

1 Q. Please state what would be the consequence on the power transmission capability
2 of a permanent earth fault on one or of both of the electrode line conductors.

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5 A. The Labrador-Island Link (LIL) has two electrode lines: a 400 km long line in
6 Labrador and a ten km line on the Island of Newfoundland. Each electrode line will
7 consist of two separate 1192.5 kcmil, 54/19, ACSR "GRACKLE" conductors having
8 the capability of being switched in and out of service individually. The electrode
9 lines are designed to the same meteorological (wind and ice) load levels as the main
10 HVdc overhead transmission line.

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12 Upon detection, a faulted conductor will be removed from service via switching
13 operations at the converter station. Under normal operations with both electrode
14 conductors in service, the LIL electrode line is designed to provide a ten minute 2.0
15 pu current overload rating (2571 A) and a 1.5 pu continuous overload current rating
16 (1929 A) under monopole operation.

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18 In the event one electrode conductor is forced out of service due to a permanent
19 earth or open circuit fault, the electrode line current capacity must be limited to
20 1023 A so as to not exceed the conductor design temperature of 75°C. Therefore,
21 with one electrode conductor out of service and the LIL in bipolar configuration, the
22 pole current must be limited to 1023 A (716 MW) to ensure an outage to a single
23 pole does not exceed the electrode rating once switched into monopole operation.

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25 In the event that both electrode line conductors are forced out of service, the
26 import on the LIL bipole will be reduced and the system blocked, as necessary, to
27 eliminate the risk of a complete dc system shut down for a pole fault with

1 subsequent load shedding on the Island. Note that following the loss of the
2 electrode line, a temporary or permanent pole fault is similar in effect to a
3 permanent bipole outage, which will result in the shutdown of the LIL and
4 controlled load shedding on the Island of Newfoundland, as there is not a high
5 current carrying capacity earth return circuit. In these circumstances, it would also
6 be possible to reconfigure the LIL to provide deliveries to the Island in a monopolar
7 mode with metallic return using one of the pole conductors as a return path.