

# MRP Energy Detailed Design

## Follow-up to IESO Responses to Stakeholder Review Comments

### Stakeholder Feedback Form

<b>Date Submitted:</b> <i>2020/12/18</i>	<b>Feedback Provided By:</b> Company Name: Ontario Power Generation Contact Name: Greg Schabas Phone: [REDACTED] Email: [REDACTED]
---	--

#### General feedback on the Detailed Design Document (please expand any section as required)

OPG is providing a final set of review comments on Version 1 of the Market Renewal Detailed Design as follow-up to recent IESO responses to previous stakeholder comments (posted on the IESO website on December 2, 2020). OPG continues to look forward to working with the IESO to address/mitigate issues identified to ensure the final design will maximize market efficiency and minimize costs to customers.

**OPG Final Design Comments on Version 1 Market Renewal Detailed Design**

	<b>Feedback</b>	<b>Comment Name</b>	<b>Detailed Comment</b>
1.	IESO Responses – 02-Dec-2020 Part 2 (ID 493)	Proposed alternative wording for use of Hydroelectric Parameters in DA & PD	<p>The IESO’s response on ID 493 states:</p> <p><i>“[...]Submitting minimum hourly output and hourly must run values for operating conditions that respect person safety, equipment and any applicable law will produce feasible DAM and pre-dispatch schedules, that if dispatched to that schedule value in real-time are operationally feasible.”</i></p> <p>During review of the IESO’s responses, such as the response above, it remains unclear whether the hydroelectric parameters may be used in DA and PD for the purpose of producing feasible day ahead market (DAM) and pre-dispatch (PD) schedules that if dispatched to that schedule in real-time could reasonably be expected to prevent the resource from operating in a manner that would endanger the safety of any person, damage equipment, or violate any applicable law (SEAL). It is unclear if SEAL conditions would ever apply in the DAM timeframe since DAM schedules are financial commitments not physical obligations.</p> <p>The use of these parameters is essential to ensure hydroelectric resources receive feasible schedules in the DAM and PD. A clear statement of hydroelectric parameter use may allow for a better understanding of the design intent prior to developing the market rules. OPG proposes the following:</p> <p><b><i>“Hourly must run, minimum hourly output, linked resource, time lag &amp; MWh ratio, max number of starts per day, forbidden zones, min DEL, and max DEL may be used for the purpose of producing feasible DA and PD schedules, that if dispatched to that schedule in real-time could reasonably be expected to prevent the resource from operating in a manner that would endanger the safety of any person, damage equipment, or violate any applicable law.”</i></b></p>
2.	IESO Responses – 02-Dec-2020 DA (ID 216,683)	Max DEL Constraint binding OR	<p>The IESO’s response (ID 216) states:</p> <p><i>“(DAM) Calculation Engine document addresses joint optimization of energy and operating reserve (OR). [...]”</i></p> <p>At a high level, it would be useful for the IESO to provide some insight into this important design concept, as it does not appear to be addressed appropriately using the Max Daily Energy Limit (Max DEL) constraint to bind operating reserve (OR).</p> <p>The IESO’s Response (DA Dec.2<sup>nd</sup> ID 683) states:</p> <p><i>“These maximum daily energy limit (Max DEL) constraints are identical to those used in today’s day-ahead calculation engine. [...]”</i></p> <p>However, it is OPG’s view that the inclusion of operating reserve in the binding constraint for Daily Energy Limit (DEL) for joint optimization is <u>not</u> effective in today’s day-ahead or pre-dispatch calculation engines. If the IESO requires confirmation that OR scheduled in PD will be available in RT, Market Rules Chapter 7, Section 3.3.8 should continue to provide the IESO with this assurance.</p>

**OPG Final Design Comments on Version 1 Market Renewal Detailed Design**

	Feedback	Comment Name	Detailed Comment
			<p>We encourage the IESO to review the current issues with the joint optimization of energy and operating reserve in the Day Ahead Commitment Process (DACP) and PD and consider alternate proposals to the Max DEL constraint.</p> <p>The alternatives proposed below build on existing good utility practice(s), to plan for at least one hour of water for contingencies. This minimum of one hour of water available for contingencies should not be scheduled for energy production and should be excluded from DEL. This hourly capacity is offered to the market for contingency using appropriate offer prices for energy and OR thereby ensuring it is available for operating reserve activation or other system contingencies.</p> <p>Proposed alternatives:</p> <ol style="list-style-type: none"> <li>1. Revise the Max DEL constraint to exclude OR; or</li> <li>2. Add an additional OR DEL parameter to account for the amount of OR that may be scheduled after binding energy schedules. As an example:               <ol style="list-style-type: none"> <li>i. Max DEL 100 MWh (binds on energy only)</li> <li>ii. Contingency OR DEL 100 MWh (available to be scheduled for OR after energy binds). If 100 MW of energy is scheduled in HE19, it binds the Max DEL energy schedule and the Contingency OR DEL would allow 100 MW of OR to be scheduled in HE20-HE24.</li> </ol> </li> </ol> <p>OPG understands there will be implementation and design considerations for both suggestions and are available to discuss. Any solution should aim to allow the scheduling of OR with water/fuel available for contingencies.</p>
3.		Economic Operating Point (EOP) needs to be known	<p>Economic Operating Point (EOP) calculations impact market participant’s DA schedules, PD schedules, RT dispatches, settlement of make-whole payments (MWP), MWP mitigation, etc.</p> <p>IESO responses have suggested the equations for determining EOP may not be available until market manuals are updated. Without a better understanding of EOP and the calculation of make whole payments (MWP), it is difficult to assess whether the market design meets intent. More information on the EOP calculation, impact on joint optimization, and MWPs should be provided prior to Market Rule development and Technical Panel engagement.</p> <p>As an example of a design concept that requires further clarification of intent and calculation, consider:</p> <p>GEN A with capacity 100 MW and Max DEL 100 MWh:</p> <ol style="list-style-type: none"> <li>1. In DAM, if 100 MW is economic for energy in HE 8, 9, and 19 does this lead to an EOP of 100 MW for all three hours?</li> <li>2. If HE8 and HE9 are the highest DA LMP, however, the Day Ahead objective function schedules GEN A in HE19 to maximize the economic gain for trade over 24 hours. Do DAM MWPs apply to HE8 and HE9?</li> </ol>

**OPG Final Design Comments on Version 1 Market Renewal Detailed Design**

	Feedback	Comment Name	Detailed Comment
			<p>3. Is the 100 MW DA schedule in HE19 eligible to set price since the Max DEL binds?</p> <p>4. In the RTM, GEN A is joint optimized to 0 MW Energy in HE19 to provide 100 MW of OR. EOP Energy is 100 MW yet Energy Schedule is 0 M. Does a RT MWP apply? If so, provide an example of the calculation.</p> <p>This is a very complex topic and would likely benefit from further technical discussions prior to market rule development.</p>
4.	IESO Reponses – 19-Oct-2020	Top Priority Settlements Examples Needed from IESO	<p>OPG requested examples of settlement equations/calculations to better understand whether the design meets the intent of the Market Renewal Program.</p> <p>As the Market Renewal Program moves into the Implementation Phase, further technical discussions are recommended for the more complex calculations. As such, we recommend focusing on higher priority calculation examples, such as:</p> <ul style="list-style-type: none"> <li>(i) MWP in both DAM and RT (i.e. DAM_MWP and RT_MWP) for: <ul style="list-style-type: none"> <li>• Hydro Electricity Resources, including cascade resources</li> <li>• Non-Quick Start Resources, including gas and oil generation resources</li> </ul> </li> <li>(ii) Generator Offer Guarantee in both DAM and RT (DAM_GOG and RT_GOG) for <ul style="list-style-type: none"> <li>• Non-Quick Start Resources, to illustrate settlement amount calculation in Variant 1, Variant 2 and Variant 3 scenarios</li> </ul> </li> </ul>
5.	IESO Responses – 02-Dec-2020 DA (ID 662)	OPG proposed parameter for Energy + OR	<p>The IESO’s response (ID 662) states:</p> <p><i>“The request for an additional parameter for energy plus operating reserve cannot be accommodated for a number of reasons. Firstly, aligning with the intent of the Market Renewal design process, there is no impact from the design that creates a material change, or an increased risk, to this limited scenario in the future market. Secondly, there are a set of mitigating actions available to market participants in today’s market that can continue to be used in the future market to reduce this risk of this type of described event from occurring. Thirdly, the calculation engines do not have the capability to evaluate additional constraints beyond those already accommodated for the co-optimization of energy and reserve.”</i></p> <p>Thank-you for the response. OPG remains interested in the IESO’s detailed design for the joint optimization of energy and OR and looks forward to receiving more information about the mitigating actions available to market participants in today’s market and whether they will continue to be enabled in the future market. For example: the market power mitigation design may require some changes to allow market participants to manage/reduce the risk of both infeasible schedules in the DAM and OR activation (ORA) compliance risk in RT.</p>

**OPG Final Design Comments on Version 1 Market Renewal Detailed Design**

	<b>Feedback</b>	<b>Comment Name</b>	<b>Detailed Comment</b>
6.	IESO Responses – 02-Dec-2020 DA (ID 672)	OR Demand Curve	<p>The IESO’s response (ID 672) states:</p> <p><i>“The materials presented at the Constraint Violations stakeholder engagement meeting on November 25, 2019 describe the interrelationship of the operating reserve penalty curves and include supporting graphs and illustrations. [...]”</i></p> <p>Thank-you for the response. The amount of materials published on the IESO website is vast and it can be difficult to distinguish which are design decisions and which are pre-reading for technical discussions. In this case, it may be more effective to include design decisions in the Appendices of the detailed design document then to point back to previous stakeholder engagements.</p>
7.	IESO Responses – 02-Dec-2020 DA (ID 673)	Shadow Price Publishing	<p>The IESO’s response (ID 673) states:</p> <p><i>“The IESO will publish the day-ahead market schedules and commitments in confidential reports to the registered market participants for their applicable resources. This information will assist market participants in understanding how their resources were scheduled for the next dispatch day. Additionally, the IESO will provide the shadow prices for binding constraints that are used to generate locational marginal prices. The list of such shadow prices is found in Table 3-30. The IESO will publish this information within five business days after the trade date. This information will assist stakeholders in understanding the constraints that affect locational prices in the day-ahead market. [...]”</i></p> <p>Thank-you for the response. It is unclear why the IESO does not plan to publish shadow price information until five business days after the trade date. In the unfortunate event where there is an IESO input error that causes a resource to be scheduled or not scheduled economically, the market participant should have as much information (as soon as possible) to start conversations with IESO staff. Otherwise, there may be cases where IESO errors are propagated for a number of days which impact resources ability to compete in the market. This would impact the resource involved, other market resources, and the customer. OPG encourages the IESO to publish shadow prices in a timely manner to promote efficient market outcomes.</p>
8.	IESO Responses – 02-Dec-2020 Part 2 (ID 472)	New Non-Quick Start (NQS) parameter for OR	<p>The IESO’s response in ID 472 states:</p> <p><i>“A parameter for maximum loading is not required because a new pseudo unit parameter has been developed that will help produce feasible reserve schedules. This parameter restricts 10-minute operating reserve from being scheduled in the duct firing region. [...]”</i></p> <p>OPG looks forward to reviewing future revisions of design documents to understand if any new parameters for pseudo units may also apply to hydroelectric. It seems that there is a common theme around many different technology types expressing concerns around</p>

**OPG Final Design Comments on Version 1 Market Renewal Detailed Design**

	<b>Feedback</b>	<b>Comment Name</b>	<b>Detailed Comment</b>
			infeasible operating reserve schedules which may not be able to be mitigated by the market participant due to conflicts with market power mitigation (MPM) and availability declaration envelope (ADE) provisions.
9.	IESO Responses – 02-Dec-2020 Part 2 (ID 331 & 376)	Hydroelectric Parameters Design	<p>The IESO’s response in ID 331 states:</p> <p><i>“[...] The new hydroelectric dispatch data parameters are provided for hydroelectric resources to determine feasible DAM schedules that respect the limitations of scheduling hydroelectric units. They will also provide efficient PD advisory schedules to help participants manage their resources as real time approaches. These new parameters uphold the intentions for the data as presented in the DAM high-level design. [...]”</i></p> <p>The IESO’s response on ID 376 states:</p> <p><i>“The Real Time calculation engine will be receiving minimum generation constraints based on the results of the most recent pre-dispatch run for the Hourly Must Run (HMR) input, as well as for the Minimum Daily Energy Limit input when required to do so. The remaining hydroelectric dispatch data will not be constrained into the Real Time calculation engine. With respect to feedback regarding the reliance on real-time must run constraints, responses are provided on the specific feedback received for each hydroelectric dispatch parameter under OBDI. In general, the design cannot allow for hydroelectric pre-dispatch schedules, other than those that reflect a must-run condition, to be reflected into the corresponding real-time hour as non-dispatchable quantities. Such constraints would preclude other dispatchable resources from being competitively evaluated to respond to changes in system conditions as the real-time hour approaches.”</i></p> <p>Thank-you for the responses. It remains unclear to OPG whether the design upholds the intentions of the DAM HLD. We look forward to Version 2 of the detailed design and future market rule stakeholder engagements to ascertain whether the hydroelectric parameters will be effective in the renewed market.</p>
10.	IESO Responses – 02-Dec-2020 Part 2 (ID 377)	Financial Risk due to Unplanned Transmission Outages	<p>The IESO’s response on ID 377 states:</p> <p><i>“[...] It is the responsibility of the generator to manage the financial risk associated with two-settlement in these situations. [...]”</i></p> <p>Thank-you for the response. The ability of a resource to use offers to mitigate the potential financial risk due to unplanned transmission outages (outside of a generator’s control) will require consideration during reference level negotiations. Please highlight this issue for further discussion with the MPM team.</p>

**OPG Final Design Comments on Version 1 Market Renewal Detailed Design**

	<b>Feedback</b>	<b>Comment Name</b>	<b>Detailed Comment</b>
11.	IESO Responses – 02-Dec-2020 Part 2 (ID 140)	Need for Higher Opportunity Costs to Manage MNSPD	<p>The IESO’s response on ID 140 states:</p> <p><i>“[...] Market participants can manage the opportunity cost of balancing real-time deviations from DAM schedules by adjusting their offer prices in the hours that starts are scheduled. Submitting higher opportunity costs to reflect the additional use of starts, in effect, provides a way for the real-time calculation engine to consider whether additional starts should be used now or saved for subsequent hours.</i></p> <p><i>A larger volume of outage slips would not be required to manage MNSPD relative to today’s market. Real-time dispatches should have greater alignment with pre-dispatch schedules that respect MNSPD, relative to today’s pre-dispatch schedules that do not respect MNSPD. [...]”</i></p> <p>Thank-you for the response. The ability of a resource to use offers reflecting the opportunity cost of starting a unit in an hour where it is not scheduled in the DAM does not appear to be part of the MPM reference level methodology. Please highlight this important issue to the MPM team for further discussion. The IESO’s expectation of greater alignment between PD and RT may not come to fruition as there will be still be demand and variable generation forecasts which will likely still result in a higher degree of volatility in RT vs PD.</p>
12.	IESO Responses – 02-Dec-2020 Part 2 (ID 217)	Highlight to MPM for Reference Level Consideration	<p>The IESO’s response on ID 217 states:</p> <p><i>“[...] Rather, it is the mitigation design that determines reference levels required for that dispatch data. Additional considerations about the market power mitigation design should be solicited through the technology-specific reference level/quantity stakeholder engagement sessions. [...] If an infeasible dispatch is produced in real-time, manual constraints can be applied by the IESO to produce feasible dispatches. The same real-time price would be produced whether that feasible dispatch is driven by the market participant’s offer or the IESO’s manual constraint. [...]”</i></p> <p>This response requires consideration within MPM reference level design and negotiations as the reference levels set by the IESO will determine if a market participant can manage the risk of infeasible DA schedules and RT dispatches. If the design is not efficient manual interventions by IESO staff may increase as compared to today’s market.</p>

**OPG Final Design Comments on Version 1 Market Renewal Detailed Design**

	<b>Feedback</b>	<b>Comment Name</b>	<b>Detailed Comment</b>
13.	IESO Responses – 02-Dec-2020 Part 2 (ID 225)	Highlight to MPM for Consideration of Cascades on Reference Levels	<p>The IESO’s response on ID 225 states:</p> <p><i>“[...]Market Participants can rely on the existing mechanisms they have to manage this uncertainty in the future market. If this uncertainty precludes a resources from following dispatch instructions in the real-time market, the market participant may contact the IESO to take manual actions to produce a feasible dispatch as they may today.”</i></p> <p>Thank-you for the response. Please highlight the need to maintain existing mechanisms to manage uncertainty to the MPM reference level team as this is an important concept which should be included in opportunity cost methodology.</p>