



# **Energy Imbalance Market Resource Sufficiency Evaluation**

## **White Paper**

**September 19, 2018**

# EIM Resource Sufficiency Evaluation White Paper

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## 1. Purpose & Background

The ISO conducted two stakeholder workshops on April 30 and July 19, 2018 titled “EIM Offer Rules”. The EIM Offer Rules workshop series was a part of the ISO’s 2018 roadmap. The purpose of the workshop and was to discuss the EIM resource sufficiency evaluation and default energy bid (DEB) options in the EIM. Workshops serve as an opportunity for ISO staff to engage with stakeholders to better understand concerns and determine if a policy initiative and/or tariff changes are necessary. This white paper discusses the outcome of the EIM resource sufficiency evaluation portion of the workshop. The default energy bid options and EIM mitigation will be discussed in a separate policy initiative.

## 2. References

Presentations and stakeholder comments from the April 30 and July 19, 2018 workshops can be found on the ISO’s website [www.caiso.com](http://www.caiso.com) under the Stay Informed, Stakeholder Processes, Miscellaneous Stakeholder Meetings page. Reference “Energy imbalance market offer rules – technical workshop” on April 30, 2018 and July 19, 2018.

<http://www.caiso.com/informed/Pages/MeetingsEvents/MiscellaneousStakeholderMeetings/Default.aspx>

The ISO responded to stakeholder comments and questions following the April 30 workshops. These responses are published on the ISO website and can also be found in [Appendix A](#) of this document.

## 3. Resource Sufficiency Evaluation Improvements

As a result stakeholder engagement during the April 30 and July 19, 2018 workshops, the ISO has identified several improvements for the EIM resource sufficiency evaluation. Several of these items do not require tariff changes and therefore are being addressed through the appropriate business practice manual (BPM) change process. Each subsection below identifies EIM resource sufficiency evaluation improvements and the ISO response to outstanding stakeholder concerns.

The purpose of the resource sufficiency evaluation is to ensure each EIM entity can adequately balance their own supply and demand prior to participating in the energy imbalance market. The resource sufficiency evaluation does not determine if a balancing authority area is able to meet its reliability requirement. The resource sufficiency evaluation ensures that balancing authority areas do not inappropriately lean on the capacity, flexibility and transmission of other balancing authority areas in the EIM footprint.

### 3.1 Fifteen-minute freeze for flexible ramping test failures

The flexible ramping test is performed as part of the hourly resource sufficient evaluation to ensure each balancing authority area has sufficient ramp capability to meet its fifteen-minute forecasted energy and flexible ramping product requirement less the diversity benefit. The test evaluates for ramp intervals from the last 15-minute schedule from the preceding operation hour to each 15-minute interval of the current operating hour. If any of the four ramp tests is failed, transfers are limited to the quantity from the last 15-minute interval of the preceding operating.

The ISO proposes to evaluate each ramp test individually for failure and only limit transfer in those 15-minute intervals that had insufficient ramping capability. Assuming T is the start of the operating hour being evaluated: The 15-minute ramp tests from T-7.5 to T+7.5. The 30-minute ramp tests from T-7.5 to T+22.5. The 45-minute ramp tests from T-7.5 to T+37.5. The 60-minute ramp tests from T-7.5 to T+52.5. If a ramp test is failed, the transfers will be limited to the previous 15-minute interval schedule. If the 15-minute ramp test is failed, the transfer will be limited to the last 15-minute interval of the previous operating hour's transfer. If the 30-minute ramp test is failed, the transfer will be limited to the first 15-minute interval of the current operating hour's transfer. If the 45-minute ramp test is failed, the transfer will be limited to the second 15-minute interval of the current operating hour's transfer. If the 60-minute ramp test is failed, the transfer will be limited to the third 15-minute interval of the current operating hour's transfer.

This change can be implemented through the business practice manual process because it does not require tariff changes. The ISO plans to implement this enhancement by the end of the 2018 calendar year.<sup>1</sup>

### 3.2 Introduction of a 1% tolerance band for flexible ramping test

Stakeholders have expressed concern related to failure of the flexible ramping tests by a very small quantity. Stakeholders have experienced failing the flex ramp test by inconsequential amounts (i.e. 0.5 MW) and believe when the failure is extremely small they should still be able to participate in the EIM. The ISO agrees that the precision of the current tests is beyond what is necessary to ensure that leaning on flexibility is not occurring.

The CAISO proposes that if the ramping capability for one of the four ramping test is within 1% off the total ramping test requirement that the EIM entity not have its EIM transfers limited. For example,

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<sup>1</sup> The details concerning the flexible ramping sufficiency test are included in Section 11.3.2.1 of the BPM for the EIM and tariff changes are not required to support this enhancement. Reference Tariff Sections 29.34(m) and 29.34(n): Flexible Ramping Resource Sufficiency Determination and Effect of Resource Plan Insufficiency: <http://www.caiso.com/rules/Pages/Regulatory/Default.aspx>

assume the 45 minute ramp test requirement is 500MW up, if an EIM balancing authority area has ramp capability to increase output in 45 minutes by 495MW or more the EIM balancing authority area we pass the flexible ramping test even though its actual ramp capability may be less than the 500MW requirement. The introduction of a 1% tolerance band for the flexible ramping test aligns with the 1% value that is used in the balancing test.

This change can be implemented through the business practice manual process because it does not require tariff changes. The ISO plans to implement this enhancement by the end of the 2018 calendar year.

### 3.3 Fifteen-minute granularity for balancing and capacity tests

Additional changes to the resource sufficiency evaluation need market design and tariff changes to move from an hourly evaluation to 15-minute evaluation. The 15-minute granularity for the balancing and capacity tests will be included in the *Day-Ahead Market Enhancements: Phase 1* initiative, which is scheduled for EIM Governing Body approval in October 2018. The implementation is planned in the Fall of 2020. The ISO proposes the following changes:

- The resource sufficiency balance test will be performed for each fifteen-minute interval and corresponding under/over scheduling penalties will be applied for the corresponding fifteen-minute interval.
- The resource sufficiency capacity test will be performed for each fifteen-minute interval and failure will result in limiting EIM transfers for the previous fifteen-minute interval.<sup>2</sup>

### 3.4 Use of new approach to calculate flex ramp requirement

Stakeholders have suggested the flexible ramping test should be scaled based upon the actual forecasted level of load, wind and solar for a given market interval. Currently, a histogram is used to calculate the flexible ramping requirement. However, a histogram may not accurately reflect the amount of renewable energy capacity that is currently available. The ISO is proposing the use of a new technique to more accurately determine the flexible ramping requirement based on varying factors such as load.<sup>3</sup>

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<sup>2</sup> Reference *Section 3.1: Resource Sufficiency Evaluation* in the Day-Ahead Market Enhancements Phase 1 proposal: <http://www.caiso.com/Documents/SecondRevisedStrawProposal-Day-AheadMarketEnhancementsPhase1-Fifteen-MinuteGranularity.pdf>

<sup>3</sup> A histogram is currently used to calculate the flexible ramping requirement as well as the amount of historical inertia declines that is applied as an incremental amount to the flexible ramping requirement.

One of the proposed methodologies is outlined in the *Day-Ahead Market Enhancements* initiative and was discussed during the June 19, 2018 DAME workshop.<sup>4</sup> The ISO has completed simulations using this methodology to quantify potential benefits. The simulation showed that use of the probabilistic forecasting approach instead of the histogram resulted in a more accurate day-ahead flexible ramping product requirement. The ISO plans to complete a similar simulation to recognize potential benefits between the fifteen-minute market and the 5-minute real-time dispatch. The results from the simulation will determine if a new methodology (as opposed to the histogram) will be beneficial for use in the real-time market.

Introducing an improved approach to calculate the flexible ramping requirement does not require tariff changes.<sup>5</sup> After determining if the benefits of using the DAME approach warrant changing the current histogram used in the real-time market, the ISO will discuss with stakeholder the proposed changes through business practice manual change process. Changes to the flexible ramping product requirement calculation will result in system changes that must be prioritized with other implementation activities. The ISO will determine the planned implementation date prior to starting the business practice manual change process since the implementation date must be known to establish the effective date of the business practice manual changes.

### 3.5 Address CAISO undelivered inerties

Stakeholders have raised concern that the ISO is counting supply from intertie resources towards the ISO's resource sufficiency evaluation. In order to remedy this, Powerex has proposed that only physical supply – internal generators plus intertie energy that is associated with a physical generator – should count towards the resource sufficiency evaluation.<sup>6</sup> The ISO does not have the infrastructure to complete bid verification to ensure intertie resources are tied to a physical generator. This standard is also greater than for other EIM entities which does not validate if the intertie transactions are supported by an actual physical generator ensuring that an intertie schedule will flow. Also, in the EIM Year 1 Enhancements Phase 2 initiative the ISO clarified that approved e-Tags are not needed for submission of

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The ISO is proposing changes to the calculation of the requirement, but is not proposing changes to the intertie deviation histogram.

<sup>4</sup> Reference *Day Ahead Market Enhancements: Updates to Revised Straw Proposal, FRP Requirement* (Slide 49 – 56). <http://www.caiso.com/Documents/Agenda-Presentation-Day-AheadMarketEnhancements-Jun19-2018-Updated.pdf>

<sup>5</sup> The details concerning the flexible ramping sufficiency test are included in Section 11.3.2.1 of the BPM for the EIM and tariff changes are not required to support this enhancement. Reference *Tariff Sections 44.2.4: Determination of Uncertainty Requirement*: <http://www.caiso.com/rules/Pages/Regulatory/Default.aspx>

<sup>6</sup> Reference Powerex comments in response to the July 19 EIM Offer Rules Technical Workshop, page 3: <http://www.caiso.com/Documents/PowerexComments-EIMOfferRulesTechnicalWorkshop-Jul19-2018-RST.pdf>

import/export base schedules used in the resource sufficiency evaluation. In addition to approved e-Tags, adjusted and pending e-Tags are acceptable. Pending e-Tags were allowed because in EIM Year 1 Enhancements Phase 1, an incremental requirement to the capacity test and flexible ramping test was introduced to cover changes in imports/exports from what was used at the T-40 resource sufficiency evaluation and what was actually tagged. The incremental requirement is applied in the same manner to the ISO and EIM entities what imports/exports assumed in the final resource sufficiency evaluation do not actually flow.

The ISO's 15-minute market enforces a constraint that 15-minute dispatchable interties must have a transmission profile to support any FMM award. So if a 15-minute dispatchable intertie does not have an e-Tag prior to T-40, the 15-minute resource would not be used for the ISO to pass its resource sufficiency evaluation. The ISO does not enforce a similar transmission profile constraint for hourly block interties. Therefore, it is only undelivered ISO hourly blocked intertie resources that may count towards the resource sufficiency evaluation even if the intertie energy is not delivered. The ISO will investigate if a similar T-40 E-Tag deadline could be applied to hourly blocks. This would ensure that all intertie resources have an E-Tag and are appropriately accounted for in the resource sufficiency evaluation.

In order to address undelivered intertie resources, specifically hourly block intertie resources, the ISO has started the [Intertie Deviation Settlement](#) initiative. The topic of ISO undelivered intertie resources will be addressed holistically to determine causes for undelivered intertie resources and solutions to mitigate the impacts of undelivered intertie resources. The ISO plans to bring the *Intertie Deviation Settlement* initiative to the EIM Governing Body and ISO Board of Governors in March 2019 for implementation in Fall 2019. Additionally, the *RA Enhancements* initiative will specifically address delivery of resource adequacy on the interties. *RA Enhancements* will develop criteria for allowing intertie resources to provide RA such as requiring a physical generator and transmission to be associated with the RA intertie resource.

### 3.6 Additional metrics regarding the resource sufficiency evaluation

In order to increase and enhance transparency of the resource sufficiency evaluation, stakeholders have requested additional metrics be published by the ISO. Specifically, Powerex has asked for an evaluation of the 95% confidence level (P95) that is used in the flexible ramping test:

*To the extent the RS test requirements have historically overstated the capacity and flexibility needed in each hour to meet the needs of an EIM entity more than 95% of the time [...], then there is an opportunity to reduce the burden faced by EIM entities to ensure they do not “lean on other participants. By the same token, to the extent the RS test requirements have historically understated the capacity and flexibility needed in each hour to meet an EIM entity’s needs more than %5 of the time [...], then the protections against leaning are likely not being fully met.*

Per request from stakeholders, the ISO has already published data related to the frequency of resource sufficiency evaluation failures for each BAA. This information was presented at the August 29, 2018

Market Performance Planning Forum meeting.<sup>7</sup> The ISO plans to develop additional metrics that will be published and discussed at the Market Performance Planning Forum (MPPF) meeting on December 11, 2018.

### 3.7 Use of available balancing capacity (ABC) in the resource sufficiency evaluation

During the July 19 workshop, stakeholders discussed available balancing capacity and asked if available balancing capacity should count towards passing the resource sufficiency evaluation. Stakeholders explained that available balancing capacity is additional flexibly that can be used, if needed, by the EIM entity balancing authority area.

The ISO will **not** allow available balancing capacity to count towards the resource sufficiency evaluation for the following reasons:

- Available balancing capacity is intended to resolve infeasibilities for each EIM balancing authority area individually. It is not allowed to address imbalance in other EIM balancing authority areas. Available balancing capacity is conditionally dispatched in the market to reduce power balance constraint violation in its balancing authority area. Therefore, it cannot be generally dispatched for imbalance energy.
- The resource sufficiency evaluation is designed to measure what energy is being made available to the market to share across the entire EIM footprint. Available balancing capacity is not intended to be shared.
- The purpose and functionality of available balancing capacity was discussed as part of a FERC proceeding, the outcome of which has been documented in the ISO tariff. The ISO tariff explicitly states: “The CAISO will not apply the EIM Available Balancing Capacity towards its evaluation of the resource sufficiency tests”.<sup>8</sup> The concept of counting available balancing capacity towards the resource sufficiency evaluation would directly question the determinations made by FERC when the available balancing capacity proposal was accepted.<sup>9</sup>

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<sup>7</sup> The August 29, 2018 MPPF presentation can be referenced at:  
<http://www.caiso.com/Documents/Presentation-MarketandPerformancePlanningForum-Aug292018.pdf>

<sup>8</sup> Reference Tariff Section 29.34.r: Use of EIM Available Balancing Capacity:  
<http://www.caiso.com/rules/Pages/Regulatory/Default.aspx>

<sup>9</sup> See FERC Order in Docket No. ER15-861-006.



### 3.8 Holistic review of the resource sufficiency evaluation

Stakeholders have requested a holistic review of the resource sufficiency evaluation. They state the EIM footprint has changed since the EIM implementation in 2014 and therefore the resource sufficiency evaluation approach should be evaluated. The ISO plans to complete a holistic review of the resource sufficiency evaluation during the extension of the day-ahead market to the EIM (EDAM), which is scheduled to start in the middle of 2019. Any EDAM design will require a day-ahead resource sufficiency evaluation. In order to introduce a day-ahead resource sufficiency evaluation, the ISO will need to align the day-ahead resource sufficiency evaluation with the real-time resource sufficiency evaluation. This is the appropriate time and place for a holistic review.

## 4. Stakeholder Engagement

The ISO has appreciated stakeholder engagement and comments during the April 30 and July 19, 2018 workshops. At this time the ISO is addressing items that were prioritized by stakeholders: freezing transfers for fifteen-minute intervals for failure of the flexible ramping test, introduction of a 1% tolerance band for the flexible ramping test, and a new approach to calculate the resource sufficiency evaluation requirement. None of these items require tariff changes and therefore can be implemented with the business practice manual (BPM) change process. Therefore, the ISO will not be pursuing a stakeholder initiative for the energy imbalance market resource sufficiency evaluation at this time.

The ISO will discuss this paper during a stakeholder conference call on September 26, 2018. The ISO requests that any outstanding questions or comments are discussed at that time.

5. Appendix A: Matrix from April 30 Meeting

**April 30, 2018**  
**Energy Imbalance Market**  
**Technical Workshop**

**Energy Imbalance Market**  
**Resource Sufficiency Evaluation**

**Stakeholder Comments Matrix**  
***Categorized by Question***

## 5.1 Introduction

The ISO held a workshop titled “EIM Offer Rules” on April 30<sup>th</sup>, 2018. The purpose of the workshop was to discuss the following topics:

- Real-time resource sufficiency test (RST) in the EIM, and
- Additional default energy bid (DEB) option for hydro resources.

Stakeholders presented at the workshop to discuss questions and/or concerns related to the two topics. Following the workshop, stakeholders submitted written comments. The presentations and written comments are located at the ISO website on the “Stay Informed: Miscellaneous stakeholder meetings” page.<sup>10</sup>

This document was created in response to the resource sufficiency test (RST) written comments. In reviewing the written comments, the ISO recognized questions could be grouped into three categories: training, enhancements/data requests, or policy. The respective tables are listed below and identify the question/comment, ISO response, and entity who submitted the question/comment.

## 5.2 Training Questions and Comments

Training Question/Comment	ISO Response	Entity
<b>Ensure the resource sufficiency test (RST) is equitably tested and enforced upon all EIM BAAs.</b>	The RST is applied equally to all BAAs that are participating in the EIM.	BPA Chelan Portland Powerex WPTF
<b>The capacity test should be applied to all EIM entities in all hours.</b>	<p>The capacity test is applied to all entities for all hours. Failing the capacity test results in the automatic failure of the flexible ramping test.</p> <p>The balancing test allows an EIM entity that elects to use the CAISO forecast to be exempt from the over/under scheduling penalty. If the ISO forecast is used and BAA’s imbalance (determined by comparing the BAA base schedules and the ISO’s demand forecast is within +/- 1%, the over/under scheduling penalty does not apply. If the EIM entity uses its own forecast, the over/under scheduling penalty applies. This is necessary</p>	Powerex

<sup>10</sup> The Miscellaneous stakeholder meetings page on the ISO’s website is located at: <http://www.caiso.com/informed/Pages/MeetingsEvents/MiscellaneousStakeholderMeetings/Default.aspx>

Training Question/Comment	ISO Response	Entity
	<p>because an entity could elect to submit base schedules as “long” or “short”.                      The over/under scheduling penalty does not apply to the ISO and will not apply to EDAM entities in the future because there is not an opportunity to determine the amount of imbalance to be met in the real-time market because base schedules are not submitted. The reference for imbalance settlement is the day-ahead schedule.</p>	
<p><b>Improve accuracy of resource sufficiency requirement to ensure there is no leaning on other EIM entities.</b></p>	<p>The intent of the RST is to ensure each EIM BAA carries adequate capacity to maintain the balance between generation and load. This prevents one EIM entity from leaning on another.</p> <p>The ISO is planning to improve the calculation of the flexible ramping requirement. A proposed methodology has been discussed in the Day Ahead Market Enhancements (DAME) initiative.</p>	<p>Chelan</p>
<p><b>Resource sufficiency tests are needlessly challenging for EIM Entities to pass:</b></p> <ul style="list-style-type: none"> <li>• <b>RST involve compressed timelines</b></li> <li>• <b>Capacity test commingles concepts that should be evaluated separately</b></li> </ul>	<p>Although the calculation for the requirement is complex, when the tests were originally developed it was assumed that EIM entities would bid all available EIM participating resources. It was not expected that an EIM entity would seek to only make available EIM participating resources necessary to pass the resource sufficient evaluation. The tests have been modified over time, such as freezing the load forecast and the VER forecast, recognizing that the EIM entities were looking to determine the amount to EIM participating resources needed versus making all that is available.</p> <p>In order to address the compressed timeline that occurs as a result of the publication of the fifteen-minute market, the ISO freezes the load forecast and VER forecast that is used in the test to ensure the target doesn’t move. This was implemented on December 12, 2017.</p> <p>The objective of the balancing test is to determine if the EIM Entity will be subject to the under-over scheduling penalty. The</p>	<p>Powerex</p>

Training Question/Comment	ISO Response	Entity
	<p>capacity test ensures there are sufficient economic bids to meet the demand forecast and historical intertie declines. The objective of the flexibility test is to determine if there is adequate ramping capability to meet system needs. Failure of the capacity test will result in a failure of the flexible ramp sufficiency test. Passing of the capacity test will result in credits being applied to the flexible ramp capacity test.</p>	
<p><b>Should ABC count towards the RS requirement?</b></p>	<p>No. The resource sufficiency test is intended to determine if there are adequate economic bids to enable the market to meet imbalance needs of each Balancing Authority Area (BAA). Available balancing capacity (ABC) can only be dispatched if the BAA is violating its power balance constraint. ABC is used for reliability needs after all effective economic bids in the EIM have been exhausted and cannot be used to meet the imbalance needs of another EIM BAA.</p> <p>Assume a BAA #1 has no economic bids from participating resources and used ABC to pass its RST. The market optimization would dispatch another BAA's participating resource to meet the needs of BAA #1. This enables BAA #1 to effectively lean on the rest of the EIM BAAs to meet its own imbalance needs.</p>	<p>Idaho NVE PGP Portland Puget Sound</p>
<p><b>What is the purpose of the RST? Is it to prevent leaning on other BAAs and/or ensure adequate ramping capacity?</b></p>	<p>The RST ensures EIM entities do not lean on others' generation capacity, generation flexibility, and transmission. Besides ensuring entities offer their own generation into the EIM, the RST ensures entities enter into forward bilateral contracts to make up for any shortfalls (including purchasing any needed transmission).</p>	<p>NVE</p>
<p><b>When a BAA fails the RST, do the transfers freeze completely or are they locked in one direction?</b></p>	<p>When a BAA fails the RST, the transfers are frozen in the direction in which the entity failed. For example, if an EIM BAA does not have adequate generation to serve load, the imports will be capped at the previous schedule. If an EIM BAA has excess generation in comparison to load, the exports will be capped at the previous schedule.</p>	<p>NVE</p>

### 5.3 Enhancement/Data Requests

Enhancement/Data Request	ISO Response	Entity
<b>When was the net import/export solution (to avoid incorrect calculation of the requirement for failed back to back intervals) implemented and how does it affect EIM entities?</b>	This was implemented on June 12, 2018. The intent of the fix was to improve the calculation of net import capability when an EIM entity fails the flex ramp test for two consecutive hours. Previously the net import capability was calculated using the last binding FMM interval of the prior hour; therefore, if the entity failed the flex test in the prior hour, the net import capability was limited to the base transfer of the previous hour's last fifteen-minute interval. With the fix, the net import capability is now calculated using the total net import capability (the EIM transfer limit) which is not impacted by the flexible ramping test failures from previous hours. The same fix was also applied to net exports.	NVE
<b>The ISO should publish metrics and reporting related to the resource sufficiency test and requirement for all EIM Entities including the ISO.</b>	The ISO will begin publishing these metrics in either the monthly reports of the MPPF slides.	Powerex
<b>The ISO should complete data analysis to compare the RST requirement to the amount of uncertainty that materialized. Evaluate if FRST requirement is meeting the P95 standard.</b>	The ISO will take this request into consideration and provide a metric in the MPPF slides or one of the EIM discussions.	PGP Seattle
<b>Ensure EIM entities are correctly passing or failing RST based on 95% confidence level.</b>	This requires additional discussion to determine a methodology that all entities agree to. The ISO will coordinate a meeting to discuss how to measure the performance of the RST.	Powerex

### 5.4 Policy Questions and Comments

Policy Question/Comment	ISO Response	Entity
<b>When an entity fails the RST, freeze transfers for the corresponding interval as opposed to the entire hour.</b>	This will be implemented with the fifteen-minute scheduling granularity in the Day-Ahead Market Enhancements initiative. The DAME initiative will move to fifteen-minute	Chelan Idaho Portland PGP

Policy Question/Comment	ISO Response	Entity
	base schedules which enables the freezing of transfers for an individual interval when the EIM entity has failed the RST for the corresponding interval.	Puget Sound Seattle
<b>RST requirement should be published ahead of time to allow adequate response by BAA.</b>	<p>The RST requirement considers the final 15-minute schedule of the preceding operating hour. This impacts the credits the EIM entity receives. Therefore, the requirement cannot be calculated until after the market has run. It is not feasible to publish the requirement any sooner than it already is.</p> <p>The intent of RST was not to facilitate “strategic” participation. It was to determine if sufficient resources were economically bid into the EIM, not to determine the number of economic bids that should be participating. Therefore, the assumption was made that EIM entities would economically bid to the fullest extent of their participating resources.</p> <p>The ISO will not change the load forecast or the VER forecast (already implemented) after the first test has run at T-55. This was implemented on December 12, 2017.</p>	NVE PacifiCorp Powerex Seattle
<b>Are the consequences of failing the RST adequate?</b>	<p>Yes. Freezing transfers for the corresponding interval (as implemented with the DAME initiative) prevents the EIM BAA from participating in the EIM for that interval. This eliminates the potential for EIM entities to lean on each other.</p> <p>Stakeholders examined a penalty as opposed to freezing transfers during the EIM Y1 policy initiative. It was determined that the penalty would need to be too high to make this a feasible option.</p>	NVE
<b>Uncertainty of renewable resources should be taken into consideration when determining the RST requirement.</b>	<p>The flexible ramping requirement currently uses historical net load (load – wind – solar) to account for uncertainty at a net level.</p> <p>The CAISO plans to improve the flexible ramping requirement methodology in the Day Ahead Market Enhancements initiative. Instead of using a histogram approach, the CAISO proposes to calculate the requirement</p>	PacifiCorp Portland PGP Powerex Puget Sound Seattle

Policy Question/Comment	ISO Response	Entity
	based on potential uncertainty of load, wind and solar. This will improve the accuracy of the requirement in relation to the amount of wind, solar, and load on the system for the corresponding interval.	
<b>Credits should be allocated ahead of time so BAA can anticipate the balancing capacity requirement reduction.</b>	Credits (inclusion of imports/exports to reduce the RST requirement) can only be allocated once the market has run; it is impossible to determine the appropriate amount of credits prior to the market run.	Portland
<b>Import/export transfer limits used for setting the requirement should be based on expected future transfer capacity.</b>	Future transfer capacity can change (for example unscheduled/forced transmission and/or generation outages). Therefore, it would be inappropriate to forecast future transmission capacity.	Portland
<b>Apply test equitably by not counting imports if physical generator and transmission are not identified.</b>	<p>This issue is limited to the ISO’s hourly block intertie resources because imports/exports that are fifteen-minute dispatchable must be tagged with a transmission profile by T-40; if a fifteen-minute dispatchable resource not, the schedule will be reduced to 0 MW and therefore does not count towards passing the RST.</p> <p>All EIM entities have imports/exports that are used in the determination of the requirement at T-40. These “hourly block” schedules must be tagged by T-20. This is the same for all EIM entities.</p> <p>Hourly blocked intertie schedules are considered in the historical non-delivery of imports/exports which increases the capacity requirement.</p> <p>The ISO will address the under-delivery of intertie resources in the Intertie Deviation Settlement initiative.</p>	PGP Seattle Powerex
<b>RST should incorporate imbalance conformances that occur systematically in a particular direction.</b>	Imbalance conformances (aka “load biases”) can change by interval and are not guaranteed to be predictable. The ISO is addressing systematic conforming and making improvements to the conforming process as a result of the Imbalance Conformance Enhancements initiatives.	Powerex



Policy Question/Comment	ISO Response	Entity
<p><b>RST should be measured relative to base schedules instead of the last interval of the previous hour.</b></p>	<p>Using base schedules in the RST would result in inaccurate ramp capability. The balancing test does not ensure base schedules are ramp feasible between hours. For example, a participating resource schedule could be decremented during an hour and there would be no way to determine if it is ramp feasible for that resource to meet a dispatch for the next interval based on the base schedule.</p>	<p>Powerex</p>
<p><b>RST should be performed with 5-minute granularity.</b></p>	<p>This is not feasible. The RST results occur in the real-time unit commitment (RTUC) which occurs in 15-minute granularity.</p>	<p>Puget Sound Energy</p>
<p><b>Is the CAISO incorrectly receiving credits towards its flexibility capacity requirement?</b></p> <ul style="list-style-type: none"> <li>• <b>Double-counting of EIM Transfer credits is flawed</b></li> </ul>	<p>No. There are no unique credits towards the flexibility capacity requirement.</p> <p>There is no double-counting in the FRST. The test recognizes that each BAA needs to individually meet their own requirements absent economic transfers between BAAs.</p> <p>Alternate options would be to:</p> <ul style="list-style-type: none"> <li>• Not apply credit because it is not possible to “isolate” the credit based on BAA and/or operating hour.</li> <li>• Use a histogram approach from previous trade day to determine if there’s a net change between hours.</li> </ul>	<p>Powerex</p>