



# **Optional Interconnection Study Report**

**GIP-232-OPT-R1**

**System Interconnection Request #232**

**50.6 MW Wind Generating Facility**

**Antigonish County (L-6552)**

2011-07-27  
Control Centre Operations  
Nova Scotia Power Inc.

### Executive Summary

The Interconnection Customer (IC) signed an Optional Interconnection Study Agreement to study the connection of their proposed generating facility to the NSPI transmission system based on the assumption that OATT Studies TSR-100 and TSR-200 are excluded from the Queue. This report is the result of the Optional Study Agreement.

The Interconnection Customer submitted an Interconnection Request (IR) for Energy Resource Interconnection Service (ERIS) to NSPI for a proposed 50.6 MW wind generation facility interconnected to the NSPI transmission system. The Point of Interconnection (POI) requested by the customer is the 138 kV line L-6552 (formerly L-6511) between the 93N-Glen Dhu substation and the 4C-Lochaber Rd substation, approximately 8.8 km from 4C-Lochaber Rd substation. It requires approximately 13 km of newly-constructed line from the wind farm located near Big Marsh.

This study shows no remaining capacity on the 138kV Transmission System Interfaces between Onslow Import (ONI) and Cape Breton Export (CBX). IR#232 would cause several thermal overloads on the local 138 kV systems which could not be eliminated by reduced Special Protection System (SPS) arming levels. Therefore thermal uprating on L-6552 is needed to accommodate this wind facility. When CBX is low with no Langan unit armed, one of the Trenton units has to be displaced by IR#232 in order to prevent overloads on L-6515 with the loss of 79N-T81 (during summer).

With both Trenton units online, the arming levels of Group 5&6 SPS have to be modified to alleviate the potential overloads on L-6511 and L-6503 which are initiated by IR#232 under certain contingencies. When one Trenton unit is off-line, the Group 5&6 SPS arming levels will have to be further reduced to accommodate IR#232.

The existing Group 3 SPS will be modified to mitigate the overloads on L-6511 under the loss of L-7003&L-7004 with a high CBX level.

This report recommends that the POI for this wind facility be moved to L-7003 between 3C-Port Hastings and 67N-Onslow, which requires approximately 17 km of new spur line from the wind farm at Big Marsh. This option also requires the modifications on the Group 5 and 6 SPS to alleviate the potential overloads on L-6511, L-7003 and L-7019. The details will be further assessed in the SIS study.

No concern regarding short-circuit or voltage flicker was found for this project on its own, provided that the project design meets NSPI requirements for low-voltage ride-through, reactive power range and voltage control system. Harmonics must meet the Total Harmonics Distortion provisions of IEEE 519.

The preliminary non-binding estimated cost of facilities required to interconnect IR#232 to 138 kV line L-6552 is \$17.0 Million and the preliminary non-binding estimated cost on the 230 kV line L-7003 option is \$16.8 Million. Both estimates include a contingency of 10%. These estimates will be further refined in the System Impact Study and the Facility Study.