Feedback Form

Market Renewal Program – Stakeholder Update on Navigating Design Solutions and Operational Commitments in Pre-Dispatch: Thermal State Parameters and Start-Up Notifications – March 24, 2022

Feedback Provided by:

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Design Implementation Solutions

Section / Topic	Feedback
Implementability – Inputs to Day-Ahead Market Engine for Re-Run/Delay	OPG requests the IESO to consider allowing Market Participants (MPs) to provide revisions to their inputs in case of a Day-Ahead Market (DAM) re-run in response to a change in IESO inputs. OPG has concerns that if the MP's inputs are fixed, but IESO inputs are changed, it could lead to unanticipated changes in the DAM schedule and result in significant impact to the MP's resources, of particularly concern is the impact on hydroelectric cascade systems. If the MP is not able to revise their inputs in response to IESO changes, it can lead to negative reliability, operational and economic consequences. Please confirm if the constrained area designation would be held fixed (i.e. dynamic constrained area) in case of DAM re-run.

Thermal State Parameters

Section / Topic	Feedback

Minimum Generation Block Down Time (MGBDT)	There are inconsistencies in the definition of MGBDT presented in *Market Renewal Program: Energy Offers, Bids and Data Inputs Detailed Design Document V2.0*, Market Rule Amendment Proposal Batch 2 and the March 24 presentation. This is a major impediment to the MP's understanding of the implementation process. In *Market Renewal Program: Energy Offers, Bids and Data Inputs Detailed Design Document V2.0* pages 43 to 44, the definition of MGBDT (hot/warm/cold) is "…the minimum number of hours a generation unit must remain offline before it may be scheduled to generate at or above its MLP when the generation unit is considered to be in…" This indicates that during the MGBDT (hot/warm/cold) defined hours, the unit must remain offline. However, this is in conflict with the presentation, where the MGBDT (hot/warm/cold) is used by the pre-dispatch (PD) calculation engines to infer the thermal state of a unit based on submitted data. The definition of MGBDT from Market Rule Amendment Proposal Batch 2 ("minimum generation block down-time means, for each thermal state, the minimum time, in hours, between the time a generation resource was last at its minimum loading point before de-synchronization and the time the generation resource reaches its minimum loading point after synchronization") does not include the use of MGBDT by the PD calculation engine to infer a resource's thermal state, in conflict with what was presented in the March 24 presentation. In the presentation (slide 20), MGBDT was used to infer the time-interval of the different thermal states, which was not indicated in the design and definition documents above. 1. What is the correct interpretation of the MGBDT definition and its use in PD calculation engine? 2. If the intent of the IESO design is to expand on the MGBDT term to include inference to thermal states, and if the change in thermal state for some resources is measured in days and not hours, how would the IESO incorporate and resolve these differences into the current definition and design process? 3. In a situation where MGBDT is per the Batch 2 definition above, the MGBDT could be the same value for hot, warm, cold thermal states and be submitted as 4 hours without consideration of the impact to pre-dispatch scheduling. However, a unit's thermal state impacts its lead time, such that hot lead time is 4 hours, warm lead time is 6 hours, and cold lead time is 10 hours. Please provide an example of

how the PD calculation engine will address instances where the lead time is greater than MGBDT.

4. In a situation where MGBDT is used by the PD calculation engine to infer a unit's thermal state, the resource may submit MGBDT (hot) as 10 hours, MGBDT (warm) as 30 hours, and MGBDT (cold) as 40 hours with the same lead times stated in Question 3. These MGBDT times are based off the time boundaries for the resource to transition from one thermal state to the next, which in turn is based on understanding from the March 24 presentation. Please provide an example of how the PD calculation engine will address this instance.

5. For the following example, please provide a graphic similar to slide 20 of the presentation to show how the PD calculation engine infers the thermal state and calculate the appropriate start-up offers:
   - A resource was scheduled below minimum loading point (MLP) two days before the current dispatch day (D-2) in HE21, it was dispatched below MLP at 20:45 and was offline with breaker open at 21:20 (HE22);
   - The resource remained offline for D-1;
   - MGBDT (hot) = 10 h, MGBDT (warm) = 30 h, MGBDT (cold) = 40 h;
   - Start-up offer (hot) = $1000, Start-up offer (warm) = $2000, and Start-up offer (cold) = $3000 submitted for all hours;

   For dispatch day (D), please depict in graphical form which hours are defined as hot, warm, and cold.

6. For the example in Question 5, please confirm that using MGBDT (warm) and MGBDT (cold) do not render the unit unavailable for the dispatch day.

7. Please confirm that MGBDT (hot) is the only thermal state parameter used in the second commitment pass in the DA engine.

For the MGDBT (thermal state) terms in slide 20 of the presentation, the time interval identified as MGBDT (hot) does not directly correspond to the time-period where a unit is in the hot thermal state; rather it is the time where a unit cannot be scheduled back to or above MLP after ramping down from MLP. In this case the unit would only reach the actual hot thermal state at the end of the MGBDT (hot) interval. It would be more precise to refer to the initial interval as MGBDT (in alignment with Batch 2 definition), and refer to the hot, warm, cold thermal states as MGBDT (hot), MGBDT (warm) and MGBDT (cold), respectively.

Pre-Dispatch Scheduling and Commitments

Section / Topic	Feedback
Binding Start-Up Instructions for GOG-Eligible Resources	1. Please provide details on how the PD calculation engine assigns the thermal state of a unit based on offers submitted, particularly for instances where a unit's thermal state straddles HE24 of a given day or spans a period of multiple days. • For example, a unit is at MGBDT (warm) at HE20 of the dispatch day and will stay at MGBDT (warm) until HE3 of the next day. Day 1 MGBDT (warm) = 30 hours and Day 2 MGBDT (warm) = 32 hours. At what time would the unit transition between the two thermal state offers? 2. In the stakeholder session, the IESO answered a question about how the MGBDT uses the pre-dispatch schedule of MLP or alternately the hour of de-sync as an input for binding start-up logic. OPG would appreciate a written example for a unit with a pre-dispatch schedule below MLP in HE21 of the dispatch day, was not dispatched down until 20:45, and ramped off with breaker open at 21:10.

Thermal State Parameters in PD Calculation Engine

Section / Topic	Feedback
Evaluation of First Time-Step Available to Start (Binding Start-Up Instruction)	Please confirm that when a unit goes below MLP after the top of the hour, the start of the MGBDT would be rounded up to the start of the next hour. As an example, for a unit with MGBDT (hot) of three hours: 1. If the unit goes below MLP at 03:00 for HE3, when is next possible commitment hour? 2. If the unit ramps below MLP at 03:10 for HE4, when is next possible commitment hour?

General Comments/Feedback

1. The IESO stated that a unit should submit dispatch data for all three thermal states but would need to specify the applicable thermal state to be used in the DA calculation engine to generate the dispatch schedule. If a unit has already indicated a specific thermal state to be used in the DA calculation engine, why is there a need to submit data for all three thermal states?

2. Could the IESO clarify what would happen when a unit ramps down prematurely (i.e. earlier than scheduled) in the dispatch day and therefore its thermal state no longer aligns with what was submitted for the DAM for the next day? For example:
    - A unit has MGBDT (hot) = 4 hours, MGBDT (warm) = 7 hours;
    - Unit was committed to run until HE20 of the dispatch day (D);
    - The unit thermal state was submitted as "hot" for the DAM (D+1);
    - The unit ends its run commitment earlier than expected at HE15 of the dispatch day (D);
    - For the next day, the unit's thermal state is now "warm", which is in conflict with the "hot" submitted for the DAM

    How would the market participant resolve the discrepancy between the unit's actual thermal state and scheduled thermal state in the DAM?

3. OPG requests the IESO provide a day-in-the-life example walkthrough of a NQS resource including, but not limited to:
    - Offer submission for DAM and Pre-dispatch (data inputs, requesting a higher reference level, and data validation of non-financial reference levels);
    - DA calculation engine and Ex-Ante Mitigation;
    - PD calculation engine including use of MGBDT, Lead Time, Thermal States, Offer revision rules, requesting a higher reference level, ADE exemptions, Binding Start-Ups, NQS Extensions and NQS De-commitments;
    - Real-Time calculation engine initialization and De-commitment;
    - Settlement of DA-GOG, RT-GOG, situations with PD advancements of DA-GOG, and make-whole payments.

4. OPG submitted feedback on February 17th in response to the January 26th webinar on Market Renewal Program: Market Participant Readiness Planning. IESO response to this submission has not been made available. OPG requests a timely response from the IESO on this submission.

OPG thanks the IESO for this opportunity to comment on the Market Renewal Implementation – Stakeholder Update on Navigating Design Solutions and Operational Commitments in Pre-Dispatch: Thermal State Parameters and Start-Up Notifications – March 24, 2022.