

DELIVERED BY HAND

February 5, 2015

Board of Commissioners
Of Public Utilities
P.O. Box 21040
120 Torbay Road
St. John's, NL A1A 5B2

Attention: G. Cheryl Blundon
Director of Corporate Services
and Board Secretary

Ladies and Gentlemen:

Re: The Board's Investigation and Hearing into Supply Issues and Power Outages on the Island Interconnected System

A. Enclosure

This correspondence is in response to the Board's letter of January 9, 2015 requesting a submission from Newfoundland Power (the "Company") in relation to The Liberty Consulting Group's ("Liberty") *Report on Island Interconnected System to Interconnection with Muskrat Falls Addressing Newfoundland Power* (the "Liberty Report"). In its follow up letter on January 22, 2015, the Board requested Newfoundland Power to address each of Liberty's conclusions and recommendations in the Company's submission.

Each of the conclusions and recommendations outlined in the Liberty Report are addressed in the enclosed *Response to Liberty Consulting Group Final Conclusions and Recommendations* (December 17, 2014).

B. General Observations

Liberty's assessment that Newfoundland Power's overall engineering and customer operations conform to good utility practices is accurate. Further, the conclusions in the Liberty Report are generally sound. Finally, Newfoundland Power accepts that Liberty's recommendations appear reasonable in the circumstances. These recommendations will be fully assessed by the Company.

Most of the recommendations in the Liberty Report are aimed at improving the reliability of Newfoundland Power's electrical system. The Company has mature reliability management systems and practices. These systems and practices have evolved over time to better respond to



the specific operating environment in which Newfoundland Power delivers service to its customers.

Newfoundland Power has achieved significant improvement in its electrical system reliability performance over the past decade or so. This improved reliability performance, and the costs to achieve it, have been the subject of continuing regulatory oversight of the Board. Reliability performance has been a prominent focus of Newfoundland Power's annual capital budget and general rate applications.

Newfoundland Power accepts that electrical system reliability performance can be further improved. The recommendations contained in the Liberty Report may contribute to cost effective reliability improvement for Newfoundland Power. Newfoundland Power intends to assess these recommendations within the context of its existing reliability management framework and report to the Board on the results of this assessment in a manner similar to the recent past.

We trust that the enclosed and foregoing are found to be in order.

If you have any questions please feel free to contact the Company.

Yours very truly,



Peter Alteen, QC
Vice President,
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Enclosures

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**Response to
Liberty Consulting Group
Final Conclusions and Recommendations
(December 17, 2014)**

February 5, 2015

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1.0 Introduction

In early January of 2014, electricity customers on the Island Interconnected System experienced power outages, some of which lasted for extended periods of time. As a result, the Newfoundland and Labrador Board of Commissioners of Public Utilities (the “Board”) initiated its “Investigation and Hearing into Supply Issues and Power Outages on the Island Interconnected System (the “Investigation”).¹ Newfoundland Power Inc. (“Newfoundland Power” or the “Company”) and Newfoundland and Labrador Hydro (“Hydro”) were named as parties in the Investigation.

To assist with the Board’s Investigation, the Liberty Consulting Group (“Liberty”) was engaged to provide expertise into the events and circumstances surrounding and leading up to the January 2-8, 2014 period. Liberty has also been engaged to examine long term reliability issues after the integration of the Muskrat Falls project.² To date, Liberty has provided its (i) *Supply Issues and Power Outages Review Island Interconnected System Interim Report* (the “Interim Report”); (ii) the *Report on Island Interconnected System to Interconnection with Muskrat Falls addressing Newfoundland Power* (the “Final Report”) and (iii) the *Report on Island Interconnected System to Interconnection with Muskrat Falls addressing Newfoundland and Labrador Hydro* to the Board concerning reliability matters on the Island Interconnected System.

Liberty submitted its Interim Report on April 24, 2014, which focuses on the causes of outages and the identification of measures that Hydro and Newfoundland Power could take to mitigate the risk of outages prior to Muskrat Falls interconnection. Liberty’s Final Report, submitted on December 17, 2014, assessed the adequacy and reliability of Newfoundland Power’s electrical system up to interconnection with Muskrat Falls. The Final Report addressed immediate term actions to address reliability for the 2014-2015 winter season, and identified opportunities for ensuring reliability of service in the longer term.

Liberty’s Interim Report included recommendations for Newfoundland Power which the Company observes to be reasonable. Liberty’s Final Report addresses Newfoundland Power’s progress with the Interim Report recommendations and includes a series of additional conclusions and recommendations for the Company. Newfoundland Power’s response to these additional conclusions and recommendations is contained in this report.

2.0 Liberty Final Report Recommendations

There were a total of 13 recommendations for Newfoundland Power in Liberty’s Final Report in the areas of planning and design, asset management, power system operations, emergency management, and customer service and outage communications. The Company observes that the intent of these recommendations is to provide opportunities for Newfoundland Power to improve its service to customers.

¹ The Board divided the Investigation into two separate phases. Phase 1 involves the immediate reliability issues for the Island Interconnected System prior to interconnection with Muskrat Falls. Phase 2 involves reliability issues post-Muskrat Falls interconnection.

² The Board and Liberty have not yet reported on reliability issues after the integration of the Muskrat Falls project. These matters will be addressed following the Board’s review of the January 2-8, 2014 outages and short term reliability concerns.

2.1 Response to Recommendations

Newfoundland Power's initial assessment of Liberty's Final Report recommendations is provided below. As some of the recommendations concern similar subject matter, it is convenient for them to be assessed collectively by Newfoundland Power.

Electrical System Reliability

Liberty Recommendation 2.1

"Increase the emphasis on the Rebuild Distribution Lines initiative in annual capital budgets, with the goal of reducing distribution equipment failures."

Liberty Recommendation 2.2

"Perform a structured evaluation of the costs and benefits of reinstituting a regular annual program for addressing worst performing feeders."

Liberty Recommendation 2.3

"Develop a weighted analytical scoring of criteria process to support capital planning; include in this a scoring criterion that relates expected project costs to avoided numbers of customer interruptions or minutes."

Liberty Recommendation 2.4

"Investigate the installation of downstream feeder reclosers for the purpose of improving distribution SAIFI and SAIDI indices, in addition for reducing cold load pick up difficulties, with priorities given to feeders based on installation costs versus anticipated avoided customer interruptions."

Newfoundland Power reviews electrical system reliability data, assesses the condition of electrical system assets, and evaluates equipment performance on a continuing basis. The results of these efforts are used in the development of cost effective means of managing overall electrical system reliability. They also provide a basis for the estimates of cost and system benefits that justify the Company's reliability focused capital expenditures.³ These expenditures, including cost benefit justification, are reviewed annually by the Board.⁴

Newfoundland Power accepts that Liberty Recommendations 2.1, 2.2, 2.3 and 2.4 are aimed at improving the overall reliability performance of Newfoundland Power's distribution systems. It is the Company's intention to fully evaluate these recommendations, including their cost effectiveness, within the existing reliability management framework described in the previous paragraph. The results of the assessment of these reliability focused recommendations will be provided as part of Newfoundland Power's continuing reporting to the Board, commencing with the Company's 2016 Capital Budget Application.

³ The reliability focused capital expenditures submitted by Newfoundland Power may be of a recurring or a more specific nature. For example, annual capital expenditures on the Company's distribution systems are routinely made under the *Rebuild Distribution Lines* and *Reconstruction* projects. An example of specific or more specific distribution capital expenditures would be the Company's *St. John's Underground Distribution* project which concerns the distribution system serving the commercial core of the city of St. John's.

⁴ In addition, Newfoundland Power's general rate applications provide the Board with evidence related to the Company's overall electrical system reliability performance.

Asset ManagementLiberty Recommendation 3.1

“Unless it can show that fungus and insect infestation does not occur on its wood poles, Newfoundland Power should reconsider the need to treat its transmission poles for fungus and insect infestation, as does Hydro.”

Liberty Recommendation 3.2

“Consider conducting “sounding” tests on all older distribution poles (not just those obviously rotted) when inspecting feeders; reconsider chemically treating distribution poles to extend their lives.”

Newfoundland Power will assess the deterioration presented by fungus and insect infestation in wooden poles in its service territory. This assessment will be used to determine what changes, if any, are warranted in the Company’s existing wood pole maintenance practices. The results of this assessment will be provided as part of Newfoundland Power’s continuing reporting to the Board.

SCADA and Outage ManagementLiberty Recommendation 2.7

“Centrally report multiple device operations.”

Liberty Recommendation 4.1

“Include in the specification for the new SCADA system the ability to turn an operator console into a formal training system simulation console for instruction and evaluation.”

Liberty Recommendation 4.2

“Consider including a short-term forecasting application, if possible, when it replaces its current SCADA system.”

Liberty recommendations 2.7, 4.1, and 4.2 are within the scope of Newfoundland Power’s existing capital project to replace its existing SCADA system. Development of specifications and vendor selection for this project is currently underway. The Company intends to incorporate the capabilities described in these Liberty recommendations in its procurement process.⁵ This will permit a full assessment of costs and benefits associated with recommendations 4.1 and 4.2.⁶ The results of this assessment will be provided as part of Newfoundland Power’s continuing reporting to the Board.

⁵ It is possible that capabilities such as centrally reporting multiple device operations will not form part of the SCADA specification but will be included in Newfoundland Power’s planned Outage Management System replacement which Liberty has indicated should improve the effectiveness of system operations (see Conclusion 4.6). At this stage, the Company will ensure that the capability to centrally report multiple device operations will result once existing plans for SCADA, the Geographic Information System and Outage Management System are fully complete.

⁶ The capabilities described in Recommendation 2.7 are commercially available and incorporated in the Company’s existing plans for SCADA, the Geographic Information System and Outage Management System.

Documentation and Procedures

Liberty Recommendation 2.5

“Document protective relay scheme objectives, criteria, and methods for protecting transmission lines, buses, and distribution feeders.”

Liberty Recommendation 2.6

“Conduct circuit breaker operation tests from relays (so called trip checking) on a periodic basis to assure that all relay trip circuits and circuit breakers operate as intended.”

Liberty Recommendation 7.1

“Include in the System Restoration Manual a section delineating actions for the loss of supply to its system, such as occurred in January 2014.”

Newfoundland Power agrees with Liberty recommendations 2.5, 2.6, and 7.1 concerning the Company’s documentation and procedures. Documentation is being developed to formally capture Newfoundland Power’s approach to protection and control. The periodic testing of circuit breakers is being incorporated into the Company’s substation maintenance activities. Newfoundland Power’s System Restoration Manual has been updated to address loss of supply.

Customer Communications

Liberty Recommendation 8.1

“Monitor the “customer experience” of the new multi-channel communications services, and adjust the service offering as necessary to ensure a good customer experience.”

Newfoundland Power commenced SMS-Texting and email notification service to customers for feeder-level outages in December 2014. The service is currently available via the Company’s website. Newfoundland Power continues to monitor customer experience and feedback to ensure satisfactory performance of the service. Broader promotion of this service is expected to commence in February 2015, with a customer communication included with monthly bills followed by social media outreach.

3.0 Liberty Final Report Conclusions

Liberty’s Final Report for Newfoundland Power included a total of 54 conclusions concerning planning and design, asset management, power system operations, generation, outage management, emergency management, and customer service and outage communications. Newfoundland Power has reviewed the conclusions in Liberty’s Final Report and has assessed that they are generally consistent with the Company’s view.

3.1 Summary of Conclusions and Newfoundland Power Comments

The following table lists the 54 conclusions reached by Liberty in its review of Newfoundland Power and identifies whether or not the Company accepts a conclusion or has additional comments by way of clarification.

<i>Conclusion</i>	<i>Comment</i>
2.1 T&D reliability has substantially improved since 1999 and has recently remained stable overall.	Accepted
2.2 The large contribution that the distribution system makes to outages and the number of equipment-caused failures indicate room for further improvement in reliability. (Recommendation #2.1)	Accepted
2.3 Newfoundland Power focused on worst performing feeders for some time, but has recently ceased committing resources to them despite the fact that such feeders still exhibit disproportionately high outage metrics. (Recommendation #2.2)	See Additional Comments
2.4 Newfoundland Power's Transmission and distribution systems operate effectively in ensuring adequate service reliability.	Accepted
2.5 The expanded work of the Inter-Utility System Planning and Reliability Committee commenced in 2014 should improve planning coordination between Newfoundland Power and Hydro.	Accepted
2.6 Capital programs have been effective in improving reliability, but better methods for prioritizing projects under consideration exist. (Recommendation # 2.3)	See Additional Comments
2.7 Newfoundland Power has incorporated appropriate levels of redundancy in its transmission and distribution systems and in its substations.	Accepted
2.8 Newfoundland Power employs appropriate design standards, criteria, and practices for transmission and distribution lines.	Accepted
2.9 Current use of SCADA and use of automatic reclosers on feeders downstream from substations currently do not serve to minimize interruption frequency and duration. (Recommendation # 2.4)	Accepted
2.10 Newfoundland Power employs appropriate lightning and animal protection.	Accepted
2.11 Newfoundland Power makes effective use of short circuit studies.	Accepted
2.12 Completion of in-process developments in the Geographic Information System will increase its effectiveness.	Accepted
2.13 Newfoundland Power's protective relay schemes conform to industry practice, but they do not operate under documented guidance. (Recommendation #2.5)	Accepted

Conclusion	Comment
2.14 A temporary delay in testing of electromechanical relays is being addressed.	Accepted
2.15 Newfoundland Power does not formally periodically exercise its circuit breakers. (Recommendation #2.6)	Accepted
2.16 Newfoundland Power does not centrally track actions to address the causes of frequent protective device operations. (Recommendation #2.7)	Accepted
3.1 Asset management at Newfoundland Power operates: (a) under a program, (b) with an organization, and (c) with the support of sufficient numbers and skills to meet system reliability needs effectively.	Accepted
3.2 Newfoundland Power uses an effective combination of periodic O&M inspection and maintenance programs and capital transmission, distribution, and annual capital substation capital rebuild and modernization projects to address condition, reliability, and operating issues with its transmission, distribution, and substation assets.	Accepted
3.3 Newfoundland Power completes its transmission, substation, and distribution inspection and maintenance work in a reasonably timely fashion.	Accepted
3.4 Newfoundland Power's transmission line and pole inspection and corrective maintenance practices are consistent with good utility practices, except that the Company does not have a program to chemically treat its aged poles. (Recommendation #3.1)	See Additional Comments
3.5 Newfoundland Power's distribution feeder and pole inspections and corrective maintenance practices are generally consistent with good utility practices, except for: (a) lack of periodic sounding (testing for internal decay) of all aged poles, and (b) a slow replacement rate for aged distribution poles. (Recommendation #3.2)	See Additional Comments
3.6 Newfoundland Power's substation inspection, corrective maintenance, and preventive maintenance practices are consistent with good utility practices.	Accepted
3.7 Newfoundland Power's vegetation management practices are consistent with good utility practices.	Accepted
3.8 Newfoundland Power's T&D System Rebuild and Modernizations Strategies are generally consistent with system needs.	Accepted

Conclusion	Comment
3.9 As indicated in Chapter II, despite notable reliability improvement since 1999 and stable SAIFI and SAIDI metrics exhibited recently, it appears that room remains for improving distribution equipment-caused customer interruptions by applying more weight to the Rebuild Distribution Lines Project. (Recommendation #2.1)	See Additional Comments
4.1 The System Control Center is appropriately equipped and backed up by two other locations.	Accepted
4.2 Although the SCC has a control console used for one-on-one training, it does not have software for simulating the electric systems under normal and emergency conditions. (Recommendation #4.1)	Accepted
4.3 Newfoundland Power's use of its Central Dispatch Team to relieve the System Control Center of duties for managing and dispatching planned work and trouble call crews during regular hours and emergencies is a sound practice.	Accepted
4.4 The System Control Center and the Central Dispatch Team are appropriately staffed.	Accepted
4.5 Newfoundland Power appropriately monitors its transmission system, its infeed points from Hydro, and Hydro's generation via a link between Hydro's Energy Management System and Newfoundland Power's SCADA system.	Accepted
4.6 The planned replacement of Newfoundland Power's SCADA system and its Outage Management System should improve the effectiveness of its system operations.	Accepted
4.7 The System Control Center and the Central Dispatch Team appropriately use software tools for managing system operations.	Accepted
4.8 Newfoundland Power's SCC does not have an Energy Management System because it links its SCADA system to Hydro's EMS.	Accepted
4.9 The System Control Center does not have an operations software tool for producing daily forecasts. (Recommendation #4.2)	Accepted
4.10 If Hydro had timely consulted with Newfoundland Power about solutions for mitigating Hydro's generation shortfalls, Newfoundland Power would possibly have been better able to mitigate the issue with voltage reductions and load curtailments.	Accepted
5.1 Newfoundland Power has appropriately operated and maintained its generating units.	Accepted

<i>Conclusion</i>	<i>Comment</i>
5.2 Newfoundland Power has maintained a reasonable level of generating availability.	Accepted
5.3 Newfoundland Power has analyzed and is addressing issues, such as water and fuel supply, that may enhance the capacity it can make available to the Island Interconnected System during periods of generation shortage.	Accepted
5.4 Newfoundland Power can control its larger units through SCADA or other automatic means.	Accepted
6.1 The numbers and locations of field personnel assigned to outage response duties are appropriate in meeting outage-related needs.	Accepted
6.2 Newfoundland Power provides customers with appropriate options for reporting outages and restoration information.	Accepted
6.3 Newfoundland Power appropriately responds to trouble calls.	Accepted
6.4 The Outage Management System has served adequately, but the Company is appropriately moving to a commercially provided replacement.	Accepted
6.5 Outage cause coding supports Company needs.	Accepted
6.6 The estimated restoration time process appears to have been reasonably effective, and should improve with the replacement of the existing SCADA system.	Accepted
7.1 Newfoundland Power's emergency response practices are effective and consistent with good utility practices.	Accepted
7.2 Newfoundland Power has made effective pre-assignment of management and operational duties for its emergency management organization.	Accepted
7.3 Newfoundland Power's Emergency Command Center has appropriate capability and functionality.	Accepted
7.4 Newfoundland Power has a well-defined process for tracking severe storms.	Accepted
7.5 Newfoundland Power has a range of in-house and contractor resources for timely restoration of even large severe weather events.	Accepted
7.6 Newfoundland Power conducts training exercises for its emergency management personnel.	Accepted

Conclusion	Comment
7.7 Newfoundland Power's formal System Restoration Manual is consistent with good utility practice, except that it does not describe actions for insufficient generation. (Recommendation #7.1)	Accepted
7.8 Newfoundland Power and Hydro cooperate in severe storm restoration efforts.	Accepted
8.1 Newfoundland Power has made significant progress on the outage improvement recommendations, but important monitoring work remains. (Recommendation #8.1)	Accepted

3.2 Additional Comments from Newfoundland Power

Newfoundland Power considers the Liberty Final Report conclusions to be generally accurate. However, by way of clarification, the Company makes the following observations on 5 of the conclusions reached by Liberty.

Liberty Conclusion 2.3

"Newfoundland Power focused on worst performing feeders for some time, but has recently ceased committing resources to them despite the fact that such feeders still exhibit disproportionately high outage metrics."

Between 2011 and 2014, Newfoundland Power did not propose expenditures under its Distribution Reliability Initiative project. This was because, in Newfoundland Power's view, the results of the reliability data review and engineering assessment did not justify expenditure in those years. The reasoning supporting these decisions was included in the Company's annual capital budget applications for these years.

In its 2015 Capital Budget Application, the Company indicated that it intended to use additional reliability measures to assess distribution feeder reliability.⁷ As a result of the most recent analysis, Newfoundland Power's 2015 Distribution Reliability Initiative includes \$863,000 in capital expenditures to improve 2 of its worst performing feeders.⁸

Liberty Conclusion 2.6

"Capital programs have been effective in improving reliability, but better methods for prioritizing projects under consideration exist."

The Company is satisfied with its current approach to prioritizing capital expenditures, but recognizes that other methods exist. Whether or not different approaches to prioritizing capital

⁷ The additional reliability measures were Customer Hours of Interruption per Kilometer ("CHIKM") and Customers Interrupted per Kilometer ("CIKM"). Prior to this, the data analysis performed in the Company's evaluation of worst performing feeders used the SAIDI and SAIPI reliability metrics.

⁸ Newfoundland Power's 2015 Capital Budget was approved in Order No. P.U. 40 (2014).

expenditures would produce better results than those achieved by Newfoundland Power in its service territory is, in Newfoundland Power's view, questionable. However, Newfoundland Power evaluates other methods on a continuing basis and makes changes where appropriate.

Liberty Conclusion 3.4

"Newfoundland Power's transmission line and pole inspection and corrective maintenance practices are consistent with good utility practices, except that the Company does not have a program to chemically treat its aged poles."

Newfoundland Power has not experienced the degree of fungal infestation or rot in wood poles that would warrant a program to chemically treat aged wood poles. This particular issue was recently addressed in Newfoundland Power's 2013 General Rate Application. During the hearing for this application, Newfoundland Power's evidence was that decay was not a problem encountered to date due to a combination of factors, including cool temperatures.⁹ In addition, it is not clear to Newfoundland Power that chemically treating aged wood poles is consistent with good utility practice in climates similar to that of the Company's service territory.

Liberty Conclusion 3.5

"Newfoundland Power's distribution feeder and pole inspections and corrective maintenance practices are generally consistent with good utility practices, except for: (a) lack of periodic sounding (testing for internal decay) of all aged poles, and (b) a slow replacement rate for aged distribution poles."

As indicated above, the Company has not experienced the degree of fungal infestation or rot in wood poles that would appear to warrant changing its inspection and maintenance practices for wood poles.

Newfoundland Power accepts that the rate of replacement of its distribution poles appears slow.

Liberty Conclusion 3.9

"As indicated in Chapter II, despite notable reliability improvement since 1999 and stable SAIFI and SAIDI metrics exhibited recently, it appears that room remains for improving distribution equipment-caused customer interruptions by applying more weight to the Rebuild Distribution Lines Project."

Newfoundland Power relies on a number of distribution capital projects to maintain and improve reliability. The Rebuild Distribution Lines project includes scheduled preventative capital maintenance. This typically consists of either the complete rebuilding of portions of deteriorated distribution lines, or the selective replacement of various line components. It is, however, only one of a number of recurring capital budget projects directed at distribution reliability. For example, the Reconstruction project includes unscheduled preventative maintenance and the Distribution Reliability Initiative project includes expenditures directed at worst performing feeders.

⁹ See page 86, lines 9-11 of the January 25, 2013 transcript for the 2013 Newfoundland Power General Rate Application.

Newfoundland Power is not convinced that simply applying more weight to the Rebuild Distribution Lines project is necessarily the most effective way for Newfoundland Power to manage distribution system reliability. The most effective means to improve distribution reliability may, for example, involve a combination of existing projects or additional, as yet unidentified, projects.