

1 Q. **Reference Avalon Capacity Study:**

2 Reference Avalon Capacity Study: The measures required to meet the 3PF (Including BDE)
3 are much more extensive than those for the 3PF (not including BDE); please explain why
4 the ac network is so sensitive to this fault.

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7 A. The system is particularly sensitive to the three-phase fault at the Bay d’Espoir Terminal
8 Station as such an event results in the worst-case suppression of dynamic voltage support
9 from units at the Bay d’Espoir Hydroelectric Generating Facility (“Bay d’Espoir”) and the
10 surrounding area. This scenario was assessed in an operational study performed by
11 TransGrid Solutions in consultation with Newfoundland and Labrador Hydro and submitted
12 to the Board of Commissioners of Public Utilities as part of Phase Two of the Investigation
13 and Hearing into Supply Issues and Power Outages on the Island Interconnected System.¹

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15 As per the results of the operational study, a three-phase fault at the Bay d’Espoir Terminal
16 Station results in suppression of reactive support during the fault and poor post-fault
17 recovery voltages in the area of the Sunnyside Terminal Station. This is illustrated in Figure
18 1 and is explained by the limited dynamic reactive support in the Sunnyside area as
19 compared to the reactive support provided by the generators in Bay d’Espoir and the
20 synchronous condensers in the Soldiers Pond Terminal Station.

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22 The post-fault recovery voltages at the Sunnyside Terminal Station deteriorate as a function
23 of increased power flows in the transmission corridor between the Bay d’Espoir Terminal
24 Station and the Soldiers Pond Terminal Station. In the event of a Labrador-Island Link bipole
25 outage, power flows in the corridor increase significantly and voltages at the Sunnyside
26 Terminal Station may become suppressed to the point of collapse.

¹ “Stage 4A LIL Bipole: Preliminary Assessment of High Power Operation,” TransGrid Solutions Inc., November 21, 2018

- 1 Three-phase faults in other locations such as the Sunnyside Terminal Station are severe, but
- 2 do not result in as significant a suppression of dynamic reactive support from the units in
- 3 Bay d’Espoir during the fault. Post-fault recovery voltage profiles are improved and
- 4 therefore the risk of voltage collapse is reduced.

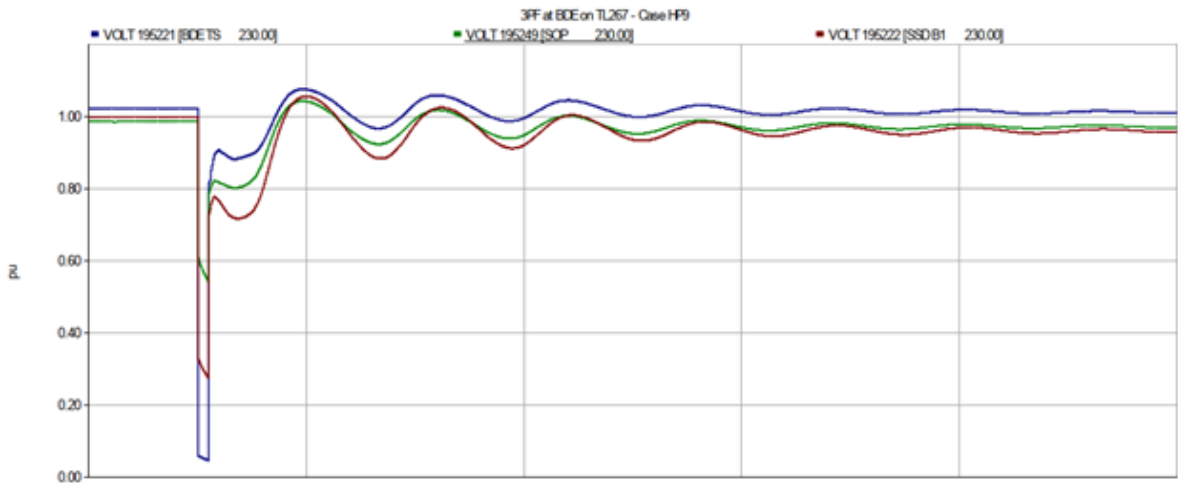


Figure 1: ac Voltage Following Three-Phase Fault at the Bay d’Espoir Terminal Station