

Final Minutes of Meeting

Date held: July 29, 2013	Time held: 2:00 pm – 4:00 pm	Location held: Clarkson, via Teleconference
Attended	Company Name	Attendance Status (A)ttended; (R) Registered; (S)ubstitute; (TC) Teleconference
Basterra Ripodas, Koldo	Acciona Energy North America	TC
Labij, Christina	Acciona Energy North America	TC
Dumoulin, Serge	Brookfield Power	TC
Cormier, Pascal	Brookfield Power	TC
Viswanathan, Samira	Bruce Power	TC
Reid, Dave	Bruce Power	TC
Levy, Tom	Canadian Wind Energy Association	TC
Bennett, Chad	Capital Power Corporation	TC
Chintapalli, Raj	Customized Energy Solutions	TC
Kouman, Cedric	EDP Renewables North America Development – Canada	TC
Jayaraman, Jay	Enbridge	TC
MacRobbie, Ian	Enbridge	TC
Timm, David	GDF SUEZ North America	TC
Maddix, Melanie	Goreway Station Partnership	TC
Paul, Rob	Goreway Station Partnership	TC
Oelke, Lisa	HB Solar Canada Inc.	TC
Plante, Matthieu	HQ Energy Marketing	TC
Maljukan, Sasa	Hydro One Networks	TC
Lo, Pat	Hydro One Networks	TC
Fleming, Ted	Internat Energy Solutions	TC
Davis, JJ	Kruger Energy	TC
Reed, Mike	Leader Resources Services Corp.	TC
Tang, Chi	McMaster University	TC
Tulley, Keegan	Ministry of Energy	TC
Maniyali, Yaser	Navigant Consulting	TC
Thomas, Joshua	NextEra Energy Resources	TC
Tuck, Jennifer	NextEra Energy Canada	TC
Samant, Sushil	Northland Power	TC
Byers, Darren	Ontario Power Authority	TC
Urukov, Vlad	Ontario Power Generation	TC
Ejebe, Gabriel	Open Access Technology International	TC
Matthiessen, Erick	Pattern Energy	TC
Chee-Aloy, Jason	Power Advisory LLC	TC
Burnham, Steve	RBC Capital Markets	TC

Date held: July 29, 2013	Time held: 2:00 pm – 4:00 pm	Location held: Clarkson, via Teleconference
Attended	Company Name	Attendance Status (A)ttended; (R) Registered; (S)ubstitute; (TC) Teleconference
Doolittle, Robin	RBC Capital Markets	TC
Cary, Rob	Rob Cary & Associates	TC
Fong, Adrian	Suncor Energy	TC
Calabrese, A	Suncor Energy	TC
Banack, Adam	Torys LLP	TC
Jorgensen, Hal	TransAlta	TC
Jablonicky, Mike	TransAlta	TC
Smith, Peter R.	TransAlta	TC
Mathany, Douglas	TransAlta	TC
Poovong, Greta	TransAlta	TC
Mullrooney, John	TransAlta	TC
Kuntz, Margaret	TransCanada	TC
Haysom, Joan	University of Ottawa	TC
Deol, Paul	wpd Canada	TC
Long, Jesse	wpd Canada	TC
McCuaig, Paul		TC
Tymchak, Jill		TC
Chung, Jo	IESO	TC
Drake, Gordon	IESO	TC
Duru, Josh	IESO	TC
Finkbeiner, Darren	IESO	TC
King, Ryan	IESO	TC
Scribe: Josh Duru, 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.asp

Meeting Objectives

The IESO will review and discuss the recommendations for the flexible nuclear floor price and the setting of a floor price for variable generators. Stakeholder feedback is requested by August 7, 2013 on the materials provided.

Item 1 Welcome, Review of Meeting Agenda

Ryan King of the IESO welcomed the Floor Price Focus Group (FPFG). Introductory remarks were made including an overview of the agenda.

Item 2 Review of Discussion Paper

Josh Duru of the IESO walked the stakeholder group through the presentation which included the findings from experience with the flexible nuclear floor price, considerations for a floor price for variable generators, recommendations for the floor price for flexible nuclear and variable generation, and next steps.

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

A member asked how much (MW, frequency) voluntary nuclear curtailments occurred since the implementation of the flexible nuclear floor price.

The IESO responded that the discussion paper details the effect on the market clearing price through a recalculation methodology and the hours of surplus baseload generation since the implementation of the floor price. Regarding the dispatch instructions for flexible nuclear generation, the IESO does not provide market participant confidential information. Interested parties can review the hourly Generator Output & Capability report and compare that to shadow prices that are near the flexible nuclear floor price to gauge the frequency and magnitude of flexible nuclear dispatch.

A member asked (i) why the lack of contract-based floor prices within variable generator contracts has been influential in the setting of the offer floor price for variable generators; (ii) how the IESO was expecting to accomplish the collaborative dispatch between nuclear, wind, and solar; and (iii) why the IESO has diverged from the initial proposal of variable generator floor prices of -\$10 and -\$15.

The IESO responded that:

- The initial discussion of floor prices at -\$5, -\$10 and -\$15 was on the basis that the then, ongoing OPA contract negotiations may prioritize contract vintages and the IESO would therefore leave adequate space in order for that range to be built into the contracts. With contract floors not being incorporated, the IESO deemed that spread between floor prices unnecessary.*
- The IESO will use collaborative dispatch between flexible nuclear and variable generation due to the chunky nature of dispatching flexible nuclear. In those instances when the surplus does not equal the 300 MW threshold of dispatching flexible nuclear, control room operators will block the flexible nuclear dispatch instructions generated by the dispatch and scheduling optimizer (DSO) until the technical*

limitations of dispatching flexible nuclear are met. In the meantime the control room will manually search for the next most economical option to dispatch, which would likely be wind at -\$6.50, to be dispatched until the 300 MW threshold is met.

- The IESO acknowledged that the -\$10 was initially considered because of the \$10 Wind Power Production Incentive (WPPI)/EcoEnergy revenue that would be foregone if a wind generator was dispatched. The IESO also reiterated that -\$10 and -\$15 floor prices for variable generators was continued for consideration based on the potential for contract floors as being considered in the OPA contract negotiations at the time, and since that was not included in the contracts, the IESO would like to incentivize generators to offer close to their marginal cost. The marginal cost for flexible nuclear has been established at or near -\$5 and the marginal cost of variable generators is believed to be \$0, therefore the IESO wanted the floor price for variable generators as close to the floor price for flexible nuclear while still accounting for the loss penalty factors and maintaining the desired dispatch order.*

The member continued to note that he has heard that there are two levels of marginal costs for wind generators, the first being for a unit to maneuver output through blade pitch control and the second for the shutdown of wind turbines.

A member stated that it is difficult to understand why the IESO has moved from a \$5 spread in offer floor prices to a \$1.50 and \$0.50 spread which does not allow variable generators to stagger their offers for different facilities based on their desired operation.

The IESO responded that based on stakeholder feedback through SE-91 it was assumed that all variable generators would migrate their offers to the floor price and since everyone would be at the common price point, the random dispatch order generated by the DSO would decide the dispatch.

The member responded that until variable generators have had an opportunity to gain experience and see what the dispatch outcomes would be with varying offer price laminations strategies, it would be unfair to assume that all variable generators would offer at the floor price.

The IESO appreciated the feedback and indicated that it is something that would be taken into consideration when recommending the floor prices to the IESO Board of Directors. The IESO noted that since the loss penalty factors for variable generators are set to 1, the difference between offer price laminations would not have to be significant and therefore within a spread of \$1.00 there is the possibility of 100 offer-price laminations that would affect the dispatch outcome.

A member asked how the application in the DSO which holds flexible nuclear curtailment in the constrained schedule would affect the unconstrained schedule.

The IESO responded that when the DSO is holding the dispatching off of flexible nuclear generation at the -\$5 floor price during times of SBG that do not yet meet the 300 MW threshold, wind at -\$6.50 (i.e. the next economical resource) would be dispatched off while the flexible nuclear would be dispatched on. The IESO indicated that there was no other technically feasible solution to achieve the objective of sharing dispatch response given the 'blocky' nature of flexible nuclear generation. Such constraints would only be reflected in the constrained schedule and not in the unconstrained schedule.

A member asked, referring to the discussion paper, what the IESO means when gauging “material impact” on the market clearing price and system operations.

The IESO responded that a quantitative assessment on the change in MCP was done during the first five months of experience with the flexible nuclear floor price and a qualitative assessment of its materiality was made. The IESO observed a -\$3.03 reduction in the clearing price that could be attributed to the implementation of the floor price. The IESO does not deem that change in clearing price significant based on this qualitative analysis and that this change was reflective of marginal cost. In regard to the material impact on system operations, the IESO looked at the historical offered resource quantities between the current flexible nuclear and the historical flexible nuclear offer strategies and concluded that shift in MWs between the historical and present flexible nuclear offers did not adversely affect dispatch outcomes.

The member then asked if the analysis for the discussion paper was entirely qualitative.

The IESO responded that it was a qualitative analysis of materiality that was supported by the quantitative data provided within the discussion paper.

A member asked if there was a reason that HOEP never aligned with the -\$5 floor price for flexible nuclear generation during the month of July.

The IESO responded that HOEP can at times mask the occurrence of negative prices because prices are calculated every 5 minutes and not hourly. The MCP is a better indication of the occurrence of negative prices and the discussion paper indicates that the low MCP during the first 5 months of experience with the flexible nuclear floor price was in fact -\$129.4, well below the -\$5 floor price. This is indicative of exhausting all offers at -\$5 and the potential for it to be a significant SBG event in which flexible nuclear may no longer have been available.

A member reiterated that the IESO should not assume that the marginal cost of variable generation is 0 or that variable generators would not like to utilize different offer laminations above the floor price.

The IESO responded that the consideration for additional space between the floor prices would be taken into consideration.

A member asked what the constrained management settlement credit (CMSC) implications would be based on the differences between the constrained and unconstrained schedule if the DSO is holding the dispatch of flexible nuclear generation. The member also asked if the \$3 reduction in MCP displayed in the discussion paper was a flat number and if so, if the IESO could provide those values for both on and off peak.

The IESO responded that there would be CMSC and uplift considerations in that scenario and committed to bringing a simple example of CMSC implications with negative offer prices to the SE-91 group. The IESO responded that the IESO would revise the MCP calculation to separate the on and off peak.

IESO Staff Notes

Below find an example of the CMSC implications of negative offer prices during coordination of flexible nuclear and variable generation dispatch.

Example:

In this example, the most economical resource to dispatch down is flexible nuclear that is offered at -\$5 but only a 50 MW reduction is required due to global oversupply. The MCP generated by the unconstrained sequence is -\$5 showing flexible nuclear as the marginal resource.

When the surplus quantity is less than can be provided by flexible nuclear, a 100 MW variable generation facility is the next dispatched resource (i.e. the next economical resource). Control Room operators will apply a constraint to the facility to hold the flexible nuclear facility at its current output so that it will not be reduced by the DSO and is therefore the facility being constrained on. The variable generator would otherwise have continued to run but is dispatched down by the DSO and therefore is being constrained off by 50 MW.

Since MCP is equal to the offer price of the flexible nuclear generation, there is no CMSC paid to that facility because there is no operating profit loss to be compensated by having constrained them on to full output.

When generators offer their energy below \$0, certain rules apply that change the offer prices used in the determination of CMSC¹. For the variable generator that has been constrained off, any of their offer prices below \$0 will be adjusted to be equal to the MCP (-\$5) and therefore no CMSC will be paid since the calculation shows there is no operating profit loss to be compensated by having constrained them off.

Following the meeting, the IESO amended Table2: Market Clearing Price Recalculation to separate the on and off Peak (below).

¹ When offer prices are below a specified lower limit, they are adjusted to be made equal to that specified limit. This limit is the lesser of \$0 or MCP. (Refer to IESO Market Rules Chapter 9, section 3.5.6)

Year	ON PEAK			OFF PEAK		
	Average MCP	Recalculated Avg MCP	Change	Average MCP	Recalculated Avg MCP	Change
2010	44.778	44.781	0.003	33.122	33.253	0.131
2011	36.975	37.145	0.17	26.779	28.688	1.909
2012	25.689	25.813	0.124	18.805	20.872	2.067
Feb 1 - June 30, 2012	21.453	21.639	0.186	15.936	18.56	2.624
January 2013	38.043	38.043	0	22.231	23.718	1.487
Feb 1 - June 30, 2013	30.371	30.05	-0.321	23.234	17.973	-5.261

The member asked if the IESO could consider any impact the flexible nuclear floor price would have on exports.

The IESO responded that an export floor price was established prior to the implementation of a flexible nuclear floor price. Since the export floor price was set in the same range as the flexible nuclear floor price the IESO will not do any further analysis as the market would be in a similar state prior to the implementation of a flexible nuclear floor price.

Referring to the 3rd graph on page 2 of the discussion paper, "MWs Offered between -\$10.01 and -\$130," the member asked where the 100 MW of reduction between 2012 and 2013 could have shifted.

The IESO responded that there were less MWs offered overall from February to June 2013 in comparison to 2012, therefore those 100 MWs may simply have not been available. The IESO also noted that there was a slight increase in the MWs offered between 0 and -\$10 and that the IESO has seen a number of MW's drop below -\$130 as well.

The members then asked if the IESO would be reviewing the floor prices again.

The IESO responded that the floor prices will not be reviewed every six months and brought back to the FPPG for consideration, but that the IESO would continue to monitor the effects of the floor price on system operations and the IESO administered market.

A member reiterated the point that wind generators would want space between the floor prices in order to offer different laminations for their generation. The member continued to note that the IESO had only discussed the floor prices for variable generation being -\$10 and -\$15 and that the loss penalty factor analysis was not discussed with the FPPG until now and feels the stakeholding was moving along too rapidly for an IESO Board decision that has to be made in September.

The IESO responded that the initial proposal of -\$10 and -\$15 floor prices for variable generation was being responsive to stakeholder comments regarding the contract implications of floor prices. The IESO always intended to set the floor prices for variable generation based on the review of the floor price for flexible nuclear generation. The IESO's current recommendation of floor prices for variable generation is in response to that review and the advancement of the OPA contract negotiations, which did not include contract floors. Participants in SE-91 were aware of the tight timelines when the initial floor prices for flexible nuclear were implemented and for the IESO to have time to review those effects prior to the dispatching of variable generators was implemented. The IESO has committed to taking the comments back for consideration regarding the desire to restore the space between floor prices which was indicated in previous FPPG discussions.

A member asked if the IESO could run a simulation that would incorporate the dispatching of wind, offering at the proposed floor price of -\$6.50, during the 5 months of experience with the flexible nuclear floor price to see what the impact on the constrained and unconstrained schedule would be.

The IESO responded that there are too many manual considerations for control room operators during times of SBG, as the depth and duration of an SBG event are gauged by the control room with all the best information available during real-time. Without knowing the rationale for every decision a control room operator makes in those instances it would be nearly impossible to guess and therefore the IESO cannot commit to running that type of simulation.

The member then asked if the IESO could provide more information on the constraints that are present during those instances of SBG.

The IESO responded that some thought would be put into what could be presented to the stakeholder group, noting that type of information may involve confidential generation information.

A member reiterated the concern that this stakeholder process is moving too rapidly for stakeholders to provide input on the recommended floor prices for variable generation and stated that the IESO is deviating from the initial proposed floor prices without having observed market participant behavior on the initial proposal of -\$10 and -\$15. While the member was appreciative of the IESO commitment to take into account concerns regarding the desire for increased space between floor prices, the member indicated he would like the opportunity to discuss any revised recommendation with the IESO.

The IESO responded that the intent of this session was to receive input from the FPFG and the IESO will take the comments heard today and those submitted in writing to develop a final recommendation. The IESO will decide based on that assessment if a further session will be required to discuss the recommendations.

A member asked what the smallest level of SBG is that the system operator would be able to accept.

The IESO responded that all levels of SBG have to be managed by the system operator but the variables will be assessed on a situation to situation basis. The IESO must adhere to interconnection standards and while respecting those standards will consider all best available options to manage SBG which includes assessing if interties are available to manage the surplus.

Item 3 Wrap-Up

Ryan King of the IESO thanked all members for their participation.

Action Items

Action Item Summary				
#	Date	Action	Status	Comments
1	July 29, 2013	IESO to provide an example of a CMSC scenario with negative offer prices to display the effects of the changes to the constrained and unconstrained schedules due to the DSO holding the dispatch of flexible nuclear generation until the 300 MW threshold of surplus is reached.	Closed	Example has been included in these minutes.
2	July 29, 2013	IESO to recalculate Table 2: Market Clearing Price Calculation, to separate the on and off peak.	Closed	Recalculation has been included in these minutes.