



Final Report prepared for

Nova Scotia Power Inc.

**System Impact Study
For
45 MW Wind Generating Facility in
Colchester County, Nova Scotia
IR082**

H-329537

October 21, 2008

Executive Summary

This report presents the results of a System Impact Study (SIS) for the Nuttby Mountain 45 MW wind generation facility project (IR082) that is proposed to be connected to the existing L-5040 69 kV line of the Nova Scotia Power Inc. (NSPI) transmission system. The objective of this study was to investigate the potential impacts of the proposed wind generation facility on the NSPI power system.

Accordingly, system studies were carried out employing load flow, short circuit, transient stability and voltage flicker analyses. NSPI's GIP procedures and system planning criteria document were followed in compiling the results for this SIS.

Based on the study results, it is concluded that the incorporation of the proposed wind generation facility into the NSPI transmission system at the specified location has no serious negative impacts on reliability of the NSPI system. The following is a summary of findings and recommendations:

- The proposed IR082 wind generation facility may cause thermal overloading of the L-5040 line during summer conditions when the Tatamagouche load is low and the proposed wind generation facility is operating at its full capacity. Consistent with the Interconnection Request for Energy Resource Interconnection Service, it is recommended that the line conditions should be monitored under such operating conditions and the proposed wind generation facility output be curtailed should the line thermal limit be exceeded.
- The proposed wind generation facility does not meet the GIP reactive power requirements of 0.95 power factor (leading and lagging) at the Point of Interconnection. It is recommended to install 8.5 MVAR shunt capacitor bank at the 34.5 kV collector bus to maintain acceptable voltage profile at the Point of Interconnection (POI). The analysis ignored reactive power losses and charging within the 34.5 kV collector system. Further, it is recommended that the reactive power loss assessment should be carried out during the detailed design phase of the project, and if required, appropriate mitigation measures should be provided such that the IR082 wind generation facility meets the NSPI operating requirements at the interconnecting 69 kV bus.
- The short circuit contribution of the IR082 facility does not call for any breaker upgrade at 69 kV and 138 kV voltage levels.
- The system is transiently stable for all the simulated disturbance conditions.
- The proposed wind generation facility is not categorized as bulk power in accordance with the current NPCC A-10 Criteria.
- The proposed wind generation facility meets the Low Voltage Ride-Through (LVRT) requirements for faults in the NSPI system.
- The proposed wind generation facility does not instigate any voltage flicker beyond NSPI's power quality requirements.

The preliminary cost estimate for the generation interconnection facilities is about CDN\$ 594,534.