Stakeholder Engagement Pre-Reading

Non-Quick Starts in Pre-Dispatch Scheduling – November 1, 2019

The external stakeholder engagement session on November 1, 2019 will cover two topics:

- Non-Quick Start Lead Time
- Non-Quick Start Offer Price Changes

The purpose of this document is to provide stakeholders with information on the detailed design and set expectations for the session. These materials are required reading for the session.

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Disclaimer

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1. Session Objective

The detailed design engagement meetings are to be considered technical working sessions. The sessions will focus on specific topics that external stakeholders either expressed an interest in during the high-level design phase or where the IESO has identified the need for further stakeholder input to inform the draft detailed design. Each session will concentrate on the proposed design for one specific aspect of the energy market detailed design.

The IESO is publishing materials for each engagement session no later than two weeks in advance of the session. This information is being shared in advance to provide stakeholders the opportunity to review and consider the potential impacts on their organization. The material should also help stakeholders identify who from their respective organizations may be most appropriate to attend the session and provide feedback. Stakeholders are encouraged to submit questions in advance of the sessions that will be addressed either at or before the session.

Stakeholder feedback, questions or concerns can be sent directly to engagement@ieso.ca.

These sessions will allow for interactive discussions with stakeholders regarding the reading material which will be focused on the questions identified below.

Stakeholders may also submit written feedback after the session if they choose to do so. However, these engagement sessions are designed to collect stakeholder feedback in-person and to facilitate a discussion with other stakeholders on that feedback. The IESO will use the input from these sessions to inform the detailed design decisions. Following each engagement session, the IESO will publish a brief summary of the discussion and allow for a short window for feedback for those not able to participate.

In the pre-engagement session, the IESO will be asking the following questions:

- What questions do stakeholders have about the proposed design?
- What questions do stakeholders have about the rationale for the proposed design?
- Do stakeholders agree that the proposed design is consistent with the Market Renewal principles? If not, what changes would be required to better align with the principles?

Figure 1 - Principles of Market Renewal

PRINCIPLES				
Efficiency Lower out-of-market payments and focus on delivering efficient outcomes to reduce system costs	**Competition** Provide open, fair, non-discriminatory competitive opportunities for participants to help meet evolving system needs	**Implementability** Work together with our stakeholders to evolve the market in a feasible and practical manner	**Certainty** Establish stable, enduring market-based mechanisms that send clear, efficient price signals	**Transparency** Accurate, timely and relevant information is available and accessible to market participants to enable their effective participation in the market

2. Background

Electricity markets require a mechanism to cost-effectively transition from day-ahead scheduling to real-time operations. While a day-ahead market can efficiently schedule resources to meet the following day's expected demand, conditions can change after the day-ahead scheduling process is complete. There may be changes in demand due to weather conditions or changes in supply from variable generators. Electricity markets evaluate bids and offers from all resources between the clearing of the day-ahead market until real-time operations, known as the pre-dispatch (PD) timeframe. This evaluation addresses deviations between day-ahead and real-time in order to reliably meet real-time demand at the lowest possible cost.

2.1. Pre-Dispatch (PD) Scheduling Process

The Pre-Dispatch (PD) scheduling process produces projected prices and advisory schedules over a number of future hours based on forecasted system conditions. **Advisory schedules** are produced for all resources, and provide market participants with information on how their resource is likely to be scheduled and dispatched in real-time. These schedules are produced hourly based on changing system conditions. Most resources do not receive a binding dispatch instruction until the real-time timeframe, so advisory schedules provide valuable information that the market participant can use to prepare for those operations.

2.2. Pre-Dispatch Scheduling for Non-Quick Start Resources

Certain generators – like non-quick start (NQS) resources – require unique treatment during PD scheduling due to operational requirements. NQS resources must remain online at their minimum loading point (MLP) for their minimum generation block run time (MGBRT) prior to shutting down[1]. These operational requirements expose NQS resources to financial risk because they do not have the flexibility to shut down if they were dispatched offline in real-time before completing their MGBRT hours.

In the current market, NQS resources are eligible to receive commitments and financial guarantees through the Real-Time Generation Cost Guarantee (RT-GCG) program. A commitment guarantees that the IESO will dispatch the resource in real-time for at least its MGBRT hours at its MLP, even if the resource becomes uneconomic. These commitments are sometimes referred to as 'operational commitments' because they must be met in order to respect the physical operating requirements of the resource. Under the RT-GCG program, market participants representing NQS resources are able to self-commit after receiving an advisory schedule and meeting eligibility criteria. The RT-GCG program reimburses the market participant for any eligible costs that it incurs from delivering on its commitment, if those costs are not offset by revenue earned from injecting energy.

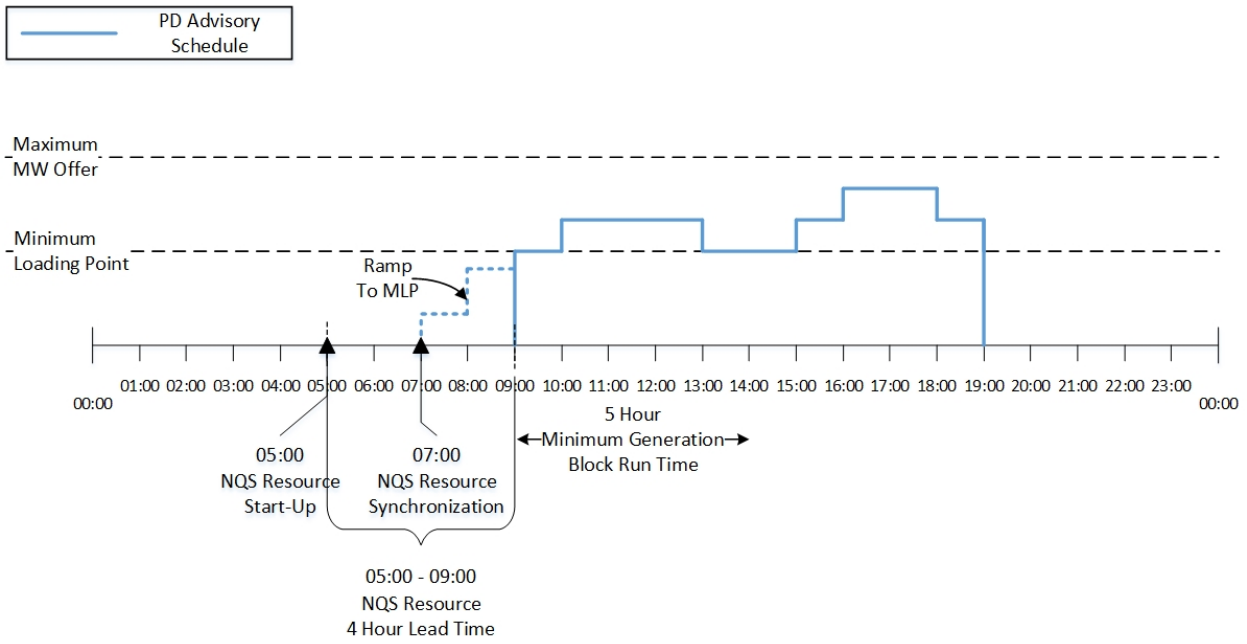
In the renewed market, rather than the market participant initiating a commitment, the PD scheduling process will automatically generate advisory schedules and commitments for NQS resources using dispatch data provided by the market participant. The RT-GCG program will no longer exist in the renewed market, but NQS resources will still be eligible for cost guarantee payments.

[1] MLP is the minimum output, in MW, that a resource associated with a generation facility must maintain to remain stable without the support of ignition. MGBRT is the minimum number of consecutive hours a NQS resource must be scheduled to its MLP.

2.3. Pre-Dispatch Advisory Schedules for NQS Resources

The future PD scheduling process will use market participant lead time data to identify when a NQS resource needs to initiate its start-up processes in order to be ready to produce energy in a specific hour[2]. For example, if a resource has a lead time of four hours, the PD scheduling process will calculate that the resource needs to initiate its start-up processes by 05:00 in order to be at its MLP by 09:00. This example is illustrated in **Figure *2***.

Figure 2 - Example of PD Advisory Schedule

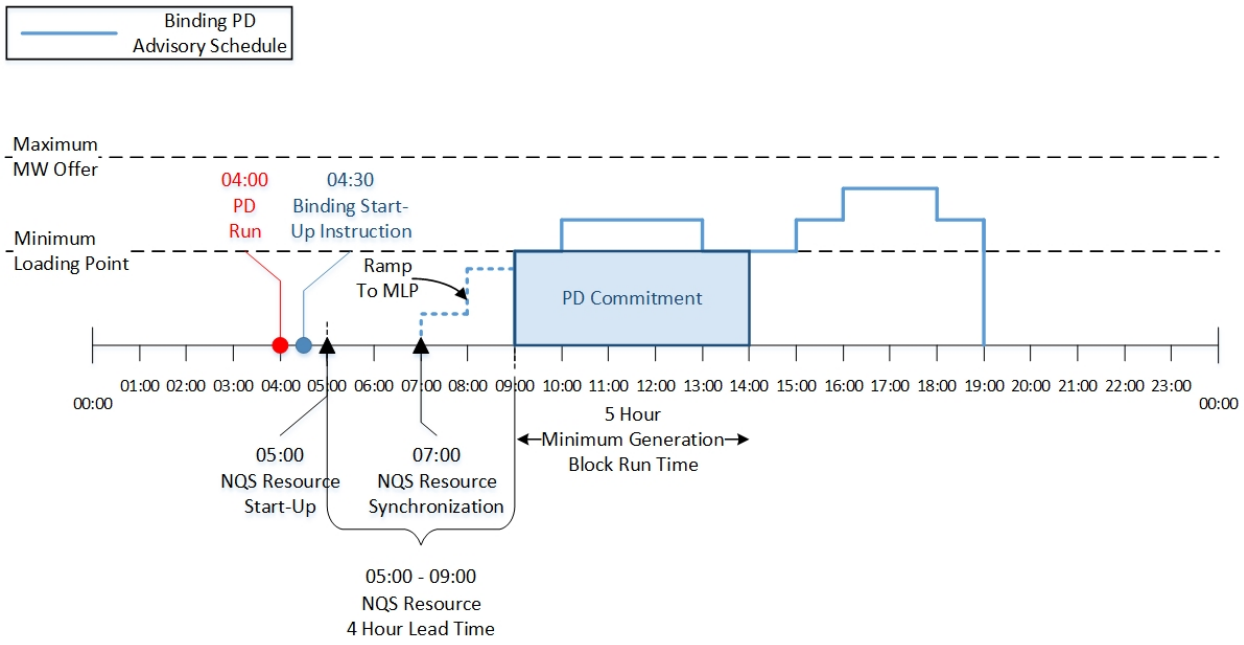


The PD scheduling process would issue (non-binding) advisory schedules for the NQS resource in the hours leading up to 04:00. Advisory schedules will, at a minimum, be for the NQS resource's MGBRT at its MLP. The schedule may also include hours beyond the MGBRT and for levels above MLP, if the additional energy that the resource can provide is the most economic solution. Advisory schedules are for the market participant's reference only; these schedules do not form a commitment and may change from hour-to-hour based on forecasted system conditions.

Assuming that the resource is still the most economic option, the 04:00 run of the PD scheduling process would issue the NQS resource a commitment and binding start-up instruction. The 04:00 run of the PD scheduling process is the last possible opportunity for the process to issue the resource a commitment that respects its four-hour lead time, given that results won't be published until sometime after 04:00. See illustration in **Figure *3***.

[2] Lead time is explained in Section 3 of this document and Section 2.5 of the Enhanced Real-Time Unit Commitment High-Level Design.

Figure 3 - Example of Binding PD Advisory Schedule



Similar to commitments under the RT-GCG program, commitments generated by the PD scheduling process will guarantee that the resources will be dispatched in real-time for at least its MGBRT hours at its MLP. The binding start-up instruction is the signal to the market participant to initiate its start-up processes. Lead time is the amount of time (in hours) that a resource needs to reach MLP from an offline state. The lead time ramp profile represents the MWs that will be generated by a NQS resource while it ramps from an offline state to its MLP.

The version of the advisory schedule that the PD scheduling process issues at the same time as the binding start-up instruction and the commitment is known as the **binding PD advisory schedule**. The binding PD advisory schedule is an important record that will be used in applying restrictions on offer price increases.

3. Lead Time Parameters

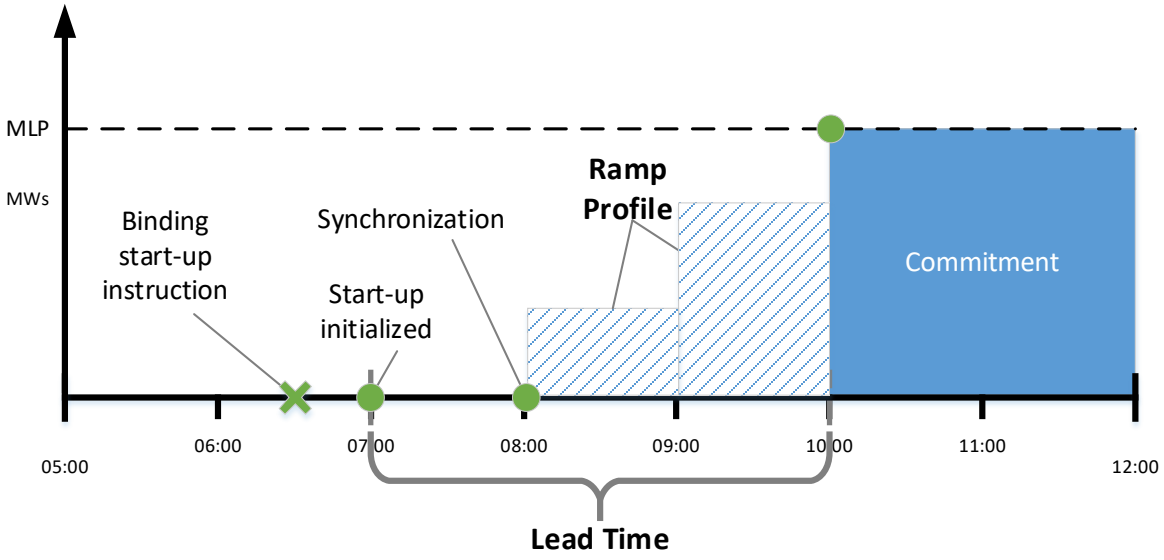
The change from NQS resources self-committing under the RT-GCG program to the PD scheduling process issuing commitments necessitates new data inputs. Market participants will provide these data inputs to the IESO for use in the day-ahead market and PD scheduling process. The following sections outline the new data inputs that NQS resources will submit for use in the scheduling process.

3.1. Lead Time

In order to schedule NQS resources and issue binding start-up instructions at the right time, the pre-dispatch scheduling process needs to know how long it will take an offline NQS resource to reach its MLP. The IESO is introducing a new parameter called 'lead time' to capture this data.

Lead Time (LT) is the amount of time (in hours) that a resource needs to reach MLP from an offline state. Lead time includes start-up initialization, synchronization, and ramp to MLP.

Figure 4 - Example: Lead Time and Lead Time Ramp Profile



3.2. Lead Time Ramp Profile

The PD scheduling process needs to account for the MWs that will be generated by a NQS while it ramps from an offline state to its MLP. The scheduling process needs to consider data in order to avoid inefficiently scheduling other resources or intertie transactions during the ramping hours. During the PD timeframe, the scheduling process finalizes intertie transaction schedules and NQS start-ups and extensions.

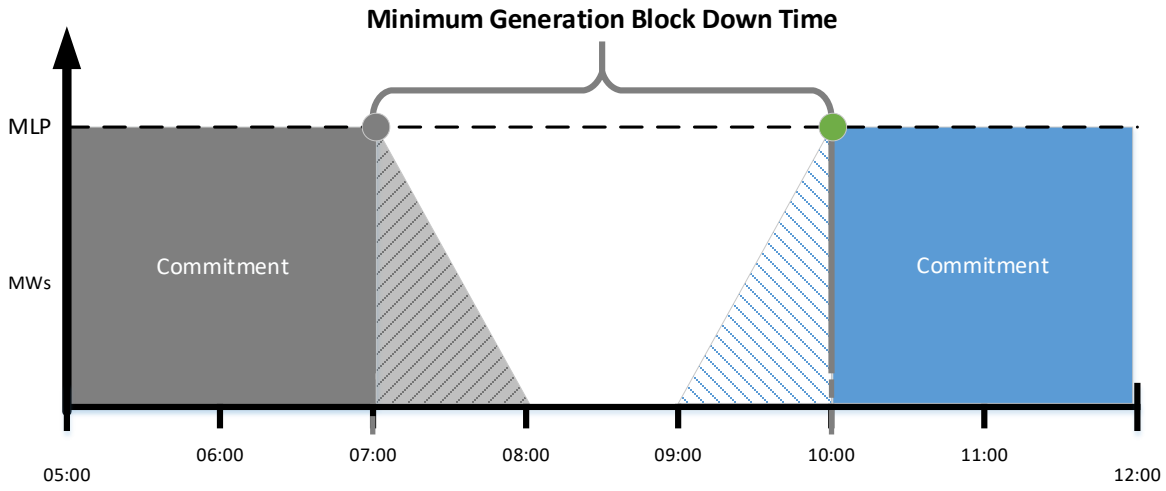
The IESO is introducing a new parameter called the 'lead time ramp profile'. The ramp profile will have multiple data points, including the number of ramping hours and the average MWs for each hour. The lead time ramp profile will enable the PD scheduling process to predict the quantity of MWs that will be generated during each ramp hour and produce an expected time for synchronization to the grid.

The new lead time ramp profile will only be used to schedule ramping MWs below MLP. In the current market, all ramping MWs are scheduled using a combination of the resource's energy offer pairs and the submitted ramp rate. In the future, the PD scheduling process will schedule in respect of the resource's MLP, below which they are understood to be non-dispatchable. Therefore, existing ramp rates will only be used to schedule MWs above MLP and the lead time ramp profile will be used to schedule MWs for a resource while it ramps to MLP.

3.3. Minimum Generation Block Down Time

Minimum generation block down time (MGBDT) is the amount of time (in hours) that must elapse between when a generation facility was last at its MLP until when it can reach MLP again. MGBDT will commence once a resource has been scheduled below its MLP.

Figure 5 - Example: Minimum Generation Block Down Time



4. Lead Time Scheduling in Pre-Dispatch

The following sections outline how the new lead time parameters will be used in the PD scheduling process. Details on how lead time parameters will be used for scheduling in the Day-Ahead Market (DAM) will be included in the detailed design document.

4.1. Lead Time and Hours Offline

There is a correlation between how long a NQS resource has been offline and the length of its lead time. Generally speaking, the longer a resource has been offline, the longer its lead time will be.

The correlation between hours offline and lead time is mediated by the temperature of the resource. The length of time offline affects a resource's temperature; the longer a resource has been offline, the colder it gets. The temperature of the resource in turn affects its operating capabilities and therefore lead time; the colder the unit is, the longer it may take to reach MLP. Because the IESO does not have access to a resource's temperature, it must use data on how long the resource has been offline to infer its lead time.

On a daily basis, market participants will have the opportunity to submit lead time parameters[3] for three temperature scenarios – hot, warm, and cold – and indicate what the corresponding data will be for each scenario. Three scenarios were selected as the number of thermal states required to model an NQS resource's lead time and MGBDT.

4.2. Data Submission

As identified in high-level design, market participants will submit lead time parameters with other dispatch data during the day-ahead market submission window. If the market participant does not receive a DAM commitment, they will also be able to update their lead time parameters after DAM schedules are published up until the initial PD scheduling run for the next day (at 20:00). The data will be applied for all hours of the dispatch day. The IESO will allow market participants who receive a DAM

[3] Lead time parameters include: lead time, minimum generation block down time, and lead time ramp profiles.

commitment to update lead time parameters before the initial PD scheduling run for the next day, if it is feasible from a scheduling impact perspective. The detailed design document will contain additional details on this aspect of the design.

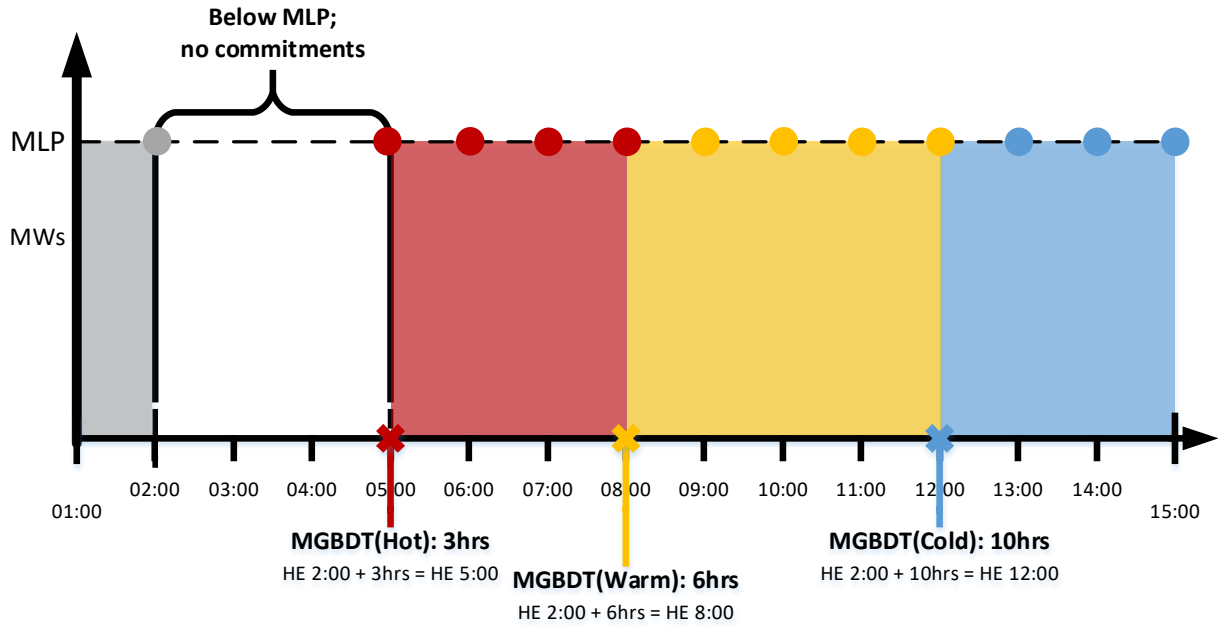
Market participants will provide daily data inputs for their lead time parameters for all three temperature scenarios (i.e. hot, warm, and cold).

- Lead Time and MGBDT data will each be a single value, representing a number of hours.
- Lead time ramp profiles will have two components:
    - The number of ramping hours from synchronization to MLP, and
    - For each ramping hour, an average MW quantity representing the resource's expected output for the given ramp hour. For example, if a market participant has submitted a lead time value of three hours, the corresponding warm ramp profile might look like this:
        Number of hours ramping: **2**
        Quantity for ramp hour 1: **50MW**
        Quantity for ramp hour 2: **100MW**

Each MGBDT of hot, warm and cold will represent the minimum number of hours a resource must remain offline before it may be scheduled to generate at its MLP using its corresponding hot, warm or cold lead time dispatch data and ramp to MLP profile. The PD scheduling process will use these values to provide a binding start-up instruction for the specified unit to start while respecting the technical data provided to support the unit's temperature status.

The three temperature scenarios are illustrated by the example in **Figure 6**. In the illustration, the shaded areas indicate the temperature state of the resource based on its MGBDT data and the coloured dots indicate the lead time and lead time ramp profile data that would apply to reach MLP in that hour.

Figure 6 - Example: MGBDT Temperature Scenarios



In the example in **Figure 6**, Generator A is dispatched below its MLP at 02:00. Based on it's MGBDT data (i.e. hot MGBDT of 3hrs), it cannot be scheduled to reach MLP again until at least 05:00. Generator A can

be scheduled to reach its MLP in any hour from 05:00 to 08:00 using its hot lead time and hot ramp profile. At 08:00, Generator A enters its warm state because it has been below its MLP for over six hours (i.e. its warm MGBDT value). Commitments starting at 09:00 until 12:00 must use its warm lead time and warm ramp profile in order to respect the warm temperature state of the resource. Likewise, at 12:00 Generator A will reach its cold state, so any commitments starting at or after 13:00 must use its cold lead time and cold ramp profile.

4.3. Data Validation Rules

The following data validation rules will apply when market participants enter daily dispatch data for lead time, MGBDT, and lead time ramp profiles:

- The MGBDT dispatch data values must be less than or equal to the registered maximum values[4]:
    - The MGBDT(hot) value must be less than or equal to the maximum MGBDT(hot) registered value[5];
    - The MGBDT(warm) value must be less than or equal to the maximum MGBDT(warm) registered value; and
    - The MGBDT (cold) value must be less than or equal to the maximum MGBDT(cold) registered value.
- The hot, warm, and cold MGBDT values must be mutually exclusive (i.e. cannot overlap) and sequential:
    - The MGBDT(hot) value must be less than submitted MGBDT(warm) value;
    - The MGBDT(warm) value must be less than the submitted MGBDT(cold) value; and
    - The MGBDT (cold) value must be greater than the submitted MGBDT(warm) value.
- The lead time dispatch data values must be less than or equal to the submitted MGBDT values:
    - LT(hot) must be less than or equal to the submitted MGBDT(hot) value;
    - LT(warm) must be less than or equal to the submitted MGBDT(warm) value; and
    - LT(cold) must be less than or equal to the submitted MGBDT(cold) value.
- Lead time ramp profiles must conform to the following rules:
    - The number of ramp hours for the resource to ramp from synchronization to its MLP must be a positive integer between the values of 1 and 24;
    - The number of ramping hours must be less than or equal to the corresponding submitted lead time (hot, warm or cold) hours;
        - Ramp hours (hot) must be less than or equal to the submitted LT(hot) value;
        - Ramp hours (warm) must be less than or equal to the submitted LT(warm) value;
        - Ramp hours (cold) must be less than or equal to the submitted LT(cold) value;
    - The average quantity of energy, in MW, for each ramp hour must be less than or equal to the resource's registered MLP and greater than zero; and
    - The average quantity of energy for subsequent ramp hours must be greater than or equal to the quantity in the previous ramp hour.

4.4. Scheduling Example

The following example illustrates how the PD scheduling process will leverage lead time parameters to issue binding start-up instructions and commitments.

[4] As established during the facility registration process.

[5] Note: MGBDT(hot) can be equal to zero if an immediate start-up or turnaround is feasible for the resource.

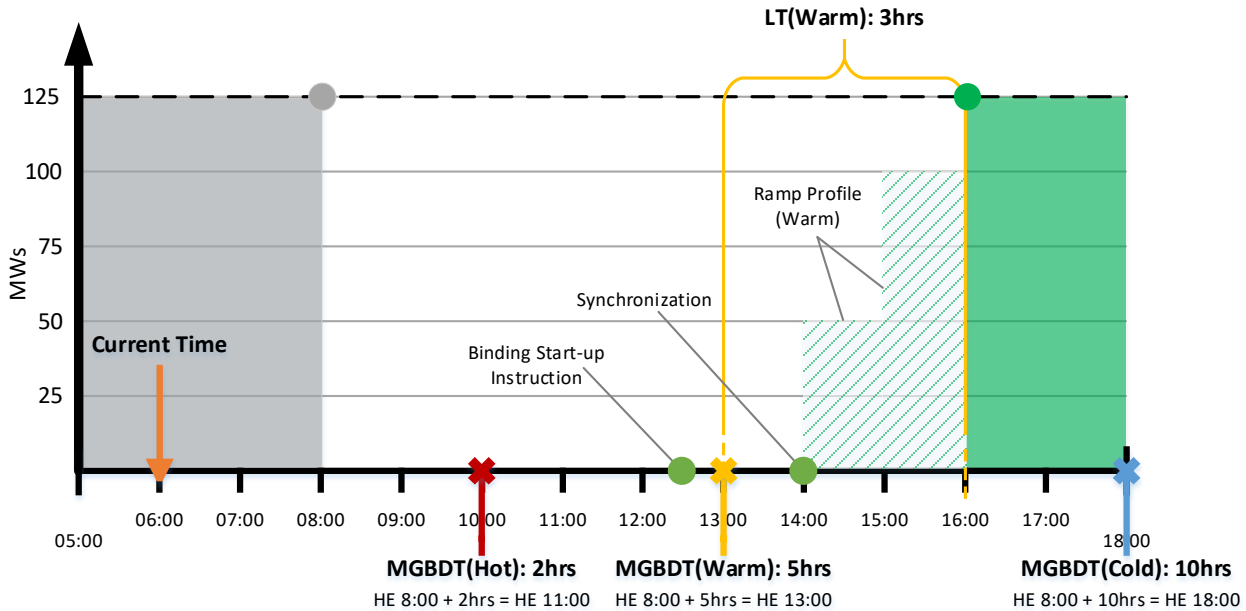
At 06:00 the PD scheduling process identifies a supply need at 16:00 where starting up Generator A is the most economic option. Generator A is currently online and has commitment until 08:00.

Generator A has submitted the daily dispatch data in Table 1 below.

Table 1 - Daily Dispatch Data for Generator A

	Hot	Warm	Cold
Minimum Loading Point	125MW		
Minimum Generation Block Down Time	2hrs	5hrs	10hrs
Lead Time	1hr	3hrs	5hrs
Ramp Profile	1hr H1: 85MW	2hrs H1: 50MW H2: 100MW	4hrs H1: 25MW H2: 50MW H3: 75MW H4: 100MW

Figure 7 - Example: Lead Time Scheduling for Generator A



As illustrated in **Figure 7**, the PD scheduling process calculates that there are eight hours between when Generator A will end its commitment at 08:00 and when it will be needed again at 16:00. The scheduling process then determines that Generator A will be warm at 16:00 by comparing the length of the time it will have been below its MLP (i.e. eight hours) to its MGBDT data. Generator A enters a warm state after

being below MLP for five hours, but won't enter its cold state until after being below its MLP for ten hours (i.e. 18:00). Therefore, Generator A will be warm at 16:00 and the scheduling process will apply its warm lead time of three hours.

Using the warm lead time ramp profile, the PD scheduling process predicts that Generator A will synchronize at 14:00. The scheduling process also accounts for the MWs that Generator A will output during its ramp: 50MW in HE 14:00 and 100MW in HE 15:00.

The PD scheduling process would issue an advisory schedule to Generator A hourly from 06:00 until 12:00, revising the schedule if needed. At 12:30[6] the engine would issue a binding advisory schedule and start-up instruction to Generator A for its commitment starting at 16:00.

5. Restriction on Offer Price Increases

In high-level design, the IESO identified a number of restrictions on changes to offer data for NQS resources that receive a commitment through the DAM or PD scheduling process.[7] It is appropriate to implement restrictions on offer price increases after a NQS resource receives a commitment because allowing increases could enable the resource to exercise market power. Committed resources have a competitive advantage up to their full capacity once they are online. Their start-up and speed-no-load costs no longer need to be considered by the PD scheduling process because they are already committed (sunk) costs. Compared to offline NQS resources, energy from the committed NQS resource is significantly cheaper up to its full offered capacity. This competitive advantage would allow the resource to increase its offer price for quantities up to full capacity, and continue to be dispatched.

The sections that follow will focus on the restrictions that will apply to energy and operating reserve (OR) offer price increases after a NQS resource has received a commitment through the PD scheduling process only.

Market participants can increase offer prices for all dispatch hours up until they receive a commitment through the PD scheduling process[8]. Once they receive a commitment, they can only increase offer prices for dispatch hours outside of the binding PD advisory schedule.
The offer increase restriction specifically applies to:

- energy offer price increases for megawatts (MW) above MLP[9], up to the resource's maximum energy offer MW quantity; and
- operating reserve (OR) offer price increases for all MWs up to an NQS resource's maximum OR offer MW quantity.

There may be exceptional circumstances where the restriction on offer price increases may be lifted for MWs above the binding PD advisory schedule quantity. These exceptions are discussed further in Section 7.

[6] Based on current estimates, PD scheduling process results will be published 30 minutes after the run starts.
[7] See Section 3.2 of the Enhanced Real-Time Unit Commitment High-Level Design.
[8] Note: the offer change restrictions will not supersede the existing Mandatory Window restrictions, which restrict all changes to dispatch data changes within two hours of real-time operations.
[9] MW quantities at or below MLP are considered part of a NQS resource's commitment cost. NQS resources with a DAM or PD commitment will not be allowed to increase offer prices for their commitment costs. See Section 3.2 of the Enhanced Real-Time Unit Commitment High-Level Design for further details.

It is important to note that the restriction to offer price increases described above only apply to NQS resources that receive a PD commitment. NQS resources that receive a DAM commitment are not subject to restrictions for energy offer price increases above MLP, or OR offer price increases.

6. Restriction Applicability and Timelines

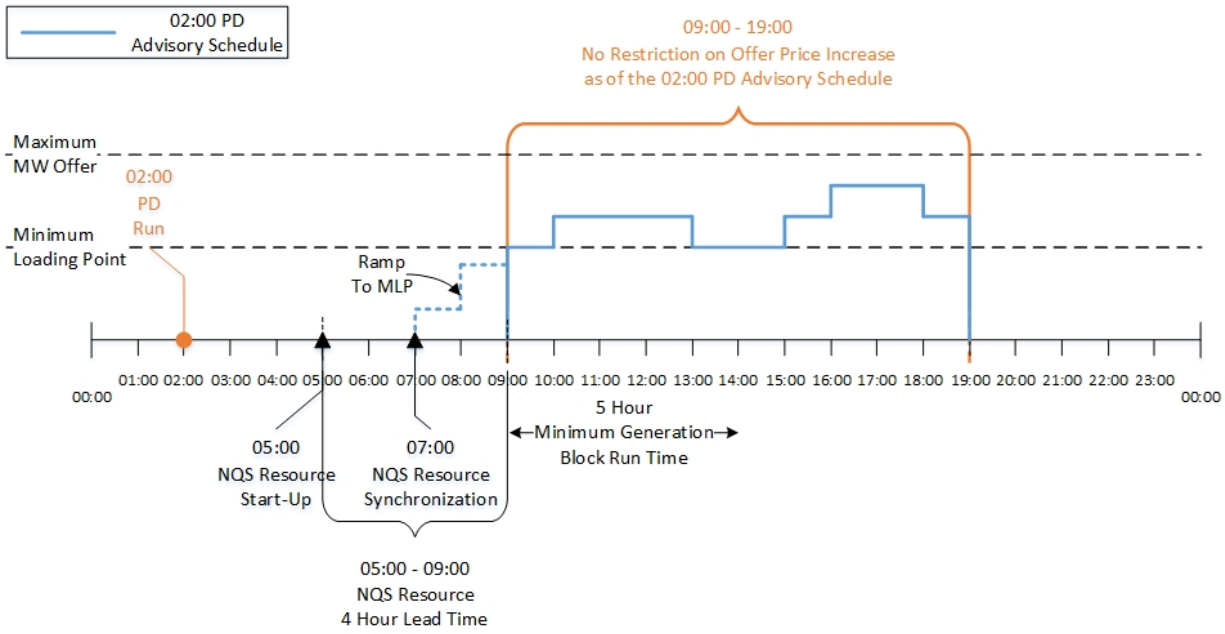
The following examples illustrate the applicability of restrictions on offer price increases on advisory schedules leading up to and including the binding PD advisory schedule. The examples all share the following assumptions:

- the NQS resource does not have a DAM schedule and commitment
- the NQS resource has a four-hour lead time and a two-hour lead time ramp profile
- the advisory schedule (prior to the binding PD advisory schedule) and the binding PD advisory schedule are the same, with the NQS resource scheduled to generate at or above MLP between the hours of 09:00 and 19:00

6.1. Example 1 - PD Advisory Schedule (No Commitment)

Figure 8 below shows the advisory schedule that is produced by the 02:00 run of the PD scheduling process. The scheduling process does not issue a binding start-up instruction or operational commitment; the first hour of operation at or above MLP is 09:00 and the resource's lead time is four hours, so there is no need to issue a commitment yet. As a result, there is no restriction on offer price increases and the resource is free to modify its offers for the rest of the day[10].

Figure 8 - Example 1: PD Advisory Schedule for a NQS Resource – No Commitment



Advisory schedules in advance of the binding PD advisory schedule may provide useful information for market participants regarding anticipated PD commitments. Because these earlier advisory schedules do not issue a binding start up instruction or operational commitment, they will not trigger any

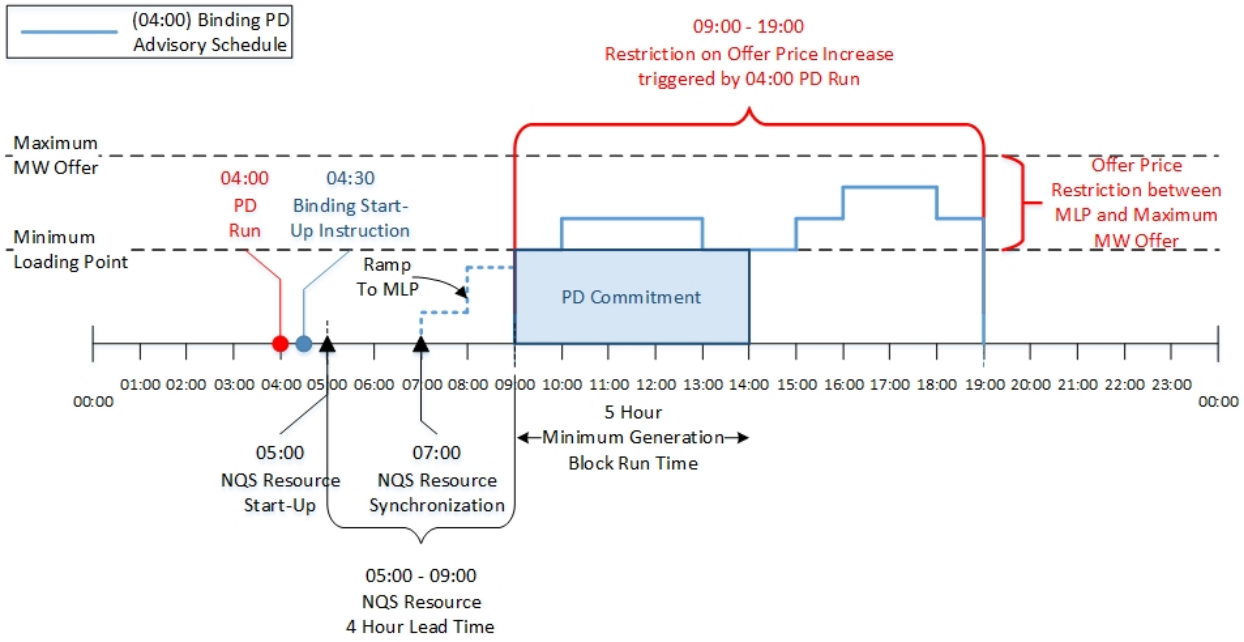
[10] Note: Mandatory window restrictions will still apply.

restriction on offer price increases and market participants can continue to revise their offers as they see fit (subject to the two-hour mandatory window restriction).

6.2. Example 2 - Binding PD Advisory Schedule (Commitment)

In **Figure 9** below, 04:00 is the run of the PD scheduling process that issues the binding start-up instruction and PD commitment. The issuing of this commitment triggers the restriction on offer price increases. The restriction is in effect for all hours within the binding PD advisory schedule. In this example, the restriction on offer price increases is in effect as of the 04:00 run, and applies to all hours of the binding PD advisory schedule (09:00 to 19:00). The restriction applies to all MWs between the resource's MLP and its maximum offer quantity.

Figure 9 - Example 2: Binding PD Advisory Schedule for a NQS Resource



6.2.1. Rationale for Restriction on MWs up to Binding PD Advisory Schedule

Restrictions on offer price increases for MWs up to a resource's binding PD advisory schedule (e.g. the striped, orange shaded area in **Figure 10**) are necessary because allowing offer price increases following the issuance of the binding PD advisory schedule could impact competition and efficiency of the PD scheduling process.

When a NQS resource receives a commitment from the PD scheduling process, the binding PD advisory schedule is an indication of when the resource was economic. The resource was issued a commitment based on its submitted offers, because it was part of the lowest-cost solution to serve demand across all of the hours and the MW range scheduled. This solution may also include hours beyond the commitment and MW production higher than the MLP of the resource.

Absent a restriction on changes to offer prices within the binding PD advisory schedule after the schedule was issued, NQS resources would have incentives to offer at prices based on what is likely to result in a commitment, then modify them following their commitment to reflect their economics.

These incentives could lead to uncompetitive offer behaviour, resulting in potentially inefficient commitments if these commitments displace resources that have offered economically.

It is important to note that this restriction on offer price increases does not apply to resources that receive a DAM commitment because the resource is subject to a balancing settlement at real-time prices for differences between the DAM and real-time schedules. Resources that increase their offer price for DAM scheduled quantities will have to buy back that energy if it becomes uneconomic and is not scheduled in real-time.

6.2.2. Rationale for Restriction on MWs above Binding PD Advisory Schedule

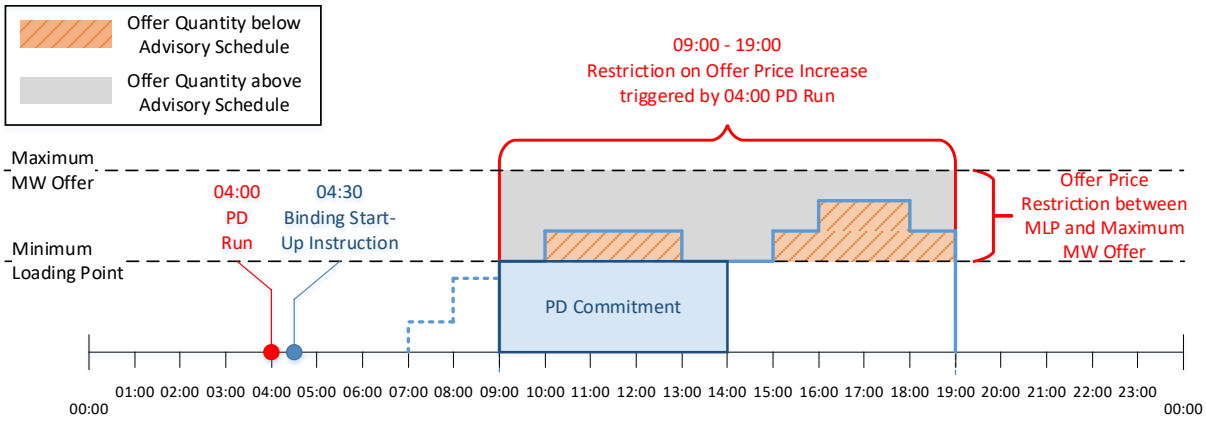
Restrictions on offer price increases for MWs above a resource's binding PD advisory schedule (e.g. the solid grey shaded area in **Figure 10**) are necessary because changes could inappropriately impact competition between resources. Once a NQS resource receives a commitment it holds a competitive advantage over other NQS resources that do not have a commitment. This is because subsequent runs of the PD scheduling process and the real-time market will consider the resource's start-up and speed-no-load offers sunk for committed units.

This advantage would allow a committed resource to increase its offer price for quantities up to the full capacity of the resource and continue to be dispatched ahead of NQS resources that do not have a commitment. This condition would give the resource the ability to increase their offer price and remain the marginal resource.

The resource also has a significant informational advantage over other market participants:

- It will know when it is the marginal resource; and
- It has knowledge that something significant changed following the day-ahead market and that the market required significant additional supply in the form of the operational commitment.

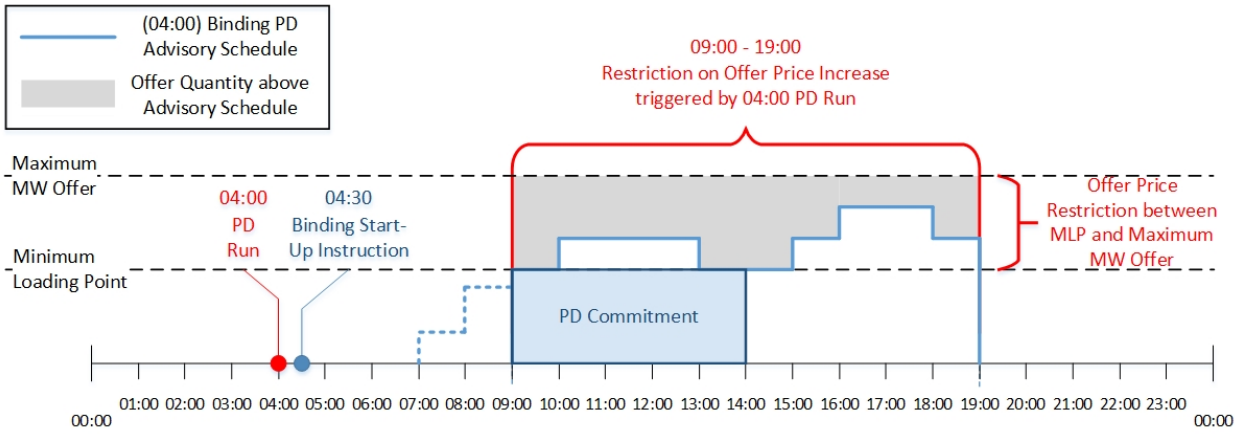
Figure 10 - Restrictions on MWs above and below Binding PD Advisory Schedule



7. Relaxation of Offer Price Increase Restrictions

In high-level design external stakeholders flagged that there may be exceptional circumstances under which the IESO may need to relax the restriction on offer price increases for MW quantities offered above the binding PD advisory schedule (shown in the grey-shaded area in **Figure 11**). The IESO acknowledged these concerns and agreed to explore the circumstances further in detailed design.

Figure 11 - Offer Quantity Above Binding PD Advisory Schedule



Further to the commitment made in high-level design, the IESO has drafted conditions for discussion with stakeholders. When the following conditions are met, the restriction on offer-price changes will be lifted for MW quantities above the binding PD advisory schedule:

1. Timing: An increase to fuel or opportunity cost must have occurred after the commitment was issued and prior to the mandatory window.
2. Reference level change: An increase to the energy reference level must have been approved after the commitment was issued, prior to the mandatory window.

These conditions are explained in further detail below.

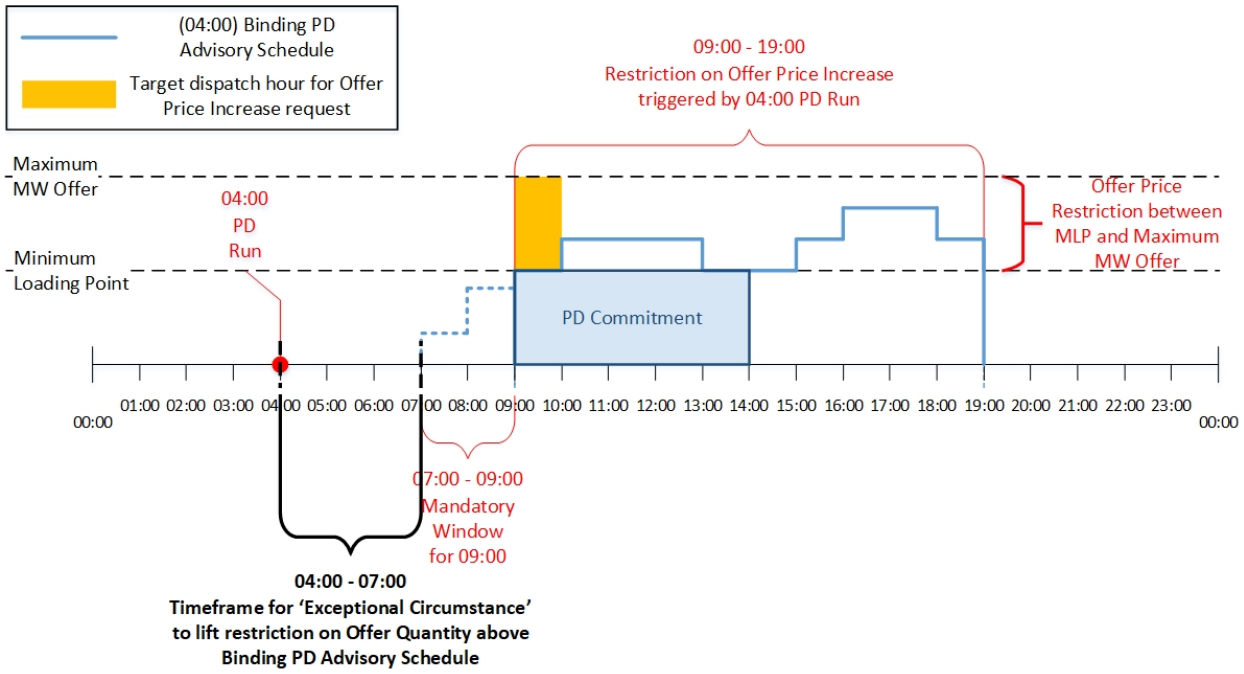
7.1. Condition 1: Timing

It is important to define the timeframe in which the circumstances necessitating an offer price increase would have to occur in order to warrant relaxing the restriction. Given that the restriction on offer price increases only goes into effect once the PD scheduling process has issued a binding PD advisory schedule, these circumstances would need to occur between when the binding schedule was issued and the start of the mandatory window for the dispatch hour for which offer prices are to be increased. Prior to the binding PD advisory schedule, market participants are able to revise offers without restriction to reflect their expected costs for the remainder of the day.

The following two examples illustrate how timing considerations will determine in which hour(s) the restriction can be relaxed to allow offer price increases above the binding PD advisory schedule.

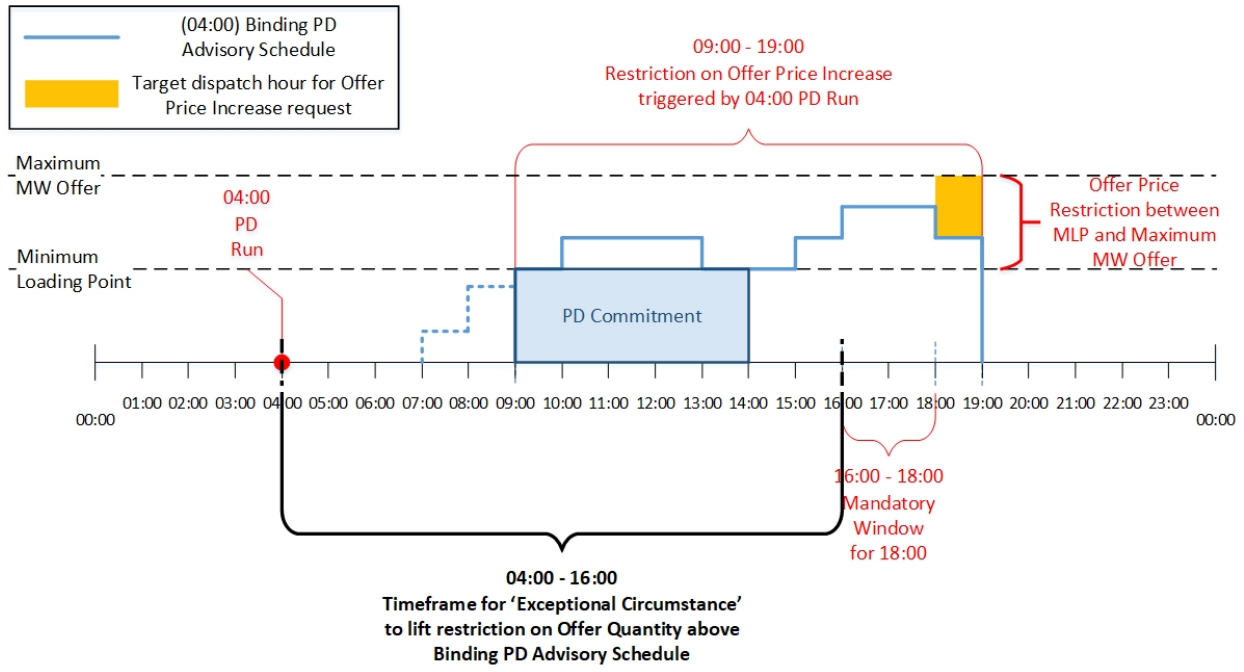
As illustrated by the example in **Figure 12**, in order for conditions to have occurred warranting relaxing the restriction on offer price increases for dispatch hour 09:00, an event would have to occur between the 04:00 issuance of the binding PD advisory schedule and the start of the mandatory window for hour 09:00, which begins at 07:00.

Figure 12 - Example 1: Timeframe for Exceptional Circumstance



Similarly, the example in **Figure 13** shows that, in order for conditions to have occurred warranting relaxing the offer price increase restriction for dispatch hour 18:00, an event would have had to occur between the 04:00 issuance of the binding PD advisory schedule and the start of the mandatory window for hour 18:00, which begins at 16:00.

Figure 13 - Example 2: Timeframe for Exceptional Circumstance



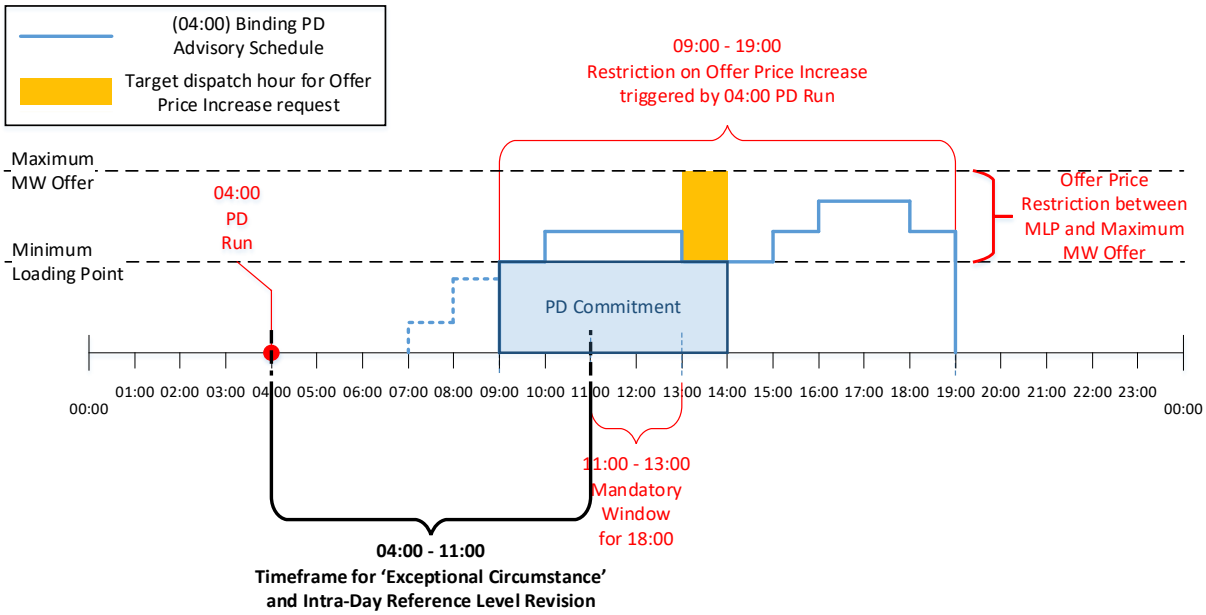
7.2. Condition 2: Reference Level Change

In order for NQS resources to qualify to increase their offer prices for the MW quantities offered above the binding PD advisory schedule, the market participant must first secure an increase to the resource's energy reference level through the intra-day reference level revision process.

As discussed in the Market Power Mitigation Stakeholder Engagement Pre-Reading, market participants may request a temporary revision to the fuel or opportunity cost components of a resource's reference levels if they believe that the existing reference levels will not reflect short-run marginal costs for one or more hours of a specific dispatch day.

As illustrated in **Figure 14**, submission of reference level change requests will need to be done in a timely fashion in order to allow sufficient time for the request to be assessed and approved. The IESO will have to complete its assessment prior to the start of the mandatory window in order to give the market participant time to increase their offer price.

Figure 14 - Timeframe for Intra-Day Reference Level Revision



All reference level revision requests must be accompanied by supporting documentation at the time of submission. If the IESO finds the request verifiable and substantiated, it will revise the applicable cost component for the relevant hours of that dispatch day. If the IESO is not able to verify and substantiate the change request in time, or does not approve the change request, it will use the original reference level and notify the market participant.

The requirement for the IESO to review and approve intra-day reference level revisions prior to enabling offer price increases highlights the importance of identifying the supporting documentation that will be required to submit a reference level revision request.

The IESO expects to start determining the specific costs that will go into reference levels and the supporting documentation that will be required to substantiate those costs in Q2 2020. This

consultation will also identify supporting documentation for reference level change requests. During this consultation, the IESO anticipates working closely with stakeholders to make these determinations.

Even though this consultation is not currently expected to begin until Q2 2020, the IESO welcomes stakeholder input on what types of documentation might be most efficient to use for intra-day reference level revision requests.

8. Conclusion

In preparation for the engagement session, stakeholders are encouraged to submit any questions or requests for clarification that they would like to discuss in the interactive session.

For questions or feedback, please email engagement@ieso.ca.