

California Independent System Operator Corporation
Fifth Replacement Tariff

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44. Flexible Ramping Product

44.1 In General.

The CAISO may enforce flexible ramping constraints in the Real-time Market to meet Forecasted Movement and Uncertainty Requirements, using tools as further described in the Business Practice Manual that estimate the Demand Forecast and Supply forecast error, as set forth in this Section 44.

44.2 Uncertainty Awards

44.2.1 Optimization.

The CAISO will optimize the procurement of Uncertainty Awards in the Real-Time Market simultaneously with the procurement of Energy and Ancillary Services, as applicable. Uncertainty Awards do not overlap with Ancillary Services Awards or Available Balancing Capacity.

44.2.2 Variable Energy Resources.

The CAISO will use the CAISO's own forecast (Independent Third Party Forecast) to determine the Uncertainty Awards and Forecast Movement for Variable Energy Resources.

44.2.3 Eligibility for Uncertainty Award.

44.2.3.1 Generally.

All resources that have Economic Bids in the RTM that can be dispatched on a five-minute basis by RTD are eligible for receiving Uncertainty Awards.

44.2.3.2 Suspension.

If the CAISO deems the resource to be non-compliant, the CAISO will suspend the resource's eligibility as specified in Section 34.13.2.

44.2.3.3 Ineligible Operating States.

A resource is not eligible for an Uncertainty Award if it is in a Forbidden Operating Region or during an MSG Transition.

44.2.4 Determination of Uncertainty Requirement.

44.2.4.1 Requirement.

The CAISO will determine the Uncertainty Requirement for each Real-Time Market run, by each BAA and for the EIM Area overall.

44.2.4.2 Procurement Curve.

- (a) **Generally.** Based on statistical analysis of the Uncertainty Requirement, the CAISO will calculate constraint relaxation parameters to ensure the total cost of the Uncertainty Awards will not exceed the cost of expected power balance violations in absence of the Uncertainty Award, by each Balancing Authority Area and for the EIM Area overall, as set forth in the Business Practice Manual.
- (b) **Procurement Curve Cap.** The CAISO will establish in the Business Practice Manual a limit on the procurement curve –
- (1) at an amount less than the contingency relaxation penalty pricing parameter specified in the Business Practice Manual for market operations, in the case of an upward demand curve; and
 - (2) at an amount more than the regulation down relaxation penalty pricing parameter specified in the Business Practice Manual for market operations, in the case of a downward demand curve.

44.3 Forecasted Movement

44.3.1 Generally.

The CAISO will determine the Forecasted Movement for each Generating Unit, System Resource, Pumped Storage, Pseudo-Tie, Non-generating Resource, PDR, Participating Load, and any other resource that has a schedule or dispatch change in the Real-Time Market as described below.

44.3.2 RTD Forecasted Movement.

For the RTD, the Forecasted Movement for the resource will be the MW difference between the resource's non-binding dispatch instruction in the first five-minute advisory RTD interval and its Dispatch Instruction in the financially binding RTD interval, in the same RTD run.

44.3.3 FMM Forecasted Movement.

For FMM the Forecasted Movement will be the difference between the resource's advisory FMM schedule in the first advisory FMM interval and its FMM Schedule in the financially binding FMM interval for the same applicable FMM run.