# Embedded and Renewable Generation (SE-57)

ieso
Power to Ontario.
On Demand.

**Minutes of Meeting**

| **Date held**: June 16, 2009 | **Time held:** 9:00 am | **Location held:** Holiday Inn (Mississauga) |
|---|---|---|
| **Invited/Attended:** | **Company name:** | **Attendance Status:** (A)ttended; (R)egrets; (S)ubstitute |
| Adams, Tom | Independent | A |
| Bell, Brian | Ontario Power Generation | A |
| Besner, Serge | Environment Canada | Via teleconferencing |
| Burkom, Jack | Brookfield Power | A |
| Cadieux, Francois | Independent | A |
| Caffyn, Sean | UPC Solar | Via teleconferencing |
| Cary, Rob | RCAI | A |
| Choi, Daniel | Samsung C&T | A |
| Frick, Scott | St. Lawrence Seaway | A |
| Garner, Tracy | Ontario Power Authority | A |
| Gavrilidis, Anna | Sherwood Electromotion Incorporated | A |
| Gursoy, Berk | Brookfield Power | A |
| Hayden, Dan | Epcor | A |
| Heaton, Randy | TransCanada Energy | A |
| Hunt, Bob | Hunt Management Services | A |
| Kosnik, Tom | First Solar | A |
| Krause, Don | Genivar | A |
| Kuber, Kathryn | Ministry of Energy and Infrastructure | A |
| Kuntz, Margaret | TransCanada Energy | A |
| Lee, Andrew | Acciona Energy | A |
| Loughren, Chris | Bruce Power | A |
| Malinowski, Martin | Rodan Energy Solutions | A |
| Maljukan, Sasa | Hydro One Networks | A |
| Manougian, Harout | Elektron Consulting | A |
| Mehta, Adarsh | CanWEA Board Director | A |
| O'Rourke, Brian | SNC-Lavalin | A |
| Pakela, Gregory | DTE Energy | Via teleconferencing |
| Pelland, Sophie | Natural Resources Canada | Via teleconferencing |
| Peterson, Dave | Ontario Power Generation | A |

| **Date held**: June 16, 2009 | **Time held:** 9:00 am | **Location held:** Holiday Inn (Mississauga) |
|---|---|---|
| **Invited/Attended:** | **Company name:** | **Attendance Status:** (A)ttended; (R)egrets; (S)ubstitute |
| Rabadi, Adi | Invenergy | A |
| Radan, George | Aquilon Power Corporation | Via teleconferencing |
| Rangooni, Justin | Canadian Wind Energy Association (CanWEA) | Via teleconferencing |
| Reid, Robert | N-Sci Technologies Incorporated | Via teleconferencing |
| Reyns, Roberta | Ontario Power Generation | A |
| Roks, Cindy | Ontario Power Authority | A |
| Romaniuk, Oliver | FPLE Canadian Wind | A |
| Russell, Stewart C. | Samsung C&T | A |
| Sasso, Andrew | ENWIN Utilities | Via teleconferencing |
| Shields, Stephen | Ontario Energy Board | Via teleconferencing |
| Sorensen, Kevin | Gilead Power | A |
| Taylor, Kris | Essex Power | A |
| Tintor, John | Aquilon Power Corporation | Via teleconferencing |
| Vallejo, Patricia | NextEra Energy Canadian Wind | A |
| Yang, Bunli | E4 | A |
| Chase, Maia | IESO | A |
| Drake, Gordon | IESO | A |
| Finkbeiner, Darren | IESO | A |
| Harrison, Cynthia | IESO | A |
| Hastings, Martin | IESO | A |
| Huber, Devon | IESO | A |
| Lafoyiannis, Peter | IESO | A |
| Lam, Tim | IESO | A |
| Robitaille, Dave | IESO | A |
| Rochester, Dan | IESO | A |
| Romeo, Rick | IESO | A |
| Savage, Jessica | IESO | A |
| Singh, Diljeet | IESO | A |
| Tang, Jessica | IESO | A |
| Scribe: *Jessica Tang*<br>Please report any corrections, additions or deletions e-mail to jessica.tang@ieso.ca | | |

All meeting material is available on the IESO web site at: SE-57

**Agenda Item #1 Administration**

Dave Robitaille of the IESO welcomed the group and described recent low demand events as well as the increase in renewable energy.

**a. Review Agenda**

The agenda was approved with no changes.

**b. Action Items**

Dave Robitaille of the IESO reviewed the open action items from last meeting. The second action item is open and will be on-going as market rule changes are required. Dave stated that the market rule amendments around Performance Standards are being introduced at the Technical Panel on June 23, 2009. Finally, the fourth action item remains open and will be addressed as SE-57 moves forward.

**Agenda Item #2 - Overview of NERC's Paper on Accommodating High Levels of Variable Generation**

Khaqan Khan of the IESO provided a summary of NERC's paper and their recommendations.

**Member Questions, Comments and Discussions**

A member stated that NERC applies across North America and their conclusion are broad and may not be applicable to Ontario. He stated that these generalizations need to be looked at from a local perspective. He then asked what the IESO is doing specifically. Khaqan stated that the NERC members include many people from different provinces in Canada and the first report is meant to be at a high level. More details will come out in two years with the next report, which is currently being worked on. He stated that the IESO is a lead in accommodating variable generation and there is a work plan for SE-57 that outlines the actions the IESO is taking going forward.

Another member asked at what point are there diminishing returns associated with expanding the size of a control area. The IESO stated that the experience ACE Diversity Interchange in NYISO, ISO New England and NBSO has shown improvements in control performance with respect to load and generation balancing and feedback from these balancing authorities has been very positive. The IESO is in conversation with its neighbors in NPCC to investigate opportunities for Ontario's participation in this expanded ACE sharing program.

**Agenda Item # 3 - Centralized Forecasting**

Martin Hastings of the IESO presented the benefits and findings around centralized renewable forecasting.

**Member Questions, Comments and Discussions**

There were a few questions of clarification around the presentation and the methods used to measure forecast error.

The following questions were asking regarding error calculations:

- Has the IESO looked at correlation factors? Martin stated that they had not looked at correlation factors at this time.
- Why is the error calculation over forecast value and not over capacity? Martin stated that the calculation represents a material error when using the forecast value. Furthermore, he stated that this method is consistent with how other jurisdictions calculate error.
- Is there an optimum error? Martin said at this time there is only the knowledge of what other jurisdictions do and have achieved.
- Is there any data to indicate if the error calculated is from generator neglect or system performance? Martin answered that there is varying quality of forecast submission from generators that is resulting in higher errors.

A member asked if there are restrictions on solar ramp rates (as they are very fast). Martin said that he did not know of any off hand.

Some participants asked about the cost of providing centralized forecasting and is the IESO looking to tolerances and penalties instead of centralized forecasting. The IESO stated that in 2008 CALISO's cost was around $352,000USD and in New York, they charge their wind farms and the costs are around $200,000USD. Alberta is expecting to pay 10-20 cents/MWh. The IESO went on to state that it is an option to penalize for inaccurate forecasts however it wouldn't help the IESO in real-time until behavioural changes occurred. Furthermore, if penalties become frequent for some wind farms, it may be beneficial to just have a cost.

A member stated that today's forecasting systems do not predict high ramping weather systems. Martin stated that centralized forecasters are looking at this issue and predicting these weather systems is expected to improve over the years.

Martin concluded by stating that the IESO believes centralized is the best approach but is welcoming feedback from stakeholders. He went on to say that there are still many outstanding questions, like how do we procure this? Do we contract it out? Do we run a pilot? etc.

The paper will be posted for a two week comment period.

**Agenda Item #4 - Management of Minimum Load Periods**

Jessica Tang of the IESO presented and described the issues associated with dispatching of typical baseload generation during periods of minimum load. She stated that the draft paper will be posted for comment for a two week period after which another meeting will be held (expected the end of July).

**Member Questions, Comments and Discussions**

The following questions, along with the response, were asked regarding the presentation:

- Can we find out how often and how many MW of water hydro generators have spilled to date as well as how many MW of nuclear generation have been manoeuvred down for SBG? Is 1500MW reasonable for hydro? The IESO stated that they would take this as an action item and that 1500MW is not unreasonable. Bruce Power stated that, to date, they have had 290,000MWh of lost production due to minimum load conditions.
- How are gas generators/SGOL permitted during SBG? Jessica stated that it is based on economics and explained the current rules and procedures.
- Are you planning on forecasting SBG over the next few years? Dan Rochester of the IESO stated that the IESO just began forecasting this in the 18-month outlook and has not looked out further. This is the mandate of the Ontario Power Authority.
- What is the impact of NUG production on SBG? How will it change going forward? NUGS are non-dispatchable and are part of baseload generation. They have typical operating patterns during minimum load periods. However, there are a number of NUGS whose contracts are ending and, as the contracts expire, they have to chose some other form (i.e., self-scheduling generator or dispatchable) moving forward. The member asked over what time frame with the contracts expire. The IESO is unable to answer this question.

Representatives from each resource area were invited to speak to concerns during minimum load conditions.

- Nuclear:
  - Chris Loughren, from Bruce Power, outlined the following points with respect to manoeuvring a Bruce nuclear unit during periods of low demand:
    - 213 SBG dispatch instructions so far this year resulting in 290,000MWh of lost generation.
    - Prefer single, large derates – reactive power does not change so the same amount of steam is going into the lakes regardless of the amount. This could result in an environmental regulation limit violation, thus dictating the manoeuvre (this is commonly referred to as CSDV – condenser steam discharge valve).

- Big concern is that gas and commissioning units are online while Bruce units are being dispatched down. If this keeps up, these units may not be around for summer peak as a result of possible equipment damage.
- NUGs are operating as baseload, but they are natural gas units that can move.
- Understanding that nuclear units are dispatchable, prefer to have a single large manoeuvre then be dispatched off. It is easier for wind unit to move, especially for small amounts of MW.

- Dave Peterson of OPG outlined the following points around manoeuvring an OPG nuclear units during periods of low demand:
  - Similar concerns to that of Bruce Power with the difference being that all manoeuvres are reactor power based (in other words, no CSDV):
    - All manoeuvre procedures must be approved by Canadian Nuclear Safely Commission (CNSC).
    - All manoeuvres are monitored by the CNSC.
    - Not predictable when the units can move.
    - Manoeuvring must be done in small steps.
    - Return to service is slow, limiting the ability of the unit to contribute. Prefer to be moved for longer periods of time.
    - Complicated procedures for manoeuvring.
    - Shutdown is not preferred because of the thermal changes that are huge stresses on the units. A shutdown may impact maintenance schedules (i.e. advancing the schedule) which impacts the IESO with respect to planning their grid outages.
    - For the most part, can only manoeuvre 20-40MW, or a 3% change in reactive power. There are only a few units that can do 50-60% reduction of reactive power but the frequency of these manoeuvres is limited to normally once a week.
- A wind representative stated that wind is a market driven producer. She stated that wind is willing to move but has compensation been considered to keep wind whole during this period? Darren Finkbeiner of the IESO stated that compensation discussions for any resource need to be a conversation separate from this one. We are looking to understand, based on the review criteria, what makes sense operationally, then we can go to the next step and look at contract implication and how to move forward. For now, let's just focus on the technology and implications.

- Hydro:
  - Dave Peterson of OPG discussed the implications around spilling water during periods of low demand:

- OPG goes to significant lengths to ensure only generate minimum amounts during SBG. They are maximizing generating during on-peak and pumping during off-peak.
- When spill is required, can do it anytime, but it can involve problems (safety of the public who may be fishing for example).
  - Need visual inspection of the spillway and this can generally only be down during daylight hours. It can be a difficult task at night, when these conditions generally occur.
  - Spilling takes a lot of time to organize. Most stations are not manned. Sending people to the spillways takes time and most spillways are quite long, so the need to get a helicopter in some instances (only for emergencies).
  - Some spillways are secondary and flooding may send fish up stream. Once spilling is complete, the fish need to be rescued.
- There are minimum flow requirements and some requirements are joint with the US, which takes coordination to spill.
- Essentially, there are environmental, regulatory and safety implications with spilling hydro.

o A participant asked if public safety shouldn't be first and foremost. The IESO stated that it was first on the list on hydro implications and assured the participant that this was not overlooked.

- Gas and General Comments
  - o A member reinforced that a delay in commissioning should not be trivialized and that some NUGs are COGENs and cannot really manoeuvre.
  - o Another member stated that commissioning unit delays is a financial issue and is no different than any other driver. This was taken off the table for this discussion.
  - o A participant asked if the IESO was looking at a two settlement system. The IESO stated that this is a real-time issue and needs to be dealt with right now. That proposal would take too long.
  - o Another participant stated that New York is able to deal with SBG better because they have a day-ahead market (DAM). How is it that these other units are coming online while nuclear units are being dispatched down? Darren Finkbeiner stated that the IESO is speaking and learning from what other jurisdictions do and is developing the Enhanced Day-Ahead Commitment (EDAC) program that has 24 hour optimization which is expected to minimize some of these impacts. He went on to explain that both guarantee programs (SGOL and DAGCG) operate in a way that, day ahead, if the min is economic for the minimum generation block run time, the generator is constrained on for their minimum period. If they do not get a day-ahead schedule, they can still offer in real-time. All the generator needs in real-time is 1MW economic in the constrained sequence for 1 hour and they get constrained on for their minimum run times are their minimum loading point. The IESO is looking to see how appropriate this is and is also looking to potentially change these programs.

- A member asked the following questions (along with the IESO answers):
  - Have you looked at peak versus average, as peak forecasting may be what is driving gas on? We need peak for the peak hour reliability but are looking to see if peak is appropriate during minimum load.
  - Are you looking at getting rid of IOGs overnight? Not at this time.
- Another member stated that the IESO has suggested more SBG in the future as well as more wind. Will the primary demand recover and can the IESO give guidance on what type of environment we will be looking at. The IESO stated that this is unknown and lays in a political window. We don't know how or when the recession will end and cannot give an update on wind (due to recent announcements such as setback proposals as an example, the previous estimate may have been high). The IESO has not settled on a view of the future and it may best come from the OPA. Some key decisions will be made in the summer (such as nuclear choices) which will play a large role in the outlook of the energy environment.
- A participant asked if manoeuvrability has been built into the specs for the new nuclear units? The IESO stated that they do not know these answers.
- A member asked a follow up question regarding inadequate transmission. Darren Finkbeiner stated that in the paper, we discuss global and local conditions. An example was the loss of an XxE transmission line which resulted in a local surplus. This is in addition to the chronic interface in the Northwest, where we usually have local surpluses. New transmission is a part of this and there is already some work being down (new tieline with Quebec, phase shifters).
  - A member asked for more clarification about the phase shifters as it has been talked about for a number of years. The IESO stated that they are still moving forward with them.
- A participant asked if price was always negative during SBG? The IESO stated that this is not always the case because of the constrained and unconstrained pricing algorithm.

**Agenda Item #5 - Review of Standards Requirements to Meet Potential Policy Changes**

Diljeet Singh of the IESO introduced the topic of possible new standards to meet possible policy changes.

**Member Questions, Comments and Discussions**

There were no member questions or comments.

| Action Item Summary | | | | |
|---|---|---|---|---|
| # | Date | Action | Comments | Status |
| 1 | January 31, 2008 | The IESO will provide an overview of the potential injections to the Technical Panel in time for their deliberations on potential market rules. | This will be an on-going item as SE-57 progresses. | Open |
| 2 | January 31, 2008 | The IESO is to coordinate the threshold for providing telemetry with the LDC's requirements. | | Open |
| 3 | June 16, 2009 | How often and how many MW of water Hydro generators have spilled to date as well as MW of manoeuvred nuclear generation. | | Open |


Committee Chair: David Robitaille
dave.robitaille@ieso.ca