Stakeholder Feedback and IESO Response

Market Renewal Program: Engagement session on March 24, 2022

The IESO held an engagement session on March 24, 2022 and received written feedback:

1. Workbench Energy
2. Ontario Power Generation

Related presentation materials and recorded sessions have been posted on the IESO 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.

Workbench Energy

Table 1 | Workbench Energy Feedback and IESO Responses

Feedback	IESO Response
1. We'd like to understand how a binding pre-dispatch ramp MW in pseudo-units is translated to physical-unit ramp MW in real time, and how the IESO evaluates the settlement of those ramp MW independently (for energy delivered, energy consumed, and operating reserve) and as part of a committed run (for top-up payment, as may be applicable).	1. For resources registered as pseudo-units, the Ramp-Up Energy to MLP parameters are submitted on the constituent combustion turbine (CT) and steam turbine (ST) physical units. These constituent ramp profiles are aggregated to achieve the pseudo-unit ramp profile that will be used to schedule the ramping energy a pseudo-unit expects to inject in the hour(s) prior to reaching MLP in the first hour of its operational commitment. The Ramp-Up Energy to MLP parameter is only used in the Day-Ahead Market (DAM) and Pre-Dispatch (PD) calculation engines.

Feedback	IESO Response
	The Real-Time calculation engine will use hourly energy ramp rates submitted on the pseudo-unit resource to determine 5-minute dispatches for the pseudo-unit, which are then assigned to the constituent CT and ST physical units based on the CT/ST shares that are pre-defined as part of pseudo-unit registration. When ramping up to MLP, there is an added component that assigns the entire pseudo-unit ramp schedule to the physical unit CT if the ST has not yet synchronized. This is described in the Real-Time Calculation Engine draft market rules posted February 4, 2022, sections 10.6.4.2 to 10.6.4.4. Ramp hours are not eligible for make-whole payments or Generator Offer Guarantee (GOG) hence translation from pseudo-unit to physical units will exclude these hours. Details of the PSU translation will be provided in the settlement batch.
2. From there, we will want to understand how the settlement is impacted by real-time physical unit ramps that are faster and that are slower than the binding start-up instructions.	2. There are no impacts to the DAM and RT settlement when a unit ramps faster. However, if a unit ramps slower and is unable to meet its binding start-up instructions, start-up costs and speed-no-load will be pro-rated as defined in the detailed design for DAM and RT market. In addition, the unit may also be subjected to Generator Failure Charge (GFC), if the unit fails to ramp to MLP as scheduled at the start of the PD commitment.
3. The IESO has identified that the thermal state of the GT will lead the thermal state of the pseudo-unit in real time. In the circumstance where a facility has multiple pseudo-units in different deemed thermal states (based on different last-run hours), will IESO assume different thermal states for different pseudo-unit resources? As it is the STG that truly determines thermal state, this presents a specific challenge to	3. The IESO will assume different thermal states for different pseudo-unit resources based on the combustion turbine (CT) submitted MGBDT (Hot/Warm/Cold) parameters, and the last time the CT was at its MLP (the "last-run" hour of the CT). Any coordination and alignment necessary for each PSU based on the ST status can be managed by the Market Participant through independent

Feedback	IESO Response
building independent binding start-up schedules for separate PSUs.	updates of MGBDT relative to the last time the associated CT was at its MLP.
4. Stakeholders will benefit from understanding how and when a participant can identify to the IESO a deviation from the thermal states. For example, where a resource is between warm and cold conditions, how can that be communicated and respect by the scheduling algorithms in order to respect equipment capability? Is the IESO dispatch algorithm able to "reset" to MLP if the resource hits MLP ahead of schedule? How will that amended MLP time be considered in the settlement process	4. Market participants will be able to update previously submitted thermal state daily dispatch data and have the most current and valid information reflected in the PD scheduling algorithm. These updates will serve to identify the new break point hours that apply to the hot/warm/cold thermal state and any new dispatch data that account for the noted deviations. Generally speaking, these daily dispatch data parameters can be revised at any time following DAM publishing and throughout the dispatch day, subject to the revised values passing validations (including Market Power Mitigation validations against applicable reference levels) described in the Offers, Bids and Data Inputs v2.0. Details of the dispatch data submission validation rules will be provided in the Market and System Operation Batch. Successful revisions to daily dispatch data parameters that are made following DAM publishing will apply to the next run of the pre-dispatch calculation engine that uses that data, and be reflected in the schedules generated by the PD calculation engine. If a resource reaches MLP ahead of schedule through an earlier synchronization or a faster ramp up then anticipated, the settlement treatment will be as described in answer #2.

Ontario Power Generation

Table 2 | Ontario Power Generation Feedback and IESO Responses

Feedback	IESO Response
DAM Inputs Section: 1. 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.	1. The IESO will not initiate a re-run of the day-ahead market (DAM) calculation engine as a result of a change in system conditions. A re-run will only be initiated in the event of technical issues, or if an unintentional and material error is identified in the initiating inputs. As a result of the stringent criteria, DAM calculation engine re-runs are expected to occur infrequently. Unintentional input errors will only be corrected to restore the inputs to the values that should have been used at the start of the DAM calculation engine. When a DAM re-run is required, there are a limited number of inputs, separate of any required corrections, that may be updated from the initiating values as a result of automated processes, not as a result of the IESO requiring input changes. The inputs to the DAM are intended to capture system conditions and expectations at 10:00 EPT for Day 1. Consequently, revisions to market participant inputs will not be permitted in the event of a DAM calculation engine re-run. Dynamic constrained areas are published in advance and will be not be subject to change in the event that a DAM re-run is required.
Minimum Generation Block Down Time (MGBDT) Section: 1. What is the correct interpretation of the MGBDT definition and its use in the PD calculation engine?	1. The correct interpretation of the MGBDT parameter and its use in the PD calculation engine is described in the March 24 presentation. The contents of this presentation is consistent with both the detailed design documents (with one exception noted below); and the draft Market Rules posted to date. The IESO acknowledges that the Offers, Bids and Data Inputs detailed design document v2.0 misstated the intended design of MGBDT by implying that all three thermal state

Feedback	IESO Response
	(hot/warm/cold) values define "…the minimum number of hours a generation unit must remain offline before it may be scheduled to generate at or above its MLP…". The minimum number of hours between MLP schedules applies only to the MGBDT (Hot) parameter value. However, this intended design for the MGBDT (Hot) parameter is correctly captured in the Pre-Dispatch Calculation Engine detailed design v2.0, page 37 (Table 3-6) and page 98; and the Day-Ahead Market Calculation Engine detailed design v2.0, pages 33-34 (Table 3-8) and page 84. In addition, the intended design for all three MGBDT (Hot, Warm and Cold) values to be used by the PD calculation engine to infer the thermal state of a resource is correctly captured in both the Offers, Bids and Data Inputs detailed design v2.0 pages 42-43; and the Pre-Dispatch Calculation Engine detailed design v2.0, pages 37-38 (Table 3-6) and pages 99-101. There is no conflict here with the March 24 presentation. The IESO believes that the Market Rule Amendment Proposal Batch 2 definition of MGBDT is consistent with the March 24 presentation. This definition identifies what the MGBDT for each thermal state should represent when being submitted by the market participant for a given resource. As described in the March 24 presentation, the many applications of the MGBDT parameter in the calculation engines are included in the February 4, 2022 posting of the calculation engine market rules, and summarized below: Day-Ahead Calculation Engine, Appendix 7.1A: Section 8.6.3.4 Pre-Dispatch Calculation Engine, Appendix 7.2A: Sections 5.8, 8.6.3.3, and 8.6.3.8
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	2. IESO received feedback (during the March 24 presentation and also during previous engagements with the Market Power Mitigation

Feedback	IESO Response
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?	reference level determinations for NQS resources) that NQS thermal state transitions can occur beyond the current 24-hour limit for MGBDT. As a result, a design change will be proposed at the upcoming IESO Engagement Days in June. This design change allows for MGBDT (Warm) and MGBDT (Cold) values to be submitted above 24 hours, up to a maximum of 99 hours. MGBDT (Hot) will continue to be capped at 24 hours.
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.	3. As noted in response to question MGBDT #1., MGBDT is defined per the Batch 2 definition and will be used by the PD engine to infer a resource's thermal state per draft Market Rules for the PD calculation engine Appendix 7.2. With that said, MGBDT values for hot, warm and cold thermal states may all be submitted using the same value. OPG's example in this question where: • MGBDT (Hot) = MGBDT (Warm) = MGBDT (Cold) = 4, and • Lead Time (Hot) = 4, Lead Time (Warm) = 6, Lead Time (Cold) = 10, Is not permitted because Lead Time must be less than or equal to MGBDT for each thermal state as described in the Offers, Bids and Data Inputs detailed design v2.0 page 45.
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.	4. As stated in response to question MGBDT #2 above, MGBDT (Warm) and MGBDT (Cold) submissions will be permitted above 24 hours up to a maximum value of 99 hours. The PD engine will use the MGBDT (Hot/Warm/Cold) values and Lead Time (Hot/Warm/Cold) values to provide binding start-up instructions consistent with the example provided in slide 26 of the March 24 presentation.

Feedback	IESO Response
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.	5. Figure 1 in the appendix shows the inferred thermal state to be used by the PD calculation engine based on the example provided and summarized below: • The example assumes that the resource's actual output dropped below MLP at 20:45 on dispatch day D-2. Because MGBDT is measured at an hourly granularity, the PD engine will "round up" to the start of HE 22 (21:00) on dispatch day D-2 when determining the initial down time of the resource. • Given MGBDT (Hot) = 10 hours: 10 hours after the initial down time of HE 22 (21:00) on dispatch day D-2, the start of the resource's hot thermal state is HE 8 (07:00) on dispatch day D-1. • Given MGBDT (Warm) = 30 hours: 30 hours after the initial down time of HE 22 (21:00) on dispatch day D-2, the end of the hot thermal state and the start of the warm thermal state is HE 4 (03:00) on dispatch day D. • Given MGBDT (Cold) = 40 hours: 40 hours after the initial down time of HE 22 (21:00) on dispatch day D-2, the end of the warm thermal state and the start of the cold thermal state is HE 14 (13:00) on dispatch day D.
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.	6. Regarding the example in question #5, using MGBDT (Warm) = 30 hours and MGBDT (Cold) = 40 hours will not render the unit unavailable in dispatch day D (refer to the response to question MGBDT #5 and Figure 1). The unit will be eligible for a commitment starting in HE8 on dispatch day (D-1) and onward.
7. Please confirm that MGBDT (hot) is the only thermal state parameter used in the second commitment pass in the DA engine.	7. For the DA engine, a resource's first commitment in the dispatch day does not respect the MGBDT (Hot) parameter (referring to the minimum number of hours between MLP

Feedback	IESO Response
	schedules) when scheduling the first hour of commitment. Any subsequent DA engine commitment that follows the first commitment will respect the MGBDT (Hot) parameter (the minimum number of hours between MLP schedules) when scheduling the first hour of these subsequent commitments. Based on this, the IESO confirms that the MGBDT (Hot) is the only MGBDT thermal state parameter used in the in the DA engine. MGBDT (Warm) and MGBDT (Cold) parameters are not used in the DA engine.
Binding Start-Up Instructions for GOG-Eligible Resources (BSU) Section: 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?	1. Section 3.5.5 of the Pre-Dispatch Calculation Engine Detailed Design document v2.0 (pages 73-75) describes how daily dispatch data parameters are treated when the pre-dispatch look-ahead period spans two dispatch days. Specifically, for MGBDT, hourly PD runs starting at 00:00 to 19:00 inclusive on Day 1 will use MGBDT values submitted for Day 1. Hourly PD runs starting at 20:00 to 23:00 inclusive on Day 1 will use MGBDT values submitted for Day 2. OPG's example identifies the resource transitioning to: • its warm thermal state in HE 20 (starting 19:00) of dispatch day 1, based on a Day 1 MGBDT (warm) = 30, • its cold thermal state at HE 3 (starting 02:00) on dispatch day 2, based on a Day 1 MGBDT (cold) = 37, • its warm thermal state in HE 22 (starting 21:00) of dispatch day 1, based on a Day 2 MGBDT (warm) = 32, and • its cold thermal state at HE 3 (starting 02:00) on dispatch day 2, based on a Day 2 MGBDT (cold) = 37 (unchanged) Using the daily dispatch data parameters described above and Section 3.5.5 of the PD

Feedback	IESO Response
	calculation engine detailed design v2.0, the following figures illustrate: • Figure 2 in the appendix: The warm thermal state transition occurring at 19:00 (Day 1) that would apply to Day 0 PD runs from 20:00 to 23:00 and to Day 1 PD runs from 00:00 to 19:00. While the cold thermal state transition is shown starting in 02:00 (Day 2), this was included for illustration, but would not be included in look-ahead period of the noted PD Runs. • Figure 3 in the appendix: The updated warm thermal state transition occurring at 21:00 (Day 1) and the unchanged cold thermal state transition occurring at 02:00 (Day 2) that would apply starting with the Day 1 PD run at 20:00.
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.	2. Figure 4 in the appendix illustrates which runs of the PD engine use the PD MW schedule as the initial down time input for MGBDT evaluation; and which runs of the PD engine use the actual MW output as the initial down time input for MGBDT evaluation. In either case, the start of the initial down time is demarcated by when the resource's PD MW schedule or Actual MW output drops below Minimum Loading Point (MLP). Initial down time is never demarcated by the time of de-synchronization or breaker open status. The figure uses OPG's example where: • the resource's PD schedule drops below MLP in HE 21 (at 20:00) • the resource's real-time dispatch and actual MW output drops below MLP at 20:45 • the resource ramps off with breaker open at 21:10. As shown in Figure 4, all PD Runs up to and including the 20:00 PD Run, which aligns with the

Feedback	IESO Response
	HE 21 (starting 20:00) PD schedule below MLP, will use the PD MW schedule as the initial down time input for MGBDT evaluation. All subsequent PD runs starting with the 21:00 PD run will use the actual MW output of the resource to determine the initial down time for MGBDT evaluation. In this example, the resource's actual output drops below MLP at 20:45. The PD engine will "round up" the start of the next hour, HE 22 (starting 21:00) to identify the initial down time for MGBDT evaluation.
Evaluation of First Time-Step Available to Start (FTS) Section: 1. 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?	1. The IESO confirms that when a resource goes below MLP after the top of the hour, the initial down time will be "rounded-up" to the start of the next hour for the purpose of evaluating the MGBDT. Examples of this can be found in Figures 1, 2 and 3 in the appendix. • Using MGBDT (Hot) = 3 hours, if the resource goes below MLP exactly at 03:00, there is no "rounding-up" required. The resource's next possible commitment hour is HE 7 starting at 06:00. This is 3 hours (the MGBDT (Hot) value) after 03:00. • Using MGBDT (Hot) = 3 hours, if the resource goes below MLP at 03:10, the initial down time will be "rounded-up" to 04:00. The resource's next possible commitment hour is HE 8 starting at 07:00. This is 3 hours (the MGBDT (Hot) value) after the 04:00 "rounded-up" initial down time.
General Comments/Feedback (GEN) Section: 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	1. Dispatch data for all three thermal states must be submitted prior to the execution of the DA calculation engine because: • MGBDT and Lead Time dispatch data for all three thermal states are mandatory submissions prior to the DAM because of the inter-related nature of these parameters, as well as the Ramp-Up Energy to MLP parameter

Feedback	IESO Response
used in the DA calculation engine, why is there a need to submit data for all three thermal states?	as it pertains to dispatch data validation. There are dispatch data validations that require all three thermal state dispatch data parameters to be present (e.g. MGBDT (Hot) <= MGBDT (Warm) <= MGBDT (Cold); and Lead Time (Hot) <= Lead Time (Warm) <= Lead Time (Cold)). Further, the number of hours associated with a Ramp-Up Energy to MLP submission must be less than or equal to the Lead Time parameter for the same thermal state. Dispatch data for only one thermal state will not be accepted if it cannot validate it against dispatch data submitted for the other thermal states. There are no restrictions to revising any of the daily dispatch data thermal state parameters (MGBDT, Lead Time and Ramp-Up Energy to MLP) so submitted values for these parameters can be revised after the DAM completes prior to the start of the Real-Time Market. All dispatch data submission validation and restriction rules will be posted for public stakeholder comment with the Market and System Operations batch.
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);	2. The earliest opportunity that the PD calculation engine will be able to recognize a discrepancy between the MP submitted DAM thermal state (hot) and the actual thermal state (warm) is at the 20:00 PD Run on dispatch day (D). This PD run is the first one that includes dispatch hours of dispatch day (D+1) in its look ahead period. If there was a DAM schedule and commitment issued by DAM for D+1, this (and subsequent) PD runs will recognize the actual thermal state (warm) and if possible, schedule the Ramp-Up Energy to MLP parameter and issue a binding start-up instruction that aligns with this actual thermal state (warm). There is no action required by market participants if there is enough time for the 20:00 PD Run or a subsequent PD run to issue

Feedback	IESO Response
• 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?	a binding start-up instruction for the resource to meet the first hour of its DAM schedule and commitment (i.e. if the Lead Time (Warm) is less than the difference between 21:00 and the start of the DAM commitment). If there is not enough time, it is the market participants' responsibility to ensure that it can meet the DAM commitment by revising dispatch data and initiating their start up sequence prior to the 20:00 PD Run on dispatch day (D). From a Settlements perspective, the thermal state Start Up Offer selected by a market participant for the DAM will be the one used for settlement as part of its DAM settlement. No settlements adjustments are made if the actual thermal state of the resource differs in real-time with respect to the Start-Up Offer. This is similar to the current DACP process where DACP commitments are settled using the start-up cost submitted prior to the DACP run, and are not adjusted if actual real-time conditions differ from those associated with the DACP submission.
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;	3. The IESO thanks OPG for this specific request. Integrated day in the life examples on how resources will participate and be treated in the renewed market will be provided around the time that the last batch of market rules and market manuals are out for stakeholder review. We will use this request to ensure we are providing relevant information at that time.

Feedback	IESO Response
• 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.	4. Thank you for the reminder on this feedback. The IESO will endeavour to have a response provided very shortly.

Appendix

Figure 1

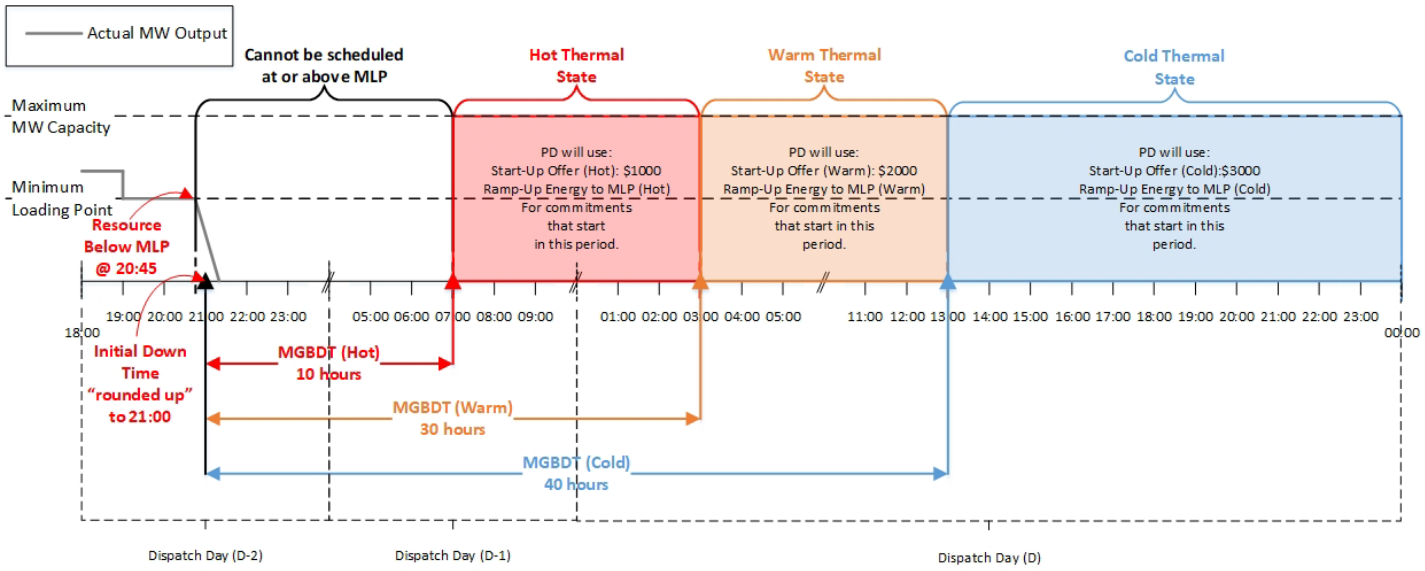


Figure 2

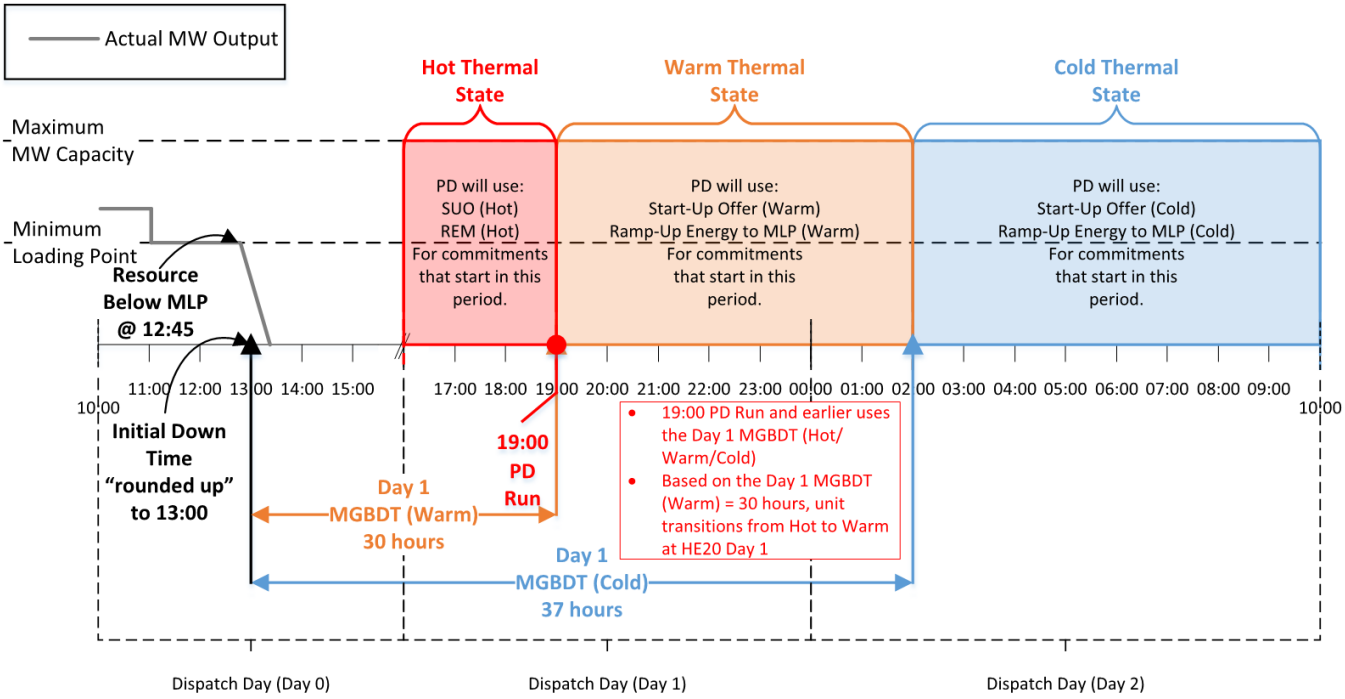

Actual MW Output
Hot Thermal State
Warm Thermal State
Cold Thermal State
Maximum MW Capacity
Minimum Loading Point
PD will use: SUO (Hot) REM (Hot) For commitments that start in this period.
PD will use: Start-Up Offer (Warm) Ramp-Up Energy to MLP (Warm) For commitments that start in this period.
PD will use: Start-Up Offer (Cold) Ramp-Up Energy to MLP (Cold) For commitments that start in this period.
Resource Below MLP @ 12:45
Initial Down Time "rounded up" to 13:00
19:00 PD Run
Day 1 MGBDT (Warm) 30 hours
Day 1 MGBDT (Cold) 37 hours
• 19:00 PD Run and earlier uses the Day 1 MGBDT (Hot/ Warm/Cold)
• Based on the Day 1 MGBDT (Warm) = 30 hours, unit transitions from Hot to Warm at HE20 Day 1
10:00 11:00 12:00 13:00 14:00 15:00 17:00 18:00 19:00 20:00 21:00 22:00 23:00 00:00 01:00 02:00 03:00 04:00 05:00 06:00 07:00 08:00 09:00 10:00
Dispatch Day (Day 0)
Dispatch Day (Day 1)
Dispatch Day (Day 2)

Figure 3

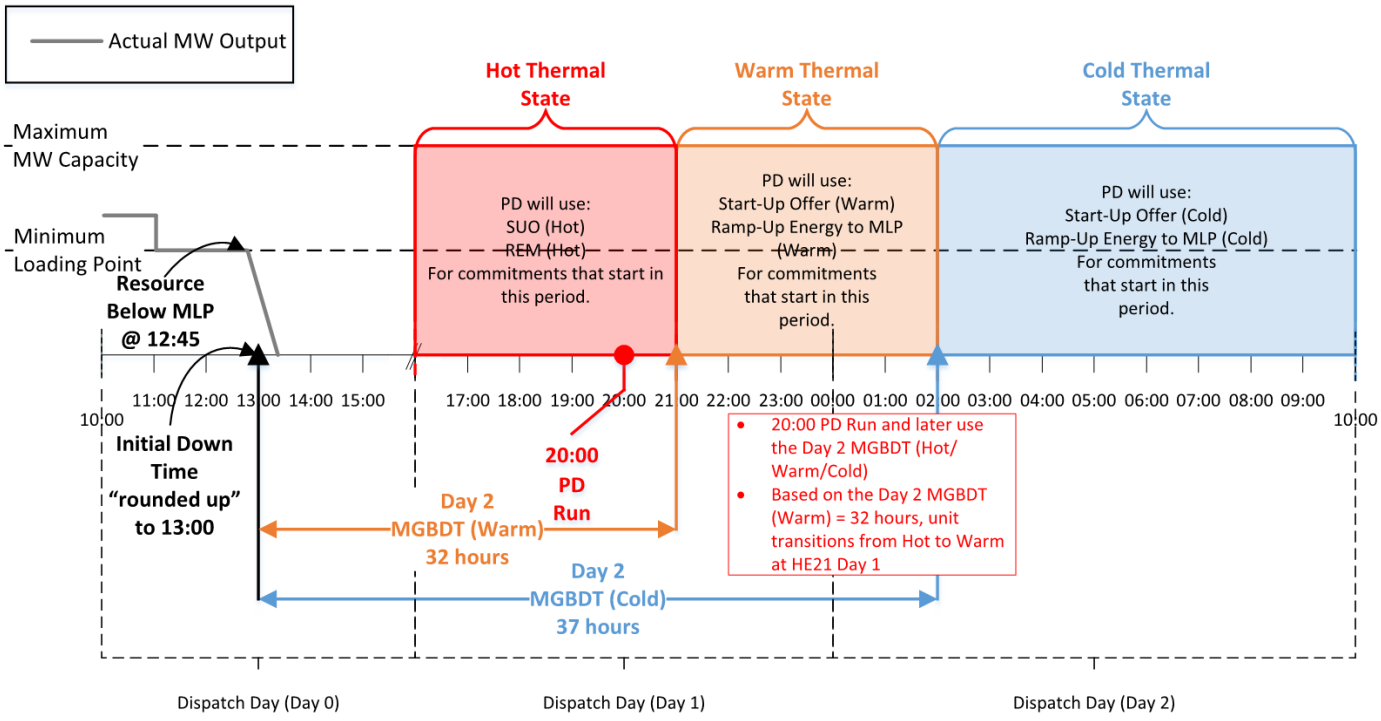
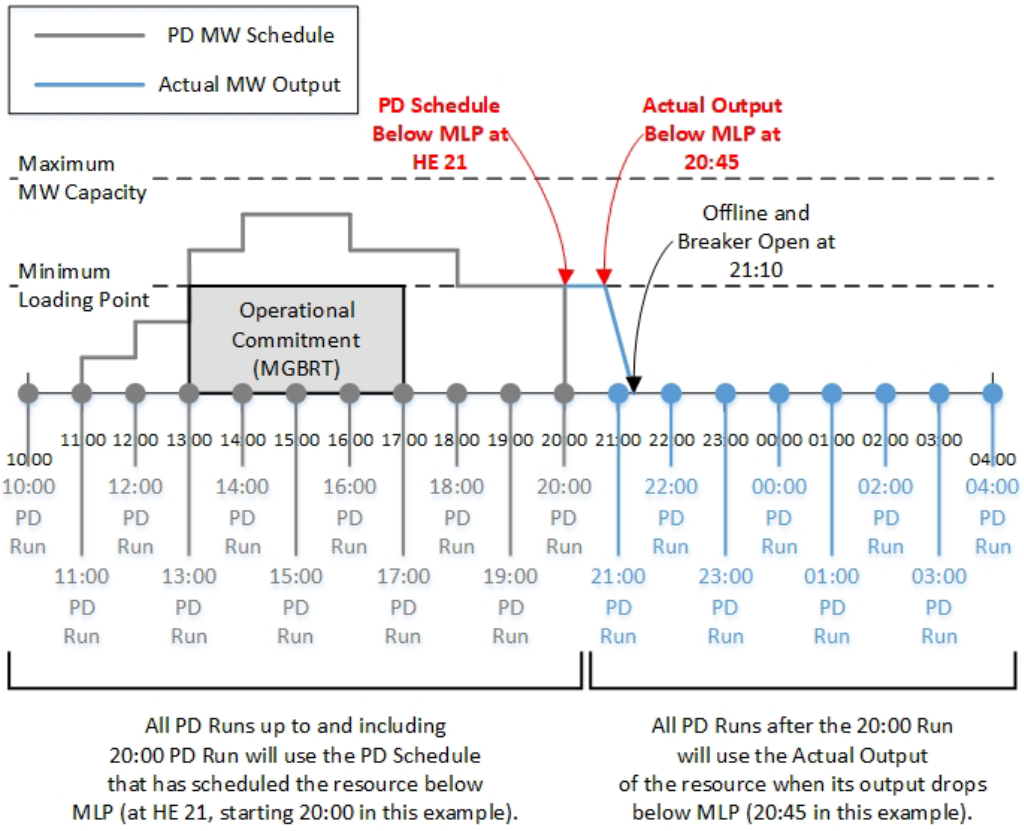

Actual MW Output
Hot Thermal State
Warm Thermal State
Cold Thermal State
Maximum MW Capacity
Minimum Loading Point
PD will use: SUO (Hot) REM (Hot) For commitments that start in this period.
PD will use: Start-Up Offer (Warm) Ramp-Up Energy to MLP (Warm) For commitments that start in this period.
PD will use: Start-Up Offer (Cold) Ramp-Up Energy to MLP (Cold) For commitments that start in this period.
Resource Below MLP @ 12:45
10:00 11:00 12:00 13:00 14:00 15:00 17:00 18:00 19:00 20:00 21:00 22:00 23:00 00:00 01:00 02:00 03:00 04:00 05:00 06:00 07:00 08:00 09:00 10:00
Initial Down Time "rounded up" to 13:00
20:00 PD Run
Day 2 MGBDT (Warm) 32 hours
Day 2 MGBDT (Cold) 37 hours
20:00 PD Run and later use the Day 2 MGBDT (Hot/ Warm/Cold)
Based on the Day 2 MGBDT (Warm) = 32 hours, unit transitions from Hot to Warm at HE21 Day 1
Dispatch Day (Day 0)
Dispatch Day (Day 1)
Dispatch Day (Day 2)

Figure 4


PD MW Schedule
Actual MW Output
PD Schedule Below MLP at HE 21
Actual Output Below MLP at 20:45
Maximum MW Capacity
Minimum Loading Point
Offline and Breaker Open at 21:10
Operational Commitment (MGBRT)
10:00 PD Run
11:00 PD Run
12:00 PD Run
13:00 PD Run
14:00 PD Run
15:00 PD Run
16:00 PD Run
17:00 PD Run
18:00 PD Run
19:00 PD Run
20:00 PD Run
21:00 PD Run
22:00 PD Run
23:00 PD Run
00:00 PD Run
01:00 PD Run
02:00 PD Run
03:00 PD Run
04:00 PD Run
All PD Runs up to and including 20:00 PD Run will use the PD Schedule that has scheduled the resource below MLP (at HE 21, starting 20:00 in this example).
All PD Runs after the 20:00 Run will use the Actual Output of the resource when its output drops below MLP (20:45 in this example).