

IESO SENIOR MANAGEMENT UPDATE

To: Stakeholder Advisory Committee

Date: October 30, 2008

Subject: **Embedded Generation (SE-57)**

Information Item

Background

Stakeholder Engagement #57 (SE-57) was created by the IESO with the intention of facilitating the integration of embedded generation into the reliable operation of the IESO controlled grid and the efficient operation of the IESO administered markets. SE-57 began in December of 2007 with the issuing of a discussion paper reviewing the current state of embedded generation. This paper proposed three discussion areas requiring recommendations from stakeholders. These recommendations were to be the focus of the SE-57 group and included:

- a review of Connection Assessment and Approval requirements and rules,
- evaluation of existing Performance Standards for embedded generators,
- the development of an effective and inexpensive means of providing Real-Time visibility.

The following memo will summarize the progress of SE-57 through subsequent SE meetings, discussion papers and submitted stakeholder feedback.

The memo concludes with a brief discussion of the additional focus of SE-57, which includes:

- the development of a dispatch criteria,
- a communication path for dispatch instructions,
- discussions related to compensation for dispatching of embedded resources, and
- operational awareness of resources (i.e., production forecasts, outage implications).

These topics are aimed to increase the efficiency of embedded generators, by taking into account their impact on the decision processes within the IESO administered markets. For example, the ability to respond to IESO instruction during specific system events on the IESO controlled grid (ICG) and accounting for their output when scheduling imports/exports and large units with commitment costs.

Connection Assessment and Approvals (CAA) Process

Small embedded generators that connect to their Local Distribution Companies (LDC) are not subject to IESO's CAA process. In order to connect at the LDC, embedded generators follow the process as instructed by their local LDC. To account for the effects of embedded generators, the IESO has recommended that LDCs request a System Impact Assessment (SIA) on behalf of all embedded generators once their installed capacity exceeds the potential that could result in a 10MW injection into the ICG. Discussions have identified that the calculation of the potential injection trigger amount be based on a correlation study between load profiles of the LDC and generation profiles that are reflective of the generator characteristics of the installed embedded generation aggregate.

Future actions include working with the LDC's to address known impacts of high penetration of distributed generation in various zones through-out the province.

In addition, the OEB will need to address several topics related to their Distribution System Code (DSC) in reference to LDC cost allocation for SIA requests, system losses during back feed injection, and timelines associated with the connection and assessment process and their effects on the DSC.

Performance Standards

SE-57 has resulted in several recommendations related to performance standards affecting embedded generators. The outcome of these recommendations is intended to ensure reliable operation in the future while facilitating connections to LDC's and removing barriers associated with market entry.

New provisions to applicable performance standards include requirements for low voltage ride through (based on CSA-235 emergency requirements) and features that prevent automatic reconnection of an embedded generator following a trip off.

SE-57 efforts have also identified a need to remove the requirement for power factor regulation of generation connected to circuits of 50kV or less, so as not to conflict with existing distribution requirements.

Other modifications of existing provisions included requirements for reactive power, voltage variation, automatic voltage regulation, under frequency load shedding, load power factors and excitation governing systems. These modifications are meant to facilitate connections for all embedded generator types and remove conflicts with distribution requirements.

Real-Time Visibility

The IESO has brought forth a need for embedded generators to submit real-time operational data in order not to impede efficient operation of the market and IESO's real-time response to system events. IESO's ability to access such data will further benefit day-to-day operations by maintaining the current standards in modeling and forecasting. This would be done by incorporating the effects of embedded generations in studies related to generation and load profiles.

The IESO will work with the LDCs, the Ontario Power Authority and the Ontario Energy Board to develop an effective and inexpensive means of providing real-time visibility of embedded generators.

Next Steps

SE-57 will continue to follow through with the identified recommendations in the areas of Connection Assessment and Approvals (CAA) Process, Performance Standards and Visibility through further stakeholding of issues, market rule amendments and discussions with other involved parties (LDC's, OPA, OEB).

In order to be prepared for increased penetration of embedded generation other initiatives need stakeholding. These initiatives include possible dispatch criteria, communication path for dispatch instructions, the appropriateness of compensation for dispatch and future operational awareness. These topic areas will increase IESO's ability to manage operation of the ICG efficiently and help ensure that the benefits of embedded generation are not undermined by inefficient integration of this valuable resource.