IN THE MATTER OF
the *Electrical Power Control Act, 1994,*
SNL 1994, Chapter E-5.1 (the *"EPCA")*
and the *Public Utilities Act,* RSNL 1990,
Chapter P-47 (the "*Act*"), as amended;

AND

IN THE MATTER OF
the Board's Investigation and Hearing
into Supply Issues and Power Outages
on the Island Interconnected System.

CONSUMER ADVOCATE
REQUESTS FOR INFORMATION
CA-NLH-1 to CA-NLH-56
Issued: July 2, 2014

CA-NLH-1 Please provide the definition of Hydro's system operating states (i.e., normal, high-risk, emergency), and the procedures implemented upon declaration of each operating state.

CA-NLH-2 It is understood that Hydro plans its transmission system to an N-1 criterion (PUB-NLH-186). Please identify the critical elements that are assumed to be forced out of service when Hydro plans its transmission system.

CA-NLH-3 Should the system be able to withstand the loss of the Sunnyside transformer (or any transformer for that matter) without losing firm load?

CA-NLH-4 Should the system be able to withstand the loss of the Sunnyside sub-station (or any sub-station for that matter) without losing firm load?

CA-NLH-5 Please provide details of Hydro's generation planning and operating criteria and associated time frames; i.e., time in advance of operating day. Please equate the criteria to a reserve margin.

CA-NLH-6 Please provide details of Hydro's planning and operating criteria and associated time frames for supply to a transmission constrained area. Specifically, provide details of Hydro's current planning and operating criteria for supply to the Avalon Peninsula.

CA-NLH-7 Please provide details of Hydro's planning process. For example, at what intervals prior to the operating day does Hydro prepare demand/supply schedules and what is included in the schedules; i.e., real-time, day-ahead, week ahead, season ahead, etc., demand forecast, available generation, transmission outages, etc.

CA-NLH-8 What level of control during a system emergency does Hydro have over generation that it does not own on the Island?

CA-NLH-9 What level of control does Hydro have over planned maintenance scheduling of generation that it does not own on the Island?

CA-NLH-10 What documentation governs operation of generation that Hydro does not own on the Island; i.e., license, connection agreements, grid code, etc? Please file copies of such documentation.

CA-NLH-11 Has Hydro completed an agreement with Corner Brook Pulp & Paper (CBPP) for interruptible power for the coming winter and beyond; i.e. winter of 2014/15 and beyond? If so, what are the terms, conditions and price?

CA-NLH-12 What is the status of negotiations with other Industrial Customers on the Island Interconnected System for interruptible load, and are terms, conditions and prices similar to that negotiated with CBPP?

CA-NLH-13 Referencing page iii of the Board's May 15, 2014 Interim Report on Supply Issues and Power Outages on the Island Interconnected System, the Board includes as a key priority action "*complete negotiations in relation to interruptible load and, to the extent that it can secure economically available interruptible load, have a contract in place*". On what basis will Hydro determine the amounts of "economically available" interruptible load from Industrial Customers and what process will Hydro follow to gain approval of these interruptible contracts?

CA-NLH-14 Has Hydro approached Newfoundland Power to modify the terms, conditions and prices offered to its Curtailable Service customers

in order to make it a more effective resource during system emergencies? What might Hydro recommend to make this resource more effective during system emergencies?

CA-NLH-15 What process will Hydro follow to gain approval of any changes to Newfoundland Power's Curtailable Service?

CA-NLH-16 Please explain the arrangement with CBPP in terms of generation and curtailable load and how they interact to provide value to the system under normal and emergency situations.

CA-NLH-17 Are there other customers who own generation that can be approached about making their generation available during system emergencies under terms, conditions and prices similar to those offered CBPP?

CA-NLH-18 Does Hydro intend to modify/introduce procedures granting it control during system emergencies over Island generation that it does not own? Would greater control be beneficial, and what would be involved in obtaining the necessary control over Island generation it does not own? Does NPCC have any requirements in this regard?

CA-NLH-19 What are the current plans for the 16 MW diesel blackstart project?

CA-NLH-20 Please provide the current monthly load forecast for capacity and energy on the Island Interconnected System for the next three years broken down by customer including Newfoundland Power and each individual Industrial Customer.

CA-NLH-21 What role did Holyrood black start play during the supply

disruptions of the 2013/14 winter? How would the diesel project underway at Holyrood have impacted the events?

CA-NLH-22 Under the contract with North Atlantic Refining, would Hydro cut firm demand before cutting supply to North Atlantic Refining? Where does supply to North Atlantic Refining stand in terms of control actions during a system emergency?

CA-NLH-23 The Board's Interim Report dated May 15, 2014 provides a summary of key priority actions. Please provide a table identifying each of the key priority actions identified in the Board's Interim Report, Hydro's proposed completion/in-service date, the estimated cost in Dollars, and the estimated impact on rates. Please include a comments section that discusses in general terms the expected value provided to customers from each of these key priority actions; i.e., identify expected reliability improvement such as reductions in energy not supplied.

CA-NLH-24 It is stated in the Liberty Interim Report (page ES-2): "*Liberty believes it is time to reassess the service reliability and cost balances that underlie the decisions on what level of supply resources to make available*". What does Hydro use as a guide on cost trade-offs and rate impacts when considering projects to improve reliability? Please provide copies of all studies undertaken by Hydro to determine customer willingness to pay for reliability improvements and any sources for such studies undertaken elsewhere in North America.

CA-NLH-25 Please provide a detailed project update and schedule for the Muskrat Falls and interconnecting transmission project.

CA-NLH-26 Please provide Hydro's current 10-year generation and transmission expansion plan for the Island Interconnected System base case scenario showing all additions, in-service dates, project costs and estimated impact on rates.

CA-NLH-27 How much emergency support will Hydro be able to rely on over its interconnections post Muskrat Falls? Please provide details for the calculation.

CA-NLH-28 Please provide the most recent capacity resource table showing peak demand, demand management initiatives including interruptible power contracts (shown separately), existing generation, capacity purchases/sales, emergency capacity supply available over interconnections, new capacity relating to generation, sales/purchases, transmission and demand management, and reserve margins for each of the next 10 winter periods.

CA-NLH-29 Please provide the most recent energy resource table showing energy demand, energy conservation, existing energy generation, energy sales/purchases, new energy additions relating to generation, sales/purchases, transmission and energy conservation, and excess/deficit for each of the next 10 years.

CA-NLH-30 Will Hydro's planning and operating criteria for supply to the Avalon Peninsula change post Muskrat Falls? Specifically, please provide a detailed analysis of the demand/supply situation for the Avalon Peninsula post Muskrat Falls showing demand, existing generation, new generation, sales/purchases, demand management including interruptible supply contracts, firm imports over the transmission feeding the Avalon Peninsula and reserve margins for

		the 10-year period following commissioning of Muskrat Falls and interconnecting transmission project. Please show results for base case and contingency scenarios.
	CA-NLH-31	Please describe Hydro's models and modeling capability for the power system post Muskrat Falls. What is the source for the data used to model HVDC transmission in terms of capacity and reliability?
	CA-NLH-32	Has Liberty approached Hydro to use its models and data, or is Liberty utilizing its own models and data?
	CA-NLH-33	In determining best industry practice for electrical networks, please explain what consideration Hydro gave to the reliability standards of other islanded systems (geographically and electrically) around the world. Did Hydro consider how these islanded systems standards differed from nearby interconnected systems under the same jurisdictions?
	CA-NLH-34	Has Hydro taken any substantive action toward reviewing its protection design standards to take account of circuit breaker failure considerations? How will these standards change to meet NERC Requirements once Newfoundland is interconnected with the North American network?
	CA-NLH-35	Please provide any plans for the training of Hydro personnel to prepare for management of NERC compliance.
	CA-NLH-36	Does Hydro have a standard bus configuration for its 230 kV and 138 kV? How are bus configurations (ring-bus, breaker and a half, relief bus, etc) determined on a case by case basis?

CA-NLH-37 It appears that in several 230 kV ring bus configurations, more than one load transformer is connected to a single node meaning that most of the load served by the affected bus configurations will be tripped for specific bus faults or for breaker fail conditions. How much load is exposed to this condition, by area?

CA-NLH-38 Please provide the latest update on Hydro's schedule to implement their plans to achieve NERC compliance.

CA-NLH-39 What criteria does Hydro apply to the security and reliability of the Island Interconnected System to ensure successful recovery following a contingency covered by the N-1 planning criteria? How much time is allowed to return the system to an N-1 compliant operating condition?

CA-NLH-40 Post Muskrat, how does Hydro plan to manage winter readiness? Will the December 1st deadline to bring all generation on-line be maintained?

CA-NLH-41 How will Hydro treat the loss of the HVDC link in considering its reserve requirements?

CA-NLH-42 What assurance can Hydro give that the December 1st, 2014, operational readiness planning deadline will be respected with all planned generation and transmission outages complete?

CA-NLH-43 What is the achievable forecasted LOLH on December 1, 2014 if all equipment is in service?

CA-NLH-44 Can Hydro provide a quantitative assessment of how it converts LOLE requirements into LOLH and vice versa?

CA-NLH-45 What forced outage rates will Hydro be using for its various plants in determining its LOLH from 2014/15 onwards? In determining the forced outage rates, what consideration was given to recent performance of units, in particular the Holyrood, Hardwoods, Stephenville and Bay d'Espoir units? What is the lowest possible LOLH assuming that all generating and transmission belonging to Hydro's, NP's and other generation owners' assets are online?

CA-NLH-46 Can Hydro provide more information as to how the various reserve requirements are allocated according to time-responsiveness? Eg. 5-10 seconds, under 1-2 minutes, 5-15 minutes.

CA-NLH-47 What would be the resultant long-term impact – post-Muskrat Falls - on LOLH if short-term needs driving an increase in Island firm installed generation capacity were to proceed (eg. The acquisition of CT to overcome reserve shortfalls)?

CA-NLH-48 Does Hydro plan to arrange for annual technical support and service agreements with the (a) HVDC converter station supplier, (b) HVDC submarine cable supplier, (c) HVDC overhead line supplier and (d) a marine service contractor that is qualified to handle submarine cable repairs?

CA-NLH-49 Please provide a list of the bipolar outage scenarios that will be studied for (a) the Labrador Island Link and (b) the Maritime Link. For each of the outage scenarios, please provide the expected restoration time from a bipolar outage to (a) one operating pole and (b) both poles.

CA-NLH-50 What is the expected annual energy availability, scheduled energy unavailability and forced energy unavailability of (a) the Labrador

Island Link and (b) the Maritime Link? Please provide the availability studies that document the failure rate, mean time to repair, required maintenance, required spare parts, redundancy of in-service equipment, response time of qualified HVDC O&M personnel to report to the site when called-out to investigate faults, number of HVDC O&M personnel required and required skill sets of O&M personnel.

CA-NLH-51 Will the Labrador Link and Maritime Link utilize redundancy in telecommunication paths between the HVDC converter stations and between the HVDC converter stations and the primary and backup system control centers? If yes, please describe the telecommunications technologies and paths that will be used.

CA-NLH-52 Will the Labrador Link and Maritime Link converter stations each have on-site, back-up generation that can be used to charge the station batteries, maintain the converter heating and cooling systems, maintain lighting and maintain other converter station critical loads? If yes, how many days will the back-up generation be able to operate on the fuel stored at each converter station?

CA-NLH-53 Will the Labrador Link and Maritime Link converter stations each have a primary and back-up station auxiliary power supply?

CA-NLH-54 Further to CA-NLH-53, will the back-up auxiliary supply be available when the converter station is disconnected from the AC transmission network?

CA-NLH-55 Further to CA-NLH-53, will the primary and back-up auxiliary power supplies both be impacted by voltage disturbances on the AC transmission or AC retail distribution networks?

CA-NLH-56 Further to CA-NLH-53, in the event that both the primary and back-up auxiliary power supplies are interrupted, what is the specified ride-through time in seconds before the converter station is tripped?

Dated at St. John's in the Province of Newfoundland and Labrador, this 2nd day of July, 2014.

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