

1 Q. **Reference: Volume 1, Attachment 7, Technical Note on the Labrador-Island Link**
2 **Reliability**

3 Please explain why generic faults, which were the cause of many of the transformer
4 failures, can be ruled out for the LIL.

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7 A. The International Council of Large Electric Systems, CIGRE, provides periodic reports on the
8 reliability of HVdc systems worldwide. The most recent report was published in 2018 and
9 contains historic data up to 2015–2016.¹ While the possibility of generic faults exists for the
10 Labrador-Island Link (“LIL”), upon occurrence the outage times should be greatly reduced
11 from those indicated in the CIGRE data. When looking at the CIGRE data, most long-term
12 outages are related to the transformer or cable failures. The LIL has been designed with
13 mitigating measures for long-term outages associated with transformer and submarine
14 cable faults. This includes the provision of redundancy and spares for major equipment
15 types, and the ability to operate a pole at 1.5 per unit steady-state overload.

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17 In particular, there is a spare converter transformer located at each converter station in
18 Muskrat Falls and Soldiers Pond to reduce the outage duration in the event of a failure. The
19 third submarine cable installed under the Strait of Belle Isle is a spare cable that can be
20 switched to either pole. These design attributes of the system are examples of the
21 measures in place to reduce the potential impact of such events on energy availability.

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23 Finally, each pole of the LIL is designed for 2.0 per unit overload for 10 minutes and 1.5 per
24 unit steady-state overload. Therefore, in its configuration for maximum bipole output, the
25 LIL is operating well below the equipment’s rated value and the resultant impact of long-
26 term outages can be covered by the designed overload of the pole. Further, since the
27 equipment is operating below its rated values, the stress and aging of components is
28 reduced, leading to a decreased likelihood of equipment failure.

¹ Source: “A survey of the reliability of HVdc systems throughout the world during 2015-2016” CIGRE, 2018.