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Market Renewal Program: Market Settlements

Market Power Mitigation (Part 2 of 3)

Jessica Tang: Senior Manager, Energy Implementation
Patricia Murray, Tim Cary, Denise Myers: Supervisors, Energy Implementation

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Meeting Purpose and Agenda

Purpose: Prepare stakeholders for their review of the proposed market rules and market manuals that codify the Market Settlements detailed designs

Agenda:

- Brief overview of conforming changes to Market Entry obligations and procedures
- Overview of structure and content of the proposed market rules and market manuals for Settlements and Billing
- Review basic examples of settlement amounts

Approach

- Market settlements is by nature very calculations-heavy
- To assist in understanding, the IESO has prepared a number of examples for stakeholder review
- To further aid synthesis of the rules, or to aid broader understanding of Market Renewal, stakeholders are encouraged to ask for additional scenarios and examples

Engagement Timeline

December 1: Materials posted for stakeholder review

December 14: Introduction and discussion with participants

Throughout December and January: Stakeholders can request additional examples or scenarios through engagement@ieso.ca

Mid-January: Segmented discussions with stakeholders to review examples/scenarios

February 21: Comments/feedback on market rules and market manuals due to IESO

Segmented Stakeholder Discussions

The IESO will host stakeholder meetings in mid-January for market participants to review the base-case(s) and answer any additional participant questions relating to settlement

Meetings dates/times are posted on the Market Renewal Implementation webpage for stakeholder sign-up: https://www.ieso.ca/en/Market-Renewal/Stakeholder-Engagements/Implementation-Engagement-Market-Rules-and-Market-Manuals

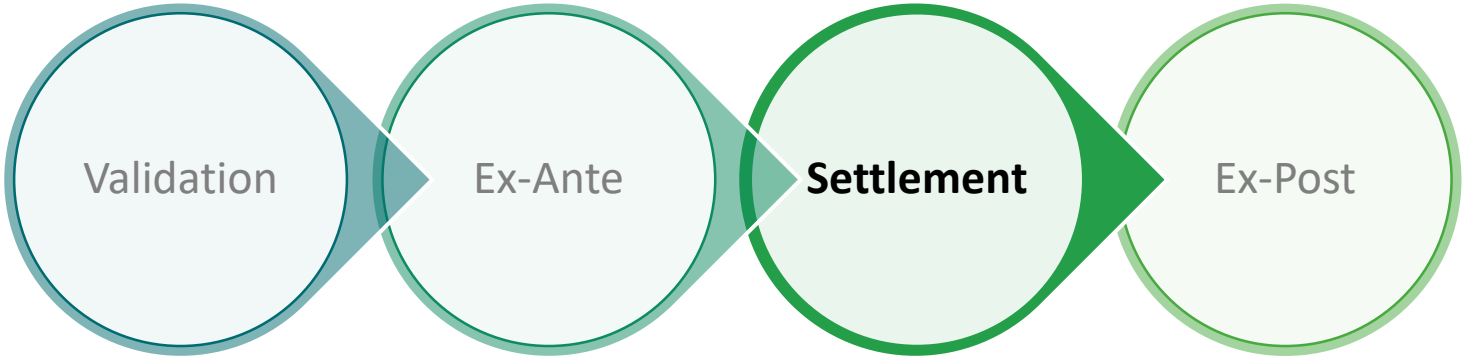
Market Rule Chapter 9 Section Summary:
Market Power Mitigation

Settlement Mitigation: Background

Background: Market Power Mitigation

- Market power mitigation describes the ways that the IESO assesses and responds to attempts to exercise market power
- The IESO will generally use conduct tests and impact tests to do this assessment:
  - Conduct test: Did a market participant submit dispatch data that was significantly different than they would have under competitive conditions?
  - Impact test: Were prices or make-whole payments determined using the submitted dispatch data significantly higher than what they would have been under competitive conditions?

Market Power Mitigation Processes



Settlement Mitigation: Rationale

Settlement mitigation is required to:

- replace existing processes that stop functioning due to locational prices (e.g. local market power process, constrained off watch zone process, etc.)
- ensure resources do not exercise market power via settlement outcomes

Reference Levels: Reminder

- The IESO will use reference levels and reference quantities in the conduct test and impact test:
  - Reference levels and reference quantities are compared to submitted dispatch data to assess if a resource fails the conduct test
  - If a resource fails the impact test, reference levels are used to replace the submitted dispatch data when the IESO determines settlement
  - Market Manual 14.2 covers the topic of reference levels

Settlement Mitigation

Assessment of mitigation carried out as part of settlement process:

- Was a condition met that resulted in restricted competition at the resource?
- Did the resource fail the conduct test?
- Did the resource fail the impact test?

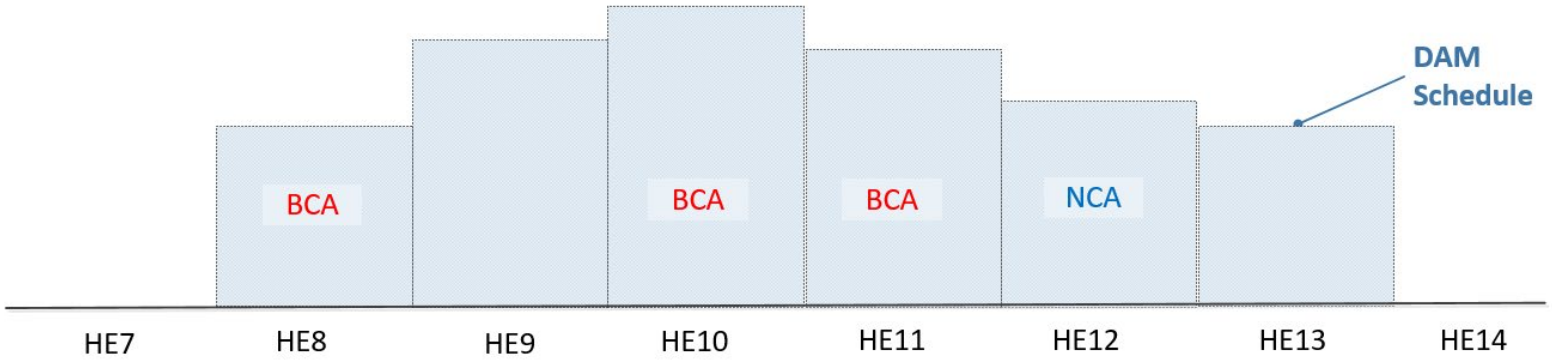
If the answer to all three is ‘yes’, the IESO replaces dispatch data with reference levels in order to determine make-whole payments

Conditions for Testing Settlement Mitigation

Settlement Interval: Dispatch Hour or Dispatch Interval

- Calculation of DAM_MWP, RT_MWP and RDSA are carried out on the basis of inputs per dispatch hour or dispatch interval
- For these make-whole payments, the conditions that a resource meets per dispatch hour determine:
  - When to carry out settlement mitigation; and
  - Which conduct and impact thresholds should be used

Settlement Interval: Dispatch Hour or Dispatch Interval

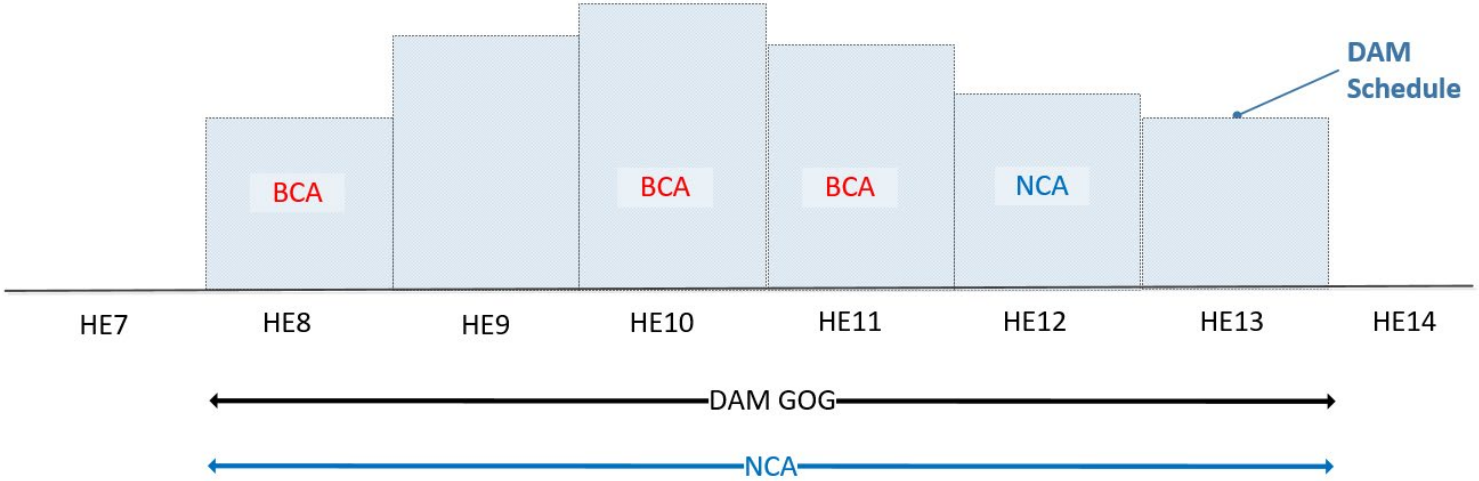


In this example, the DAM_MWP is tested for settlement mitigation using the BCA thresholds for HE 8, HE 10 and HE 11 as the resource met the BCA condition for those dispatch hours. The DAM_MWP for the resource for HE 12 is tested for settlement mitigation using the NCE thresholds for HE 12 as the resource met the NCA conditions for that dispatch hour.

Settlement Interval: Commitment Period

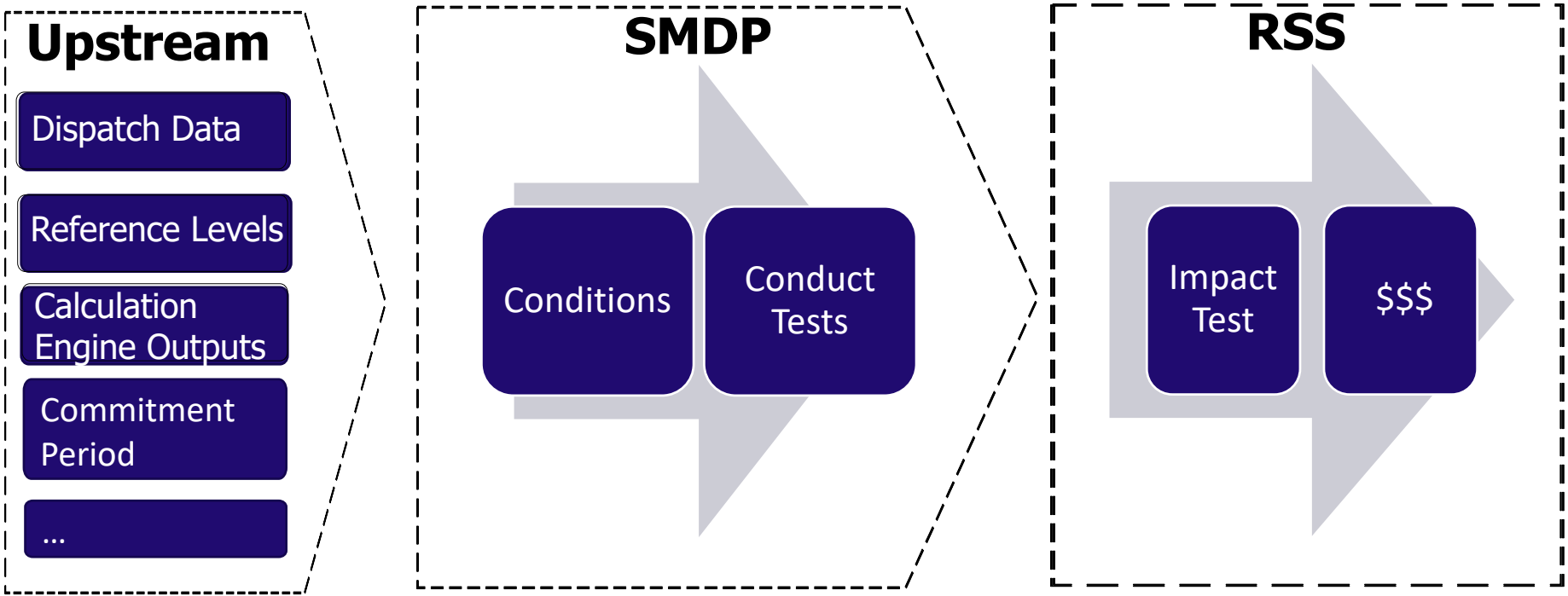
- Calculation of DAM_GOG and RT_GOG are carried out on the basis of inputs per commitment period
- For these make-whole payments, the conditions that a resource meets for any hour per commitment period determine:
  - When to carry out settlement mitigation; and
  - Which conduct and impact thresholds should be used

Settlement Interval: Commitment Period



In this example, the DAM_GOG is tested for settlement mitigation using the NCA condition for each dispatch hour in the relevant commitment period. The reason is that the NCA condition was the most restrictive condition met for the resource for the relevant commitment period.

Settlement Mitigation: Related Solutions



Settlement Charges Related to Mitigation

Settlement Charges Related to Mitigation

Charge Name
Reference Level Settlement Charges
Ex-Post Mitigation for Physical Withholding Settlement Amount*
Ex-Post Mitigation for Economic Withholding on Uncompetitive Interties Settlement Amount*

*Previously discussed as part of the Market Power Mitigation Batch

Reference Level Settlement Charges

- Market participants may request a higher fuel cost component or use of an alternate fuel cost profile for a resource
- If requested, participants are required to provide relevant supporting documents
- If these documents are not provided, the IESO will issue a reference level settlement charge where appropriate and will determine the relevant make-whole payments using the reference level that excludes the requested update

Reference Level Settlement Charges

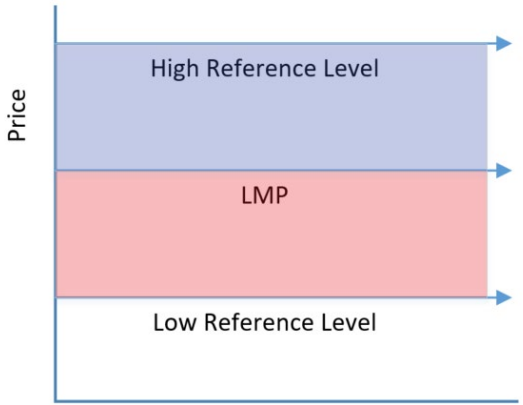
In general, the calculation of the reference level settlement charge is as follows:

$$Charge = Schedule \times (LMP - Low\ RL\ Value) \times Persistence\ Multiplier$$

The purpose of the reference level settlement charge is to increase the incentive for market participants to provide supporting documents for fuel cost change requests or requests to use alternate cost profiles

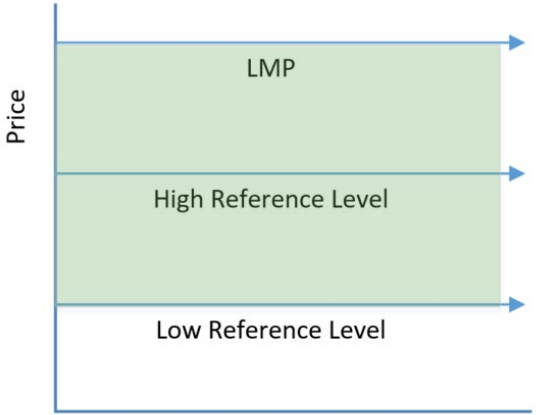
Reference Level Settlement Charges

Figure A



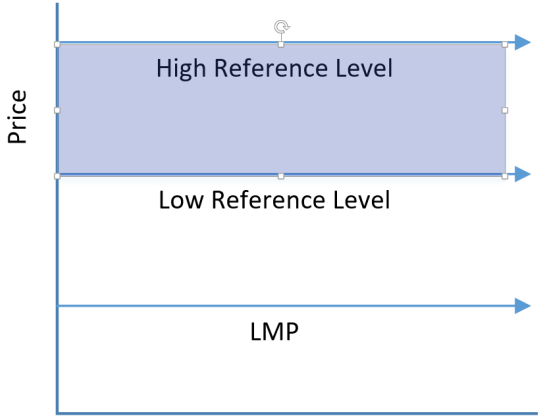
Settlement Charge Applied

Figure B



No Settlement Charge Applied: High LMP

Figure C



No Settlement Charge Applied: Low LMP

Settlement Mitigation Scenarios

Settlement Mitigation Scenario: DAM_MWP, Hydro, BCA

Resource Information	
Technology type of resource	Hydroelectric
Capacity	150 MW

Dispatch Hour
HE 9

DA OR Schedule
0

DA Energy Schedule
100

DA Energy LMP
$100

Constrained Area Type and Applicable Test Threshold	
Constrained area	BCA
Conduct test threshold	Energy RL + MIN(300% of Energy RL, $100/MWh)
Impact test threshold	As-offered MWP > Mitigated MWP * 1.2

Energy Offers – Dispatch Data		
PQ #	**Price ($/MWh)**	**Quantity (MW)**
1	5	0
2	5	50
3	800	150

Energy Offer Reference Level		
PQ #	**Price ($/MWh)**	**Quantity (MW)**
1	5	0
2	5	50
3	250	150

Settlement Mitigation Scenario (cont'd)

Conduct Test		
Lamination	0-50 MWh	50.1-150 MWh
Offer price	$5/MWh	$800/MWh
Is the conduct test carried out?	Yes	Yes
Conduct test threshold	$250 + $100= $350/MWh	$250 + $100= $350/MWh
Conduct test outcome	Pass	Fail

Data used to calculate as-offered MWP

As Offered MWP: Energy Offers		
PQ #	**Price ($/MWh)**	**Quantity (MW)**
1	5	0
2	5	50
3	800	150

Data used to calculate mitigated MWP

Mitigated MWP: Energy Offers		
PQ #	**Price ($/MWh)**	**Quantity (MW)**
1	5	0
2	5	50
3	250	150

As at least one PQ pair of the submitted offer fails the conduct test, the entire energy offer is replaced with the reference level values

Settlement Mitigation Scenario (cont'd)

Impact Test	
Impact test needed?	Yes
As-offered MWP	$30,250
Mitigated MWP	$2,750
Impact test threshold	20%
Impact test	$30,250 > ($2,750 * 1.2) → **True**
Impact test outcome	**Fail**

Settlement Mitigation Scenario (cont'd)

Outcome	Mitigation applied: Mitigated Settlement Amount Selected

Settlement Amount Appearing on Settlement Statement	
Mitigated MWP	$2,750

The high energy offer drives the impact test failure. When the energy offer reference level values are used in place of the submitted values, the operating profits derived from the energy revenues are sufficient to cover most of the short-run marginal costs (SRMC) of the resource. The portion of the SRMC not covered by the energy revenues constitute the $2,750 DA MWP that is paid.

Settlement Mitigation Scenario: DAM GOG, Thermal, NCA

Resource Information	
Technology type of resource	Thermal
MLP	50
Capacity	150 MW

DA OR Schedule
0

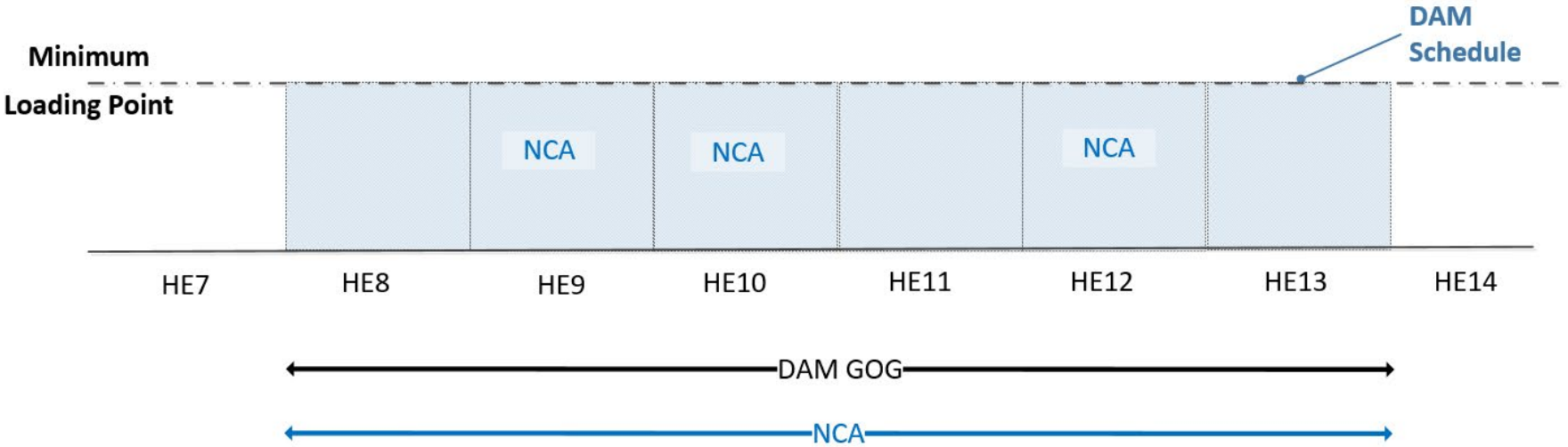
Thermal State
Cold

DAM_GOG Commitment Period
HE 8 - 13

Dispatch Hour	DA Energy Schedule	DA Energy LMP
8	50	$100
9	50	$100
10	50	$100
11	50	$100
12	50	$100
13	50	$100

Constrained Area Type and Applicable Test Threshold	
Constrained area	NCA
Conduct test threshold	Energy RL + MIN(50% of Energy RL, $25/MWh)
Impact test threshold	As-offered MWP > Mitigated MWP * 1.1

Settlement Mitigation Scenario (cont'd)



The DAM_GOG is tested for settlement mitigation using the NCA condition for each dispatch hour in the commitment period from HE 8 to HE 13.

Settlement Mitigation Scenario (cont'd)

Energy Offers – Dispatch Data		
PQ #	**Price ($/MWh)**	**Quantity (MW)**
1	200	0
2	200	50
3	210	150

Energy Offer Reference Level		
PQ #	**Price ($/MWh)**	**Quantity (MW)**
1	50	0
2	50	50
3	200	150

Start-Up Offer (Cold)
$90,000/start

Start-Up Offer Reference Level (Cold)
$8,000/start

Speed No-Load Offer
$500/hour

Speed No-Load Offer Reference Level (Cold)
$450/hour

Note: This resource was committed and its offers were not mitigated via ex-ante mitigation. This could occur if the price impact test in ex-ante mitigation was passed. Given that energy offers up to MLP cannot set LMPs, passing the impact test in this case is not surprising, as long as the high submitted commitment costs did not impact the dispatch instruction or the decision to commit this resource.

Settlement Mitigation Scenario (cont'd)

Energy Offer Conduct Test		
Lamination	0-50 MWh	50.1-150 MWh
Offer price	$200/MWh	$210/MWh
Dispatch hours tested for conduct	HE 8 - 13	HE 9, 10, 12
Conduct test threshold	$50 + $25= $75/MWh	$50 + $25= $75/MWh
Conduct test outcome	Fail	Pass

For the portion of the energy offer > MLP, only those hours where the NCA condition was met are tested.

Start-Up Offer Conduct Test	
Start-up offer (cold)	$90,000/start
Start-up offer (cold) reference level	$8,000/start
Conduct test threshold	$8,000 * 1.25 = $10,000
Conduct test outcome	Fail

Speed No-Load Offer Conduct Test	
Speed no-load offer	$500/hour
Speed no-load offer reference level	$450/hour
Conduct test threshold	$450 * 1.25= $562.50
Conduct test outcome	Pass

Offers <= MLP are a commitment cost and are tested if the resource meets a condition in at least 1 hour in the commitment period.

Settlement Mitigation Scenario (cont'd)

Dispatch Data Parameter	Conduct Test Result	Parameter to Determine Mitigated MWP
Energy Offer Up to MLP	Fail	Reference Level
Energy Offer Over MLP	Pass	Submitted Dispatch Data
Start-Up Offer	Fail	Reference Level
Speed No-Load Offer	Pass	Submitted Dispatch Data

Settlement Mitigation Scenario (cont'd)

Data used to calculate as-offered MWP

As-Offered MWP: Energy Offers		
PQ #	**Price ($/MWh)**	**Quantity (MW)**
1	200	0
2	200	50
3	210	150

As-Offered MWP: Start-Up Offer (Cold)
$90,000/start

As-Offered MWP: Speed No-Load Offer
$500/hour

Data used to calculate mitigated MWP

Mitigated MWP: Energy Offers		
PQ #	**Price ($/MWh)**	**Quantity (MW)**
1	50	0
2	50	50
3	210	150

Mitigated MWP: Start-Up Offer Reference Level (Cold)
$8,000/start

Mitigated MWP: Speed No-Load Offer Reference Level (Cold)
$500/hour

Red font indicates a reference level value replaces submitted dispatch data for the calculation of the mitigated MWP

Settlement Mitigation Scenario (cont'd)

Impact Test	
Impact test needed?	Yes
As-offered MWP	$123,000
Mitigated MWP	$0
Impact test threshold	10%
Impact test	$123,000 > ($0 * 1.1) → **True**
Impact test outcome	**Fail**

Settlement Mitigation Scenario (cont'd)

Outcome	Mitigation applied: Mitigated Settlement Amount Selected

Settlement Amount Appearing on Settlement Statement	
Mitigated MWP	$0

The high commitment costs drive the impact test failure. When the start-up offer reference level value and the energy offer reference level values for the energy offer up to MLP are used in place of the high submitted values, the operating profits derived from the energy revenues are sufficient to cover the commitment costs of the resource.

Settlement Charges Related to Mitigation Scenarios

Reference Level Settlement Charge Scenario

Resource Information	
Resource Name	GS
Capacity	100 MW

DA Schedule	DA LMP
100	$250

Energy Reference Level Values (Low)		
PQ #	**Price ($/MWh)**	**Quantity (MW)**
1	150	0
2	150	100

Energy Reference Level Values (High)		
PQ #	**Price ($/MWh)**	**Quantity (MW)**
1	300	0
2	300	100

$$\textbf{RLSC Charge} = \textbf{Schedule} * (\textbf{LMP} - \textbf{Low RL Value}) * \textbf{Persistence Multiplier}$$

$$\textbf{RLSC Charge} = \mathbf{100} * (\mathbf{250} - \mathbf{150}) * \mathbf{1}$$

$$\textbf{RLSC Charge} = \$\mathbf{10,000}$$

Reminder: The RLSC is only applied when a market participant fails to provide the required supporting documentation to support a temporary reference level change request. This documentation is agreed to at the point of registration of the resource's reference levels

Settlement Charges Related to Mitigation Scenarios

- Settlement charges related to assessment of physical withholding and intertie withholding were already discussed during a technical panel session related to the market power mitigation batches:
  - February 15, 2022: https://www.ieso.ca/-/media/Files/IESO/Document-Library/tp/2022/iesotp-20220215-mrp-market-power-mitigation-batch-scenarios.ashx

Next Steps

Next Steps:

Throughout December and January: Stakeholders can review appendix material, and request additional examples or scenarios through engagement@ieso.ca

Mid-January: Segmented discussions with stakeholders to review examples/scenarios (Sign Up: https://www.ieso.ca/en/Market-Renewal/Stakeholder-Engagements/Implementation-Engagement-Market-Rules-and-Market-Manuals

February 21: Comments/feedback on market rules and market manuals due to IESO

Thank You

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