Minutes of Meeting

Date held: July 24, 2012	**Time held:** 9:00 am – 11:15 am	**Location held:** IESO Clarkson Facility
Invited/Attended	**Company Name**	**Attendance Status** (A)ttended; (R)egrets; (S)ubstitute; (TC) Teleconference
Brason, Tracy	Brookfield Renewable Power	A
Cary, Rob	Robert Cary & Associates	A
Chee-Aloy, Jason	Power Advisory LLC	A
Cumming, Alison	Ontario Power Authority	A
Ellard, Barbara	Ontario Power Authority	A
Jayaraman, Jay	Enbridge Green Energy	A
Samant, Sushil	Northland Power	A
Scott, Christopher	Suncor Energy Services Inc.	R
Van Koughnett, Kevin	TransAlta Corporation	A
Observers		
Applebaum, David	NextEra	TC
Banack, Adam	Torys LLP	TC
Bantu, Ravi	RES Americas Inc.	TC
Bennett, Chad	Capital Power	TC
Brown, George	Acciona Energy	TC
Chintapalli, Raj	Customized Energy Solutions	TC
Cormier, Pascal	Brookfield Power	TC
Davis, JJ	Kruger Energy Chatham	TC
Graovac, Dejan	Toronto Hydro	TC
Gray, Stan	Pattern Energy	TC
Jennifer Tuck	NextEra Energy	TC
Keller, Casey	IPR-GDF Suez North America	TC
Lindsay, Gary	Consultant	TC
Louw, Brennan	Ministry of Energy	TC
Newland, Helen	Fraser Milner Casgrain LLP	TC
Pelland, Sophie	CanmetENERGY, Natural Resources Canada	TC
Peterson, David	Ontario Power Generation	TC
Shahid, Khan	Northland Power	TC
Simmons, Sarah	Sussex Strategy Group	TC
Szarek, Joanna	Virelec Ltd.	TC
Tinkler, Mark	Customized Energy Solutions	TC
Urukov, Vlad	Ontario Power Generation	TC

Scribe: Jo Chung, Market Development
Please report any corrections, additions or deletions to: stakeholder.engagement@ieso.ca

All meeting material is available on the IESO web site at:
http://www.ieso.ca/imoweb/consult/consult_se91-DTWG.asp

Meeting Objectives:
The working group will review current IESO market schedule processes and discuss future requirements for dispatching variable generators, including loss penalty factors, and calculating congestion management settlement credits (CMSC).

Item 1 Welcome and Review of Meeting Agenda
Jordan Penic of the IESO welcomed the DTWG, and invited members, observers and IESO staff to introduce themselves. Gordon Drake of the IESO reviewed the agenda.

Item 2 Tie Breaking
Dina Shoukri of the IESO provided background on loss penalty factors and an overview of the proposed tie breaking solution for variable generators.

Member Questions, Comments and Discussion, with the IESO's response in italics:

A member commented that from a generator perspective, the proposed solution is nice and simple and assuming randomization, should meet the objective of achieving an equitable solution over the long-term.

A member asked if the randomization would be applicable when regional constraints occur.
The IESO responded that when transmission constraints occur, tie breaking will also be applicable but will not only consider loss penalty factors. The DSO will respect the dispatch order produced by the randomization, but will also look at the generators best suited to resolve the constraint. For example, if there are three generators behind a congested interface, they may be dispatched according to the randomized list of generators.

A member requested further clarification on the concept of randomly determining the dispatch order for variable generators.
The IESO responded it is proposing to set an order in the event that the IESO needs to dispatch variable generators who have all offered at the same floor price – the randomly generated dispatch order list will be used to determine the sequence of which variable generators are dispatched.

A member asked what other solutions the IESO considered.
The IESO responded it considered setting the penalty factor for all variable generators to 1.00 – however this solution could create operational issues as it may result in dispatch instructions to a large number of generators that fall within the filter threshold and therefore no change in output is realized.

A member asked how the IESO will prevent the same generator from being dispatched more frequently than others, and whether there will be any recourse mechanisms for a generator if this occurs.
The IESO responded that as the population of variable generators grows, that this likely won't happen since the listing should be random. The proposed solution won't guarantee everyone is equally dispatched, but is expected to be equitable. The IESO added it that if an unusual pattern emerges with the randomization solution, that it would look at the algorithm.

A member asked why a proposed solution of moving down a list of generators, as in the case of load shedding was not considered.
The IESO responded that such a solution would be more complicated – for example, if a generator which is first on the list is only partially dispatched, do they move to the bottom of the list? Also, how does a new generator get added to the list? The proposed randomization solution is the simplest solution identified.

A member asked whether the size of the generator (bigger versus smaller) would impact how often it is dispatched under the proposed solution.
The IESO responded that using a random order reduces the influence of the position of the generator relative to another generator. The DSO will dispatch as many MW it can of the most expensive resource, and the randomizer will always change that order. This will result in only one generator being partially dispatched at a time, as all generators ahead of this last generator will be fully dispatched.

A member commented that for load shedding, a load won't be cut above a certain level in a year. The member asked whether the IESO will similarly track the number of dispatches a wind farm gets and evaluate the frequency at the end of a year.
The IESO responded it would not, and added that tie breaking will only occur when there are no constraints on the system. Certain locations will be dispatched regardless of dispatch order if there are constraints in a specific area. The proposed randomization should result in equitable, but not equal treatment.

A member commented that the IESO may wish to consider setting the penalty factors for variable generators to a number other than 1.00. For example, a uniform penalty factor based on the average for the wind fleet may reduce operational issues/deviations.
The IESO noted the member's suggestion.

A member commented that there may be some inequality on the frequency of dispatch for some of his facilities that are dispatched more often due to recurring transmission constraints, in addition to being dispatched again when no constraints exist.
The IESO responded that the proposed mechanism maintains the value of where the generator is located with the ability to mitigate constraints in congested areas while delivering an equitable solution. The solution does not address the frequency of dispatch for certain areas that are often congested.

A member asked whether the randomizer will be used in the pre-dispatch process as well as in real-time.
The IESO responded it expects to use the randomizer in both pre-dispatch and real-time. The IESO asked members for any feedback on when the ideal time would be to move from one daily randomized order to another.

The member responded that, from a wind generator point of view, the ideal time to move from one daily randomized order to another is when there is the least expectation of wind dispatch. He noted that midnight is an option, but could result in having a group of farms generating, with another group not generating at midnight and then a significant amount of dispatch volatility over midnight as the order changes.

A member commented that the principles on tie breaking, such as the uniform penalty factor for all variable generators, the use of a random order determined daily, and pre-publication of that order should be embedded in the market rules, and not detailed in the market manuals.
The IESO responded that generally, the market rules are for the most part enabling, with details in the market manuals. The IESO added that it will consider the member's comment when drafting the market rules.

A member asked whether once curtailed, whether variable generators could offer into the Operating Reserve (OR) market. Another member added that the IESO should, from a tools/system point of view, consider this OR capability now versus later if simple and cost effective.
The IESO responded that the ability of variable generators to participate in OR/ancillary markets will be considered at a later date, and not addressed in the near term. From a systems point of view, our design is not advanced enough where a simple tool change can be implemented at this time.

Item 3 Market Schedule and Congestion Management Settlement Schedule
Silviu Motoc of the IESO provided a review of the market schedule and CMSC for variable generators and walked through some examples.

On slide 8 (Proposed Solution – CMSC), a member requested clarification as to whether the proposed CMSC calculation would be disabled if a constant dispatch instruction straddled multiple intervals.
The IESO clarified that for prolonged periods where a generator is dispatched down at or near the same level, that CMSC will be calculated for each "mandatory" dispatch interval even if the dispatch instructions have been filtered out and not sent to the generator.

A member asked whether a generator's CMSC for the ramp-up interval ending 30 (slide 12 of the presentation) would be represented by the triangle above the red line, similar to the CMSC earned on the ramp-down in interval ending 15.
The IESO responded that the CMSC calculation for the ramp-down versus ramp-up is different. The CMSC calculation considers the maximum of actual energy produced and constrained schedule relative to the market schedule at the end of the interval. This will mean that CMSC is paid in some ramping intervals but not necessarily in all.

A member asked how the proposed CMSC calculation for variable generators differs from that of other generators.
The IESO responded that one difference is that the CMSC calculation for other dispatchable generators takes place in every interval. However, for variable generators it will only be calculated in "mandatory" and "release" intervals.

Item 4 5-Minute Forecast Publication Requirements

JoAnne Hosick of the IESO provided an overview of the proposed 5-minute forecast publication requirements.

A member asked whether the 5-minute forecast would be used in MIO (multi-interval optimization).
The IESO responded that it would be used in MIO.

A member asked whether the rolling 48-hour forecast or the 5-minute forecast would be useful in the calculation of forgone energy payments (for OPA contract purposes).
The IESO responded that the 5-minute forecast should always be better, since it is closer to real-time. It was also noted that the 48 hour is produced in advance of the dispatch hour and is based on hourly averages, and should rarely correspond to the 5-minute forecast.

A member asked whether the 5-minute forecast will contain the same information as the IESO's CMSC report.
The IESO responded that the information may be different depending on how a generator is economically scheduled.

A member asked how outages will be interfaced with the 5-minute forecast.
The IESO responded that the outage submission requirements for variable generators will be the same as for all other generator types, and that the telemetry received from variable generators will include all outages, including ones smaller than 10MW via "Available MW" telemetry data. The forecaster will use this telemetry information and submitted outages in its determination of the 5-minute forecasts.

Item 5 Review of Follow-up Items and Next Steps

Jordan Penic thanked the group for their participation, and reviewed the list of action items (please see action item summary table). He indicated the next session of the DTWG will be tentatively scheduled for Thursday, August 30th, with the next session for the Floor Price Focus Group (FPFG) taking place on August 8th. The agenda for the next session of the DTWG includes the discussion of any feedback received on the materials presented today.

A member asked whether a loss penalty factor other than 1.00 would in effect change the set floor prices.
The IESO responded the effective price of each generator will be different from the set floor prices when multiplied by a loss penalty factor other than 1.00, but that the floor prices themselves would not be affected.

A member asked when the draft market manual material related to all dispatch related rules will be available for stakeholder review. He asked whether it would be possible to see draft manual language prior to presenting the consolidated dispatch rules set at the September Technical Panel meeting. Another member reiterated that members need to see a proposed timeline for the presentation of market manual material in order to provide meaningful comments on the market rules.

The IESO noted the members' concerns, and added that if there are concerns with placing details in market manuals versus the market rules from a FIT contract perspective, that the FIT contract defines the market rules to include market manual content.

IESO Note: *The OPA FIT contract contains the following definition: "**IESO Market Rules** means the rules made under Section 32 of the Electricity Act, together with all market manuals, policies, and guidelines issued by the IESO, as may be amended from time to time."*[1]

A member asked when the webinar to look at technical requirements for dispatch workstations will take place.
The IESO responded the webinar is planned for August and will provide an overview of the requirements, as well as gather information on the technical needs of variable generators.

Action Item Summary				
#	Date	Action	Status	Comments
1	Nov 7, 2011	Terms of Reference: IESO to add language to reflect the synergies/interplay between the floor price focus group and DTWG.	Closed	Updated in Final ToR
2	Nov 7, 2011	Terms of Reference: Update dates.	Closed	Updated in Final ToR
3	Nov 7, 2011	Add action item for floor price focus group: IESO to investigate whether other ISOs have implemented floor prices for different types of generators.	Closed	
4	Nov 7, 2011	Dispatch Frequency presentation (slide 9, 3rd bullet): IESO to confirm between Apr-Sept 2010 there were only 4 intervals where dispatches would have been issued.	Closed	Presentation updated December 15
5	Nov 7, 2011	IESO to ensure generators are not subject to inappropriate negative CMSC.	Closed	Discussed at March 23 DTWG
6	Nov 7, 2011	IESO to post link to previous SE-91 presentation which forecasts surplus conditions roughly 15% of the time with expected increase in variable generation.	Closed	See link under Item 5
7	Nov 7, 2011	IESO to provide link to defined terms (minimum loading point, minimum run time, etc).	Closed	See link to Chapter 11 of the market rules under Item 7.
8	Nov 7, 2011	IESO to provide the number of forecasted resources when such numbers are available.	Open	
9	Nov 7, 2011	IESO to focus on resource type, as well as resource size.	Closed	IESO to consider this difference when developing solutions for DTWG.

[1] http://fit.powerauthority.on.ca/sites/default/files/FIT%20Standard%20Definitions%20Version%201.5.1.pdf

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#	Date	Action	Status	Comments
10	Dec 15, 2011	IESO to consider producing a monthly report to clarify/update members on the status of SE-91.	Closed	
11	Dec 15, 2011	IESO to update agenda to clarify discussions on foregone energy calculations for CMSC purposes to begin in February with feedback from members provided in March, proposal to be presented in April.	Closed	
12	Dec 15, 2011	IESO to propose tentative dates for all future DTWG meetings as soon as possible.	Closed	
13	Dec 15, 2011	IESO to confirm on slide 6 of Wind and Solar Dispatch Survey Results that solar ramp rates range from 10 to 100MW/min.	Closed	
14	Dec 15, 2011	Solar members to confirm with their operators that ramp rates are higher when reducing from high to low output and lower when reducing from low to zero output.	Closed	
15	Feb 13, 2012	Solar member to provide the IESO with further feedback from solar operators on dispatch (e.g. output and any restrictions that should be considered).	Closed	
16	Feb 13, 2012	IESO to provide further details on technical limitations. IESO to consider using the simplest solution.	Closed	March 23rd DTWG
17	Feb 13, 2012	IESO to provide step by step examples of dispatch scenarios (including inputs, outputs, and timelines) which show the flow of information from IESO to variable generators as well as action required by variable generators.	Closed	March 23rd DTWG
18	Feb 13, 2012	IESO to provide further detail/consider incorporating a release flag from mandatory dispatch instructions.	Closed	May 16th DTWG
19	Feb 13, 2012	IESO to consider whether a declaration from the generator when a mandatory dispatch is issued and there is insufficient fuel is necessary.	Closed	May 16th DTWG
20	Feb 13, 2012	IESO to provide further information on compliance deadbands in other ISOs/jurisdictions that have 5-minute dispatch.	Closed	March 23rd DTWG
21	Feb 13, 2012	IESO to provide potential examples of both positive and negative CMSC for variable generators and provide a representative set to the extent possible.	Closed	March 23rd DTWG
22	Mar 23, 2012	IESO to provide details on the determination of the market schedule at a future DTWG session.	Ongoing	First session: June 27th DTWG - ongoing

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23	Mar 23, 2012	IESO to determine whether forecasts used to run DACP for variable generators will be updated for different runs.	Open	
24	Mar 23, 2012	IESO to reconsider whether informational dispatches are necessary and to provide analysis as to why informational dispatches should be sent.	Closed	May 16th – IESO has revised design and discussed revisions with DTWG. First informational dispatch after a mandatory dispatch must be sent to release a VG from its mandatory dispatch and will require acknowledgement.
25	Mar 23, 2012	Mandatory dispatches and ramp rates: IESO to determine whether a mandatory dispatch would be issued when the constrained schedule respects submitted ramp rate which don't result in the same output as the forecast.	Closed	Since this represents a limit on the expected output of the VG it will be a mandatory dispatch and must be acknowledged. This is not expected to occur.
26	Mar 23, 2012	Deratings and mandatory dispatches: IESO to confirm whether in the case of a submitted derate, if a generator can immediately generate according to available fuel once the derate is no longer applicable, or whether it will be bound to zero output for an hour.	Closed	Treatment of VG's is expected to remain the same as other generators. VG is not bound to zero output when a derate is released.
27	Mar 23, 2012	IESO to provide more detailed examples on settlements, forecasts, CMSC (detail on timing and process), day-ahead, dispatch, etc.	Closed	May 16th DTWG
28	Mar 23, 2012	IESO to provide a simulation based on historical data of the approximate number of mandatory and informational dispatches an average variable generator would have received, including the Northwest.	Closed	Results given at May 16th DTWG
29	Mar 23, 2012	IESO to reconsider if variable generators will be required to respond (accept/reject) to informational dispatches.	Closed	May 16th DTWG

Action Item Summary				
#	Date	Action	Status	Comments
30	May 16, 2012	IESO to provide a full 12 months of a simulation based on historical data of the approximate number of mandatory and informational dispatches an average variable generator would have received, including the Northwest.	Closed	Caveat: the simulated number of mandatory and informational dispatches are an approximation only, and actual results may differ materially from the simulated results.
31	June 27, 2012	The IESO committed to provide a summary of the number of dispatches which are currently filtered by the existing dispatch filtering process.	Closed	Caveat: the simulated number of mandatory and informational dispatches are an approximation only, and actual results may differ materially from the simulated results. Posted to DTWG website.
32	June 27, 2012	IESO/DTWG to determine the reporting requirements for the proposed 5-minute forecast used to determine the market schedule for variable generators.	Open	IESO's initial proposal presented at the July 24, 2012 DTWG – awaiting member feedback.
33	June 27, 2012	IESO to provide a schedule for stakeholdering of market manuals related to dispatch rules.	Open	
34	July 24, 2012	IESO to consider allowing variable generators to offer into operating reserve markets/ancillary markets at the earliest available opportunity.	Open	
35	July 24, 2012	IESO to provide draft market manual material related to all dispatch related rules as soon as possible, and no later than the September Technical Panel meeting.	Open	