

**New England States
Committee on Electricity**

To: EIPC Transmission Options Task Force
From: Ben D'Antonio and George Smith
Date: May 14, 2012
Subject: Scenario 1 HVDC – AC Interface & Momentary Loss of Source

While dynamic stability testing is beyond the scope of the Phase II reliability analysis, a foreseeable issue exists relative to the six high-voltage direct current (HVDC) terminals proposed for Scenario 1. As the Transmission Options Task Force proceeds with developing solutions that include multiple HVDC terminals, we respectfully request that you consider the following reliability issue associated with a momentary loss of source.

If HVDC converters are located in relatively close proximity and connected to a strong AC system, **a fault on the AC system may cause all HVDC sources to be interrupted momentarily during the fault.** After the fault is cleared from the AC system, the HVDC terminals will take some time to recover – typically $\frac{1}{4}$ second or more. This may present a major momentary loss of source issue with regard to the receiving portion of the interconnection. This sudden loss of source, if the AC system is not appropriately reinforced, may cause violations of voltage and stability limits, including voltage collapse and separation imbalance.

The impact of a momentary loss of source of this nature is only revealed through dynamic testing, which is beyond the scope of the agreed-upon reliability testing. Accordingly, a potentially major reliability issue may be ignored in the design of the transmission system to be used in the Scenario 1 analysis.

To ensure the viability of the solution proposed for Scenario 1 and to accurately reflect the cost of some necessary reinforcements, some limited dynamic stability testing is recommended. In the alternative, we respectfully request the TOTF consider this contingency as it develops its solutions. To avoid this large momentary loss, one design approach involves electrical separation of the AC collector systems that supply power to the sending end of each of the 3500 MW HVDC systems. The addition of large synchronous condensers would supply the short circuit strength required by each of the conventional HVDC installations.

We appreciate your consideration of this issue.