



Memorandum

To: ISO Board of Governors

From: Keith Casey, Vice President, Market & Infrastructure Development

Date: March 19, 2015

Re: **Decision on EIM year 1 enhancements phase 1**

This memorandum requires Board action.

EXECUTIVE SUMMARY

The energy imbalance market (EIM) year 1 enhancements initiative includes proposed design changes to address FERC compliance, commitments made during the original stakeholder process, and other design elements identified during implementation activities with both PacifiCorp and NV Energy. The initiative has two phases. The first phase addresses design changes that Management believes should be implemented when NV Energy joins the EIM in October 2015, and are therefore being proposed now. The second phase will address items that will benefit from having six months of operational experience under the EIM, and items that were deferred from phase 1 to allow additional stakeholder discussion. The phase 2 items will be presented to the Board later this year.

In phase 1, Management proposes modifications that further the scalability of the EIM design, address FERC compliance directives regarding the bidding of greenhouse gas costs, and address matters identified during the initial implementation with PacifiCorp.

Management believes the proposed design changes build upon the current EIM design and will support additional balancing authorities joining the EIM in the future.

Moved, that the ISO Board of Governors approves phase 1 of the energy imbalance market year 1 enhancements proposal, as described in the memorandum dated March 19, 2015; and

Moved, that the ISO Board of Governors authorizes Management to make all necessary and appropriate filings with the Federal Energy Regulatory Commission to implement the proposed tariff change.

DISCUSSION AND ANALYSIS

In phase 1, Management proposes modifications that further the scalability of the EIM design, address FERC compliance directives regarding the bidding of greenhouse gas costs, and other changes to resolve matters identified during the initial implementation with PacifiCorp. Management has determined that these design modifications should be implemented when NV Energy joins the EIM in October 2015.

The proposed phase 1 modifications include:

- Modifications to further scalability of the EIM design
 - EIM transfer limit constraints
 - Flexible ramping combination constraints
- Modifications to comply with a FERC order
 - Greenhouse gas bidding by EIM participating resources
- Modifications to resolve implementation matters
 - EIM administrative charge
 - Settlement of EIM non-participating resources
 - Resource sufficiency evaluation
 - Administrative pricing rules

In the following sections, Management discusses each of the proposed design elements.

EIM transfer limit constraints

The EIM transfer limit ensures that imbalance energy moved between EIM balancing authority areas is within the transmission capability made available to the EIM. The current EIM design enforces the EIM transfer limit by ensuring the changes in net scheduled interchange between balancing authority areas in the EIM are within the aggregate transmission rights made available to support EIM transfers. This implementation approach was appropriate for the initial implementation with PacifiCorp because there is a single path between each balancing authority area. However, as more balancing authority areas join the EIM, the EIM transfer limits should be considered separately for each intertie scheduling point. This will allow for multiple transmission providers to offer available transmission capacity to maximize the EIM transfers between balancing authority areas. Since NV Energy will be using available transmission capacity over multiple intertie scheduling points between both the ISO and PacifiCorp East to support EIM transfers, the proposed changes are needed when NV Energy joins the EIM in October 2015.

In the fifteen-minute market and real-time dispatch, the ISO enforces intertie scheduling limits to ensure energy schedules do not exceed each intertie's transmission capacity. The ISO will similarly apply these intertie scheduling limits to interties used in the EIM.

In addition, the ISO will continue to enforce EIM transfer limits to ensure that EIM transfers across EIM interties do not exceed available transfer capacity. All resources within the EIM footprint and at EIM interties compete equally to ensure the most economically efficient use of transmission up to intertie scheduling limits.

Since there will potentially be multiple intertie scheduling paths on which EIM transfers can be scheduled, Management proposes to include a transfer cost, anticipated to be a few cents per MWh, in the market optimization to enable the market to select the most direct path. In addition, the transfer cost can also be used to maximize the efficient use of EIM transfer capability made available to the EIM via intertie schedules. The ISO, as the market operator, will determine the appropriate level of the transfer cost. If an EIM entity has multiple intertie schedules that can account for EIM transfers, the ISO will consult with the EIM entity to determine the appropriate transfer costs to maximize the use of the transmission made available to the EIM.

This transfer cost included in the market optimization will not be explicitly settled. However, since the cost is included in the market optimization it can impact locational market prices. To ensure that the lowest effective transfer cost is used, during market simulation Management will determine the appropriate amount of the transfer cost by balancing the benefits from including transfer costs with the impact to locational marginal prices. Furthermore to address stakeholders concerns, once determined, Management will brief the Board on the maximum EIM transfer cost that may be used by the ISO in the market optimization and will file the proposed transfer cost with FERC to include it in the ISO tariff.

Management also proposes to calculate the financial value of EIM transfers that will be used as part of the financial settlement of the real-time imbalance energy offset for each balancing authority area in the EIM. EIM transfers are not explicitly settled because a transfer represents the imbalance energy of generators supporting the EIM transfer, which is settled with individual resources. However, to calculate the real-time imbalance energy offset for a balancing authority area, the ISO settlement calculations must consider the financial value of the EIM transfer so that supply and demand settlements within the balancing authority area are balanced. Currently, the ISO calculates the financial value by multiplying the price at the intertie over which the EIM transfer is scheduled by the quantity of the EIM transfer. Since the intertie is not the location where generation within an EIM balancing authority is located, Management proposes to use the locational marginal price of the default generation aggregation point of the exporting EIM balancing authority. This represents a weighted average locational marginal price that considers the locational marginal prices of all the generation resources in an EIM balancing authority area.

Flexible ramping constraint combinations

In the current EIM design, the ISO calculates a flexible ramping requirement and enforces a flexible ramping constraint for all combinations of balancing authority areas participating in the EIM. As new entities join the EIM, the number of requirements and

constraints will rapidly increase. Currently, there are seven combinations with PacifiCorp. The number of combinations will increase to fifteen with the addition of NV Energy and to thirty-one with the addition of Puget Sound Energy. Therefore, Management proposes to calculate a flexible ramping requirement and enforce a flexible ramping constraint only for the combination of all balancing authority areas in the EIM, and for each individual balancing authority area, to limit the number of combinations to a manageable amount.

Greenhouse gas bidding by EIM participating resources

The EIM was designed to ensure that greenhouse gas (“GHG”) compliance costs do not affect the locational marginal price in an EIM balancing authority area. This provision was included in the design because only energy generated in California or imported into California is subject to California’s GHG regulations. In its June 19 Order approving the EIM design, FERC directed the ISO to include a mechanism to allow an EIM participating-resource scheduling coordinator to opt out completely from consideration for EIM transfer into the ISO. In addition, FERC directed the ISO to design the GHG bidder to be based on the expected cost of GHG compliance obligations.

Management’s proposal meets the FERC requirements and, in response to stakeholder input, provides additional flexibility. Management proposes to allow an EIM participating resource to submit a single MW quantity and single bid price on an hourly basis to express its willingness to serve as the source of an EIM transfer into the ISO and be subject to California’s GHG regulations. The MW quantity will, by default, be set to zero. Thus an EIM participating resource will not be deemed delivered to the ISO unless it has submitted a positive MW quantity. The MW quantity is independent of the resource’s energy bid curve, thus the total output of the EIM participating resource up to the MW quantity bid is eligible to be deemed delivered to the ISO.

Management proposes to calculate a daily maximum GHG cost to meet FERC’s directive that GHG bids be based on the expected costs of compliance. On a daily basis, the ISO will calculate a single GHG cost in a similar manner to how GHG costs are calculated when included in ISO resources’ default energy bids. The GHG emissions cost will be based on the resource’s maximum heat rate, as registered with the ISO, the daily GHG allowance price, and the resource’s GHG emission rate. An EIM participating resource will submit an hourly GHG bid price at or below its daily maximum GHG cost, but not less than zero. If an EIM participating resource submits a GHG bid price above the resource’s daily GHG cost, the GHG bid price will be set to the daily maximum GHG cost. If an EIM participating resource submits a MW quantity, but fails to submit a GHG bid price, the default will be the daily maximum GHG cost.

Finally, if an EIM entity allows economic participation in the 15-minute market by imports on EIM external interties, the import resources will also submit an hourly GHG MW quantity and bid price. The daily maximum GHG cost will be consistent with the calculation of the import’s GHG regulation compliance obligation.

EIM administrative charge

The EIM administrative charge is the mechanism the ISO uses to recover ongoing operational costs from EIM market participants. After go-live with PacifiCorp, the EIM administrative charges exceeded revenue expectations. In response, on January 5, 2015 the Board approved applying only the minimum charge to the EIM entity scheduling coordinator during the redesign of the administrative charge through this stakeholder initiative. Management now proposes an EIM administrative charge that charges ISO market participants and EIM market participants the same cost for similar real-time market services.

The EIM administrative charge will be split into two separate charges: the EIM market services charge and the EIM system operations charge. The EIM market services charge will be allocated to gross instructed imbalance energy. The EIM system operations charge will be allocated to gross real-time energy flow, which is the absolute difference between the meter and the base schedule. The billing determinants for the two charges are consistent with the billing determinants of the ISO grid management charge for market services and system operations.

Management proposes that if ISO costs or forecasted volumes change, the EIM market services rate and/or EIM system operations rate will be updated when the ISO grid management charge rates are updated. Management proposes to only charge the minimum charge if an EIM entity decides to withdraw from the EIM and requests suspension of the EIM. During the six month termination period, both the EIM market services charge and the EIM system operations charge will be allocated to 5% of the EIM entity's load and exports plus 5% of its generation and imports.

Settlement of EIM non-participating resources

EIM non-participating resources are resources that have base schedules in the EIM balancing authority area, but are not dispatched through the EIM. Management proposes to align the settlement of these resources with the settlement of ISO resources with day-ahead schedules that do not economically bid into the real-time market. This will ensure that the calculation of uninstructed imbalance energy is consistent between the ISO and EIM balancing authority areas.

Resource sufficiency evaluation

The current EIM design includes a resource sufficiency evaluation to ensure that each EIM balancing authority area has sufficient bid range from participating resources to meet the 15-minute net-load forecast and ramping requirements independently prior to the start of the operating hour. If a balancing authority area fails the resource sufficiency evaluation, incremental EIM transfers with other EIM balancing authority areas are not allowed. To provide equitable treatment among all balancing authority areas, Management also proposes to perform the resource sufficiency evaluation on the ISO balancing authority area.

Management also proposes to enhance the resource sufficiency evaluation by including the historical scheduling error of imports and exports included in the base schedules.

Administrative pricing rules

On December 18, 2014, the Board approved Management's pricing enhancements proposal which included revisions to administrative pricing rules that are used during market disruptions. Since the EIM is an extension of the ISO real-time market, Management proposes to have the same administrative pricing rules apply to the EIM, which generally base real-time market prices during a market disruption on other representative real-time market prices. However, the administrative pricing rules uses the day-ahead price when real-time prices are unavailable for an extended period of time. Since the EIM does not include the day-ahead market, there are not day-ahead prices that can be used for the period of the market disruption. In this circumstance, Management proposes to use the open access transmission tariff-approved price used by the EIM entity during a market suspension to settle imbalance energy within the EIM entity balancing authority area.

POSITIONS OF THE PARTIES

Stakeholders generally support the proposed design changes. Stakeholders have expressed concerns regarding the accelerated pace of the stakeholder initiative. In response, Management has deferred certain items to phase 2 that are not required to support the implementation of NV Energy in October 2015 in order to allow for additional stakeholder discussions.

Position 1 – Including a transfer cost to determine the intertie scheduling path of an EIM transfer will be scheduled should be discussed further and alternatives should be considered that would eliminate the potential impact to locational marginal prices.

Several stakeholders have expressed concerns that the EIM transfer cost will impact the locational marginal prices in the EIM. Given the potential impact, stakeholders suggest other options be considered which minimize or eliminate the impact, such as seeking a waiver of tagging rules between balancing authority areas in the EIM.

Response: Management shares this concern and will balance the impact to locational marginal prices with the need to maximize the EIM transfers under the existing scheduling rules. With NV Energy joining the EIM, the number of intertie schedules to support EIM transfers will increase. The proposed transfer cost will ensure the market can reach a unique solution and can maximize the use of transmission capability made available to the EIM. During market simulation, Management will determine the appropriate level of the EIM transfer cost balancing these competing objectives. In addition, Management has committed to include in the ISO tariff, the maximum allowed EIM transfer costs to provide stakeholders with transparency of the potential impact to locational marginal prices.

Position 2 – Some stakeholders expressed concern that the proposed greenhouse gas (“GHG”) bidding rules provide more flexibility than is required to comply with FERC’s order and could limit EIM transfers into the ISO.

Response: To comply with FERC’s June 19 order, Management sought to develop a design to allow EIM participating resources to opt out from being considered for delivery to the ISO, and to include measures to ensure GHG bids are consistent with actual compliance costs. Some stakeholders requested a narrow interpretation of the FERC order, but also highlighted that implementing a flag could result in lower EIM transfers into the ISO, which would reduce the benefits of the EIM. Other stakeholders requested additional bidding flexibility given that actual compliance obligations are not known at the time the GHG bid is submitted, but rather at the end of the year. Management believes that the flexibility to bid an hourly MW quantity and a GHG bid capped at the maximum compliance cost balances these two competing views. The flexibility will allow EIM participating resource scheduling coordinators to manage their GHG bids to ensure compliance costs can be recovered, which should increase the number of resources willing to be the source of transfers to the ISO. In the event that EIM benefits are reduced because EIM transfers into the ISO were limited, Management has agreed to review potential long-term design changes, which could not be implemented by October 2015, in phase 2 of this initiative.

Position 3 – Some stakeholders object that the ISO’s real-time market design used for the EIM undermines existing rights for transmission purchased under other balancing areas’ open access transmission tariffs, most notably in association with the EIM transfer proposal.

Response: The extension of the ISO’s real-time market to enable the EIM has already been accepted by FERC in its June 19 order. Management’s proposed treatment of EIM transfers when an EIM entity makes use of available transmission capacity is no different than how the ISO currently manages intertie scheduling limits on its own system. FERC’s order approving the 15-minute market accepted the ISO’s market timeline and settlement rules, whereby the fifteen-minute market commences prior to the final WECC tagging deadline for hourly intertie schedules and real-time hourly block schedules are price takers.

CONCLUSION

Management requests Board approval of phase 1 of the EIM year 1 enhancements proposal discussed above. The proposed modifications will further the scalability of the EIM design, address FERC compliance directives regarding the bidding of greenhouse gas costs, and resolve matters identified during the initial implementation. The proposed modifications are important measures that will support additional balancing authorities joining the EIM. Management looks forward to continued stakeholder discussions on phase 2 items over the remainder of the year.