



Memorandum

To: ISO Board of Governors and Western Energy Imbalance Market Governing Body
From: Anna McKenna, Vice President of Market Design and Analysis
Date: March 14, 2023
Re: **Decision on market parameter changes enhancement**

This memorandum requires ISO Board of Governors and WEIM Governing Body action.

EXECUTIVE SUMMARY

The ISO market systems include configurable market parameters that govern the importance and scale of certain inputs into the market optimization algorithms. Management recommends two changes to address market performance concerns observed in the ISO's continued assessment of market performance that have been vetted through a stakeholder process.

The first proposed change is to modify a market parameter referred to as the "shift factor threshold." The function of the shift factor threshold is to limit what resources are used in the management of congestion in the ISO markets based on the resource's effectiveness to contribute to flow on a constraint. For example, if a specific resource is ineffective in addressing congestion within the specified threshold, the resource will not be part of the solution chosen to address the congestion. The proposed change to the threshold setting in the energy market addresses unintended consequences in the, separate but related congestion revenue rights market. Specifically, the current shift factor threshold applied to locations that are aggregations of high volume distributed locations can result in the optimization failing to account for substantive congestion effects. This in turn results in failing to account for material congestion in the congestion price. In such cases this can result in substantive inconsistencies in the settlement of congestion revenue rights, which are based on the price of congestion determined in the energy market and the amount of congestion revenue rights that are held at these aggregate locations. Management proposes to reduce the value of the shift factor threshold for aggregated pricing locations to more accurately reflect their contributions to congestion and improve the performance of congestion revenue rights. This element falls under the WEIM Governing Body's advisory authority.

The second proposed change is an enhancement to the process for changing market parameters used to enforce scheduling priorities and constraint relaxations in the market clearing process. The effects of such scheduling parameters are sometimes not observable until after they have actually been employed. There have been times when analysis of market outcomes has shown that the market parameters did not result in the intended scheduling priorities as prescribed in the ISO tariff. Management proposes a process to make expedited changes to those scheduling parameters so that if such outcomes are observed, the ISO can align the market parameters with the intended scheduling priorities until a permanent change can be considered and approved. These elements fall under joint authority for decision by the WEIM Governing Body and the ISO Board of Governors.

These changes were largely supported by stakeholders and are carefully tailored to ensure the markets operate optimally. The shift factor threshold proposal described in this memorandum falls under the ISO Board of Governors' approval authority with an advisory role for the WEIM Governing Body; the proposal with respect to changes in market scheduling parameters falls under the joint decisional authority of the ISO Board of Governors and the WEIM Governing Body.

ISO Board of Governors March 22, 2023 motion

Moved, that the ISO Board of Governors approve the changes to the application of the shift factor threshold as described in the memorandum dated March 14, 2023; and

Moved, that the ISO Board of Governors authorize Management to make all necessary and appropriate filings with the Federal Energy Regulatory Commission to implement the shift factor threshold change proposed in this memorandum, including any filings that implement the overarching initiative policy but contain discrete revisions to incorporate Commission guidance in any initial ruling on the proposed tariff amendment.

Joint Board of Governors and Governing Body March 22-23, 2023 motion

Moved, that the ISO Board of Governors and WEIM Governing Body approve the process to effectuate changes to market scheduling parameters as described in the memorandum dated March 14, 2023; and

Moved, that the ISO Board of Governors and WEIM Governing Body authorize Management to make all necessary and appropriate filings with the Federal Energy Regulatory Commission to implement the process to effectuate changes to market scheduling parameters proposed in this memorandum, including any filings that implement the overarching initiative policy but contain discrete revisions to incorporate Commission guidance in any initial ruling on the proposed tariff amendment.

DISCUSSION AND ANALYSIS

Shift Factor Threshold

The shift factor threshold is a market parameter that determines what power injections and withdrawals (from market resources) the market software uses in managing congestion on transmission constraints. The shift factor threshold measures a specific location's effectiveness in managing congestion relative to the change of power flow on a specific constraint. The effectiveness depends on, among other things, the transmission topology and the transmission system's specific characteristics like impedances. When the ISO implemented its nodal market in 2009, it established a two percent effectiveness threshold above which resource injections and withdrawals are used for congestion management in its markets.

At that time this threshold struck a reasonable balance between efficient congestion management and price formation, and good utility practice for reliable grid operations.

In the congestion management process, only resources with a shift factor greater than two percent are considered for re-dispatch in the congestion management process. Resources with a shift factor less than two percent were determine considered to be appropriately excluded because these resources may be electrically too distant from the constraints being managed. Using resources with a very low shift factor for congestion management could lead to an unreasonable re-dispatch of resources with little impact on relieving the congested constraint being managed. This would not be prudent or consistent with good utility practice.

To avoid these potentially harmful operational impacts, the market process disregards shift factors on a binding constraint below the two percent threshold in deriving the optimal resource dispatches and marginal congestion component. This removes the impact of those resources' injections and withdrawals for both resource dispatches and prices. The result is that resources receive dispatches that are consistent with the prices cleared in the market.

Following a 2019 change to the funding for congestion revenue rights (CRRs)¹, the ISO observed an issue in settling CRRs created by the shift factor threshold. Application of the threshold to locations with significant injections or withdrawals meant that the market was not accounting for significant flow contributions in estimating power flows and calculating congestion rents used to financially settle CRRs. This is more impactful for transmission constraints with small capacity for which the flow contributions from aggregated locations can consume the full capacity of the constraint.

Management proposes to adjust the use of the shift factor to mitigate for this issue. For large aggregated demand and generation locations, namely default load aggregation

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<http://www.caiso.com/Documents/DecisiononCongestionRevenueRightsAuctionEfficiencyTrack1BProposal-Memo-Jun2018.pdf>

points and trading hubs, the ISO proposes to reduce the threshold from two percent to 0.2 percent.

The existing two percent threshold would continue to apply to all other pricing locations. The rationale for not changing the shift factor threshold for all pricing locations is that doing so could result in an increase in computational efforts in the market clearing process and inefficient re-dispatch of resources for little gain of congestion management. The proposed change is narrowly tailored to capture the flow contributions of large aggregated locations. This logic will apply in both the congestion management process and in the price formation of the marginal congestion components of the locational marginal prices in the same way it is currently done for locations with shift factors above two percent. This will ensure that dispatches and prices remain consistent.

Because the driver for this proposed change is the impact on CRR settlements, which is only an issue for the ISO balancing authority area, Management proposes to only apply this change to the ISO's default load aggregation points and trading hubs; this will not apply to Western Energy Imbalance Market (WEIM) load aggregation points and default generation aggregation points of the WEIM. The ISO may consider applying this change more broadly in the WEIM or the proposed Extended Day-Ahead Market (EDAM) in future policy initiatives that would be brought back for a separate approval.

Based on stakeholder comments, Management also considered applying the lowered threshold to intertie locations. Management concluded that while there are compelling reasons for using a lower threshold at large intertie locations, applying such a change to all interties would create the same concerns described above when applying it to all locations. Instead, Management proposes a flexible approach in which it could apply the lowered threshold to interties that have sufficient transfer capability and result in similar inefficiency as that identified from default load aggregation points and trading hubs. Based on a future assessment of the impact of interties on the CRR settlements, the ISO would have authority to use the lowered threshold to specific interties. This information will be maintained in one of the ISO's business practice manual.

Market Scheduling Parameter Change Process

The ISO's market optimization uses a set of configurable scheduling parameters to enforce the relative scheduling and relaxation priorities in the market clearing process. The values of these parameters are defined based on studies and analysis to ensure the expected priorities actually result under different scenarios. When new functionality and market features are introduced, the values of these parameters are assessed for any needed updates.

However, given the large number of different scenarios that the market can encounter on a day-to-day basis, conditions arise under which the pre-defined values of the relative scheduling parameters do not coordinate as intended. The scheduling parameters are relevant only when the economic solutions have been exhausted and in order to clear the market and resolve constraints uneconomical adjustments are

necessary. Under such conditions, multiple uneconomical adjustments and relaxation of constraints can occur simultaneously, making correct specification of the scheduling parameters even more crucial. When the scheduling parameters are not coordinated correctly, the resulting market solutions under these extreme conditions may pose market and operational inefficiencies. To mitigate for this risk, the ISO may need to change the scheduling parameters. Since some of these scheduling parameters may be defined in the ISO's tariff provisions, the ISO would not be able to make the necessary changes quickly.

The inherent complexity of the outcomes that can result from unintended interplay of scheduling parameters precludes the ISO from specifically characterizing what scenarios may require the use of the proposed procedure. Instead, the ISO can refer to a general dynamic of scheduling parameters that may manifest under different scenarios.

The proposed parameter change procedure authority will allow the ISO to modify the scheduling parameters on a temporary basis when necessary to ensure market solutions align with intended priorities or avoid future operational or reliability problems. Management proposes that the ISO have the authority to temporarily change the scheduling run parameters for a period up to 90 days, provided the ISO file a tariff amendment with FERC within 30 days of the modification. If circumstances reasonably allow, the ISO will consult with FERC and the Department of Market Monitoring (DMM) before implementing any such modification. In all circumstances, the ISO will consult with DMM and FERC as soon as reasonably possible after implementing a temporary modification.

Further, under the proposed parameter change procedure, the ISO must notify market participants of any temporary modification within one business day and explain the reasons for the change. Importantly, the proposed procedure only allows the ISO to temporarily change the scheduling parameter values themselves; it does not allow the ISO to change the relative scheduling priorities in the tariff. That is, the ISO would change the value of the scheduling parameters while ensuring that the relative priorities are still honored.

POSITIONS OF THE PARTIES

This initiative had three rounds of stakeholder comments, with five participants submitting comments for the draft final proposal. Overall, stakeholders support pursuing the two enhancements proposed. Management adjusted the final proposal and provided further details to address participants' comments.

- Puget Sound Energy supported the proposal but expressed concerns about the decisional classification for the shift factor threshold. Management understands there is a possibility that this or any initiative “may have market or pricing implications for future EDAM participants” as Puget Sound Energy states in its comments. Nevertheless, Management proposes to apply the rule proposed by the stakeholder representatives on the Governance Review Committee, as

adopted by the Board and the Governing Body in the WEIM Governing Body February session.

- DC Energy and WPTF requested the ISO continue to assess the performance of the CRR policy implemented in 2019, which the ISO has committed to do as part of next steps beyond this limited initiative. Based on that feedback, Management adjusted the final proposal to reduce the notification window of parameter changes from three business days to one business day, which is now reflected in the final proposal.
- One stakeholder expressed concern with both reducing the threshold for aggregated locations since it will increase prices and the differentiated treatment relative to the rest of locations. Management has explained the change of the threshold will more accurately reflect the contributions of these aggregated locations to both power flow contributions and price formation, with prices either increasing or decreasing. Management expanded the analysis in the proposal to provide more insights and assess the price impacts. Regarding the concern about differentiated treatment for aggregated locations, the proposal is based on the fundamental difference in the magnitude of injections and withdrawals for aggregated locations relative to individual locations and how that difference leads to materially different power flow contributions. Any participant bidding at any aggregated location will be considered in the same way in the market clearing process.
- Some stakeholders also suggested the ISO expand this logic to include inertie locations. As discussed above, Management agrees this suggestion has merit and expanded the proposal to include the flexibility to apply the lower shift factor threshold to interties whose volume justifies application of the 0.2 percent threshold.

CONCLUSION

Management recommends two changes to market parameters. The first is to lower the shift factor threshold for the ISO balancing authority area default load aggregation points, trading hubs, and large interties. The second modification is to provide authority to change scheduling parameters on a temporary basis. These changes will improve market efficiency, and enable the ISO to nimbly address market outcomes that do not align with intended scheduling priorities.