attachment 1? A little bit further, if we could. There you go. So, here we see the breaker six-year PM and it goes on for 15-20 lines, air blast conductor, timing, trip coil measurement, check auxiliary, all these various checks are set out there and if we go a little bit further to page six of eight, we see this is what the power transformer six-year PM would have consisted of. And that's what -- that's the task as that's assigned? Is that right?

MR. MOORE:

A. That's correct, yes.

JOHNSON, Q.C.:

Q. Okay. Now if we just could go back to Table

Page 143

8.1 for a second? And I was looking at Table 8.1 from the point of view of trying to get a sense of what it cost per six-year transformer maintenance and I see, for instance, in 2010 that you completed 15 at a cost of about $300,000. In 2011, completed 11 at a cost of 257. So would I be right that these generally fall into about a $20,000 per completed maintenance session? Would that be about right?

MR. MOORE:

A. Based on the numbers that we've provided there in the table, yes, or in the report there.

JOHNSON, Q.C.:

Q. Okay, and then I notice for the Table 8.2, for instance, in 2010 there was four completed at a cost of 45,000 and the next year, in 2011, three at a cost of 62,000, et cetera, you can go on. But by my quick math, these looked like they could come in somewhere between 10 and 20,000. Would that be typical?

MR. MOORE:

A. Looking at the numbers provided, yes.

JOHNSON, Q.C.:

Q. Okay. And that, would that include all labour

Page 144

and materials and that sort of thing?

MR. MOORE:

A. Those numbers, from my understanding, included basically the labour required to do -- and any materials required just to do that specific PM at that time.

(12:15 p.m.)

JOHNSON, Q.C.:

Q. Yes, okay. So just labour costs?

MR. MOORE:

A. And some material. Typically during a PM, there's very little material used.

JOHNSON, Q.C.:

Q. Right.

MR. MOORE:

A. What we typically do, if there's items found during a preventative maintenance inspection and corrective maintenance work is required, then we would actually initiate corrective maintenance work orders at that time and then any cost of material used for the corrective work that may be found is charged to a corrective maintenance work order.

JOHNSON, Q.C.:

Q. Right. And so would they do the corrective

Page 145

work at the same visit as they're doing the PM?
MR. MOORE:
A. They may or may not, depending on the nature of the work that's required.
JOHNSON, Q.C.:
Q. Okay. And I guess they could make an assessment as to how necessary it was to do that corrective or whether it could wait?
MR. MOORE:
A. That's right.
JOHNSON, Q.C.:
Q. But you don't -
MR. MOORE:
A. In consultation with their frontline supervisor and if necessary, you know, our engineering resources as well.
JOHNSON, Q.C.:
Q. Okay. I feel like we're neighbours looking over a fence here.
MR. LEDREW:
A. Tool time.
JOHNSON, Q.C.:
Q. Tool time, is it? Yeah. There you go. Thank you very much. Okay, so it's that

Page 146

preventative maintenance that would give them the insight as to how important and how urgent any corrective maintenance could be?
MR. MOORE:
A. The preventative maintenance tactic, yes, is the -- does give us an assessment of the condition of that asset.
JOHNSON, Q.C.:
Q. Yeah. Yesterday you described preventative maintenance as a foundational tool for customer reliability. Do you recall using that expression?
MR. MOORE:
A. Yes, I recall that.
JOHNSON, Q.C.:
Q. And just explain how you view preventative maintenance as being a foundational tool for customer reliability?
MR. MOORE:
A. To elaborate on that comment, our preventative maintenance program is our -- when we develop our plan to do maintenance and assess the condition of our assets to ensure that they provide reliable services to our customers, as a proactive means of assessing the condition

Page 147

of the asset and determining if any corrective maintenance is required on that asset. The preventative maintenance inspection gives us that assessment of that asset so we can proactively attend to anything that may be found during the preventative maintenance check and that is our primary tool that allows us to ensure that that asset operates reliably for our customers.
JOHNSON, Q.C.:
Q. So it gives you an opportunity, as you say, to be proactive?
MR. MOORE:
A. That's correct, yes. It's a preventative tactic.
JOHNSON, Q.C.:
Q. Okay. And so you'd have no trouble agreeing that preventative maintenance affords Hydro or affords in fact any utility the opportunity to identify and address equipment failure potential before they occur?
MR. MOORE:
A. That would be one of the purposes of preventative maintenance.
JOHNSON, Q.C.:

Page 148

Q. And I guess an added benefit, besides reliability, is that preventative maintenance can fend off perhaps more expensive corrective maintenance expenditures?
MR. MOORE:
A. That would be the hope when you do proactive maintenance, yes.
JOHNSON, Q.C.:
Q. Right. And I guess, I take it you would agree with me that getting behind on preventative maintenance, that would, by necessity, hinder the utility's opportunity to identify and address equipment issues?
MR. MOORE:
A. I would say that being behind on preventative maintenance, I agree, is definitely not where we want to be.
JOHNSON, Q.C.:
Q. Right.
MR. MOORE:
A. And as a result, back in 2009, the analysis was done and we recognized that in terminal stations, on terminal station equipment, we were not completing our six-year preventative maintenance cycles on time and there was some

Page 149

maintenance that was behind, so we made a decision to initiate a six-year recovery plan because we are committed to doing our preventative maintenance and proactively doing maintenance on our assets. That's not saying that higher priority work can't happen in a year that's been unforeseen that may cause you to reprioritize that preventative maintenance. But that's not what we want. But we did recognize what you're saying, that yes, it is our tool. It's our proactive tool and for that reason, we initiated a plan to be fully recovered at the end of 2015 because it is our primary proactive tool to assess the condition of our assets for our customers.

JOHNSON, Q.C.:

Q. So on the level of a foundational tool principle discussion, I take it you would agree that if preventative maintenance is deferred that by nature, it exposes customers to increased risks to their reliable service, right?

MR. MOORE:

A. I would agree when we do initiate a preventative maintenance cycle and made a

Page 150

conscious decision that a six-year cycle was what we would do for these PMs, any time we defer that maintenance beyond the six-year cycle, there is a level of risk -

JOHNSON, Q.C.:

Q. Yes, that's right.

MR. MOORE:

A. - that needs to be assessed and discussed when you make that decision.

JOHNSON, Q.C.:

Q. That's right.

MR. MOORE:

A. But now having said that, that only happens when we're faced with higher priority work that needs to be done for our customers. So it's not a risk that's taken lightly. It's a risk that's driven by a need of higher priority work that needs to be done.

JOHNSON, Q.C.:

Q. Whether it's taken lightly, it doesn't remove the risk or not, right?

MR. MOORE:

A. No, I would agree, there is some risk that needs to be evaluated when you make that decision.

Page 151

JOHNSON, Q.C.:

Q. So let's just go -- let's return then to the discussion on 8.1 because this is the catch-up plan that we're looking at here now. And if we look at your catch-up plan on the transformer six-year maintenance, I take it you would agree with me that by the time the first year of the catch-up plan is done, you're behind by three, right?

MR. MOORE:

A. Okay, we're back in 2010, year one?

JOHNSON, Q.C.:

Q. Right.

MR. MOORE:

A. Okay, yes, yeah, I see those numbers.

JOHNSON, Q.C.:

Q. Right. And then by the time the 2011 is over, now you're behind by nine, right, a total of nine?

MR. MOORE:

A. Okay, yes. Yes, I'm doing the math there. Yes, that's right.

JOHNSON, Q.C.:

Q. Yeah. And then by the time 2012 is over, now you're behind by 12, right?

Page 152

MR. MOORE:

A. There is some of that in the numbers. The math is not always that exact because I think when we talked about it there yesterday, going through some of the discussion on completion of maintenance, when Mr. O'Brien was asking questions, some of the completed in those years may not have been the assets that were planned because of different reasons. Like we used the example in 2013, we did the preventative maintenance inspection on Holyrood unit one because of the fault that that transformer was exposed to due to the January 2013 events. So, when we look at the number that were planned that year and the number that were completed, some that were completed may not have been the original ones that were planned that year.

JOHNSON, Q.C.:

Q. But you're not -

MR. MOORE:

A. For various reasons.

JOHNSON, Q.C.:

Q. You're not taking issue with Liberty's statement that's above the Table 8.1 that

Page 153

Hydro fell far behind its plan by 19 transformers at the end of 2013, right?

MR. MOORE:

A. No, we're not taking exception to that. That's right.

JOHNSON, Q.C.:

Q. Okay.

MR. MOORE:

A. I just wanted to explain the math a little bit clearer for that table, that's all.

JOHNSON, Q.C.:

Q. Understood. And then if we go down to the air blast circuit breaker six-year maintenance, again and then this is connection with your catch-up plan, by the end of 2010, you're behind by six because you had planned ten and there was four done?

MR. MOORE:

A. Right.

JOHNSON, Q.C.:

Q. And then by the end of 2011, you're behind by 14?

MR. MOORE:

A. That's right.

JOHNSON, Q.C.:

Page 154

Q. And by the end of 2012, you're behind by 18?

MR. MOORE:

A. Yeah, I'm following the math there.

JOHNSON, Q.C.:

Q. Okay. And by the end of 2013, you're behind by 20. So I take it, Mr. Moore, that you would agree that with each passing year, under this catch-up plan, more preventative maintenance is getting deferred. So I take it you would agree that electricity customers are being exposed to increasing risks to reliable service as time went on under this plan? Is that right? That's the way it was -

MR. MOORE:

A. I would not say that our customers were exposed to increasing risk as we went through this plan. It was recognized that through a six-year period, we need to be fully recovered on preventative maintenance for transformers and air blast circuit breakers, and I agree what the numbers in the table there are showing, but in each of those years, as we described yesterday, there was higher priority work that required the attention of our crews that caused us to have to reprioritize some of

Page 155

the PMs and there was a very considered decision to do that and very knowledgeable people who know the assets that made that decision.

We also talked about in each year -- we talked about the table in PUB-NLH-174 there a few moments ago. There's a very extensive maintenance program in our terminal stations each year that we have been completing, the monthly checks, the quarterly checks, the annual inspections. So we've been doing all the annual inspections to ensure that any risk to our customers is mitigated because we were in the middle of a six-year recovery program to get the six-year PMs back on track by the end of 2015.

JOHNSON, Q.C.:

Q. But Mr. Moore, I mean, what I asked you is that under this plan, we saw how the amount of preventative maintenance that you're behind on is actually growing in each year of the catch-up and I would have thought that it would be no point of dispute about the fact that while these numbers were growing, customers were being put at increasing risk to reliable

Page 156

service. Now you can talk about why the preventative maintenance wasn't done and other things overtook you, but from the point of view of reliable transformers and reliable circuit breakers, the risk for customers reliability was increasing. Isn't that correct?

MR. HENDERSON:

A. I'm just going to interject here for just a sec. If you look -- I'm not sure whether we're interpreting Table 8.1 and 8.2 correctly. I think if you go to PR-PUB-NLH-167, and this shows the number of air blast circuit breakers overdue relative to their six-year maintenance at the end of each year, and just because of the math you were doing was showing it growing, I wasn't sure that that was my understanding that it was growing, and if you look at this table here, if you look at 2009, there was 19 behind. In 2010, it was 17. In 2011, it was 20. In 2012, it was 20. In 2013, it was 21. So, there was more stability in the numbers, not to say that we weren't making the progress that we wanted to, just it wasn't growing. It was more --

Page 157

there was a little bit of progress in one year and then it levelled off.

And the other thing that's going on here that's not really evident in the numbers, and I don't think it's in the evidence, but each year, there was a selection of the most overdue chosen to be done and what's not here, and I don't know the answer to this, but just to say that the priority was given to the most overdue and there's also, these numbers don't mean like the 11 that were overdue in 2013 are the same, those 11 were still overdue in 2013. They could have been different transformers. So the amount of time past their due date should have been improving over this period of time and that evidence is not here, but it should have been because of that prioritization each year.

So, I just don't think we can look at the numbers and make some kind of assumption on increasing risk, but certainly it's indicating that we weren't making the improvements, in terms of getting on track, as we intended to. But, there's more behind the numbers that I think need to be sussed out before you start

Page 158

saying we're getting increasing risk.

JOHNSON, Q.C.:

Q. Okay.

MR. HENDERSON:

A. Just because the -- but those two numbers weren't adding up, and if I -- also go to PR-PUB-NLH-169 and this one shows the terminal station transformers overdue and it's 2009 was 23, 2010 was 18. So progress was made in 2010 relative to reducing the number. But then it just levelled off for three really, 18, 17, 17, and then in 2013, it made a significant increase because of the things that we talked about that happened in 2013.

So again, I just wanted to show that this is where the numbers were already done and I think -- I'm not sure why the two don't add up but this was the one to indicate the ones that were overdue.

JOHNSON, Q.C.:

Q. Okay. But I guess I take it that you would certainly agree that even by your approach to the numbers, we're certainly not seeing any improvement in terms of the numbers that you still have left behind?

Page 159

MR. HENDERSON:

A. I'm not -- I wouldn't -- I'm not disputing that. It was your comment that you were saying it was increasing and I just want to make sure that you saw this RFI where it showed it was more of a stable number until 2013 in particular on the transformers. The other thing that's going on here is each year there's a prioritization that's being done that should have been -- and that would have been picking up the most overdue, so that the amount of years past due should have been declining, but that was not a question asked or shown in an answer. So I don't know, I can't tell you that. I've been asking the question myself in trying to understand this, but I don't have that answer yet, but that should have been happening. So, to say we were having increasing risk, I just didn't want to leave that out there with that impression because that's not what I was seeing, other than 2013, I would agree was a big increase.

(12:30 p.m.)

JOHNSON, Q.C.:

Page 160

Q. If we look at Table 5.1 for a moment, and I had a question on this, and I think it's probably best handled by an undertaking. And that is, in relation to the overdue transformer maintenance and indeed Table 5.2, the overdue breaker maintenance, starting first with the transformer maintenance, in 2013, we're seeing that there's 27 that's listed for -- that's listed as overdue for maintenance, right?

MR. MOORE:

A. That's correct, yes.

JOHNSON, Q.C.:

Q. Okay. And I'd like to know how many of the 27 that were identified in 2013 were amongst the numbers reflected in each of the '07, '08, '09, '10, '11 and '12.

MR. MOORE:

A. Just want to -

JOHNSON, Q.C.:

Q. Would that be possible?

MR. MOORE:

A. Yeah, I just want to make sure I clearly understand the question. So, if we provided it, I guess, the 27 that's listed for 2013, so

Page 161

you'd want to know specifically what transformers they are and you're wondering the last time maintenance was done on those? Is that the question?

JOHNSON, Q.C.:

Q. No, what I'm looking for is to see how many of those 27, okay, were actually listed as being overdue in '07, '08, '09, '10, '11 and '12.

MR. MOORE:

A. Yeah, we have the data to be able to get you that answer.

JOHNSON, Q.C.:

Q. Okay, and the same for -

MR. MOORE:

A. I just wanted to make sure I was very clear on the question, that's all.

JOHNSON, Q.C.:

Q. And the same for the overdue breaker maintenance.

MR. MOORE:

A. Yeah, we can do that.

JOHNSON, Q.C.:

Q. Okay. thanks.

MS. GLYNN:

Q. Noted on the record.

Page 162

JOHNSON, Q.C.:

Q. Thank you. Now we understood from the discussion yesterday with Mr. O'Brien and again today that in 2008-09, there was a dedicated team looking at long term asset planning and then there was some arrival at a plan to catch up, right?

MR. MOORE:

A. That's correct, yes.

JOHNSON, Q.C.:

Q. Okay, all right. And then the plan was to catch up within the six-year period, and -- but I guess from this morning, are we to understand that the person who designed this plan was just Mr. Ireland? Is that right?

MR. MOORE:

A. He would have led the development of that plan, in consultation with our short term planning and scheduling team and the regional manager, our regional managers at that time that were accountable for these assets. So it would have been a consultive approach, but the long term asset planning team are accountable for I'll say setting the preventative maintenance program going forward. So his

Page 163

team would have led the development of the plan, in consultation with all concerned parties.

JOHNSON, Q.C.:

Q. Okay. So who was on the dedicated team?

MR. MOORE:

A. Who's in our long term asset planning group?

JOHNSON, Q.C.:

Q. Yeah, what positions?

MR. MOORE:

A. At that time or now?

JOHNSON, Q.C.:

Q. At that time.

MR. MOORE:

A. At that time, well Mr. Ireland was the manager of long term asset planning for generation and terminals, it was called at that time, and he would have had I'll say a plant -- an equipment engineer and two asset specialists.

JOHNSON, Q.C.:

Q. Okay. And so at what date was this six-year recovery plan settled upon and said this is the company plan?

MR. MOORE:

A. I don't have an exact date, but I do know it

Page 164

would have been late in 2009 because the first year of the plan would have been in 2010 and the direction that would have been given to the short term planning and scheduling group who developed the annual work plans would -- they would have been given the direction of what would have been needed in the 2010 annual work plan as year one of the six-year plan and it would have been, I'll say, laid out for the six-year period, but going into the 2010 year, the people who were setting and establishing the annual work plan would have known what was required to be placed into the plan that year.

JOHNSON, Q.C.:

Q. And did a document emanate from this dedicated team saying look, here's our catch-up plan? It's on a sheet of paper and here it is.

MR. MOORE:

A. Yeah, we actually documented that plan on a -- I'll call it a spreadsheet, showing what was required for each crew to complete in each year to achieve that plan.

JOHNSON, Q.C.:

Q. Okay.

MR. MOORE:

Page 165

A. And I don't remember now if we actually filed that as an RFI or not. I'd have to check.
JOHNSON, Q.C.:
Q. Maybe you could -
MR. MOORE:
A. I remember we actually had a copy of the plan when we were in discussions with Liberty and explaining how we were going to achieve success over the six-year period. So we discussed the plan at that time, but I'm not sure if it was actually filed, to be honest.
JOHNSON, Q.C.:
Q. Perhaps you could undertake to see whether it has been filed and if not, to file that.
MR. MOORE:
A. Yes, I can get you a copy of that. That's fine.
MS. GLYNN:
Q. Noted on the record.
JOHNSON, Q.C.:
Q. Thank you. And I take it that once that six-year plan got put in place by Mr. Ireland and the others, there was no adjustments made to that six-year plan. It stayed in place right up until the application to the Board in 2014?

Page 166

MR. MOORE:
A. There was no adjustment to the plan, I guess, that was mapped out at that time in the spreadsheet, but the adjustments actually would take place within our computerized maintenance management system. So, the preventative maintenance checks that would have been in the 2010 annual work plan would have -- the dates would have been set in our computerized maintenance management system, our JD Edwards system, for that year for the annual work plan.
JOHNSON, Q.C.:
Q. Yes.
MR. MOORE:
A. And then at the end of 2010, the actual completion would have been recorded for each work order. So progress of the plan was tracked through our JD Edwards system, but we wouldn't have adjusted the initial, I'll say, spreadsheet that was developed in 2009.
JOHNSON, Q.C.:
Q. Okay. And this plan, you referred to it as a considered plan, but I take it that there was -- in terms of reporting up the line in terms

Page 167

of progress to plan, it was left at a verbal type basis? Is that right?
MR. MOORE:
A. There was monthly reporting taking place of progress against our annual work plan.
JOHNSON, Q.C.:
Q. Yeah. And these are verbals, right?
MR. MOORE:
A. Yes, at that time.
JOHNSON, Q.C.:
Q. Run into somebody in the hall or call them up?
MR. MOORE:
A. No, no, it was part of the monthly reporting that we would be submitting at that time as managers.
JOHNSON, Q.C.:
Q. Okay.
MR. MOORE:
A. Now having said that, like we talked about now it's actually a weekly monitoring now against our annual work plan that gets reported right to the CEO level. But at that time, it would have been a monthly update like we talked about.
JOHNSON, Q.C.:

Page 168

Q. And how -- and again, there was no criticality guidelines as to when you could get pushed off preventative maintenance and something else trumped the work? There was nothing formalized like that under this plan?
MR. MOORE:
A. No, actually we do have our -- like work order priority is very well documented and the people that are -- our short term planning and scheduling group who develop our weekly schedules and our annual work plan and schedule the work for the crews do so based on work order priority and again, we talked about the preventative maintenance would have been starting with the most overdue first. That was given the highest priority. And if it was associated with a generating unit, it would have caused it to be of a higher priority. So there was a guidelines given and well known and well understood and talked about on a regular basis with the people that were developing the schedules and the people that were executing the work.
JOHNSON, Q.C.:
Q. And these guidelines, were these written down?

Page 169

MR. MOORE:
A. Work order priority is documented.
JOHNSON, Q.C.:
Q. Yeah, but the guidelines to come up with the work order priority, they weren't written?
MR. MOORE:
A. Yeah, our work order priority is well documented, what constitutes a priority one work order documented in our computerized maintenance management system and a priority two, three and four work order. They're well documented.
JOHNSON, Q.C.:
Q. Okay. But actual written guidance as to look, it's okay to defer this preventative maintenance on this breaker at this time?
MR. MOORE:
A. No, I won't say there's written guidance -
JOHNSON, Q.C.:
Q. No.
MR. MOORE:
A. - that describes that. It is a -- what happens is if -- like I explained, the only reason why we would talk about deferring preventative maintenance would be if an outage

Page 170

got cancelled, then we may reprioritize that to some other time in the same calendar year. But to cause a preventative maintenance activity to be pushed off to a future year or reprioritized to a future year, would only be done if higher priority work comes into the plan that was unaccounted for for our customers, and that would be a very deliberate discussion amongst the regional manager and the long term asset planning manager and the short term planning and scheduling and work execution people to make that decision. But to say they had a written document that told them how to go down through that decision making process, not at that time, no.
JOHNSON, Q.C.:
Q. Nothing like that, okay. And in fact, I think Mr. Henderson indicated as well that this plan that had been in place that this is something he said that probably only came to his attention in 2014, that Hydro was in this catch-up phase. So, you know, as I understand it, you know, Mr. Henderson, by this point, you're well ensconced into the role as VP of Hydro, but even at that -- you know, you're in

Page 171

2014 before you are aware that this catch up -- you were in this catch-up phase? That's what you said yesterday?
MR. HENDERSON:
A. That's right. I was not aware, that I recall, of it being brought to my attention. It was more around the focus of getting the annual maintenance done.
JOHNSON, Q.C.:
Q. Right.
MR. HENDERSON:
A. Which I didn't realize it included a plan for catch up.
JOHNSON, Q.C.:
Q. Right, okay. And it sounds like you -- from the discussion yesterday, that you'd have to do some investigation at the time, some digging, as to where you actually were at any one point in relation to the catch-up plan. Would that be fair?
MR. MOORE:
A. I'm sure if we characterized it that way. That's probably not quite clear. Like on a monthly basis, I was well aware of the progress of our annual work plan and where we

Page 172

were against preventative maintenance that was scheduled and preventative maintenance that was completed and that was part of our monthly reporting process. But as we talked about I think earlier this morning when we talked about the work at the Hardwoods gas turbine, it was really late in 2013 when we realized that the volume of work that our crews were going to be required to complete on that job versus what was initially planned to do earlier in the year was tremendous. I think something like 20,000 hours of work in all in 2013 that we documented.
JOHNSON, Q.C.:
Q. Right, okay. But now -
MR. MOORE:
A. But I was aware of progress of -- and did have regular discussions with my managers on, you know, how we were doing with completion of our annual work plan and our preventative maintenance program. But it was late in 2013 when we realized that we were going to be not as far along in the four-year plan that we would have liked to have been, which the numbers are showing here in Table 5.1 and 5.2.

Page 173

JOHNSON, Q.C.:
Q. But compared to the system now, as I understand it, the new system that you folks have for tracking where things are, I mean, that seems to almost be like a push of a button almost now, where you can see where things are. Is that right?
MR. MOORE:
A. It's not a push of a button. There's a report that comes to me and like we explained, right up to the CEO level, on a weekly basis, but it's generated from the actual annual work plans that each area is using to manage their work.
JOHNSON, Q.C.:
Q. Yes.
MR. MOORE:
A. So on a weekly basis, the people who track the annual work plan and schedule the work, our short term planning and scheduling group, they go in on a weekly basis and tabulate how far -- what's completed versus what's planned on a cumulative basis each week. And that report then goes through -- we have a person assigned that does the data analysis and generates the

Page 174

spreadsheets and then each area will get that curve showing actual to date compared to planned work to date accompanied with a report to indicate anything that was completed that week, anything that may have been scheduled but might have to get deferred to a future week, say a planned outage may have not -- because of weather reasons, we couldn't get the planned outage or whatever.
So the regional manager provides to me, on a weekly basis, that report of actual versus planned, what got accomplished, what was in the plan that may not have got accomplished and what the recovery plan is to make sure that that gets completed within that calendar year. So that comes to me on a weekly basis, but I wouldn't call it a push of a button. There's a fair amount of analysis that goes into that report on a weekly basis that by the time it hits my inbox, shall we say.
JOHNSON, Q.C.:
Q. And I used the wrong term of push of a button. But let me understand then, and you just outlined in some detail, helpful detail, as to

Page 175

the type of information that you are now getting on a weekly basis.
MR. MOORE:
A. Yes.
JOHNSON, Q.C.:
Q. At any one time prior to that system was brought in, how would you have gotten about getting that sort of overall assessment as to where we are, you know, almost on a real time basis?
MR. MOORE:
A. In order to do that at that time would have required the same kind of rigor and analysis, but it would require -- like the reporting we had in place back before then, shall we say, was a monthly report and that monthly report would come to me from my managers and indicate just on a number basis, the number of preventative maintenance activities that are scheduled for that year and the number that we've completed to date. And the corporate target at that time was to complete 90 percent of your preventative maintenance activities in a given year, and we've since -- obviously we've provided evidence that we've changed

Page 176

that target since to 100 percent.
But back then, we were managing to a corporate target of 90 percent completion of PMs and just based on numbers, I would know -- and those numbers would include that recovery plan. But they weren't separated to say that, you know, ten are recovery and 80 are not recovery. They were just the full PMs that were scheduled that year.
(12:45 p.m.)
JOHNSON, Q.C.:
Q. Right.
MR. MOORE:
A. And on a monthly basis, I would know how many we got completed and working towards a target of 90 percent completion in any given year. And since that time, we've come to realize that, as we just explained, more rigor is required around that and now down to a weekly basis tracking all work activities, accompanied with a report of anything that may not have got done and when it's going to be rescheduled for as a recovery plan within that calendar year. So the rigor around the reporting is increased tenfold.

Page 177

JOHNSON, Q.C.:
Q. And I would suggest to you that the quality of the information that you're now receiving, in terms of, you know, the insights that you could draw from the information sounds like it's improved.
MR. MOORE:
A. Yes, I would agree with that, yes.
JOHNSON, Q.C.:
Q. But I guess in any event, even before this was brought in, I take it that you're telling us that, Mr. Moore, and I take it you ended your role sometime in 2011?
MR. MOORE:
A. That's right. Midway through 2011.
JOHNSON, Q.C.:
Q. But you'd certainly be telling us that as at the end of 2011, you knew that you were behind on this catch-up plan, right?
MR. MOORE:

Page 178

A. At the end of 2011, the way the reporting was designed at that time that I was receiving on a monthly basis, I would have known what percent of our PMs we would have completed in 2011 and the direction would have been to develop the 2012 annual work plan based on that criteria of most overdue PMs first as the highest priority, to develop our 2012 annual work plan. So we went off in 2012 with that plan and there were a number of work items that we talked about that took us off plan in 2012.
JOHNSON, Q.C.:
Q. Yes.
MR. MOORE:
A. Such that we didn't achieve, a that time would have been our 90 percent target. I think it was something like 84 percent overall for TRO in 2012, I'd have to check the exact numbers, so based on those results, in 2013 we decided and we talked about this yesterday, and I discussed this with VP at the time that what we should do is clearly articulate the expectation for completing preventative maintenance in performance documents, right,

Page 179

in 2013.
JOHNSON, Q.C.:
Q. Right, and I understand and there's no need to repeat that, but I was just trying to say there was no two ways about it that at the end of 2011, you knew you were behind.
MR. MOORE:
A. I knew where we were to and what would be required in the 2012 annual work plan to work towards achieving our 2015 target, yes.
JOHNSON, Q.C.:
Q. And likewise at the end of 2012 you knew that you were behind, right?
MR. MOORE:
A. That's correct.
JOHNSON, Q.C.:
Q. And now you indicated yesterday that resources were, the resources that you had available were reflective of the operating budget approved for that particular region each year, do you recall that?
MR. MOORE:
A. That's correct, yes.
JOHNSON, Q.C.:
Q. And then you would develop an annual work plan

Page 180

based on the available resources, right?
MR. MOORE:
A. That's correct.
JOHNSON, Q.C.:
Q. And I take it that you did not--did you seek, I should ask you, did you seek more in the budget to make up the, you know, the fact that you were falling behind relative to your catch-up plan, did you look for further resources in 2012?
MR. MOORE:
A. No, we didn't look for additional resources until 2014, but I will say that in 2012 and 2013, when we developed the annual work plan, we allotted, with our existing resources, sufficient time or allocation in our annual plan to do what we needed to do as part of our preventative maintenance recovery program with an allotment or contingency for corrective maintenance work and an allowance for some capital and operating projects. So going into each of those years, 2012, 2013, our existing resources would have achieved a portion of our recovery plan sufficient to work towards the 2015 target. But what happened in 2012 and

Page 181

even more so in 2013, a higher volume of higher priority work got injected into the plan, which ended up taking us not as far along in our recovery plan as we would have liked, and it wasn't until 2014 and '15 that we identified the additional resources that would be required to get us to success by the end of 2015.

JOHNSON, Q.C.:

Q. And I guess likewise you gave no--so you didn't consider the need to bring on extra contracting help for 2012 or 2013, did you?

MR. MOORE:

A. Not in 2012 and 2013 because like I just explained, if we were able to achieve our annual work plan as laid out that year without the volume of break-in work that we seen, we would have been able to achieve a portion of the recovery in each of those years using our existing resources and within our existing budget, and that was our goal, to balance cost and completion of work within our deliberate plan that we set for 2010 to '15.

JOHNSON, Q.C.:

Q. Now when you managed to get or there was

Page 182

contractors brought in, as you've indicated, in 2014, right?

MR. MOORE:

A. That's correct, yes.

JOHNSON, Q.C.:

Q. To really get things moving along.

MR. MOORE:

A. Right, we had the time to go to the market and find a suitable contractor that could come in with the expertise to do this work on our terminal stations.

JOHNSON, Q.C.:

Q. Yes, so you didn't have the time prior to that to go to the market and look for these people?

MR. MOORE:

A. Like I explained, we didn't--it wasn't a consideration for 2012 and 2013 because if we were able to stick to plan without the volume of break-in work that we seen, there really wasn't a need to go to the market at that time and realization wasn't there until late in the year such that you wouldn't get the work done before your December 1st winter critical date.

JOHNSON, Q.C.:

Q. So tell us, in 2014 when the decision was

Page 183

taken to go and get help from contractors, how did you go about that?

MR. MOORE:

A. We did an analysis, I'll say the first quarter or winter/spring of 2014 and we looked at the data showing all of our power transformers and all of our air blast circuit breakers, the dates that we did the last preventative maintenance check and what would be required to complete the remaining work by the end of 2015. We did an analysis of asset criticality using a specified criteria that we outlined in the June 2nd, 2014 report that we submitted to the Public Utilities Board and we made a decision that based on asset criticality and what was still left overdue to be completed by the end of 2015, we went out and went to the market and got contractors to come in to do the most critical work--the plan was to do the most critical work in 2014 and then the remaining work in 2015, such that we would be fully recovered.

JOHNSON, Q.C.:

Q. Okay, and these contractors, would these contractors assisted in each of the office's

Page 184

regions, like the Bishop's Falls, the Northern Peninsula, is that how -

MR. MOORE:

A. Mostly in the TRO Central Region, Bishop's Falls, Stephenville and Whitbourne.

JOHNSON, Q.C.:

Q. Okay, so how many contractors were involved?

MR. MOORE:

A. When we went out to the market, we actually hired one contractor at the time, but I will say one but there was actually two. There was one contractor brought in to do the full preventative maintenance inspection on power transformers and we brought in another, I'll say contractor, but it was the equipment, the OEM, the original equipment manufacturer to come in and work with our own crews to do the remaining air blast circuit breakers or the critical recovery air blast circuit breakers that year.

JOHNSON, Q.C.:

Q. Okay, so the contracting firm, not the OEM support but the contracting firm, a local company?

MR. MOORE:

Page 185

A. No, they were a company from Alberta at the time.
JOHNSON, Q.C.:
Q. From Alberta?
MR. MOORE:
A. Yes.
JOHNSON, Q.C.:
Q. And so how many people did they send down here for this work?
MR. MOORE:
A. They sent down a crew, I'm trying to remember now, I think it was three to four people in a crew and one of our own internal employees went around with them as they did their work to make sure that, you know, for site safety and to ensure that the equipment was isolated safely and just to oversee the work activity.
JOHNSON, Q.C.:
Q. Are you saying that the Alberta company supplied three to four people?
MR. MOORE:
A. Yes.
JOHNSON, Q.C.:
Q. And that's what helped to clear up this backlog as quickly as that?

Page 186

MR. MOORE:
A. Well it would have been for the full maintenance season.
JOHNSON, Q.C.:
Q. Right, I see.
MR. MOORE:
A. So it's not just to come in and do one or two transformers, I mean they actually worked for the full maintenance season and worked some very extended hours beyond what I would call a normal work year for a crew.
JOHNSON, Q.C.:
Q. So did they work in conjunction with Hydro's own crews on doing the work or were they in a terminal station -
MR. MOORE:
A. They would have been assigned a specific number of transformers to do, but one of Hydro's employees would have been on site with the contractor to oversee their work, oversee the quality of the work, ensure site safety and ensure, like work protection permits were in place and that type of thing, right, like contractor oversight while they were in our terminal stations.

Page 187

JOHNSON, Q.C.:
Q. And were there a number of bids for this work?
MR. MOORE:
A. There were a number of bids, I can't remember the exact number right now off the top of my head, to be honest.
JOHNSON, Q.C.:
Q. Including local companies too?
MR. MOORE:
A. I'm trying to remember now, I'd have to go back and check the actual records to see who bid on the work at the time.
JOHNSON, Q.C.:
Q. And their performance, was it good?
MR. MOORE:
A. Yeah, they--we provided them the actual criteria and specifications as, you know, what's required to do this six-year maintenance cycle on our assets and say we had someone on site to ensure that they complied to the contractual arrangement so that they did the work in the same manner that we would, to the same specification.
JOHNSON, Q.C.:
Q. Now was there anything that was--was there

Page 188

anything there preventing Hydro from seeking additional resources to get caught up on the six-year program, you know, prior to when it made its application?
MR. MOORE:
A. I would say with respect to preventing, like to bring in extra resources would be extra costs beyond the budget that we're managing to.
JOHNSON, Q.C.:
Q. Right.
MR. MOORE:
A. So in keeping with our mandate of least cost reliable service, our plan that year would be each year of 2012, 2013 would have been to do that portion of that recovery plan in that year with our existing resources, within our existing budget. So to bring in extra resources at the beginning of the year, not knowing that the break-in work was coming, really would have been a decision to bring in more resources beyond your existing budget, so if there's anything, I'll say, that was preventing us from just going out and hiring more resources in any given year beyond our

Page 189

work plan, it would have been a decision to work beyond our least cost budgeting approach.

JOHNSON, Q.C.:

Q. But, you know, it's least cost consistent with reliable service, though, right?

MR. MOORE:

A. Yes, I agree, the balance is very appropriate.

JOHNSON, Q.C.:

Q. Yeah, okay. And if I could bring you to page 170 of the transcript yesterday.

MR. MOORE:

A. 170.

JOHNSON, Q.C.:

Q. Page 170, lines 2 to 6. You indicated, "It wasn't until moving it to 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." And before you go into that, I also want to bring you to page 194 and if you scroll up a little bit to get to the tail end of 193, Mr O'Brien is asking, "I'm wondering why you'd wait to go through this process, why not just make an immediate application to say, look, we're not getting this preventative maintenance done, we need to

Page 190

get it done now and put it in front of the Board as a separate application." And then you said, "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." And first of all, on the first statement, I have to query why you would have regarded that it was not until moving into 2014 that we could get to a point of seeking additional resources, I don't understand that.

(1:00 p.m.)

MR. MOORE:

A. Just to elaborate a little bit, we talked a little bit about the volume of work and in particular at the Hardwoods gas turbine in 2013, so it was very late in 2013 when we did the analysis that we realized that, you know, in order to get to where we said we were going to be by the end of 2015 that we're definitely not going to be able to do it with the existing resources that we have. There's going to be a need for additional resources in 2014 and '15 in order to achieve what we set out to achieve by the end of 2015. And that's

Page 191

when, well we went through the outages then in January, that's well documented what we went through in January, and from there we developed a plan with cost estimates and submitted it to the Board on June 2nd, 2014 for the extra resources that we felt we needed to get it completed by the end of 2015 what we set out to complete when we started the plan back in 2010.

JOHNSON, Q.C.:

Q. Well, the second statement that I brought you to, "Our opportunity to fully develop this application to the Board and put a strong case was well into 2014" and were you giving consideration to trying to get some resources? It sounds like you felt that you couldn't make the case, you couldn't have a clear shot at getting these resources until 2014, so was there discussions internally about, you know, what can we do here and someone saying, well, you know, we really don't have a case that's well screwed together to try to get these resources, it will have to wait. Was anything like that going on?

MR. MOORE:

Page 192

A. No, I wouldn't say that was going on and if the way I phrased it there, I may have misled you, I guess what I was trying to say was that it was really late in 2013 when we did the analysis and all the break-in work that came on our plate in 2013, I think the 20000 hours that I spoke of, it wasn't until that time, late in 2013, that we realized that we won't be able to achieve the remainder of our recovery program by the end of 2015. So the January outages came and from there, we developed a plan and proposal to the Board on June 2nd for what we would need for extra resources to achieve success by the end of 2015. So it's more of a--it wasn't until late in 2013 when we did the analysis that we realized that we're really not going to get there in 2015 without extra resources, but up until that time, our plans each year within our existing crews and budgets would have gotten us there without the break-in work that was coming against us in those two years.

JOHNSON, Q.C.:

Q. It sounds like there was a bit of a revelation at the end of 2013, which seems odd because

Page 193

you're not really keeping up with your plan by the end of 2012, by the end of 2011 either.

MR. MOORE:

A. No, and we realized that when we tracked the numbers, but it really wasn't until late 2013 and we did the analysis that it was understood that we're not going to get there by the end of 2015 without extra resources.

JOHNSON, Q.C.:

Q. Mr. Henderson, would you expect, because we had evidence earlier about budgeting guidelines and, you know, how these are sent out, would you expect in a circumstance where, you know, preventative maintenance is, you know, you're not meeting the plan, you've got this catch-up situation, would you expect there to be an obligation on the managers below to come forward and say look, here's the circumstance, you know, we're not meeting it, you know, the preventative maintenance is very important. We need to have a discussion about the ways and means of getting around this. Maybe it means applying for more money in an operating budget, wouldn't that be an expectation before leaving it to, you know, a

Page 194

realization at the end of 2013, say, in this instance, but just generally?

MR. HENDERSON:

A. Well in--what I can say is that was, not the specifics to a catch-up or recovery program, but what was the discussion in the fall of 2013 when we were putting forward the -- it was probably early fall 2013 when we were putting together the 2014 budget, those discussions were being had, what was required to get us on track with the maintenance and at that time there was a focus on some additional resources, P&C resources, there was additional planning resources to help with the work scheduling, so that discussion happened with respect to the 2014. So it was brought to me in the fall of 2013 by each of the managers indicating what they required to complete their annual work that they had ahead of them, and so that's what was put forward in the 2014 budget and 2014 test year. So yes, the answer is yes, I would expect them to come forward with that and what I experienced in that fall of 2013 was that, people saying we need some additional resources and we put forward that

Page 195

in the 2014 budget.

JOHNSON, Q.C.:

Q. And I guess looking at what we've seen because it was almost like, if I can put it this way, every year it almost seemed to be a hoping against hope that, you know, b'ys, you know, we'll get there, but then at the same time, from 2010 to 2015, you've got increasing capital budget projects that are putting a strain, that's correct, right?

MR. HENDERSON:

A. That's correct.

JOHNSON, Q.C.:

Q. And I guess would you, in looking at this now, Mr. Henderson, would you not agree that someone should have put up their hand earlier and said, guys, we're treading water here at best, this preventative maintenance is very serious stuff, we need to have a good chat about other resources that we can get deployed here or found here, would that not be -

MR. HENDERSON:

A. That would be the expectation and I would expect in each year in the budget process that's what each manager brings forward when

Page 196

they put forward their budget proposal is the indication of what they require to do the work that they're expected to complete.

JOHNSON, Q.C.:

Q. Yes, and in terms of like this least cost consideration, I mean, I'm getting the sense that the budget may have been wagging the reliability dog a little bit in terms of, you know, each year, you know, we've got to be careful, it's least cost. Do you care to comment on that?

MR. HENDERSON:

A. I guess I can't say what was all in the minds of the people who were approving the budget prior to me coming into the role, but that discussion of what was required was what the managers brought forward. Whether they brought that forward in previous years and it was said, no, do it with the resources you have and find a way, or how that discussion went, I can't say, so I can't make a comment to say that the budget was taking priority over reliability. I would say that at that time the belief was that the reliability would be taken care of with the budget that was

Page 197

approved.
JOHNSON, Q.C.:
Q. The Liberty Report, I can bring you there to page 26, the first full paragraph of 26 and I'm referring to your plan. They talk about Hydro formed a goal of accelerating work, it sought a pace that would place work and equipment, including transformers and breakers, like T1 and B1L03 back on schedule by 2015, this is the statement I want to discuss with you. Liberty says "Prudence required the adoption of a plan of this type." But they go on to say, "It also required, that is to say Prudence also required making substantial progress in reaching the plan's goal, but that did not happen before January 2014." Okay, and then they go on to say, "Hydro indicates that it deferred transformer and breaker maintenance to provide resources to address more critical issues. Failing to make progress reasonably in accord with plans for four years for this reason does not reflect good practice." Now, first do you agree that prudence in fact does require making substantial progress in reaching the

Page 198

recovery plan's goal?
MR. HENDERSON:
A. I would say that what was happening in each of those years is prudent decision making with regard to putting the priority on the work that was most necessary for a sustained reliable service to the customers and that was being done and that was the critical focus of our folks to ensure that the resources were placed on the items that were most critical, and they assessed and made decisions on that criticality based on their knowledge of the equipment and their knowledge of the condition and their experience.
JOHNSON, Q.C.:
Q. Okay, but I'm asking you very directly, Liberty says that prudence requires making substantial progress in reaching your plan's goal, because this is Hydro's catch-up plan, it's not anybody else's plan and they're saying this requires, prudence requires making substantial progress in reaching the plan's goal. They said that's a requirement of prudence. Do you agree?
MR. HENDERSON:

Page 199

A. I agree that ideally we should have been making better progress on that plan, but we had other things that came into play that required the attention of the team and the resources and that's the way they were redirected.
JOHNSON, Q.C.:
Q. And I'm not asking you ideally, I'm asking you is your assessment -
MR. HENDERSON:
A. I understand what you're asking and to me, prudence decision is going to be up to the Board to decide, I'm providing the evidence to the Board for their decision that we were working towards that, our team was making critical decisions throughout the year as to where to address the resources that they had and I think that that was a prudent course for them to be taking to making those decisions to get the most critical work done. It would be up to the Board to decide whether that was the right decision or not.
JOHNSON, Q.C.:
Q. Do you agree that Hydro's progress over the four years in question or do you believe, I

Page 200

should say, that Hydro's progress over the first four years of that catch-up plan, that that was reasonable? Do you think that that was reasonable?
MR. HENDERSON:
A. I think you have to look at all of the decisions that were being made at the time, weighing all of the items that had to be decided by the people who are responsible, on the frontline, looking after this equipment to make those decisions for critical reliable service to our customers.
JOHNSON, Q.C.:
Q. So is it your assessment that progress made by Hydro from, in 2010, 2011m 2012, 2013 on Hydro's catch-up plan, that that was reasonable progress?
MR. HENDERSON:
A. My assessment is that our desired progress was a lot better than that, but there was other things that came into play that required decisions during that time and we were not able to make the progress in terms of number of units overdue at end of year that we intended to and had set out to do.

Page 201

JOHNSON, Q.C.:
Q. I'm genuinely interested, Mr. Henderson, in finding out your position on this question and the question is a simple one. Do you believe that Hydro's progress in reaching its catch-up plan over those four years was reasonable?
(1:15 p.m.)
MR. HENDERSON:
A. I think it was reasonable in the circumstances that our employees and our engineers had to assess and what they had before them. I think they did as a reasonable job as they could with what they had before them.
JOHNSON, Q.C.:
Q. And you say "given what they had before them", what are you referring to?
MR. HENDERSON:
A. I'm referring to the work that was unforeseen that they had to address, the weather conditions that they had to address, the system outages that had to be scheduled, the manner in which those were scheduled, all of the items that the utility has to take into consideration in order to complete and schedule work. There's many variables that

Page 202

people had to take into account. It's not as simple as just take it out and fix it, you have to schedule it, you have to make sure you're doing it in a manner that has the least impact on customers, you have to address weather issues, you have to address a number of items when you're doing the work and they had all of that to face and they did as good as job as they could with the resources and the weather conditions, the outages they were provided and all of those considerations.
JOHNSON, Q.C.:
Q. Okay, and so Hydro have evidence from, other than itself, that would say or support the contention that Hydro's progress reflected good utility practice?
MR. HENDERSON:
A. We've put forward the evidence that we have to indicate what we were doing, the considerations that we had to take into account in order to execute that work and so what we have been endeavouring to do over the last few days is to show you the considerations that the people who are managing the system had when they were making

Page 203

the decisions to defer.
JOHNSON, Q.C.:
Q. If I can turn to the acetylene issue and Mr. Moore, you indicated yesterday that in terms of consideration of more investigative sampling would be the gas levels found. You indicated that you'd have, you would have gone back and done testing in early 2104, had it not failed. Do you recall that?
MR. MOORE:
A. That's correct, yes.
JOHNSON, Q.C.:
Q. And why would you have to wait until the winter and you know, there's more load going on then, it's, you know, I take it this would be a fairly critical transformer, why would you suggest that you wouldn't get to that until the winter?
MR. MOORE:
A. The most recent date of the test that we looked at was, I think it showed a level of 11 and we were tracking since back to the early '90s, but normally by the time we would have got that test result back and a recommendation from the testing facility and our engineer

Page 204

would have reviewed the test results and looked at it over time, that engineer then would have recommended doing an additional test, which would have required a worker order to be scheduled by one of the crew members or a crew to go out and do that test. So the reason I made that statement, just looking at how we normally would have assessed the test result and if there was a recommendation for a follow-up test, then that would actually be generated as a work order, get put into our maintenance plan, which would likely be, you know, sometime after the last test was done.
JOHNSON, Q.C.:
Q. And did you indicate that the acetylene was up at 11 parts per million?
MR. MOORE:
A. I'm just subject to check here, I'm talking about the last number that we provided, I guess because we provided all the data going back, every oil sample result on our transformers going back to when we started the program has been provided, so I'm going by memory now on maybe the last number that we talked about.

Page 205

JOHNSON, Q.C.:
Q. Well I believe that in fact it is 11, but you can take that subject to check that that was the last number and I take it did you understand that Liberty's report, their interim report to the Board, indicated that acetylene should not be greater than 2 parts per million. Are you aware that Liberty said that?
MR. MOORE:
A. I do know that somewhere in the report, I don't know if we want to go to the exact page.
JOHNSON, Q.C.:
Q. Yes, it's page 44 of their interim report. In that first paragraph under the topic "Transformer Fault Causes", they say in the last sentence, "Acetylene should comprise no more than 2 parts per million in the oil of a transformer. Internal arcing generates acetylene gas", et cetera. And what do you make of Liberty's finding in that regard, that it should not exceed two parts per million?
MR. MOORE:
A. I see it there and I know that Liberty actually documented in that report, like I

Page 206

don't know where the source of that number and the analysis behind that number and where that recommendation comes from. I do see the statement there. I will say what we've done, we've been taking our readings and doing the analysis going back to the early 1990s and we've been trending those readings and they've been constant within a band since the early 1990s, and we went to our original equipment manufacturer and got a consultative opinion on this transformer and their recommendation at the time was that--or their opinion at the time was that the source of the low levels of acetylene gas that we've been seeing on a constant basis since the early 1990s, are in all likelihood coming from the tap changer compartment where we explained yesterday normal levels of acetylene gas happened because of the nature of how a tap changer operates, so we were--our action, I guess, on the levels of gas that we've been seeing in that transformer for decades would be to--and was, to talk to our equipment manufacturer and get their expert opinion on the levels that we have been seeing in that transformer and what

Page 207

may be causing that, and their recommendation was to continue monitoring. Now the last reading they suggested that we go back and take another sample just to verify the results, which our equipment engineer would have looked at the readings, looked at this recommendation and ensured that the crews would have gone out and done a follow-up sample which didn't get to happen because the transformer failed on January 4th, 2014.
JOHNSON, Q.C.:
Q. Yes. A couple of moments ago you alluded to the fact that the level of acetylene gas had been stable within a certain band for a number of years.
MR. MOORE:
A. Yeah, it's not the exact number every year, but I'll call it a ripple if you want to call it that.
JOHNSON, Q.C.:
Q. Right, understood. Had it gone up to 11 parts per million?
MR. MOORE:
A. I think it has, I'd have to look at the exact numbers and that data is in the June 2nd, 2014

Page 208

report to the Board.
JOHNSON, Q.C.:
Q. Okay.
MR. MOORE:
A. We can look at the exact data. I do remember one year it was 10 and like I mentioned, our equipment manufacturer indicated that these levels are, in their opinion, is coming from the tap changer compartment and the monitoring that we've been doing was their recommended course of action and at some planned opportunity we could go in and do a test to validate that that is actually happening.
JOHNSON, Q.C.:
Q. Mr. Chairman, would there be a vehement objection if we closed now and started tomorrow morning bright and early.
CHAIRMAN:
Q. Absolutely.
Upon conclusion at 1:26 p.m.

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 29th 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 29th day of October, A.D., 2015

Judy Moss

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