

1 **Q. (page 54, Power Supply Risk) Specifically, what questions are there with respect to**  
2 **the reliability of Hydro’s current and future generation sources?**

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4 **A. A. General**

5  
6 The reliability of Hydro’s current and future generation sources is a principal focus of the  
7 Board’s *Investigation and Hearing into Supply Issues and Power Outages on the Island*  
8 *Interconnected System* (the “Investigation”).<sup>1</sup> The Investigation followed (i) shortages in  
9 Hydro’s available generation which resulted in rotating power outages and (ii) a series of  
10 equipment and operations issues that led to additional widespread outages over the  
11 January 2-8, 2014 period.<sup>2</sup> The Board retained The Liberty Consulting Group  
12 (“Liberty”) to assist in the Investigation.

13  
14 The scope of the Investigation included an evaluation of the Island Interconnected system  
15 adequacy and reliability up to and after the interconnection with the Muskrat Falls  
16 generating facility.<sup>3</sup> The Investigation proceeded in two Phases.<sup>4</sup> While it was expected  
17 that the issue of the adequacy and reliability of supply in advance of the Muskrat Falls  
18 generating facility would be concluded as a part of Phase One, the Board’s *Phase One*  
19 *Report* (the “Phase One Report”) indicated the issue is still a concern and needs to be  
20 considered in Phase Two of the Investigation.<sup>5</sup>

21  
22 In addition to the Investigation, Hydro is currently conducting a supply adequacy study,  
23 which is scheduled for completion in November 2018.<sup>6</sup>

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25 **B. Hydro’s Current Generation Sources**

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27 The reliability of Hydro’s current generation sources has been a central focus of the  
28 Investigation. In the Phase One Report, the Board concluded that there are significant  
29 continuing risks to the adequacy and reliability of supply on the Island Interconnected  
30 system.<sup>7</sup> The Board was especially concerned about continued reliance on Hydro’s aging

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<sup>1</sup> On January 10, 2014 the Board issued a media advisory stating that it had “*advised Newfoundland and Labrador Hydro that, pursuant to the Public Utilities Act, it will hold an inquiry and hearing into the recent Island Interconnected system supply issues and power interruptions.*”

<sup>2</sup> During the January 2-8, 2014 period, approximately 75% of Newfoundland Power’s customers lost electrical service. This was the first time Newfoundland Power was required to conduct rotating power outages on a sustained basis to respond to a forecast generation shortfall on the Island Interconnected System. As part of its Investigation, the Board also reviewed widespread outages that resulted from generation shortfalls in January 2013 and March 2015.

<sup>3</sup> See Order No. P.U. 3(2014), the Board’s Procedural Order for the Investigation.

<sup>4</sup> See the Board’s October 8, 2014 letter Re: *The Board’s Investigation and Hearing into Supply Issues and Power Outages on the Island Interconnected System – Revised Process*. Phase One was intended to include the immediate reliability issues for the Island Interconnected System prior to interconnection with Muskrat Falls. Phase Two was intended to investigate reliability issues post-Muskrat Falls interconnection.

<sup>5</sup> See the Board’s *Phase One Report*, September 29, 2016, page i.

<sup>6</sup> See Hydro’s *2019 Capital Budget Application, Volume 1, 2019-2023 Capital Plan, Appendix D: Gas Turbine Planning Report, Section 11*.

<sup>7</sup> See the Board’s *Phase One Report*, September 29, 2016, page i.

1 thermal units, the announced delay in the Muskrat Falls project and Liberty’s conclusions  
2 in its *Review of Newfoundland and Labrador Hydro Power Supply Adequacy and*  
3 *Reliability Prior to and Post Muskrat Falls Final Report* (“Liberty’s Final Report”).<sup>8</sup>  
4

5 Hydro’s aging thermal units include: (i) the 490 MW Holyrood Thermal Generating  
6 Station (“Holyrood”), (ii) the 50 MW Hardwoods gas turbine (“Hardwoods”), and (iii)  
7 the 50 MW Stephenville gas turbine (“Stephenville”). The ongoing reliability of  
8 Holyrood, Hardwoods, and Stephenville continues to be monitored and assessed as part  
9 of the Investigation.

### 10 ***Holyrood***

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13 Holyrood, with 490 MW of capacity, is an important source of generation for the Island  
14 Interconnected system. It represents approximately 25% of the total generating capacity  
15 on the Island Interconnected system and is located in proximity to the island’s largest  
16 load centre.

17  
18 In Liberty’s Final Report, Liberty provided an assessment of the reliability of Holyrood.  
19 Liberty’s Final Report expressed concern regarding Holyrood’s ability to stay in  
20 operation at full capacity beyond the in-service date of Muskrat Falls, which has been  
21 delayed.<sup>9</sup>  
22

23 Since Liberty’s Final Report was filed, Holyrood has continued to experience reliability  
24 issues, including significant unit de-ratings and repairs necessary to improve boiler  
25 airflow issues.<sup>10</sup>  
26

### 27 ***Hardwoods & Stephenville***

28  
29 The reliability of Hardwoods and Stephenville has also been reviewed in the  
30 Investigation. Liberty’s Final Report concluded that the Hardwoods and Stephenville  
31 units are not dependable sources of capacity.<sup>11</sup>  
32

33 Hydro’s plans for Hardwoods and Stephenville are currently undetermined and are  
34 subject to the results of its supply adequacy study. Hydro has indicated that an initial  
35 review of near-term requirements for the facilities have indicated that both Hardwoods  
36 and Stephenville are required until Muskrat Falls is placed in service. The long-term  
37 requirement for Hardwoods and Stephenville is currently under review as part of Hydro’s

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<sup>8</sup> See the Board’s *Phase One Report*, September 29, 2016, page 51, lines 34-37.

<sup>9</sup> See Liberty’s *Review of Newfoundland and Labrador Hydro Power Supply Adequacy and Reliability Prior to and Post Muskrat Falls Final Report*, dated August 19, 2016, at page 10.

<sup>10</sup> See Hydro’s April 18, 2017 *Holyrood Thermal Generation Station – 2017 Reliability Improvements* report, and Hydro’s June 1, 2018 *Improve Boiler Load Capacity – Units 1, 2, and 3 Holyrood* report.

<sup>11</sup> See Liberty’s *Review of Newfoundland and Labrador Hydro Power Supply Adequacy and Reliability Prior to and Post Muskrat Falls Final Report*, dated August 19, 2016, at pages 9-10.

1 supply adequacy study.<sup>12</sup>  
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3 **C. Hydro’s Future Generation Sources**  
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5 The Island Interconnected System is in a period of transition. New sources of generation  
6 and supply are at various stages of integration and are anticipated to be available via the  
7 new transmission line interconnections with the North American electricity grid. These  
8 are: (i) the Maritime Link, and (ii) the Labrador Island Link and Labrador Transmission  
9 Assets. Reliability of the Island Interconnected system during and after this transitional  
10 period is under review in Phase Two of the Investigation.<sup>13</sup> It is also being considered in  
11 Hydro’s supply adequacy study.  
12

13 ***Maritime Link***  
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15 The Maritime Link transmission line between Nova Scotia and the Island Interconnected  
16 system came into service in February 2018. The reliability of the Maritime Link as a  
17 source of supply is being reviewed in the Investigation. Liberty’s Final Report stated:  
18

19 *“The extent to which Hydro can count on the Maritime Link as a source of*  
20 *dependable backup supply and the competitiveness of such supply versus*  
21 *new IIS generation are far from clear.”<sup>14</sup>*  
22

23 The Maritime Link as a reliable source of supply remains uncertain. In response to  
24 Request for Information PUB-NLH-002, filed in relation to Hydro’s *Near-Term*  
25 *Generation Adequacy Report – May 2018*, Hydro stated:  
26

27 *“Given the availability of the Labrador-Island Link (LIL), access to*  
28 *recapture energy surplus to Labrador requirements, and contracted*  
29 *supply to be delivered via the LIL, Hydro has not identified a requirement*  
30 *for capacity or energy to be delivered via the Maritime Link. As such, no*  
31 *detailed analysis for the procurement of the same has been conducted.”*  
32

33 ***Labrador Island Link and Labrador Transmission Assets***  
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35 The Labrador Island Link transmission line between Muskrat Falls in Labrador and  
36 Soldier’s Pond on the Avalon Peninsula; and the Labrador Transmission Assets between

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<sup>12</sup> See Hydro’s *2019 Capital Budget Application, Volume 1, 2019-2023 Capital Plan, Appendix D*, Page D4, lines 1-9.

<sup>13</sup> In its letter *Re: Investigation and Hearing into Supply Issues and Power outages on the Island Interconnected System – Phase Two – Availability of Information and Ongoing Reporting and Monitoring*, dated October 11, 2017, the Board outlined additional reporting requirements for Hydro that would allow the Board to monitor the progress of the integration of the new assets into the Island Interconnected system which it stated were critical to assess the adequacy and reliability of supply both prior to and after integration. The letter stated that Liberty would assist the Board by providing quarterly reports with its analysis.

<sup>14</sup> See Liberty’s *Review of Newfoundland and Labrador Hydro Power Supply Adequacy and Reliability Prior to and Post Muskrat Falls Final Report*, dated August 19, 2016, at page 87.

1 the Labrador interconnected system and Muskrat Falls will enable the transmission of  
2 electricity from Labrador to the Island Interconnected system. This includes electricity  
3 from Churchill Falls, and from Muskrat Falls once construction is complete.  
4

5 The expected reliability of the Labrador Island Link as a future source of supply on the  
6 Island Interconnected system has yet to be fully considered in the Investigation.<sup>15</sup>  
7 Newfoundland Power submitted expert evidence in relation to the reliability of the  
8 Labrador Island Link which indicates lower reliability than Hydro's estimates.<sup>16</sup> The  
9 actual reliability of the Labrador Island Link remains unknown and will inform a decision  
10 on whether additional backup generation will be required near the Island Interconnected  
11 system load centre on the Avalon Peninsula.  
12

13 In the third quarter of 2018, Hydro anticipates accessing 110 MW of recapture energy  
14 from the Churchill Falls generating facility to support the 2018-2019 winter peak.<sup>17</sup>  
15 Hydro indicates that it is currently in the process of commissioning the Labrador Island  
16 Link to operate in this manner for the upcoming winter season.<sup>18</sup>  
17

18 Liberty's Final Report concluded that Hydro has underestimated the potential number of  
19 bipole outages on the Labrador Island Link.<sup>19</sup> In addition, Liberty's Final Report  
20 indicated that "*the need for added supply to mitigate loss of load on an extended bipole*  
21 *trip has not been sufficiently considered.*"<sup>20</sup>  
22

23 The 824 MW Muskrat Falls generating facility is intended to replace Holyrood once it is  
24 commissioned. When first sanctioned in 2012, the Muskrat Falls generating facility was  
25 expected to be complete by 2018. Latest estimates indicate a scheduled in-service date of  
26 2020.<sup>21</sup>

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<sup>15</sup> The Labrador Island Link is a 1,100 km ± 350 kV HVDC transmission line designed to deliver electricity from the Muskrat Falls generating facility to the Island Interconnected system load centre located on the Avalon Peninsula.

<sup>16</sup> In the *Reliability Assessment of the Labrador Island Link, October 14, 2016*, Mr. Elias Ghannoum estimated the reliability of the Labrador Island Link to be, at most, a 50 year return period. Hydro's estimates, detailed in response to Request for Information NP-NLH-004 of the Investigation, were 150 and 500 year return periods.

<sup>17</sup> See Hydro's *Near-term Generation Adequacy Report – May 2018, Revision 1*, page 6, lines 18-21 and page 33, lines 22-23.

<sup>18</sup> See the response to Request for Information PUB-NLH-007 filed in relation to Hydro's *Near-Term Generation Adequacy Report – May 2018*.

<sup>19</sup> See Liberty's *Review of Newfoundland and Labrador Hydro Power Supply Adequacy and Reliability Prior to and Post Muskrat Falls Final Report*, dated August 19, 2016, at page 77. During a bipole outage, the Labrador Island Link is not capable of transmission.

<sup>20</sup> See Liberty's *Review of Newfoundland and Labrador Hydro Power Supply Adequacy and Reliability Prior to and Post Muskrat Falls Final Report*, dated August 19, 2016, at page 87.

<sup>21</sup> See Hydro's 2019 Capital Budget Application, Holyrood Overview, Future Operations and Capital Expenditure Requirements, page 6, lines 8-9.

1           **D.     Concluding**

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3           The reliability of Hydro’s current and future generation sources have been subject to the  
4           Board’s Investigation since 2014. In the Phase One Report, the Board concluded that  
5           despite the work that had been done, there continues to be significant risks to the  
6           adequacy and reliability of supply on the Island Interconnected system in the next few  
7           years.<sup>22</sup> More recently, the Board has directed Hydro to provide additional reporting in  
8           relation to the status of future generation sources to allow the Board to assess the  
9           adequacy and reliability of supply for the Island Interconnected system both before and  
10          after integration of Muskrat Falls.

11  
12          In addition to the Board’s Investigation, Hydro is currently in the process of conducting  
13          its own supply adequacy review.

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15          The results of Hydro’s supply adequacy review, and the findings of the Investigation, will  
16          inform decisions relating to Hydro’s existing generating facilities and the need for  
17          additional future generation sources.

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<sup>22</sup> See the Board’s *Phase One Report*, page 55, lines 36-38.