

## Operational Experience as an Energy Imbalance Market Entity

| Item | Category                                                                                                                                                              | Action                                                                                                                                                                                                                           | Readiness Category                  |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| 1    | Alignment of EIM entity operating practices with EIM market functioning                                                                                               | Understand logic of outage management to properly make operational adjustments to units required by real-time system conditions                                                                                                  | Training                            |
| 2    | Refined management of Multi Stage Generator units                                                                                                                     | Implement support plan from ISO to identify and resolve quickly situations encountered by EIM entities                                                                                                                           | Deployment/Parallel Production Plan |
|      |                                                                                                                                                                       | Review and define parameters for MSG units to maximize resource management efficiency                                                                                                                                            | Training                            |
| 3    | Account for start-up energy in balancing process                                                                                                                      | Gain understanding and familiarity of the MSG functionality                                                                                                                                                                      | Training                            |
| 4    | Consistency for interchange schedule tags and base schedules                                                                                                          | Evaluate and define the startup and shutdown profiles for units with high Pmin and reflect in the bids fully the operational capability                                                                                          | Training                            |
| 5    | Enhanced situational awareness displays and improved monitoring of generator availability, capacity, available regulation on a 5 and 15 min basis, and ramp capacity. | Define internal process of preparing base schedules and changes within the hour to increase accuracy and awareness                                                                                                               | Training                            |
|      |                                                                                                                                                                       | Improve software display to increase awareness and visibility about available capacity                                                                                                                                           | System Readiness                    |
|      |                                                                                                                                                                       | Improve VER forecast and load forecast and their submission to the markets                                                                                                                                                       | Forecasts                           |
| 6    | Improvements to Flexible Ramp Sufficiency Test                                                                                                                        | Have additional user interfaces that provide the grid operator information related to differences between any combination of telemetry, state estimation, base schedules, and cleared target operating points for all resources. | Balanced Schedules before EIM       |
|      |                                                                                                                                                                       | CAISO is also reviewing its flex ramp sufficiency test implementation for possible simplification                                                                                                                                | Balanced Schedules before EIM       |
| 7    | Load bias logic correction                                                                                                                                            | Assess the flexible ramping requirement for PacifiCorp's two balancing areas based on the collected data for the actual real-time imbalance conditions.                                                                          | Data Monitoring Readiness           |

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|    |                                                                                                        | The CAISO will be implementing software functionality to limit such erroneous load biases, similar to the logic currently used for the CAISO operator bias of load. This feature limits operator bias of load forecast that are not consistent with system available ramp.                                                                                                                              | System Readiness     |
| 8  | Increase Pool of EIM participating resources                                                           | Provide training to PacifiCorp to ensure operators are familiar with how the feature will work, including explanations on the use of prices as a signal to indicate an issue in meeting load or balancing the system.                                                                                                                                                                                   | Training             |
|    |                                                                                                        | PacifiCorp coordinated with the CAISO to increase the pool of owned and third-party resources available to participate in the EIM.                                                                                                                                                                                                                                                                      | Market Simulation    |
| 9  | Additional training of personnel and improvement of systems with increased EIM operational experience. | Removed non-conforming Industrial Loads from PACE BAA starting April 1, 2015. PacifiCorp started submission of industrial load base schedules                                                                                                                                                                                                                                                           | Market Simulation    |
|    |                                                                                                        | Provide personnel with training on outage entry and required the provision of daily spreadsheets from PacifiCorp EIM Participating Resources that describe any operational issues and the resources' ambient conditions                                                                                                                                                                                 | Training             |
| 10 | Improve Internal Processes and Tools to address identified market performance issues.                  | PacifiCorp's Grid Operations provided its balancing agent real-time continued training on CAISO EIM tools                                                                                                                                                                                                                                                                                               | Training             |
|    |                                                                                                        | PacifiCorp's Grid Operations drafted and made available to operations personnel, "best practices" procedure documents to aid in personnel's implementation of critical EIM Entity tasks. PacifiCorp will continue to update these procedure documents in real-time as needed. PacifiCorp also developed a Desk Guide for the 24/7 Grid Operations desk and an EIM Division of Responsibilities document | Operating Procedures |

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| 11 | Improve dynamic transfer capability | For BPA rate of change constraints, the CAISO, PacifiCorp, and BPA are currently examining two methodologies or approaches in the ISO testing environment to identify which methodology is superior and acceptable to BPA to the method currently in place | System Readiness |
|    |                                     | Any additional five-minute capability will help the five-minute market re-optimize the fifteen-minute market decisions that are based on system conditions and information available approximately 30 minutes prior to the five-minute market.             | System Readiness |