JULY 23, 2024

Market Renewal – Market Power Mitigation Education Session – 2 of 2

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Purpose of MPM Learning Sessions

- Working group sessions on market power mitigation (MPM) are being provided to the Technical Panel to support their review of the Final Alignment batch of MRP market rules
- These sessions are intended to:
    - Summarize information regarding the various mitigation processes found in the MRP batches
    - Clarify key areas in which the IESO has built out the MPM framework since the provisional approval of the MPM batch in response to feedback from external stakeholders

Agenda

1. Overview of Session Topics
2. Settlement Mitigation
    - Background, process, conditions, Technical Panel questions
3. After the Fact – Ex Post Mitigation for Physical Withholding
    - Background, process, conditions, scenarios
4. After the Fact – Ex Post Mitigation for Intertie Economic Withholding
    - Background, process, conditions

Overview of Session Topics

Market Power Mitigation Processes

- The renewed market will have several types of market power mitigation

Renewed Market MPM Processes	
Validation of dispatch data submissions	Discussed on July 16
Ex-ante (before-the-fact) mitigation of offer prices	
Mitigation of certain settlement payments	Discussed on July 23
Ex-post (after-the-fact) mitigation for physical withholding	
Ex-post (after-the-fact) mitigation for economic withholding at uncompetitive interties	

Settlement Mitigation

- Settlement mitigation is required to ensure that certain settlement payments (including make-whole payments) are not affected by the exercise of market power
- Calculation of these payments is in part based on a resource's dispatch data. As such, it is possible for the exercise of market power to increase these payments so they exceed the reimbursement of actual costs
- If the resource meets the criteria for assessment, a conduct test and impact test are carried out. If these are failed, the settlement payment that is paid is based on the reference level value(s)

Ex-Post Physical Withholding Assessments

- The IESO conducts ex-post assessment of physical withholding of energy or operating reserve in the day-ahead and real-time markets by dispatchable resources
- This is done by first determining if the criteria for testing were met and then, if so, by performing a conduct test and, if required, an impact test for each relevant dispatch hour
- If the conduct test and impact test are failed the IESO may apply a settlement charge

Ex-Post Mitigation for Intertie Economic Withholding

- The IESO conducts ex-post assessment of imports and exports on designated uncompetitive interties
- This is done by first determining if the criteria for testing were met and then, if so, by performing a conduct test and, if required, an impact test for each relevant dispatch hour
- If the conduct test and impact test are failed the IESO may apply a settlement charge

Settlement Mitigation

Background

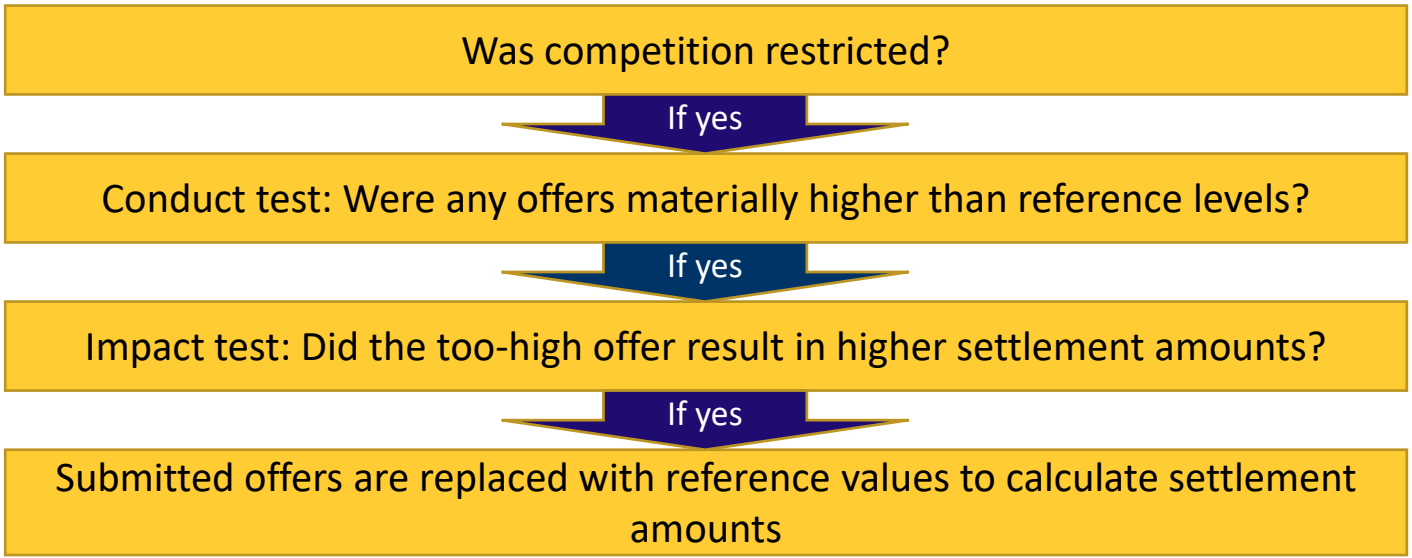
- The Settlement mitigation processes introduced by MRP:
  - are MPM assessments that are executed as part of determining the settlement amounts
  - are intended to prevent market participants from exercising market power via make-whole payments

Background

- The Settlement mitigation processes introduced by MRP:
  - replace certain existing processes and market rules such as the real-time generator cost guarantee pre-approved values and some congestion management settlement credit (CMSC) business rules
  - Are an administrative step in preparation of settlement amounts, they are not assessments of compliance

Background - Settlement Mitigation Process Overview

- Settlement mitigation process involves four steps. The criteria for each of the first three must be met in turn before mitigation is applied



Background – Assessing if Competition was Restricted via Conditions

- The first question from the process flow on the previous slide is the question of whether competition is restricted
- This question is answered by assessing constrained area conditions (narrow constrained area, energy global market power, etc)
- If a constrained area condition is met for a resource for a dispatch hour, then the resource is tested for that dispatch hour
- The particular constrained area condition that is met will influence the conduct thresholds and impact thresholds that are used

Background - Conduct Tests

- If a resource meets a constrained area condition, the IESO carries out the conduct test
- The conduct test involves comparing the submitted dispatch data to the relevant reference level value
- If the submitted value is too far above the reference level value, the conduct test is failed
- The conduct test threshold that is applied is based on the constrained area condition that is met

Background – Impact Tests

- The impact test for settlement mitigation involves comparing two settlement amounts
  - The as-offered settlement amount, based on submitted dispatch data
  - The alternate settlement amount, based on submitted dispatch data except where a resource failed a conduct test where the IESO uses the relevant reference level value

Background – Settlement Outcomes

- If the alternate settlement amount is significantly higher than the as-offered, the impact test is failed
- If the impact test is failed, the alternate settlement amount is the one paid to the market participant (the IESO includes relevant information as part of the settlement data)
- This assessment is done as part of determining settlement amounts for the settlement statement, the IESO does not pay out the as-offered settlement amount and subsequently claw back the difference, only the post-assessment amount is paid

Background – Rationale

- Settlement mitigation is required to address certain scenarios that ex-ante mitigation is not able to address:
    - Sometimes offers from resources are not eligible to set prices, but will instead drive settlement outcomes (such as energy offers up to a resource's the minimum loading point)
    - Start-up offers and speed-no load offers can have significant impacts on settlement outcomes even if they are not affecting LMPs (as explained on upcoming slides in example for "Gen A")

Settlement Mitigation: Example

- Suppose 'Gen A' is a non-quick start located close to a large load centre and there are import constraints preventing supply from other suppliers from serving load for this load centre
- Gen A is the only source of supply that can meet this local load. In this case, for ex-ante mitigation the price impact test may not fail – the LMPs at Gen A may be the same regardless of whether the relevant calculation engine uses the reference level or the submitted offer for Gen A

Settlement Mitigation: Example

- If the ex-ante mitigation impact test is not failed for Gen A, the DSO uses the submitted dispatch data for this resource
- Settlement mitigation will then assess whether Gen A has market power and if it is exercising market power via its make-whole payment

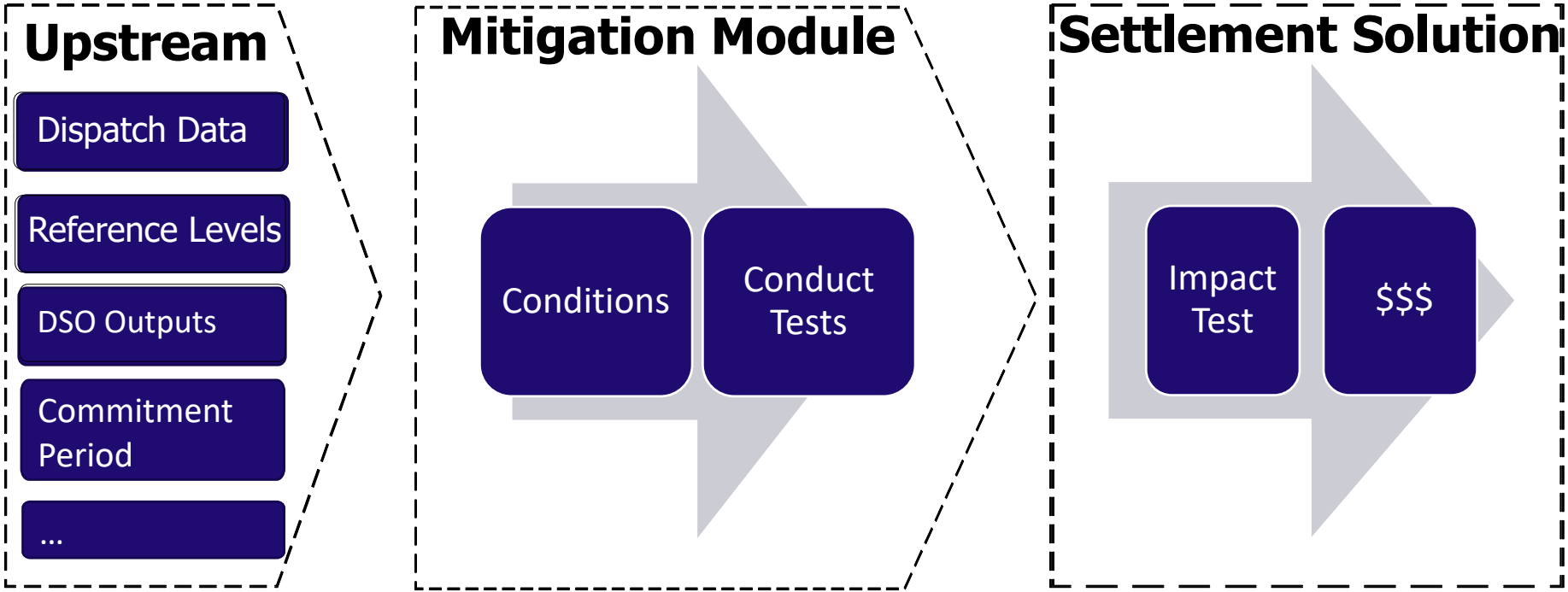
Settlement Mitigation: Example

- Suppose that Gen A submitted a start-up offer of $1M, and its start-up offer reference level value is only $100k
- Settlement mitigation will see Gen A has market power, is submitting dispatch data far more expensive than actual costs and that this dispatch data would drive a make-whole payment or generator offer guarantee that more than covers Gen A's costs
- In this case, the IESO would pay the make-whole payment or generator offer guarantee based on the start-up offer reference level value of $100k

Settlement Mitigation: Scope of Settlement Amounts

- Settlement mitigation is included in the calculation of several settlement amounts for dispatchable resources:
  - Day-ahead make-whole payment (DAMWP)
  - Real-time make-whole payment (RTMWP)
  - Ramp down settlement amount (RDSA)
  - Day-ahead generator offer guarantee (DAGOG)
  - Real-time generator offer guarantee (RTGOG)

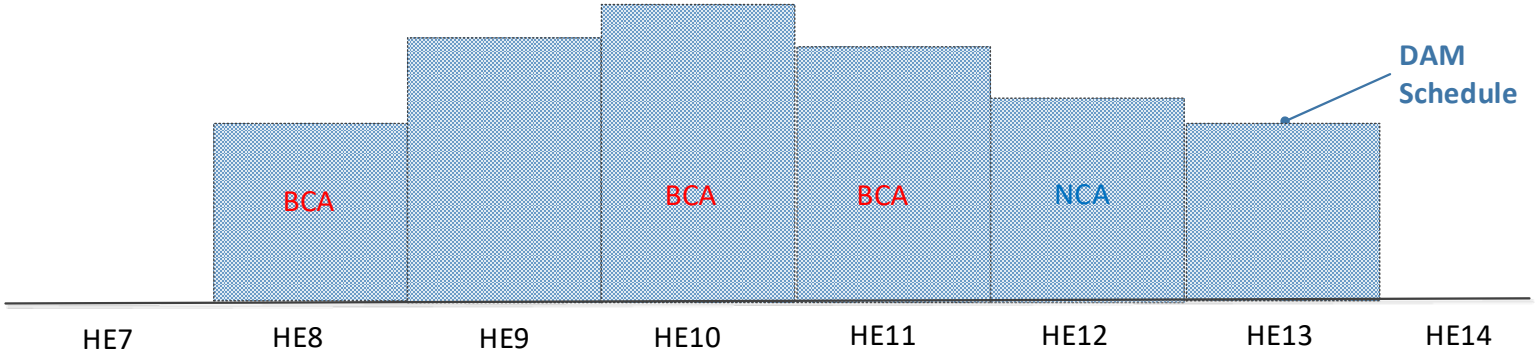
Settlement Mitigation: Process



Settlement Mitigation: Conditions – Non-GOG-Eligible

- The conditions for settlement mitigation are met for a resource for a dispatch hour if that resource:
  - was tested for ex-ante mitigation for that dispatch hour. In this case, the resource meets the same condition(s) for that dispatch hour for settlement mitigation that it met for ex-ante mitigation
  - was manually constrained up for that dispatch hour, the resource meets the reliability condition for settlement mitigation

Settlement Mitigation: Conditions – Non-GOG-Eligible cont'd



In this example, the DA-MWP for the non-GOG-eligible resource is tested for settlement mitigation using the Broad Constrained Area (BCA) thresholds for Hour Ending (HE) 8, HE 10 and HE 11 as the resource met the BCA condition for those dispatch hours. The DA-MWP for the resource for HE 12 is tested for settlement mitigation using the Narrow Constrained Area (NCA) thresholds as the non-GOG-eligible resource met the NCA condition for that dispatch hour.

Settlement Mitigation: Conditions – GOG-Eligible

- If a GOG-eligible resource meets a condition for a dispatch hour in a commitment period, it meets the condition for all dispatch hours in the commitment period
- If a GOG-eligible resource meets more than one condition for a single dispatch hour, the resource is tested for settlement mitigation based on the most restrictive condition that it meets for that dispatch hour
- Recall – A commitment period is a contiguous set of dispatch hours where a resource has a schedule and those hours are included in a single GOG calculation

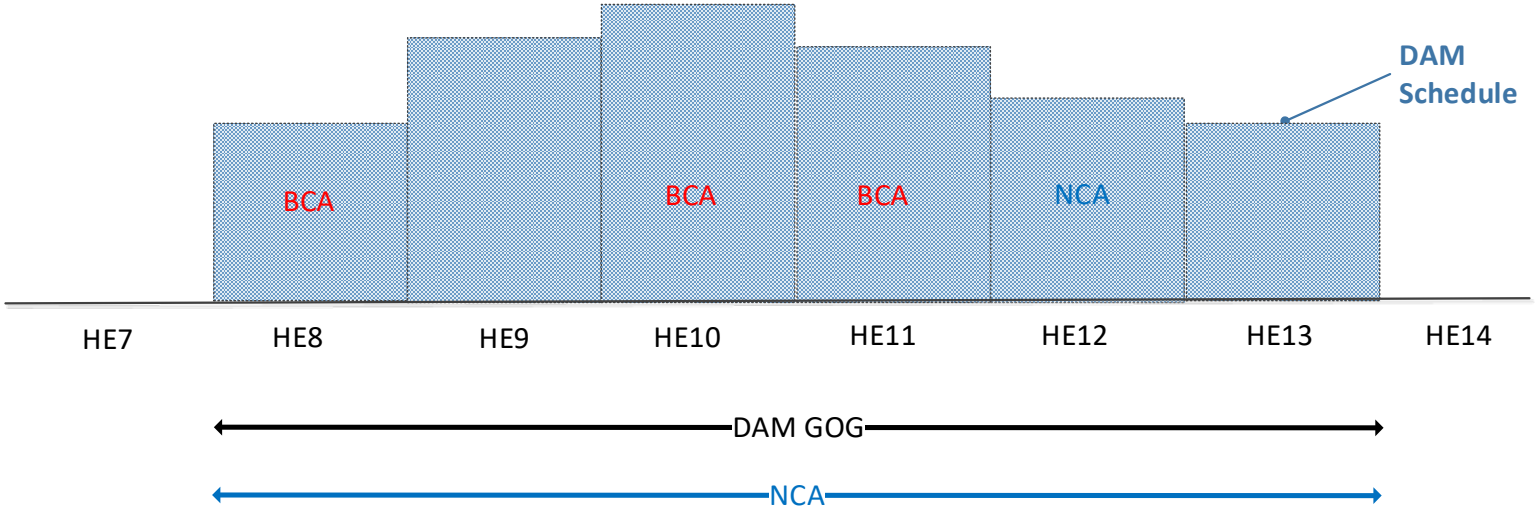
Settlement Mitigation: Conditions – GOG-Eligible cont'd

- The conditions for settlement mitigation are met for a GOG-eligible resource if the resource meets any of the following conditions:
  - tested for that dispatch hour for ex-ante mitigation, the resource meets the same condition for that dispatch hour for settlement mitigation;
  - manually committed or manually constrained up, the resource meets the reliability condition for settlement mitigation;
  - committed by the reliability pass of the DAM, the resource meets the Energy Global Market Power (EGMP) condition for settlement mitigation

Settlement Mitigation: Conditions – GOG-Eligible cont'd

- committed by the PD calculation engine, the resource meets the EGMP condition for settlement mitigation;
- in an NCA or a dynamic constrained area (DCA) and one of the NCA or DCA constraints would have been binding absent the commitment of the GOG-eligible resource; or
- committed and absent that commitment a constraint that was not an NCA or DCA constraint would have been binding

Settlement Mitigation: Conditions – GOG-Eligible cont'd



Assume that in this example the NCA condition that was met in HE12 was the most restrictive met at the resource during any hour of the commitment period. As a result, the DA-GOG is tested for settlement mitigation using the NCA condition for each dispatch hour in the commitment period.

Technical Panel Questions - SEAL

- Members of the technical panel asked for clarity regarding if certain legacy clawback mechanisms persist post-MRP
- In the legacy market, when a resource is dispatched in response to a market participant request to support the safety of equipment or personnel, applicable regulation or law (referred to as "SEAL", Chapter 9, S 3.5.6C), CMSC is paid out normally and then clawed back
- The settlement treatment when SEAL conditions occur will not be addressed via settlement mitigation; there is no direct linkage between SEAL settlement and MPM in the renewed market

Technical Panel Questions – SEAL (cont'd)

- Under MRP, CMSC will not exist and when SEAL conditions occur, the resource will be ineligible for a RTMWP, RTGOG or RDSA.
- This means that under MRP the payment for these settlement amounts will not be paid out under the SEAL condition.
- Chapter 9 (S 3.5.2c, 4.5.2b, 4.6.8) communicates the market rules for how each applicable settlement amount is dealt with under SEAL conditions under MRP

Technical Panel Questions: Interactions – Ex-Ante

- Ex-ante mitigation can affect the LMPs that are used to settle market participants
- These LMPs are an input into the settlement process, including the assessment of settlement mitigation
- Ex-ante mitigation does not directly impact settlement mitigation, though conditions to test for ex-ante mitigation will result in testing resources for settlement mitigation
- Settlement mitigation does not impact ex-ante mitigation

Technical Panel Questions: Interactions – Ex-Post

- Settlement mitigation can affect the settlement amounts that are paid to market participants
- Ex-post mitigation involves additional settlement charges that are issued after the fact (potentially months after a trade date)
- Settlement mitigation does not impact ex-post mitigation
- Ex-post mitigation does not impact settlement mitigation

After the Fact – Ex Post Mitigation for Physical Withholding

Physical Withholding: Background

- The IESO's assessment of mitigation for physical withholding (PW), including testing and any related step by the IESO, does not constitute a review for compliance with any market rule
- Assessment of PW is an administrative action, not a compliance action
- Findings of PW are not published publicly (though the IESO will publish anonymized summary data regarding physical withholding settlement amounts per month)

Physical Withholding: Background

- PW involves a market participant not submitting offers for supply that was available
- Assessment of PW involves:
    - Identifying whether a resource met a condition to test for physical withholding
    - A conduct test
    - An impact test

Physical Withholding: Background

- The IESO's view of the available supply for a resource for a dispatch day is determined based on the reference quantity value for the relevant product, resource and dispatch day
- Reference quantities and reference quantity modifiers are registered by the IESO for a dispatchable resource as was discussed in the previous learning session
- Reference quantities account for outages and de-rates for a resource on a dispatch day

Physical Withholding: Background

- Electricity storage resources (ESRs) have a methodology for determining their reference quantity values that reflects the current participation model
- If an ESR submits an energy offer for their entire capacity for at least one hour in a given dispatch day, the conduct test is passed
- This assessment approach is based on the current participation model and will be reviewed by the IESO in the event that the participation model for ESRs undergoes a significant update (e.g. via the Enabling Resources Program)

Physical Withholding: Process

The IESO carries out the following steps when assessing PW:

1. Assess conditions
2. Conduct Test
3. Impact Test
4. Issue 1st Notice of PW
5. Repeat Conduct Test & Impact Test (if required)
6. Issue 2nd Notice of PW
7. Issue Settlement Charge

Physical Withholding: Process

- Before the IESO issues a settlement charge for PW, the market participant will receive a 1st notice of PW and have the opportunity to request an alternate reference quantity value
- This provides market participants the chance to provide information that is relevant to the quantity of available supply for a resource for a dispatch day that was not available to the IESO when the reference quantity value was calculated
- For example, there may be regulatory restrictions that limit production for a particular dispatch day to a degree that cannot be forecasted when registering reference quantities

Physical Withholding: Conditions – NCA/DCA

- The NCA or DCA conditions are met for a resource if:
  - at least one transmission constraint for an NCA or a DCA is binding and the resource is in the NCA or DCA
  - The energy LMP at the resource was > $25/MWh
  - The resource can supply at least 10 MWs of energy or the market control entity for physical withholding for that resource was designated as such for resources that can supply at least 10 MW of energy; and
  - The resource offered less than the reference quantity value

Physical Withholding: Conditions – BCA

- The BCA condition is met for a resource if:
  - The resource had a positive energy congestion component of their energy LMP > $25/MWh
  - The energy LMP at the resource was > $25/MWh
  - The resource can supply at least 10 MWs of energy or the market control entity for physical withholding for that resource was designated as such for resources that can supply at least 10 MW of energy; and
  - The resource offered less than the reference quantity value

Physical Withholding: Conditions – EGMP

- The BCA condition is met for a resource if:
  - The resource had a positive energy congestion component of their energy LMP > $25/MWh
  - The resource met the EGMP condition for ex-ante mitigation
  - The resource can supply at least 10 MWs of energy or the market control entity for physical withholding for that resource was designated as such for resources that can supply at least 10 MW of energy; and
  - The resource offered less than the reference quantity value

Physical Withholding: Conditions – ORGMP

- The operating reserve global market power (ORGMP) condition is met for a resource if:
  - The OR LMP at the resource was > $15/MWh
  - The resource can supply at least 10 MWs of OR or the market control entity for physical withholding for that resource was designated as such for resources that can supply at least 10 MW of OR; and
  - The resource offered less than the reference quantity value

Physical Withholding: Conditions – ORLOC

- The operating reserve local market power (ORLOC) condition is met for a resource if the resource:
  - Was located in an OR area with a minimum constraint > 0 MW and the OR LMP at the resource was > $5/MWh
  - Can supply at least 10 MWs of OR or the market control entity for physical withholding for that resource was designated as such for resources that can supply at least 10 MW of OR; and
  - Offered less than the reference quantity value

Physical Withholding: Scenarios – Variable Generator

- Suppose a 100 MW wind resource receives a day-ahead (DA) centrally determined forecast of 13 MW and meets the BCA condition
- If the market participant does not submit their own forecast, the DA energy reference quantity value for that resource is 13 MW
- If the market participant submits their own DA forecast, the DA energy reference quantity value for that resource is equal to the submitted forecast value
- In either case, if the resource submits an energy offer >= the DA energy reference quantity value, it passes the conduct test

Physical Withholding: Scenarios

- Suppose a 10 MW ESR resource submits a DA energy offer for 10 MWs for a single dispatch hour in the DAM and meets the BCA condition
- The resource passes the conduct test

Physical Withholding: Scenarios

- Suppose that for a 50 MW dispatchable load resource participating in the DAM, the only energy bids that are submitted by the resource are submitted as non-dispatchable (i.e. with bid price equal to $2000/MWh)
- The IESO will not assess physical withholding for operating reserve for this dispatchable load in the DAM as the resource could not have provided any operating reserve given its bids were non-dispatchable
- When assessing physical withholding of operating reserve for dispatchable loads, the IESO leaves the energy bids unchanged

After the Fact – Ex Post Mitigation for Intertie Economic Withholding

Intertie Economic Withholding: Background

- The IESO's assessment of mitigation for Intertie Economic Withholding (IEW), including testing and any related step by the IESO, does not constitute a review for compliance with any market rule
- Assessment of IEW is an administrative action, not a compliance action
- Findings of IEW are not published publicly (though the IESO will publish anonymized summary data regarding intertie economic withholding settlement amounts per month)

Intertie Economic Withholding: Process

- IEW involves a market participant submitting import offers or export bids at the intertie at prices that are not consistent with the short-run marginal cost or short-run marginal benefit, resulting in either higher prices or make-whole payments
- Assessment of IEW involves:
    - Identifying whether a resource met a condition to test for physical withholding
    - A conduct test
    - An impact test

Intertie Economic Withholding: Background

- Assessment of IEW essentially replaces legacy market processes that can result in clawbacks of congestion management settlement credits (CMSC)
- These legacy market processes are the current Local Market Power and Constrained Off Watch Zone processes
- The design of the new MRP process to assess IEW drew where possible from the legacy processes and made adaptations where necessary to ensure the IEW process was effective in the post-MRP market

Intertie Economic Withholding: Background

- IEW is only assessed for transactions scheduled on intertie zones that are designated as Uncompetitive Intertie Zones
- The IESO designates an intertie zone as an Uncompetitive Intertie Zone where the following criteria (found in Chapter 7, S 22.12.1) are met:
  - A single market participant made up at least 90% of imports or exports in the previous calendar quarter; or
  - The IESO determines that effective competition in that intertie zone is or is expected to be restricted (Market Manual 14.1, S 3.1)

Intertie Economic Withholding: Background

- IEW is the *only* case where the IESO tests dispatch data that is an energy bid for mitigation
- Testing of export energy bids for IEW is limited to only be applied to market participants that benefit from increased Ontario prices (determined via the registered market control entity for the energy trader, per Chapter 7, S 22.17.1.1)
- Testing of import energy or OR offers for IEW is *not* limited in this fashion as importers benefit from increased prices for their energy imports, so this additional exclusion assessment is not warranted

Intertie Economic Withholding: Background

- The IESO uses Intertie Reference Levels (IRLs) to assess IEW
- IRLs are based on either:
    - Historic offer or bid data (where sufficient data exists); or
    - The intertie border price at the intertie (where sufficient historic offer or bid data does not exist)
- In either case, as discussed later, the IESO-calculated IRLs are only initial data used by the IESO to assess IEW. Market participants always have the chance to provide data to update the IRL where appropriate

Intertie Economic Withholding: Process

- The impact test that is carried out for IEW can either be a price impact test or a make-whole payment impact test:
  - A price impact test compares LMPs determined using the submitted dispatch data to LMPs determined using IRLs and is failed if the former are significantly higher than the latter
  - A make-whole payment impact test compares make-whole payments determined using the submitted dispatch data to make-whole payments determined using IRLs and is failed if the former are significantly higher than the latter

Intertie Economic Withholding: Process

The IESO carries out the following steps when assessing PW:

1. Assess conditions
2. Conduct Test
3. Impact Test
4. Issue 1st Notice of PW
5. Repeat Conduct Test & Impact Test (if required)
6. Issue 2nd Notice of PW
7. Issue Settlement Charge

Intertie Economic Withholding: Process

- Before the IESO issues a settlement charge for IEW, the market participant will receive a 1st notice of IEW and have the opportunity to request an alternate IRL value
- This provides market participants the chance to provide information that is relevant to the short-run marginal cost or short-run marginal benefit for a dispatch day that was not available to the IESO when the IRL was calculated
- For example, prices in other markets can sometimes inform the short-run marginal costs of imports into Ontario

Intertie Economic Withholding: Conditions – Energy

- The condition for testing for energy offers or bids are met for a boundary entity resource on an Uncompetitive Intertie Zone if:
  - A particular energy offer or bid was scheduled in the DAM and there is a positive energy congestion component in the intertie border price at the intertie zone > $25/MWh in the DAM; or
  - A particular energy offer or bid was scheduled in the RTM and there is a positive energy congestion component in the intertie border price at the intertie zone > $25/MWh in the hour-ahead run of the PD calculation engine

Intertie Economic Withholding: Conditions – OR

- The condition for testing for operating reserve offers are met for a boundary entity resource on an Uncompetitive Intertie Zone if:
  - A particular operating reserve offer was scheduled in the DAM and the day-ahead OR LMP at that intertie zone is > $15/MW; or
  - A particular operating reserve offer was scheduled in the hour-ahead run of the PD calculation engine and the real-time OR LMP at that intertie zone is > $15/MW

Next Steps

August 6: Deadline for submitting written feedback on the Final Alignment batch

Thank You

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