

NOVA SCOTIA POWER INC.

TRANSMISSION & DISTRIBUTION ENGINEERING DEPARTMENT



**FACILITIES STUDY INFRA-STRUCTURE REPORT
FOR
ESTABLISHING A 138 kV SYSTEM CONNECTION
FOR A NEW 60 MW WIND POWERED GENERATING FACILITY
AT GLENDHU IN PICTOU COUNTY, NOVA SCOTIA**

FINAL

Rev. 0

Prepared by: _____
Project Engineer Date

Approved by: *Jim Leopold* *Sept-11, 2009*
Director, Project Implementation Date



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project: Glendhu Wind

date: 2009-07-10 rev. no.: 0

Facilities Study Infra-Structure Report

System	Description
1.0	<p>SUMMARY</p> <p>This project provides for the establishment of a 138 kV system connection for a 60 MW wind powered generation facility (IR114) located at Glendhu, Pictou County, Nova Scotia. This generating facility is comprised of thirty 2.0MW wind turbine generators. Each wind powered generator will be interconnected to a 34.5 kV collection system via an individual 400V-34.5kV transformer. The 34.5 kV collection feeders will be tied to the 34.5 kV switchgear side of one 36/48/60 MVA, 34.5 - 138 kV step-up transformer. The proposed wind powered generation facility will be interconnected to the Nova Scotia Power transmission system via a 138 kV three breaker ring substation connected to the existing line L-6511 between 50N Trenton and 4C Lochaber Road substations. The new 138 kV interconnection substation will be located approximately 36 km from the 50N Trenton substation. A one-line diagram of the proposed interconnection is shown in Appendix B – One Line Diagram of System Connection.</p> <p>The system connection will consist of a 138 kV three breaker ring substation connected to L-6511 between 50N Trenton and 4C Lochaber Road such that L-6511 is split into two lines each terminating at the new Nova Scotia Power 93N Glendhu substation. The line between 93N Glendhu and 50N Trenton will remain as L-6511 but the line between 93N Glendhu and 4C Lochaber Road will be renumbered and called L-6552. One node of this 138 kV substation will be connected to the customer's interconnection substation which consists of one 138 kV disconnect switch, one 138 to 34.5 kV transformer, one loadbreak switch on the LV side of the step-up transformer and two breakers feeding 34.5 kV collector circuits each connecting fifteen wind turbines to the interconnection substation. The system connection will also include modifications to the protection and control circuitry at the 50N Trenton and 4C Lochaber Road substations. These modifications will ensure the line protection schemes at the remote terminals are compatible with the protection schemes at the new 138 kV substation. Intertrip and block close logic will also be included to ensure that the generating facility is not islanded with any portion of the Nova Scotia Power system.</p> <p>The point of interconnection will be the point at which the 3 breaker ring substation is inserted in transmission line L-6511 and will be designated as the Trenton side of breakers 93N-601 and 93N-602.</p>

Transmission Engineering
 prepared by: Tim Leopold
 Department approved by: _____

Customer Operations
 checked by: _____
 Division approved by: _____



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System	Description								
1.1	<p>The estimated cost of the Nova Scotia Power portion of the project and the estimated scheduled in-service date are as follows:</p> <table border="1" data-bbox="406 588 1299 798"> <thead> <tr> <th>Cost Estimate</th> <th>Annual Licence Cost</th> <th>Project Duration</th> <th>In-Service Date</th> </tr> </thead> <tbody> <tr> <td>\$4,596,374</td> <td>\$1480</td> <td>11 months</td> <td>2010-07-31</td> </tr> </tbody> </table> <p>The above in-service date assumes a connection with a 30 wind turbine, generating facility complete with protection, transfer trips, status, SCADA and revenue metering.</p> <p>The project in-service date is dependent upon the starting date, which cannot commence until the customer delivers to Nova Scotia Power the balance of the cost estimate for the project, in a form acceptable to Nova Scotia Power, as per the Interconnection Agreement. To meet the stated in-service date the project start date would need to be no later than Sept. 1, 2009.</p> <p>Construction on the interconnection substation and line tap also cannot begin until the customer provides Nova Scotia Power with a legally binding easement in the form acceptable to Nova Scotia Power for any land that the 138 kV substation and associated line tap require.</p> <p>ESTIMATED COSTS</p> <p>The estimated cost for Nova Scotia Power to provide a 138 kV interconnection to the Glendhu wind powered generating facility is \$4,596,374. This cost estimate is summarized in Table 1 – Glendhu Cost Estimate:</p>	Cost Estimate	Annual Licence Cost	Project Duration	In-Service Date	\$4,596,374	\$1480	11 months	2010-07-31
Cost Estimate	Annual Licence Cost	Project Duration	In-Service Date						
\$4,596,374	\$1480	11 months	2010-07-31						

Transmission Engineering	Customer Operations
Department	Division
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