

Minutes of Meeting

Date held: January 28, 2009	Time held: 9:00 am – 3:00 pm	Location held: OPA, Toronto
Invited/Attended	Company Name	Attendance Status (A)ttended; (R)egrets; (S)ubstitute
Adams, Tom	Tom Adams Energy	A
Besner, Serge	Environment Canada	A
Cary, Rob	Robert Cary & Associates	A
Cheng, Clarence	Ministry of Energy and Infrastructure	A
Chow, Bob	Ontario Power Authority	A
Cookson, Michael	Kruger Inc. (Wind Farm)	A
Edmonstone, Bill	Acciona Wind Energy Canada/Ripley Wind Farm	A
Elahi, Raubia	Ontario Power Authority	A
Fleming, Ted	Ontario Power Authority	A
Garner, Tracy	Ontario Power Authority	A
Greenhouse, Ben	FPLE Canadian Wind	A
Haggerty, Dennis	Erie Shores/ Port Burwell (Wind Farm)	Teleconference
Hayden, Dan	EPCOR Wind Farm	A
Jayaraman, Jay	Enbridge	A
Jenkins, Allan	Ministry of Energy and Infrastructure	A
Lee, Andrew	Acciona Wind Energy Canada//Ripley Wind Farm	A
MacDougall, Jim	Ontario Power Authority	A
Manougian, Harout	Elektron Consulting	A
Nagpal, Jaideep	Ontario Power Authority	A
O'Rourke, Brian	SNC-Lavalin	A
Pennie, J.C.	Windrush Energy	A
Rangooni, Justin W.	CANWEA	A
Roberti, Rob	Macquarie Capital Funds Canada Ltd. / Erie Shores Wind Farm	A
Roks, Cindy	Ontario Power Authority	A
Russell, Stewart C.	AIM SOP Phase I LP	A
Timm, David	AIM Power Generation	A
Tuenter, Hans	Ontario Power Generation	A
Vallejo, Patricia	NextEra Energy Resources	A
Facca, Mauro	IESO	A
Falvo, Michael	IESO	A

Khan, Khaqan	IESO	A
Rochester, Dan	IESO	A
Romeo, Rick	IESO	A
Scribe: Stephen Baker, IESO. Please report any corrections, additions or deletions to the following e-mail address: stakeholder.engagement@ieso.ca		

All meeting material is available on the IESO web site at:
http://www.ieso.ca/imoweb/consult/consult_windpower-sc.asp

Item 1 Welcome and Introductions

a) Review of Agenda

On the request of Stewart Russell, an item titled “Overview of Utility Wind Integration Studies” was added in the existing agenda.

b) Review of Action Items

Khaqan Khan reviewed progress on Action Items: 34, 38, 39, 40 and 41 (refer to [November 05, 2008 Minutes of Meeting](#)). It was noted that Items 40 and 41 would be closed by means of IESO and OPA presentations during this meeting.

Action Item Summary				
#	Date	Action	Status	Comments
34	May 14, 2008	Tom Adams to make a presentation on wind diversity issues: quantifiable benefits and characteristics at the next standing committee meeting.	Closed	Presented by Tom Adam on Jan 28, 2009 WPSC meeting.
38	November 5, 2008	IESO to send a link regarding information on forecasting accuracy levels to all stakeholders.	Closed	Information circulated to WPSC members on Jan 26.
39	November 5, 2008	IESO to investigate wind power variability in relation to demand.	Closed	Information circulated to WPSC members on Jan 26.
40	November 5, 2008	The IESO will develop a document highlighting existing and proposed performance requirements for generation and post it in the IESO website.	Closed	Posted and presented on Jan 28, 2009 WPSC meeting.
41	November 5, 2008	OPA to determine whether it will be able to give a presentation to WSPC at the next meeting scheduled for January 28, 2009 on proposed wind projects in Ontario including progress on enabler lines to accommodate more wind.	Closed	Presented by OPA on Jan 28, 2009 WPSC meeting.

Item 2 Upcoming wind Projects and Enabler Lines

In the introductory remarks for this item, the chair noted that based on 'WPSC participants survey feedback, it was requested to continue to invite the external speakers from various organizations on wind matters. Accordingly, two speakers from OPA are invited to present on this topic.

a) Jim MacDougall conducted a presentation on upcoming wind projects in Ontario.

Members Questions, Comments and Discussion

A member asked if OPA has considered the lead time required to solve network issues and the impact this could have on projects awaiting completed CIA reports. In response, Jim mentioned the force majeure clause in contracts could be triggered to provide some flexibility under these circumstances.

A member asked if access to credit was an issue for developers and could this cause delays to projects. Jim responded that this has not been addressed as yet.

A comment was made that many US banks have not been lending money for wind projects since September. A member asked if this might be justifiable cause to trigger force majeure clauses in contracts also noting that developers are now exposed to more risk because interest rates can change by the time they gain access to funds.

A member asked if the strength of the Canadian dollar was responsible for price increases for projects. The response was that this could partly be attributed to the Canadian dollar but mostly was due to higher demand for wind turbine generators.

b) Bob Chow presented on enabler transmission lines in Ontario.

Members Questions, Comments and Discussion

Comment: A member asked if there is an economic rating for evaluating and ranking the importance of the enabler lines.

Response: Bob responded that there is and that the justification for enablers is far clearer as opposed to conventional transmission which could take many factors into account.

Comment: Are the voltage levels for enabler transmission typically 230 kV or 500 kV?

Response: Bob Chow responded that it is almost always 230 kV or lower, and that the 500 kV system has no direct generation connected to it. The 500 kV system is used for bulk power transfer.

Comment: Has any discussion underway on future generation procurement processes beyond those mentioned in the presentation?

Response: Not yet but identification of further wind projects would precede such a process.

Comment: Are the enabler lines discussed in the presentation required in order to meet current renewable targets?

Response: The current renewable targets would require enabler lines.

Comment: How are the enablers lines given priority, how are these defined and how will stakeholders get updates on such information?

Response: They are prioritized on the connection project activity in the areas identified as having wind potential and by their interdependence on other transmission lines being built, such as the Bruce to Milton line.

Comment: Does the definition of wind potential take into account forecastability and reliability of wind?

Response: The wind potential is more a guide of energy in the regions than firm capacity at present. More detailed assessment would be undertaken by potential developers in order to manage their risk.

Comment: How much does capacity factors vary?

Response: In Ontario, average monthly capacity factors vary from 13 to 45 %.

Comment: Alberta has very high wind potential but it is not easy to forecast, making it more difficult to use and this is an underestimated issue.

Response: Developers are expected to absorb the risk associated with forecast error when assessing the viability of a project. A comment followed that in Ontario the flexibility of gas and hydro plants could reduce reliance on wind forecasts.

Comment: Studies of the flattening effect of hydro on the supply variability due to wind and the impact on transmission should be considered.

Response: The response was that this would be more likely to become an issue when wind capacity exceeds 5000 MW. This issue is currently parked in terms of study work but on the radar. A comment was also made that better and accurate forecasting would always be considered beneficial.

Item 3 Status Update on WPSC Recommendations and Actions

Khaqan Khan provided 'status update' on WPSC recommendations and associated action items. An overview of matrix of WPSC recommendations and the action items was presented. The highlights of status updates are as follows:

- two major recommendations emerging in 2008 pertain to mid-term Wind Capacity Contribution-WCC (re: 18 month & Ontario Reliability Outlook) and near-term WCC (re: System Status

Reports, System Adequacy Assessments). Status of completion and implementation of these recommendations is 100% completed

- all outstanding actions from 2008 and 2009 meetings to date are completed and closed

It was noted that based on 2007 and 2008 WPSC stakeholder recommendations, 13 recommendations out of a total of 17 have been completed while work is in progress on 4 recommendations. This reflects a 76.4% completion rate and depicts 'exceeding 2008 success criteria and expectations'.

Item 4 Round the Table - Wind Issues

Chair noted that today and onwards a portion of time of meetings will be devoted on group discussion on emerging wind related matters and issues. Each member was requested to present at least one issue that may be considered a barrier to integration of wind.

Question: Is embedded generation visible to the IESO and accounted for in pre-dispatch forecasting?

Response: An IESO working group on embedded generation, namely Stakeholder Engagement (SE-57), will address this issue. There is an IESO discussion paper regarding visibility, forecasting/reliability and performance standards related to embedded generation at the IESO SE-57 webpage.

Question: With transmission lead times being acknowledged as being very long, is there any consideration being given to locational pricing?

Response: Not at this time.

Question: If wind farm operators come up with better forecasting methods would the IESO encourage that these methods be adopted by other market participants?

Response: As per market rules it is up to the market participants to provide dispatch data on best forecast basis using their choice of forecasting methodologies. However, the IESO does meet with market participants to encourage discussions and sharing of joint ideas on best forecasting practices that could be adapted.

Question: Are standards being developed to address potential health issues around wind generation?

Response: This does not fall under WPSC mandate and scope, possibly CANWEA could have some involvement.

A member suggested a future agenda item, "time of use pricing and its effect on integration of wind". IESO noted the suggestion for future consideration.

Question: What is the correct forum to discuss reactive compensation at the IESO controlled grid (ICG) level for embedded generation, and how would costs be allocated?

Response: The IESO SE-57 working group is the correct forum for this item. We could get a speaker for information but not in the mandate of this committee. The OEB makes decisions about cost allocation.

Question: Could the draft Green Energy Act be reviewed to determine if input is required to address the long lead times of transmission development and its impact on the development of wind power.

Response: Suggestion noted for future consideration.

Question: Could we look at other jurisdictions to compare their practices when considering reverse power flows through distribution networks due to high penetration of embedded wind generation. Hydro One uses 60% of transformer nameplate rating or 400 Amps as a limit.

Response: This item/suggestion will be forwarded to IESO's SE-57 working group.

Question: What is the IESO doing to consider Surplus Base Generation (SBG)?

Response: The IESO is looking into SBG as part of its operability analysis. This is work in progress.

Question: Could the phase out of coal open up transmission capacity for wind?

Response: Transmission capacity is not reserved for any particular type of generation but the current OPA transmission capacity matrix does take into account ramp down of fossil fuel.

Question: How much of the 560 MW of RESOP generation by 2009 is expected to actually come.

Response: There is no real indication as yet.

Question: Kruger propose to connect a number of embedded generation projects in a high wind concentration area. Is there any discussion on such approach being encouraged elsewhere?

Response: The OPA is not likely to get involved in distribution system development; their focus is on transmission solutions based on the levels of proposed generation.

Comment: There are reliability issues with the dynamic reactive compensation at Kruger related area and it is questioned whether or not the requirement was necessary. In Europe these are not required.

Response: Work has been undertaken by the IESO to support this requirement. The main issue is that the distribution systems here cannot accept large levels of embedded generation that operate in voltage control mode and maintain voltages within the required limits following the loss of a generator. Consequently, the machines will operate in power factor control mode and as such, displace dynamic reactive capacity. If applicable, this item will be forwarded to IESO's SE-57 working group.

Comment: OPG has implemented a risk management tool which mitigates the impact of wind generation on their operations. OPG would like to give a presentation to WPSC at a later date.

Response: The IESO will accommodate this presentation in its next WPSC meeting.

Action Item: The IESO to accommodate OPG's presentation in its next WPSC meeting.

Action Item: The embedded generation related issues and suggestions identified by WPSC members will be forwarded to IESO's SE-57 working group for their consideration.

Item 5 Highlights of Existing and Proposed Performance Requirements for Generators

Mike Falvo gave a presentation on the present state of IESO staff efforts to facilitate generation connections by revising performance standards for generators (Market Rules, Appendix 4.2). The objective of this presentation is to determine whether these changes would be supported by the WPSC. The presentation and draft document are posted on the IESO WPSC web page under item 5 besides the January 28 agenda. It was noted that the IESO strives to review its processes and requirements and to remove unnecessary barriers to the connection of new generation.

Members Questions, Comments and Discussion

Question: A member requested an explanation of the approval process for Market Rules changes.

Response: The IESO follows a stakeholder process under Market Rules. Proposed changes are posted on the IESO website and a time is allocated for comments. The IESO responds to comments. It was noted that draft paper would further be presented and discussed in a technical panel with stakeholder representation.

Question: What is the timeline for the proposed Market Rules changes regarding generator performance standards?

Response: This date is still to be determined. Comments from the WPSC will be gathered over the next three weeks from the date of the meeting.

A member commented that they consider the IESO to have done good work so far on this issue. The members were requested to provide any further comments by February 23, 2009.

Action Item: The WPSC members to provide any further comments on draft paper titled “Existing and Proposed Performance Requirements for Generators”, posted on WPSC web page, by February 27, 2009.

Item 6 Forecasting and Compliance

Representative of Market Assessment and Compliance Division (MACD) gave a presentation regarding compliance assessment of revising dispatch data for wind generators. The presentation noted the market rules and the associated market manual forecasting related requirements. It was reiterated that a registered wind market participant is required to submit its dispatch data indicating its best forecast of the amount of energy that it will inject in each dispatch hour. It was emphasized that a registered market participant is required to submit revised dispatch data to the IESO for a material change in schedule as per requirements set out in Section 3.3.8 of Chapter 7. A few snapshots were presented as examples of the factors MACD will consider when reviewing a failure to revise dispatch data.

It was noted that MACD will be looking for evidence that the market participant has exercised due diligence in revising dispatch data (forecasts) to reflect expected injection and confirmed that MACD recognizes the variability of the wind and the challenges this presents to market participants.

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Members Questions, Comments and Discussion

Question: Should compliance be evaluated in real time instead of days after?

Response: Currently we would not since IESO resources are geared primarily towards compliance with market rules and real time assessment is not a requirement. However, the control room does monitor generators in real time and are in a position to take action where appropriate, so some form of real time compliance monitoring does exist in that respect.

Question: What incentives are there for better forecasting?

Response: The best forecast possible is a requirement of the market rules and the IESO does receive regular updates to forecasts which would suggest that the current incentive to meet the rules is working. WPSC has also developed a recommendation regarding incentives and such options will be reviewed in this year.

Question: Do we compare our wind compliance issues with other jurisdictions?

Response: Somewhat, but often there is a lack of precedence. Wind generation operators are taking their own initiative to get the best possible forecasts based on their market rules or their specific region requirements.

Comment: There appears to be no OPA incentive to attract technology that may flatten the variations in output from wind farms. In few jurisdictions compressed air is technologies are used as storage technologies to facilitate wind power.

Response: IESO's smart grid forum is looking into the prospective use and development of these technologies.

Item 7 Wind Variability

Tom Adams & Francois Cadieux gave a presentation on wind variability study in Ontario. The topic of presentation was titled as: "Quantifying the benefits of geographic diversity". The study analyzed up to 32 months of hourly production using IESO and FERC data. The parameters analyzed included performance & variability; correlation between stations (hourly and daily); and spot checked 5 minute results for a few days. The presentation detailed results that were based primarily on actual, historical data from existing wind farms connected to the ICG. Tom Adam also provided a list of areas for future wind variability related research. The presentation and draft report is available on WPSC web site.

Members Questions, Comments and Discussion

Comment: In analyzing the study data, it is important to note that the unavailability of wind turbine generators and/or connection equipment can show reductions in wind output which are not attributed to wind variance.

Response: Anomalies are relatively rare in the longer timeframes but it could affect shorter samples and comment is noted.

Comment: Weather maps would be of importance when analyzing this data. The output deviations in Amaranth wind farm were expected to be highest. The analyzes show spikes in the output of Prince wind farm.

Response: The spikes on the graph at Prince which make it appear to have the highest deviations may be the result of some telemetry issues.

Comment: The GE study discussed in the presentation had what appear to be questionable results and one member stated that some analysis on the distances between areas on the maps used in the study suggested that some clarification should be sought from GE.

Response: GE may be asked to comment further on the study results.

Action Item: GE may be asked to comment further on the study results.

An action item was raised for the IESO to promote research by providing five minute interval data for selected days. The IESO noted that it would consider this request. It was also stated that such data has been provided where proponent have the appropriate confidentiality agreements in place. The IESO does not collect any wind meteorological data. However, WPSC suggested the wind farms to retain such data.

Action Item: The IESO to consider WPSC member request re: "Upon request, the IESO to provide access to 5 minute wind variability data for selected days to promote wind research".

Question: The wind variability focuses mostly on low correlation between areas and its benefits to the system in flattening the overall variability but there are also things to be learned from high correlation occurrences.

Comment: A member agreed with this and stated that the most important thing is the ability to predict sudden changes in supply. A member asked for a definition of sudden and the reply was "something which requires the IESO to make adjustments over a 10 minute timeframe owing to 10 minutes operating reserve requirements.

Comment: An observation was made that distance may give an increased likelihood of low correlation there may be more benefit in analyzing a particular pattern or front. It is often the case that the low correlation is a result of the same front arriving at another area with some delay in time contributing to low correlation. Also, the same front can sometime cover a very wide area giving rise to high correlation.

Response: The correlation patterns would suggest that this is a valid comment.

Comment: The highest change was 21 % in mid January assuming that the Prince wind farm data was correct.

Item # 8 Overview of Utility Wind Integration Studies

Stewart Russell gave a presentation based on a Utility Wind Integration Group (UWIG) paper titled “Utility Wind Integration and Operating Impact State of the Art”. The overview was presented based on themes including: variability of wind; wind being primarily an energy source rather than a capacity source and conclusions from UWIG study-of-studies. A brief overview of transmission planning, market operations and wind integration was also presented.

Action Item: Stewart Russell presentation along with a link to UWIG paper on wind integration to be posted on the WPSC website.

Item 9 Wrap Up

Khaqan Khan reviewed and summarized the key items of the meeting and thanked the members for their active participations and engagement in this stakeholder process.

Action Item Summary				
#	Date	Action	Status	Comments
42	January 28, 2009	The IESO to accommodate OPG’s presentation in its next WPSC meeting.	Open	
43	January 28, 2009	The embedded generation related issues and suggestions identified by WPSC members will be forwarded to IESO’s SE-57 working group for their consideration.	Open	
44	January 28, 2009	The WPSC members to provide any further comments on draft paper titled “Existing and Proposed Performance Requirements for Generators”, posted on WPSC web page, by February 27, 2009.	Open	
45	January 28, 2009	GE may be asked to comment further on the study results.	Open	
46	January 28, 2009	The IESO to consider WPSC member request re: “Upon request, the IESO to provide access to 5 minute wind variability data for selected days to promote wind research.”	Open	
47	January 28, 2009	Stewart Russell presentation along with a link to UWIG paper on wind integration to be posted on the WPSC website.	Open	