



Final Report prepared for

Nova Scotia Power Inc.

**System Impact Study  
for the  
Dalhousie Mountain 50 MW Wind Generating Facility in  
Pictou County, Nova Scotia  
IR084**

H-330661

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## Executive Summary

This report presents the results of a System Impact Study (SIS) for the Dalhousie Mountain 50 MW wind generation facility project (IR084) that is proposed to be connected to the existing 230 kV line L-7004 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 provided the recommendations given in this report are implemented.

The following is a summary of findings and recommendations:

- The proposed IR084 wind generation facility may cause thermal overloading of the L-7004 230 kV line section between Onslow and the IR084 tap point under certain contingency conditions. This overloading may not exceed over 6% of the summer line rating for the operating scenarios analyzed in this study. However, it is recommended to implement appropriate measures to monitor power flow on this 230 kV line section to avoid any unacceptable loading level under any other operating scenario not investigated in this study.
- 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 7.5 MVAR shunt capacitor bank at the 34.5 kV collector bus to maintain acceptable voltage profile at the Point of Interconnection (POI). 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 IR084 wind generation facility meets the NSPI operating requirements at the interconnecting 230 kV bus.
- The IR084 wind generating facility output should be curtailed to 30MW under the stressed operating conditions such as represented by the "2010-Winter\_Peak\_StoraOff" base-case or any other operating conditions as determined by the System Operator.
- The short circuit contribution of the IR084 facility does not call for any breaker upgrade at 230 kV voltage level.
- The system is transiently stable for all the simulated disturbance conditions.
- 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 \$7,344,513.