Local Market Power Mitigation Enhancements (LMPME) Pre-market simulation training

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The **Local Market Power Mitigation Enhancement (LMPME)** initiative addresses concerns that the ISO market's current market power mitigation process can result in the dispatch of resources at prices below their costs.

(from March 2019 Memo to the ISO Board of Governors)

Today we will cover:

- Changes to the real-time market related to the LMPM runs
- New master file options allowing EIM SCs to limit transfers
- Market simulation scenarios
- Registration requirements for the new hydro default energy bid (DEB)

Impacts

Systems

- RTM
- OASIS
- CMRI
- Master File

BPMs

- Market Operations
- Market Instruments
- Energy Imbalance Market

FLOW REVERSAL AND ECONOMIC DISPLACEMENT

Flow reversal and economic displacement

Flow Reversal – mitigation results cause EIM BAAs to change from importing to exporting at mitigated bid prices during subsequent market runs.

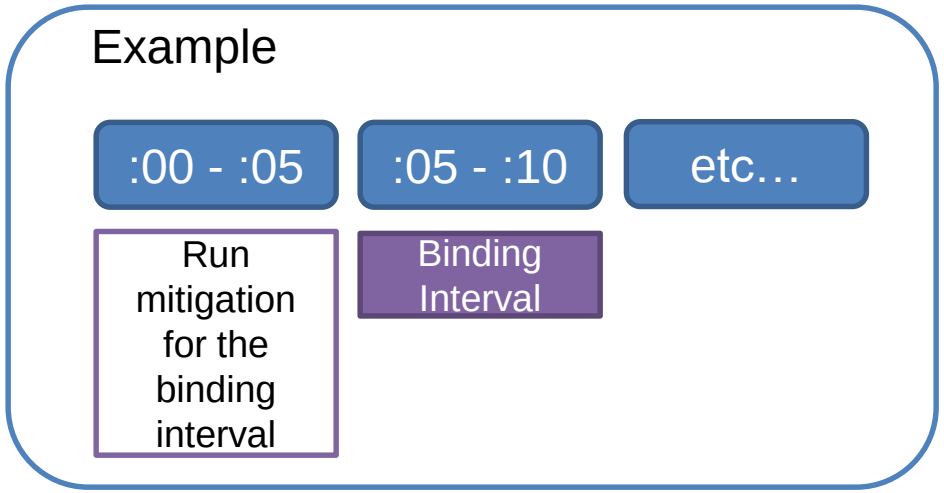
Economic displacement due to mitigated bids occurs when energy from one resource is replaced with energy from another. This can result in transfers beyond what is necessary to resolve market power.

Flow reversal and economic displacement changes

Fifteen minute market (FMM): MPM applied independently to each 15 minute interval and, unlike today, the mitigated bid does not persist to the end of the hour.

Flow reversal and economic displacement changes

Five minute market (RTD): The advisory intervals are evaluated for mitigation. Any bids mitigated in the advisory intervals are used in the corresponding binding interval RTD run.



Flow reversal and economic displacement changes

The Competitive LMP plus a small configurable tolerance of .001 shall be used for energy bid mitigation above that level.

Mitigated Bid =
Min[submitted bid, MAX (Default Energy Bid, Competitive Locational Marginal Price + $0.001)]

Master File Change – EIM SCs have the option to limit export transfers when mitigated.

NEW DEFAULT ENERGY BID (DEB) OPTION FOR HYDRO

New DEB for hydro resources with storage

Addresses concerns that some hydro resources with limited energy were being depleted inefficiently. This DEB formula captures the opportunity costs for hydro resources to sell energy in markets outside of the CAISO and to generate replacement energy from a peaking resource.

New DEB for hydro resources with storage

New formula:

$$DEB = MAX(Gas\ Floor, ST\ Comp, LT\ Geo\ Comp)$$

Gas Floor – represents a hydro generator replacing peak energy with a gas resource.

ST Comp (short-term component) – represents short-term limitations based on prices in the resource's local area ranging from the next day to the next month.

LT Geo Comp (long-term, geographic component) – represents the opportunity costs of future sales and/or bilateral sales at remote hubs for a number of months equal to a resource's storage horizon.

Hydro DEB - System Changes

Master File

- Recognize the new hydro DEB option
- Manage hydro DEB eligibility at the resource level
- New field to select and rank hydro DEB option
- Store resource's max storage horizon
- Identify default electric pricing hubs for hydro resources, request changes to additional hubs

CMRI

- Display new DEB option in the Default Energy Bid Curves Report (existing report).

MARKET SIM SCENARIOS AND REQUIREMENTS

Market Sim Scenarios

Scenario	Description
1	Mitigation will be performed on an interval by interval basis.
2	Market Participants may see a small impact to their mitigated bid due to the tolerance added the competitive LMP.
3	EIM BAA specific mitigation due to import constrained.

Refer to the Market Simulation Structured Scenarios for details regarding these scenarios.
http://www.caiso.com/informed/Pages/ReleasePlanning/Default.aspx

The following information will be needed for the execution of the structured scenarios component of the market simulation, due by August 30th, 2019.

1. Please identify one resource you would like to validate the creation of a new default energy bid for hydro resources with storage capability (Hydro DEB) functionality.

2. Please identify up to two resources to validate the mitigation framework enhancements

a. Optional rule for EIM BAAs to limit transfer quantities or avoid cases of economic displacement.

b. Modifying the mitigation framework to eliminate the balance of the Fifteen Minute Market (FMM) and balance of the hour mitigation, with reexamination and application of the competitive LMP at every interval

Submit information to MarketSim@caiso.com

Sample registration form for the unstructured component of the LMPME Market Simulation

	A	B	C	D	E	F
1	To test the Hydro DEB and additional bilateral hub functionality in Market Simulation, please provide the following information for up to 5 hydro resources. You may select zero or up to three additional bilateral hubs for a hydro resource. The additional hub cannot be the same as the resource's default hub. Please email completed form to RDT@caiso.com					
2	**RES_ID**	**Hydro DEB option**	**Maximum Storage Horizon**	**Default Hub**	**Additional Bilateral Hub**	**Weight Factor**
3	[Must be a hydro resource]	[To receive the Hydro DEB, this option must be 1]	[Assign a number from 1 to 12 (months)]	[From list of hydro resources provided.]	[Place cursor in row below and select from drop-down. Cannot be the same as the resource's default Hub]	[Assign a number from 0.1 to 1.]
4	***Example:***					
5	*Resource 1*	*1*	*6*	*PHSP15*	*PHMIDC*	*0.3*
6	*Resource 2*	*1*	*9*	*PHNP15*	*PHSP15*	*1*
7						
8						
9						
10						
11						

Submit template to RDT@caiso.com by September 20, 2019

http://www.caiso.com/Documents/MktSim_HydroDEB.xlsx

Register to request Hydro DEB Option in Production

- Hydro resources with storage capability are eligible to request the Hydro DEB option. To initiate the process, the Scheduling Coordinator should:
  - Submit a request via CIDI to register a maximum storage horizon and additional electric pricing hubs, if applicable.
  - The CIDI ticket should have 'Hydro DEB Registration' in the subject and include sufficient documentation to support the registration requirements.

- Details will be in Appendix D.8.1. of the Market Instruments BPM

Hydro DEB Registration

- Maximum storage horizon can be submitted in one of two ways:
  1. Written attestation by a representative for the resource that the proposed number of months of storage reflects the typical storage duration of the resource's reservoir
  2. Corroborating data containing at least three years of historic water levels at the specific hydro facility and regulatory filings related to the operations of the resource

- Additional Electric Pricing Hubs are available to resources that provide firm transmission contracts showing the source location, sink location, volume of firm transmission rights and the applicable dates of the contract

Hydro DEB Calculation Example: Resource with one additional hub

- Fuel region gas price = 1.50 $/MMBtu
- Default electric pricing hub = PHMIDC
- Maximum storage horizon = 2 months
- Number of additional electric pricing hubs = 1
- Additional electric pricing hub 1 = PHNP15
- Weighting factor of additional electric pricing hub 1 = 1 (i.e., resource has shown firm transmission rights greater than or equal to resource Pmax)

Hydro DEB Calculation Example: Resource with one additional hub (continued)

Electric pricing hub	Day ahead index ($/MWh)	Balance of month index ($/MWh)	Month Ahead, +1 ($/MWh)	Month Ahead, +2 ($/MWh)
PHMIDC (default)	2.00	5.00	15.00	3.00
PHNP15 (additional)	4.00	6.00	20.00	6.00

A) Gas Floor = 1.1 * (11.176 Btu/MWh * 1.50 $/MMBtu) = $18.44/MWh

B) Short-term component = 1.4 * MAX (2.00, 5.00, 15.00) = $21.00/MWh

C) Long-term component = 1.1*MAX(3.00, 4.00, 6.00, 20.00, 6.00) = $22.00/MWh

Hydro DEB = MAX(A, B, C) = MAX(18.44, 21.00, 22.00) = $22.00/MWh

Upcoming milestones

Date	Milestone
August 30	Hydro DEB market sim registration deadline
September 3 – October 11	Market Simulation
September 5	Post Draft BPM language
November 13	Production Activation

Registration dates for the hydro DEB option for production will be communicated in a market notice.

References

Title	URL
Draft Final Proposal	http://www.caiso.com/informed/Pages/StakeholderProcesses/LocalMarketPowerMitigationEnhancements2018.aspx
Draft Tariff Language	http://www.caiso.com/informed/Pages/StakeholderProcesses/LocalMarketPowerMitigationEnhancements2018.aspx
Business Requirements Specifications (BRS)	http://www.caiso.com/informed/Pages/ReleasePlanning/Default.aspx (scroll down to Fall 2019)
Market Simulation Scenarios	http://www.caiso.com/informed/Pages/ReleasePlanning/Default.aspx (scroll down to Fall 2019)
Hydro DEB market sim registration form	http://www.caiso.com/Documents/MktSim_HydroDEB.xlsx

Thank you for your participation!

For more detailed information on anything presented, please visit our website at:
www.caiso.com

Or send an email to:
CustomerTraining@caiso.com