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OUR FILE:

May 9, 2014

Ms. Nicole Godbout
Regulatory Counsel
Nova Scotia Power
1223 Lower Water Street
PO Box 910
Halifax, NS B3J 2W5

Dear Ms. Godbout,

RE: M05522 2014 IRP Assumptions re: Variable Generation Integration Costs

Further to your letter dated May 1, 2014 presenting Nova Scotia Power's (NS Power's) draft Variable Generation Integration Cost assumptions included in NS Power's 2014 IRP, the Nova Scotia Small Business Advocate ("the SBA") offers the following comments and observations as summarized below:

1. **Amount of variable generation**: The graphs on pages 4 and 11 denote the operational wind integration costs versus installed wind capacity. NSPI indicates throughout the document that 600 MW of variable generation are available and committed. Furthermore, the template on page 5 describes how NPSI will conduct the capital investment cost analysis for projects above 600 MW of variable generation. Please confirm that NSPI will evaluate in the 2014 IRP only additional to 600 MW of variable generation.

2. **NB additional tie**: If 600 MW of variable generation exist and are committed for the 2014 IRP, NSPI should evaluate a case where an additional tie to NB is constructed. This additional transmission line will provide mitigated measures for the wind integration and displace the potential need for capital investments of new fast start generators in Nova Scotia. The document describes the need for the additional tie but only at a level above 600 MW of variable generation. SBA believes that the benefits from an additional tie to NB may appear before the 600 MW level.

3. **Wind-Hydro Synergies**: The document does not provide information on potential synergies between hydro and wind in Nova Scotia. The large amount of hydro resources in Nova Scotia and its potential ability to quickly adjust its output to meet system demand can assist in reducing the wear and tear on the thermal units by utilizing hydro before thermal to follow system conditions. Therefore, SBA requests NSPI to consider in its modeling the enhanced ability of hydro resources to follow load in comparison with thermal units.

4. **Smart grid integration**: There are many new developments that can assist in the integration of variable generation. This may include the deployment of smart meters to facilitate more demand response programs, incentives to promote the installation of stationary and mobile storage facilities, and generation on the distribution system. This document does not provide any information on whether NSPI will consider the initiation of these programs in correlation with the integration costs of the variable generation.

5. **Better wind technology can reduce the wind forecast error**: The rapid growth of variable generation technology results in wind and solar actively participating in system reliability along with conventional generation. For example pitch controlled wind turbines can minimize the forecast error by adjusting to the system needs without the additional cost of non-contingency reserves. SBA requests NSPI to model different estimates of reserve requirements that will result in different integration costs. In addition the internal transmission reinforcements, which are described in page 16, will further reduce the impact of variable generation.

6. **Potential changes in unit dispatch in Nova Scotia:** The considerable increase of variable generation will increase the system uncertainty that NPSI must factor in its operating decisions. This will initiate enhancements to existing operating criteria, practices and procedures to account for the significant penetration of the new resources, and potentially result in changes in how dispatch is commenced. In practical terms, NSPI may decide to commit additional capacity for ramping capability and ancillary services to ensure the system can withstand significant contingencies (Similar to Must Run). Also

the company may initiate restrictions on the range of oscillations on thermal units, which are not designed to operate in such mode, to minimize their potential wear and tear.

7. **32 MW of additional non-spinning 10-minute reserve mentioned on page 12:** The document does not provide adequate information on how this number was derived. The 10 minute criterion is related to the procurement of enough 10 minute reserves for a balancing authority to meet is first contingency loss. NSPI must explain how the added variable generation will affect this procurement.

8. **Graphs on page 4 and 11 cost calculation:** There is no information or documentation on how the graphs on pages 4 and 11 were developed. In addition, it is not clear how NSPI will model these costs in the candidate resource plan process.

The SBA appreciates the comprehensive effort NS Power is making to review the assumptions to its 2014 IRP with the members of the IRP Participants group. In order for the SBA to reach a greater level of comfort with the proposed Variable Generation Integration Cost assumptions, however, we would appreciate obtaining more detailed information as summarized in the comments above.

The SBA appreciates the opportunity to submit these comments and information requests and looks forward NS Power's response, as well as to continuing to participate fully in NSPI's stakeholder process for the 2014 IRP.

Sincerely,

Sandy Darling for
E.A. Nelson Blackburn, Q.C.

SMALL BUSINESS ADVOCATE