Stakeholder Feedback and IESO Response

Market Renewal Program: Overview of Economic Operating Point Design, April 21, 2022

The IESO posted an overview of the Economic Operating Point design on April 21, 2022 and received written feedback:

1. Ontario Power Generation

Related materials have been posted on the IESO MRP stakeholder engagement webpage for this engagement. If interested, please visit the webpage to reference the feedback submissions directly as the below uses excerpts and/or a summary of the stakeholder feedback for the purposes of providing an IESO response.

Please contact IESO Engagement at engagement@ieso.ca if you have any questions.

Ontario Power Generation

Ontario Power Generation Feedback and IESO Responses

Note: Headings in the "Item/Topic" relate to the relevant design topics in the Overview of Economic Operating Point Design presentation posted April 21, 2022, on the IESO's stakeholder engagement webpage.

Item / Topic	Feedback	IESO Response
(1) EOP Adjustment When RLP Binds	**Slide 14 (clarification):** a) How does the EOP adjustment consider the 20 MW of energy between the Energy EOP (80 MW, as provided in the example), and the RLP (100 MW)? b) If EOP Intersection is 80 MW as shown in example table, should 80 MW be substituted into example equation instead of 20 MW, as per below? = (100-80) x (20-50)	a) The economic operating point (EOP) adjustment does not consider differences between energy EOP and the reserve loading point (RLP) value. It tests whether the operating profit received from energy and operating reserve (OR) schedules, when RLP binds, sufficiently covers the operating profit that would have been received at the EOP intersections for energy and operating reserve. b) Correct, the equation on Slide 14 has a

Item / Topic	Feedback	IESO Response
	= (20MW) x (- $30/MW) = -$600 c) Can you please clarify if the offer price should be $10/MW up to 80 MW (1st Energy PQ pair) and EOP intersection is at 80MW and thereafter $50/MW for 81 MW to 160 MW (2nd Energy PQ pair)?	typo and as per the table directly above should use 80 MW instead of 20 MW as the EOP intersection. The slide deck has been updated and will be reposted with this correction. c) Correct, in this example, the energy offer price for the first lamination is $10 up to 80 MW. The energy offer price for the second lamination is $50 for 81 MW up to 160 MW.
(2) DAM Lost Cost EOP for Cascade Resources	**Slide 20 (clarification):** There are three conditions listed for DAM lost cost EOP for cascade resources. The current wording can be ambiguous in the interpretation of application of conditions. Can the IESO provide clarity on how the conditions are applied (i.e. explicit in the operation of the AND and OR operators)?	The OR operator is applied between conditions 1 and 2 before the AND operator is applied for condition 3, illustrated with the redlined brackets as follows: • (Any resource in the cascade group has a schedule equal to physical restriction on the resource imposed by the market participant; OR • No resources in the cascade group have schedules that are equal to a manual restriction placed on the resource for IESO reliability reasons); AND • No constraint violations are identified by the DAM calculation engine The slide deck has been updated and will be reposted with this clarification.
(3) Determining Profit Maximizing EOPs	**Slide 21 & 22 (clarification):** On Slide 21, G1 is offering energy in two laminations: 50 MW @ $10/MWh, and 40 MW @ $20/MWh, and the LMP is $29/MWh. Based on this, should the EOP be evaluated at 90 MW since the LMP exceeds the highest lamination? However on Slide 22 the EOP is evaluated with 50 MW.	If G1 was not linked to G2 as a cascade in the day-ahead market (DAM), G1's EOP would indeed be evaluated as 90 MW given the $29 locational marginal price (LMP). However, since G1 and G2 are linked as a cascade and effectively evaluated as a single resource in the DAM, the alternate method for determining cascade EOPs described on slides 21 and 22 applies. The EOP for G1 is adjusted to 50 MW because the operating profits between G1 and G2, given their MWh ratio relationship, are maximized at this point. You can see at the bottom of the table on slide 22 that if the G1 EOP was left at 90 MW, an overall negative operating profit would result between G1 and G2.

Item / Topic	Feedback	IESO Response
(4) RTM Lost Opportunity EOP Considerations	**Slide 24 (clarification):** Please provide Detailed Design Document reference that outlines the formula for EOP calculation for the three operating reserve classes.	The detailed design did not include formulas for EOP calculations. They will be included in the Market and System Operations draft batch of market rules and manuals.
(5) RTM Lost Opportunity EOP Considerations	**Slide 25 (correction):** Should the 10S OR EOP intersection be 20 MW (at $18 LMP) since the LMP for 10S OR is $18?	Correct, this is a typo and slide 25 should read "20 MW (at $18 LMP)" for the 10S OR EOP intersection rather than "20 MW (at $5 LMP)". The slide deck has been updated and will be reposted with this correction.
(6) RTM Lost Opportunity EOP Methodology	**Slide 26 (example):** "Each resource's energy offers / bids for energy and operating reserve are jointly optimized in isolation vs. other resources". Can an example be provided during future engagement sessions?	The equations for jointly optimizing energy and operating reserve EOPs for a resource in isolation will be included as part of the Market and System Operations draft batch of market rules and manuals. Comparing the EOP equations to the equations from the Calculation Engine market rules will assist stakeholders in understanding the difference between joint optimization of a resource in isolation vs. joint optimization against other resources.
General	**1.** What is the post processing timeline for Economic Operating Point calculations?	EOPs are expected to be determined no later than six calendar days after the applicable trade date. Final timelines will be documented in the Market and System Operations draft batch of market rules and manuals.

Item / Topic	Feedback	IESO Response
General	**2.** Is the combined/net operating point of Energy and operating serve considered when calculating other types of Make Whole Payments, for example in RT-GOG calculations?	Yes, in addition to informing DAM and real-time make-whole payments (RT-MWP), the combined/net operating point of energy and operating reserve is evaluated and used as an input into real-time generator offer guarantee (RT-GOG) payment calculations.
General	**3.** Please confirm if the following restrictions are imposed by Market Participants: slow ramp rate, forbidden region, commitment during MGBRT, Max # of starts per day?	In the context of which restrictions could affect EOP calculations, this is not an accurate nor exhaustive list. For instance, commitment during minimum generation block run time (MGBRT) does not impact EOP calculations, while other restrictions like de-ratings, which are not included in the list, do. The EOP equations that will be provided as part of the Market and System Operations draft batch of market rules and manuals will identify which market participant-imposed restrictions are considered.
General	**4.** In what condition would a non-quick start resource become ineligible for lost opportunity payments?	GOG-eligible non-quick start resources will be ineligible for lost opportunity payments when they are online and operating below their minimum loading point (MLP).
IESO correction	**Slide 9 (correction)**	The RTM Lost Opportunity MWP and EOP is in fact not applicable to imports and exports as per the Market Settlement detailed design. The slide deck has been updated and will be reposted with this correction.