

November 10th, 2009

Mr. Shuwen Sun
Project Specialist
Brookfield Renewable Power – Wawa Hydro Operations
105 Mills Drive
Wawa, ON P0S 1K0

Dear Mr. Sun:

*Hollingsworth GS – Generator Rewinding
Notification of Approval of Connection Proposal
CAA ID Number: 2009-EX450*

Thank you for the information that you submitted regarding the generator rewinding at Hollingsworth GS.

We have concluded that the proposed change will not result in a material adverse impact on the reliability of the IESO-controlled grid. The IESO is therefore pleased to grant **conditional approval** for the modification detailed in the attached assessment report. Any material changes to your proposal may require re-assessment by the IESO in accordance with Market Manual 2.10, and may nullify your conditional approval.

Final approval to connect the facility to the IESO-controlled grid will be granted upon successful completion of the IESO Market Entry process including, without limitation, satisfactory completion of the requirements set out in the System Impact Assessment report. During this process you will be expected to demonstrate that you have fulfilled the requirements and that the facility you have installed is materially unchanged from the proposal assessed by the IESO. Please refer to the 'External Guidelines for Connection to the IESO' attachment in your approval email for key steps in the Market Entry process. In order to initiate this process, please contact Market Entry at market.entry@ieso.ca at least as soon as possible.

For further information, please contact the undersigned.

Yours truly,

Barbara Constantinescu
Manager – Market Facilitation Department
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cc: IESO Records

All information submitted in this process will be used by the IESO solely in support of its obligations under the *Electricity Act, 1998*, the *Ontario Energy Board Act, 1998*, the *Market Rules* and associated policies, standards and procedures and in accordance with its license. All information submitted will be assigned the appropriate confidentiality level upon receipt.

HOLLINGSWORTH GS – GENERATOR REWINDING IESO EXPEDITED SYSTEM IMPACT ASSESSMENT – 2009-EX450

1. PROJECT DESCRIPTION

Brookfield Renewable Power is proposing the generator rewinding at Hollingsworth GS on the Michipicoten River. The generator rewinding consists of replacing the stator winding only; no changes to the stator core or the rotor field. The new stator winding is rated at 30 MVA at 0.9 power factor. As the rotor and the runner remain unchanged, the generator power output will not change until the rotor is refurbished and the runner is upgraded in the future.

The project is scheduled to start on Sep. 8, 2009 and finish on Dec. 21, 2009.

2. EQUIPMENT DATA VERIFICATION

The rewind generator's model parameters are shown in Table 1, as compared with the original generator's model. For the rewind generator, the applicant provided the parameters based on the new winding rating of 30 MVA. These parameters have been converted to the base of 22.22 MVA.

Table 1: Model Parameters of the Rewound Generator at Hollingsworth GS

Description	Parameter	Old Value	New Value	Units
Nameplate Rating	S	22.22	22.22	MVA
Rated Power Factor	pf	0.9	0.9	-
Maximum Power Output	P	20.0	20.0	MW
GENSAL: Salient Rotor Generator Model				
D-Axis O.C. Transient Time Constant	T'do (>0)	3.54	3.872	sec
D-Axis O.C. Sub-Transient Time Constant	T''do (>0)	0.045	0.046	sec
Q-Axis O.C. Sub-Transient Time Constant	T''qo (>0)	0.035	0.103	sec
Inertia	H	3.118	3.118	sec
Speed Damping	D	0	0	pu
D-Axis Synchronous Reactance	Xd	1.072	1.089	pu
Q-Axis Synchronous Reactance	Xq	0.646	0.698	pu
D-Axis Transient Reactance	X'd	0.319	0.325	pu
D-Axis/Q-Axis Sub-Transient Reactance	X''d = X''q	0.241	0.235	pu
Leakage Reactance	Xl	N/A	0.154	pu
Open Circuit Saturation Factor	S(1.0)	0.22	0.19	-
Open Circuit Saturation Factor	S(1.2)	0.633	0.67	-

3. ASSESSMENTS

The Market Rules (Append 4.2, Reference 1) require that a generating facility connecting to the IESO-controlled grid must have the minimum capability to supply reactive power continuously in the range of 90% lagging to 95% leading power factor based on active power output at its generator terminals for at least one constant system voltage.

Although the stator winding rating of the generator has been increased to 30 MVA, the applicant confirmed that the generator will be registered at the original rating of 22.22 MVA to limit the generator VAR output. The rewound generator will meet the above Market Rules requirement. Since both the MVA rating and the power output of the generator remained unchanged, the generator rewinding will not have adverse impact on the reliability of the IESO-controlled grid.

4. CONCLUSIONS AND REQUIREMENTS

The IESO concluded that the generator rewinding at Hollingsworth GS will not have a negative effect on the reliability of the IESO-controlled grid.

The applicant shall register the generator MVA rating as 22.22 MVA during the IESO Market Entry process.

As soon as the commissioning tests are completed and actual data is available, the connection applicant is required to provide updated parameters and models for the rewound generator. If the actual data differ materially from the data that is used in the report, the assessment will need to be repeated.

5. NOTIFICATION OF CONDITIONAL APPROVAL

It is recommended that a Notification of Conditional Approval of the Connection Proposal be issued to the applicant, subject to the requirements detailed above.