

1 Q. Please explain the consequences of a HVdc cable failure if there is no spare HVdc  
2 cable including the impact of the limitation of the HVdc cable overload capability to  
3 a five minute period of 2 pu current on the supply of power to the Island  
4 Interconnected System. In the response include both the case of the Maritime Link  
5 being in and out of service.

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8 A. The Labrador-Island HVdc Link (LIL) project design includes a spare HVdc cable.  
9 Therefore, for the situation to arise as posed in the question there would have to be  
10 a loss of two cables.

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12 If the LIL is operated at full load (i.e., 830 MW delivered at Soldiers Pond) with the  
13 spare HVdc cable already out of service, the failure of a second cable would result in  
14 load shedding on the Island Interconnected System.

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16 Where the LIL is operating at 830 MW with the Maritime Link (ML) in service and  
17 only two LIL submarine cables in operation across the Strait of Belle Isle, the  
18 proportionate share of the delivered 830 MW includes 157 MW for ML and 673  
19 MW for Island use. For the loss of a second cable in the Strait of Belle Isle, the ML  
20 export would be curtailed and the LIL would switch to two per unit current (100%  
21 overload) on the remaining pole for five minutes. This mode of operation would  
22 deliver 662 MW for Island use. The difference in the pre-event and post-event  
23 deliveries is 11 MW, which will be made up by on-Island spinning reserve.

24 Following the five-minute monopolar operation, the LIL deliveries must be reduced  
25 to 396 MW to prevent overload and subsequent damage to the single cable in the  
26 Strait of Belle Isle. The move from 662 MW delivered to 396 MW delivered at the  
27 five minute mark would result in a maximum on-Island load shed of 266 MW.

1           Where the LIL is in operation with the ML out of service and only two LIL submarine  
2           cables in operation across the Strait of Belle Isle, from an on-Island load shedding  
3           perspective, the worst-case scenario would have the full LIL capability of 830 MW  
4           delivered at Soldiers Pond entirely for Island use. In this case, the loss of a second  
5           cable in the Strait of Belle Isle, there would be no ML export to curtail. When the  
6           LIL switches to two per unit current (100% overload) on the remaining pole for five  
7           minutes, the delivered power to the Island falls from 830 MW to 662 MW. The  
8           maximum load shed on the Island assuming no governor action on the Island would  
9           be 168 MW. Following the five-minute monopolar operation, the LIL deliveries  
10          must be reduced to 396 MW to prevent overload and subsequent damage to the  
11          single cable in the Strait of Belle Isle. The move from 662 MW delivered to 396 MW  
12          delivered at the five minute mark would result in a maximum further on-Island load  
13          shed of 266 MW. In total, the worst-case load shed would equal 434 MW.

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15          Given the potential magnitudes of on-Island load shed for the scenarios where one  
16          of the three cables across the Strait of Belle Isle has failed, Hydro would institute  
17          operating restrictions on the LIL to minimize the risk to the Island Interconnected  
18          System. Hydro's response to PUB-NLH-237 describes the operation with one  
19          submarine cable out of service.