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Final Report prepared for

Nova Scotia Power Inc.

System Impact Study
For
32 MW Wind generation facility in Cumberland County, NS

H-329424

July 9, 2008

Executive Summary

This report presents the results of an System Impact Study (SIS) for the Higgins Mountain 32 MW wind generation project (IR046) that is proposed to be connected to the existing L-6513 138 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, the SIS was carried out employing load flow, short circuit, transient stability and voltage flicker analyses. The study was performed according to the NSPI's GIP procedures and system planning criteria document.

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 IR046 wind generation facility does not cause any serious overloading on the existing NSPI transmission system for all the tested contingencies under different operating conditions. No voltage violation is observed.

- The proposed wind generation facility marginally meets the reactive power requirements of 0.95 power factor (leading and lagging) at the Point of Interconnection. This result is based on the assumption of ignoring reactive power losses and charging within the 34.5 kV collector system of the wind generation facility.

- NSPI's existing Import SPS will be affected. It is recommended that the existing Import SPS be modified to include cross-tripping of the L-6513B section, instead of tripping the entire L-6513 line. Alternatively, the SPS cross-trip point could be moved to the NS-NB border to ensure that the generation associated with IR045 also stays with NS load. There is no impact on the Export SPS.

- Short circuit contribution of the proposed generation facility is quite small. The highest increase (3.87%) occurs at the 138 kV bus of the interconnecting switching station, which would be a new facility in the NSPI system. The short circuit current levels at Onlsow and Springhill are well within their respective breaker interrupting capacities.

- 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 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.

Preliminary cost estimate for the generation interconnection facilities is about CDN$ 8.78 million.