

1 Q. With reference to IC-NLH-011, please provide a copy of any analysis conducted of equipment
2 installation or other mitigation measures considered by Hydro, including cost, to ensure the
3 limitation represented by the Technical Conference #3 presentation slide 47 is resolved or
4 mitigated.

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7 A. Based on the nature of the Island Interconnected System, the relationship between the
8 Labrador-Island Link (“LIL”) and the Maritime Link is one that is complex to improve or mitigate.
9 Given that the Island Interconnected System size in comparison to the rated capacity of the LIL
10 (900 MW), the Maritime Link must provide frequency support at higher LIL flows. In order for
11 the Maritime Link to provide an adequate amount of frequency support following a LIL bipole
12 trip, it must immediately runback exported power to stabilize system frequency and keep it
13 above 58 Hz. There are mitigating measures that Newfoundland and Labrador Hydro (“Hydro”)
14 is actively investigating to provide frequency support, including the exploration of batteries,
15 which have not yet been determined to be feasible for the Island Interconnected System.

16 Hydro is assessing the following options that could potentially reduce the dependency of
17 Maritime Link exports on LIL power transfer:

18 i. **Increase the amount of Under Frequency Load Shedding (“UFLS”):** Increasing
19 the amount of UFLS will facilitate higher LIL transfers and allow more power to
20 be sunk on the Island. However, there is a limit to the amount of UFLS that can
21 be triggered. When too much UFLS is triggered it will result in an over-frequency
22 event after the system recovers that could have an impact on Hydro’s
23 generation assets. Hydro’s Transmission Planning Group is currently working
24 with a consultant named TransGrid Solutions to determine the maximum
25 amount of UFLS that the system can withstand. Once this is determined, Hydro
26 will modify the UFLS scheme accordingly to the maximum LIL power transfer
27 capability. There would likely be no capital investment required for this option.

1 The final UFLS scheme will be incorporated into Hydro’s firm energy analysis in
2 preparation for the Supply Expressions of Interest process to refine Hydro’s firm
3 energy requirements that were identified over the study period.

4 An increase in UFLS would potentially displace some of the wind energy
5 included in the Minimum Investment Required Expansion Plan. There would be
6 no impact on Hydro’s proposal to build both capacity options (Bay d’Espoir Unit
7 8 and the on-Avalon Combustion Turbine) within its Minimum Investment
8 Required Expansion Plan.

9 ii. **More Frequency Support from the Maritime Link:** Hydro has been in
10 discussions with the Nova Scotia System Operator as it pertains to additional
11 frequency support from the Maritime Link, but it is not possible for their existing
12 generating fleet to provide the incremental reserves that would be required. In
13 addition, Nova Scotia’s expansion plans predominantly include non-dispatchable
14 generation. There is therefore no expectation that there will be any increase in
15 reserves in the foreseeable future. Therefore, a commercial agreement
16 involving additional frequency support services from Nova Scotia Power Inc. is
17 considered improbable.

18 iii. **Battery Energy Storage System (“BESS”) with Frequency Supports:** Hydro is
19 undertaking feasibility analysis to investigate the capability of BESS solutions to
20 support system frequency for a sudden loss of supply. Additional frequency
21 regulation in the form of a BESS with frequency support on the Island
22 Interconnected System could allow for higher LIL power transfer since they may
23 transiently respond to a LIL bipole trip and could assist in keeping the frequency
24 above 58 Hz. This may reduce the dependency on the Maritime Link in providing
25 frequency support and therefore allow more power to be sunk on the Island.
26 Given the extreme frequency response needed to support the system following
27 a bipole trip, detailed transmission planning studies and feasibility analysis
28 would be required for this option. For further discussion on Hydro’s plans to
29 study the role of BESS in enabling higher LIL power transfer, please refer to
30 Hydro’s response to PUB-NLH-339 of this proceeding.