

NOVA SCOTIA POWER INC.
CUSTOMER OPERATIONS
TRANSMISSION & DISTRIBUTION ENGINEERING DEPARTMENT



FACILITIES STUDY INFRA-STRUCTURE REPORT
FOR
ESTABLISHING A 138 kV SYSTEM CONNECTION
FOR A NEW 30 MW WIND POWERED GENERATING FACILITY
AT AMHERST IN CUMBERLAND COUNTY, NOVA SCOTIA

Rev. 1

Prepared by: Ren Tutty 2009/03/13
Project Engineer Date

Approved by: Sam Leopold 2009/03/13
Director, T&D Assets Date



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Project: Amherst Wind

Date: 2008-12-30 Rev. no.: 0

Facilities Study Infra-Structure Report

System	Description
<p>1.0</p>	<p>SUMMARY</p> <p>This project provides for the establishment of a 138 kV system connection for a 30 MW wind powered generation facility (IR045) located at Amherst, Cumberland County, Nova Scotia. This generating facility is comprised of twenty, Acciona 1.5 MW double fed induction generators. Each wind powered generator will be interconnected to a 12 kV collection system. The 12 kV collection feeders will be tied to the 12 kV switchgear side of one 21/28/35 MVA, 12 - 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-6535 between 30N Maccan and New Brunswick Power's Memramcook substations. The new 138 kV interconnection substation will be located approximately 12 km from 30N Maccan. 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-6535 between 30N Maccan and Memramcook such that L-6535 is split into two lines each terminating at the new Nova Scotia Power Amherst Wind interconnection substation. 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 12 kV transformer, one breaker on the LV side of the step-up transformer and three breakers feeding 12 kV collector circuits connecting twenty wind turbines to the interconnection substation. The system connection will also include modifications to the protection and control circuitry at the 30N Maccan and Memramcook 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 terminals on the Nova Scotia Power side of the transformer 138 kV disconnect switch.</p> <p>The estimated cost of the Nova Scotia Power portion of the project and the estimated scheduled in-service date are as follows:</p>

Transmission Engineering	prepared by: <u>Ron Tutty, P. Eng.</u>	Customer Operations checked by: _____
Department	approved by: _____	Division approved by: _____



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1.1	<table border="0" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;"></td> <td style="width: 25%; text-align: center;">Annual Licence Cost</td> <td style="width: 25%; text-align: center;">Project Duration</td> <td style="width: 25%; text-align: center;">In-Service Date Date</td> </tr> <tr> <td style="text-align: right;">Cost Estimate</td> <td style="text-align: center;">\$272</td> <td style="text-align: center;">10 months</td> <td style="text-align: center;">2009-11-30</td> </tr> <tr> <td style="text-align: right;">\$4,529,695</td> <td></td> <td></td> <td></td> </tr> </table> <p>The above in-service date assumes a connection with a 20 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 following condition is met:</p> <ul style="list-style-type: none"> 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. <p>Construction on the interconnection substation and line tap 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 Amherst wind powered generating facility is \$4,529,695. This cost estimate is summarized in Table 1 – Amherst Cost Estimate.</p>		Annual Licence Cost	Project Duration	In-Service Date Date	Cost Estimate	\$272	10 months	2009-11-30	\$4,529,695			
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Cost Estimate	\$272	10 months	2009-11-30										
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