Q. Black Tickle Diesel Plant: Please provide all analyses performed of the risks of delay due to the securing of materials and equipment required to address the consequences of the Black Tickle diesel plant fire.

A. The risks associated with delay in securing material and equipment to address the consequences of the Black Tickle diesel plant fire were discussed and reviewed in various meetings held between Transmission and Rural Operations (TRO) Management personnel. On June 1, 2012, a meeting was held by TRO Management in which it was decided to refocus efforts to restore Black Tickle to its pre-fire condition. This decision was made after evaluating the current operating environment, with a focus on ensuring the mobile gensets would not be required to operate during the winter months. The severity of the risk of operating the mobiles during winter was increased after the 225 kW mobile that was sent to site as part of the initial response failed on May 12 due to suspected snow exposure after a significant snow event.

The lead time required, and relatively short shipping season, for delivery of major components in order to have commissioning complete before a major snowfall were Hydro's primary determinants that the project must proceed with no delay.

It should be noted that alternative options were considered to address the consequences of the fire. The use of portable generation throughout the winter was considered to allow for the possibility of pursuing alternatives such as: restoring the plant to pre-fire condition; restoring the plant to pre-fire condition with improvements; building a new plant to current Hydro standards; and building a new plant with consideration for a modular design.

Additional details on the analysis of the alternatives, and the ultimate decision to move ahead with the restoration to pre-fire condition can be found on page 10 of the report titled *Black Tickle Diesel Fire Restoration Project* submitted to the PUB on April 1, 2013, as a response to the letter requesting a detailed report in relation to the Black Tickle fire restoration project dated January 3, 2012. This report is attached as PR-PUB-NLH-018 Attachment 1.

In summary, the risks associated with this project were reviewed and discussed in initial project meetings, and ultimately a decision on the final project scope and timelines was based on the experience of Hydro's Operations and Engineering personnel.

A REPORT TO
THE BOARD OF COMMISSIONERS OF PUBLIC UTILITIES

Black Tickle Diesel Fire Restoration Project

Newfoundland and Labrador Hydro

Update - April 2013

newfoundland labrador hydro
a nalcor energy company

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1 Introduction

On September 27, 2012, Newfoundland and Labrador Hydro (Hydro) filed with the Board of Commissioners of Public Utilities (the Board) an application for the restoration of its $1,000,000 Allowance for Unforeseen Items amount for 2012. The need for this supplementary allowance arose from the unforeseen requirement to make emergency restoration and begin permanent restoration of diesel generation in the community of Black Tickle, as a result of a fire that occurred in March 2012. Attached to that application was a report on the project to restore the Black Tickle diesel plant.

The Board issued, and received responses to, 13 requests for information on this matter. On January 3, 2013, the Board issued a letter requesting a detailed report in relation to the Black Tickle fire restoration project addressing:

A. The use of the Allowance for Unforeseen Items in the circumstances, setting out:
    i) The length of time it would have taken Hydro to prepare an application for approval of a supplementary capital expenditure in relation to the restoration of permanent generation;
    ii) The serious negative consequences that would have developed if the application was filed; and
    iii) Evidence demonstrating that the delay was not possible.

B. System planning for the Black Tickle plant following the fire and closure of the fish plant, setting out:
    i) Updated load forecasts for 2012 to 2015;
    ii) Considerations surrounding the drop in forecast load as a result of the closure of the fish plant and system capacity;

iii) Whether there were other short-term solutions, such as portable generation, that would allow sufficient time for full consideration of alternatives in relation to the restoration of permanent generation;

iv) available alternatives for the restoration of permanent generation, including the installation of generation with capacity more closely matching forecast load and the installation of fire suppression equipment; and

v) Potential issues and concerns in relation to the gap between capacity and load and the lack of a fire suppression system with the restoration of the plant to pre-fire condition.

This report addresses these issues.

2 Black Tickle Fire and Plant Restoration

The fire at the Black Tickle Plant occurred on March 14, 2012 and immediate efforts were focused on the safe restoration of power to the community. To that end, a serviceable unit was used to restore power, and another dispatched from Bishop's Falls. Upon the restoration of power, work began to ensure that reliable and safe power could be delivered to the community on a more permanent basis. By March 26, three units were in service, albeit on a temporary basis.

At the same time, Operations and Engineering resources were mobilized to determine the requirements to restore the plant to its pre-fire condition. The requirement to restore the plant to its pre-fire condition was based upon the knowledge and experience of the professional engineers, managers and others involved as to the approximate time it would take to complete work to achieve that level and the questionable reliability regarding operating the mobile generating units in Black Tickle in the winter months. It was determined that if further upgrades were desired, it would likely make it next to impossible to have them completed in time to serve the Black Tickle load over the next winter. At this same time, it was evident to Hydro's staff, based upon their experience with the operation, overhaul and refurbishment of 22 (including Natuashish) diesel plants, that the lead time for delivery of some of the compromised components would make it a challenge to restore the plant to permanent operability before winter conditions made some work impossible.

Knowing that temporary generation would be required to support the load in the community while permanent work was being completed, Hydro considered the available options for mobile generation, and secured the units which were readily available.

By the end of April, the first preliminary estimates had been received with respect to the required Protection and Control (P&C) work. Within a few days, there was an announcement

that the fish plant in Black Tickle would not resume operations. Hydro regrouped to determine the implications of the revised load.

The complete scope of work for the restoration of the plant documentation was first available for review in June of 2012 – five months before the plant restoration had to be completed to meet the winter load. The entire cost estimate was first available at this time. It was clear, based upon the expertise of Hydro personnel, that work needed to proceed immediately to ensure that reliable and safe permanent generation to Black Tickle would be available before the end of the shipping season and the start of winter.

Hydro began the restoration of the plant, and on September 27, 2012, submitted to the Board an Application regarding its Allowance for Unforeseen Items amount and a report on the events at Black Tickle. Work proceeded with major portions of the work being completed as follows:

- Switchgear (all three units) rebuild - July 9 to Oct 10;
- Generator (G2) Refurbishment - Aug. 16 to Oct 31;
- Procurement of G1 and G3 engine replacements - Aug. 16 to Oct. 31;
- Gensets G1, G2 and G3 fully installed and commissioned - Nov. 26; and
- Mobile gensets removed - Nov 29.

It is apparent that there was little time for delay in the restoration work to meet the winter load and return the mobile diesels. Hydro is now preparing its submission to the insurer for proceeds payable under its policies.

A The use of the Allowance for Unforeseen Items in the circumstances, setting out:

i) the length of time it would have taken Hydro to prepare an application for approval of a supplementary capital expenditure in relation to the restoration of permanent generation;

An estimate of stringent time frames to complete such an application is shown in the table below, with detailed information following the table.

Item No.	Dates	Description
1.	June 9, 2012	Preliminary scope of work and budget prepared
2.	June 15, 2012	Scope of work and budget agreed upon by team areas
3.	June 15, 2012	Additional data prepared for inclusion in report
4.	June 22, 2012	Regulatory/ Finance review concluded
5.	June 29, 2012	Leadership Review
6.	July 4, 2012	Application filed

1. As was stated in response to PUB-NLH-13, the first draft of the Unforeseen Item Report was available on June 9, 2012. One may consider this the initial scope of work and budget estimate for restoration of the plant. It should be noted that at the same time this work was being prepared, portable temporary generation was being acquired, and operational issues related to the temporary repairs were being handled. Many of the same people were required for each task. The areas of responsibility required to participate in the capital-related detailed work were:
   - General Manager, Transmission and Rural Operations (TRO),
   - Long-Term Asset Planning (LTAP), TRO,
   - Operations and Work Execution, TRO,
   - Mechanical Engineering,
   - Protection and Control Engineering ,

- Civil Engineering, and
- Electrical Engineering.

2. As was stated in response to PUB-NLH-13, the second draft of the Unforeseen Item Report was available on June 15, 2012. One may consider this to be the agreed upon scope of work and budget estimate for restoration of the plant.

3. There would be additional data to gather to meet the requirements of the Capital Budget Guidelines. It is assumed, for this estimate, that this work would have been completed simultaneously with Item 2 above.

4. The Regulatory and Finance review would consist of review of content and project justification to ensure compliance with Capital Budget Guidelines and accounting requirements.

5. The Leadership Team review would consist of a high-level analysis of the project scope, justification, and budget.

6. The reasonable time for an application to be filed, given statutory holidays.

It is not possible to determine exactly how long the preparation and approval of a supporting report for an application for approval of the $2.7 million (before insurance proceeds) estimated to be expended to restore the Black Tickle plant. The specific personnel required to be involved may not have been available each time they were required, adding an inestimable amount of time to any submission.

ii) the serious negative consequences that would have developed if the application was filed;

The serious negative consequence Hydro was attempting to avoid was leaving the community of Black Tickle without least-cost, reasonably safe and reliable power during the harsh winter months experienced in coastal northern Labrador. This consequence could have resulted from the processing time inherent in a capital approval filing. Constraints were outlined in Hydro's response to PUB-NLH-6, and included:

- The winter unreliability of the mobile diesels which were available on an emergency basis to provide temporary reliability to the community, as indicated by the in-service failure ;
- Lead times on items which were required for the restoration; and
- The availability of ferry service to deliver items at a reasonable cost, compared to the alternatives.

iii) evidence demonstrating that the delay was not possible.

There is no empirical evidence to provide with respect to Hydro's concern that any delay could result in the community of Black Tickle being without power during the winter. Hydro's experienced staff, with their own knowledge and anecdotal evidence, considered the risk to the community of Black Tickle too high to warrant a delay in any reasonable step of the restoration while awaiting completion of another step. For instance, parts needed to be ordered when the need was clearly identified, without awaiting preparation of the entire scope of work or cost estimates.

Summary

Hydro gives careful consideration to the use of its allowance for unforeseen items. While hindsight may reveal that a component was, in fact, received in time for it to have awaited Board approval, the decision made at a point in time was based upon experience or knowledge

which indicated such a delivery could take much longer. For example, the ferry may stay in service in one year longer than another, but Hydro has to consider the worst case when planning such a critical job. In this case, Hydro's staff believed and continues to believe, that winter power supply in Black Tickle plant would have been at great risk if it had not proceeded with the work on an emergency basis, using the allowance for unforeseen items as approved by the Board for such emergencies. While the total proposed cost exceeded the $1,000,000 allowance, Hydro noted in its original report that insurance proceeds were likely, and it is still expected that the total cost will be reduced by insurance proceeds once its insurance claim is settled.

B System planning for the Black Tickle plant following the fire and closure of the fish plant, setting out:

i) updated load forecasts for 2012 to 2015;

Hydro's Spring 2012 Load Forecast for Black Tickle

		2012	2013	2014	2015	2016	2017	2018
Black Tickle								
	Gross Peak (kW)	269	268	266	262	257	253	249
	Net Peak (kW)	247	246	244	239	235	231	227
	Gross Energy (MWh)	1,177	1,172	1,162	1,141	1,121	1,101	1081
	Net Energy (MWh)	1,092	1,088	1,078	1,060	1,041	1,022	1003
	Total Sales (MWh)	977	973	964	947	930	912	895
	Company Use (MWh)	39	39	39	39	39	39	39

ii) considerations surrounding the drop in forecast load as a result of the closure of the fish plant and system capacity;

The fire occurred on March 14, and at this time the plan was to utilize an XQ 1000 (1000 kW) unit and an XQ 500 (500 kW) unit that were available from Toromont Cat. Due to the load requirement with the fish plant forecasted to run, and an attempt to match the generation more appropriately with the load, the plan was to use the XQ1000 unit in Port Hope Simpson and relocate a Hydro-owned 600 KW mobile unit (that was then in service at Port Hope Simpson) to Black Tickle. A charter vessel was sourced at a cost estimate of $100,000 to move the mobiles into Black Tickle, but when it was announced on May 2, 2012 that the fish plant was not opening, it was decided to send the XQ1000 back to Toromont and exchange it for another XQ500 unit. The plan was then to have the software changed on both XQ500 mobile units to operate as 320 kW prime power units. This was completed to better match the new estimated peak, with the assumption the fish plant will not reopen in the future.

With the progress in getting two of the existing units running at the plant, and the fact the fish plant was not going to start up, it was decided to continue to operate the plant in a repaired mode, and delay the shipping via a charter and save the majority of the $100,000 charter cost. The plan was then to install the two 320 kW portable units once the shipping season began in June/July timeframe to facilitate the refurbishment of the plant.

For the restoration solution, there was insufficient time to procure equipment to match the new load forecast, and as a result the concentration was on restoring the existing assets.

iii) whether there were other short-term solutions, such as portable generation, that would allow sufficient time for full consideration of alternatives in relation to the restoration of permanent generation;

The option of using portable generation throughout the winter of 2013 was considered to allow for the possibility of pursuing other alternatives such as:

- Restoring plant to pre-fire condition;
- Restoring to pre-fire conditions with improvements ;
- Building a new diesel plant, using Hydro's latest plant design (similar to the plant in St. Lewis); and
- Building a new plant with consideration for a modular design.

It is also important to note, in all alternatives with the exception of restore to pre-fire condition, the scope included fire protection being installed.

The original concentration after the fire was on the emergency restoration of power and the preparation of the estimate to restore the plant to its pre-fire condition. This estimate was a priority to enable Hydro and its insurer to understand the extent of an insurance claim. The first draft of the estimate to restore to pre-fire condition was completed on April 27, 2012 and on May 1, 2012 there was a meeting held with Operations and various

engineering discipline leads to discuss the alternatives, as stated previously. From May 9-11, 2012 a team of Operations and Engineering staff developed the scope for each of the options in preparation for a Request for Proposal (RFP) to consultants to obtain an estimate for each option and prepare a recommendation for the permanent solution. On May 12, 2012 the portable diesel unit that was sent in from Bishop's Falls had its generator fail, due to being buried in a significant amount of snow – a weather event which is normal for this area. Prior to issuing the RFP, the regional management in the Labrador region expressed strong concerns over operating portable diesel units in the harsh environment in Black Tickle, the very short construction season, and the need to have the plant operational prior to the shipping season ending. This concern resulted in further discussions and a decision to move forward with the option to restore Black Tickle to its pre-fire condition, and have the plant operational without the use of mobiles prior to the next winter season. The concerns expressed by regional operation staff about the challenges of providing power to Black Tickle via portable units were confirmed when both of the new, portable diesel units supplied by Toromont experienced generator failures as well. Fortunately, when the last unit failed, there was a unit in the plant fully commissioned and able to support the community load.

iv) <u>available alternatives for the restoration of permanent generation, including the installation of generation with capacity more closely matching forecast load and the installation of fire suppression equipment;</u>

As stated in above, alternatives were considered but due to the concern of operating the portable diesel units in the harsh climate of Black Tickle, the best option to ensure reliable service throughout the following winter (winter of 2013) was to restore Black Tickle to its pre-fire condition. Fire protection was being considered in all other alternatives, but due to space requirements in the plant, and the need to focus on getting the plant functioning prior to the shipping season closing, it was decided to defer the fire protection and include it as a separate future budget proposal.

v) potential issues and concerns in relation to the gap between capacity and load and the lack of a fire suppression system with the restoration of the plant to pre-fire condition.

Due to the strong concerns of ensuring that reliable power could be restored to Black Tickle prior to the winter of 2013, there was a conscious decision made to proceed without consideration of the short falls of generation not matching the future load and no fire suppression being added. If it is determined the fish plant will no longer operate (under any ownership) into the future, the configuration within the Black Tickle plant can then be modified to better match the load, in accordance with Hydro's planning criteria. With respect to fire suppression, it was decided to plan its installation with a separate future capital budget for installation of fire protection systems in diesel plant on a priority basis, utilizing a risk ranking tool presented in a 2012 Hatch report on Diesel Plant Fire Protection.