

148 FERC ¶ 61,089
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Cheryl A. LaFleur, Acting Chairman;
Philip D. Moeller, John R. Norris,
and Tony Clark.

California Independent System Operator Corporation

Docket No. ER14-2017-000

ORDER CONDITIONALLY ACCEPTING TARIFF REVISIONS

(Issued July 31, 2014)

1. In this order, the Commission conditionally accepts California Independent System Operator Corporation's (CAISO) proposed tariff revisions to implement enhancements to its Full Network Model, which extends the modeling of unscheduled flows to its day-ahead market and allows CAISO to enforce physical flow limits on its interties in CAISO's day-ahead market, effective September 8, 2014 and October 1, 2014, as requested.¹ The Commission's acceptance is conditioned on a compliance filing including information on the accuracy of CAISO's model through testing, a triggering mechanism describing conditions under which CAISO will not enforce physical flows on its interties in its day-ahead market, and minor tariff revisions agreed to by CAISO, in addition to the filing of an informational report on CAISO's pre-implementation activities, all as described below.

¹ CAISO requests that the Commission accept its proposed revisions to tariff sections 11.2, 27.5.1.1, 30.5.2.1, and 30.5.2.4, and the new defined term "Transaction ID," reflecting enhancements to CAISO's base market model and the use of transaction identifiers effective September 8, 2014. CAISO requests that the Commission accept the remainder of its proposed tariff revisions effective October 1, 2014. CAISO Transmittal at 1.

I. Background

2. CAISO's Full Network Model is "a detailed, computer-based mathematical representation of the physical transmission system the ISO operates" and "includes all transmission network busses...and transmission constraints within the ISO balancing authority area as elements of a looped network."² CAISO explains that the Full Network Model includes "all intertie busses between the ISO balancing authority area and other balancing authority areas that are interconnected with the ISO."³ CAISO uses its Full Network Model to operate its day-ahead and real-time markets.⁴

3. In the instant filing, CAISO proposes to enhance its Full Network Model to account for unscheduled flows from outside CAISO's market in the day-ahead market. These unscheduled flows are the result of the difference between the contract path of scheduled electricity and the actual path of electricity in real-time. CAISO states that, until recently, there has not been sufficient data to model unscheduled flows in the day-ahead market, because CAISO's ability to predict unscheduled flows in the day-ahead market depends on the availability of data from outside CAISO's balancing authority area.⁵ CAISO states that recent cooperation among Western Electric Coordinating Council (WECC) utilities has allowed sufficient data to become available to model unscheduled flows in the day-ahead time frame.⁶

4. CAISO explains that the results of an inquiry into a September 2011 system disturbance that resulted in cascading outages throughout Arizona, southern California, and the Baja Peninsula caused it to reconsider its lack of consideration of unscheduled flows in the day-ahead time frame.⁷ CAISO states that the report recommended system

² *Id.* at 6.

³ *Id.*

⁴ In order to appropriately balance load and resources within its balancing authority area, CAISO operates a number of markets. The real-time market is conducted in fifteen minute intervals and serves to balance load and resources and set prices in real-time. The day-ahead market considers available supply and demand bids to identify the most efficient combination of resources to meet system needs. *See id.* at 6.

⁵ *Id.* at 7.

⁶ *Id.* at 14.

⁷ *See Arizona-Southern California Outages on September 8, 2011 – Causes and Recommendations* (Apr. 2012) (September 2011 Blackout Report), available on the Commission's website at <http://www.ferc.gov/legal/staff-reports.asp>.

operators (1) better align day-ahead forecasts with expected real-time operating conditions, and (2) improve the real-time visibility of their systems by increasing situational awareness of external contingencies that could impact the real-time operations of their systems.⁸

5. CAISO notes that in the day-ahead timeframe, it enforces flow limits on its interties based on a consideration of scheduled contract flows, but not the actual flows that are produced by those contract schedules. However, CAISO explains, the physical flow of electricity is different from its contracted path; so while a scheduled flow of electricity may not breach the flow limit at an intertie in the day-ahead market, it can still cause congestion from a physical flow perspective in the real-time market. CAISO states that the resulting infeasible schedules force it to redispatch its resources in real-time, where there is less flexibility to commit inexpensive units.⁹ CAISO states that this costly real-time redispatch increases congestion offset costs.¹⁰ Furthermore, CAISO states that this causes an importer of electricity to be overpaid in the day-ahead market.¹¹

II. CAISO Proposal

6. CASIO proposes three changes to its Full Network Model. First, CAISO proposes to model unscheduled flows in the day-ahead market within CAISO's balancing authority area based on available information from other balancing authority areas.¹² Second, CAISO proposes to enforce physical flow constraints on the interties in the day-ahead market, consistent with the way CAISO currently models and enforces constraints in its

⁸ CAISO Transmittal at 8.

⁹ *Id.* at 13.

¹⁰ These costs are allocated to all scheduling coordinators based on metered demand. *See* CAISO Tariff at 11.5.4.2.

¹¹ CAISO states that if an importer is dispatched in the day-ahead market based on an infeasible schedule through the intertie, that importer will be paid in the day-ahead market based on an uncongested intertie. In the real-time market their schedule is curtailed and the intertie is considered congested, so the price at the intertie is reduced. The importer is paid the higher day-ahead for its scheduled energy and has to compensate the market at a lower price for its curtailed energy in real-time. The importer thus receives a too-high price for the electricity that is actually delivered and makes a profit off the curtailed MWs because of the favorable difference between the day-ahead and real-time price. *See* CAISO Transmittal at 12, n.12.

¹² *Id.* at 21.

real-time market. Finally, CAISO proposes to extend its modeling of the grid external to the CAISO-controlled grid to reflect the anticipated day-ahead and actual real-time topology of other balancing authority areas in the West.¹³

7. CAISO's proposed methodology for estimating unscheduled flow in the day-ahead market involves creating base schedules for WECC balancing authority areas external to CAISO's balancing authority area by setting the amount of generation equal to the sum of the amounts of demand and the net scheduled interchange in these external balancing authority areas (treating losses as part of a balancing authority area's demand). In its tariff filing, CAISO proposes to include these base schedules in the Full Network Model it uses in market runs.

8. CAISO's proposed tariff provisions refer to its business practice manual for details on how CAISO will model the unscheduled flows on its system. CAISO states that to produce an accurate model of unscheduled flows, it must have discretion on how to use the data to produce a model. CAISO notes that this treatment is consistent with the discretion granted to other Regional Transmission Operators (RTO) and Independent System Operators (ISO) in managing unscheduled flows. CAISO states that it has found only high level information regarding the modeling of unscheduled flows in the tariffs of other balancing authority areas, and notes that they keep technical information in their business practice manuals.¹⁴ CAISO also states that the Market Surveillance Committee supports granting discretion to CAISO.

9. CAISO states that the most important data it will use to implement these modeling enhancements consists of: (1) telemetry data; (2) load and generation distribution factors; (3) demand forecasts; (4) net interchange schedules; (5) generation forecasts; and (6) generation and transmission outages. This data has mainly become available via Peak Reliability (which is a company that performs the reliability coordinator and interchange

¹³ *Id.*

¹⁴ *Id.* at 24 (citing NYISO Market Administration and Control Area Services Tariff, Section 17.1.1.1.1 ("In the Real-Time Market, expected unscheduled power flows will ordinarily be determined based on current power flows, modified to reflect expected changes over the real-time scheduling horizon") and PJM OATT Attachment K, Section 5.3 ("When there are agreements between the LLC and others for compensation to be paid or received for unscheduled transmission service (loop flow) into or out of the PJM Region, the net compensation received shall be included in the Total Congestion Charges that are distributed in accordance with Section 5.2."))).

authority functions in the Western Interconnection), the WECC interchange tool, and CAISO's state estimator.¹⁵

10. The second major change CAISO proposes is to enforce physical flow constraints at the interties in the day-ahead market, in addition to enforcing intertie constraints based on scheduled flows.¹⁶ CAISO's enforcement of physical flow constraints in the day-ahead market will be based, in part, on its proposed modeling of unscheduled flows in the day-ahead market. However, CAISO proposes to grant itself the flexibility to not enforce the physical flow constraints over the interties to the extent its modeling or data is insufficiently accurate, and to the extent the enforcement of the constraints would result in adverse reliability impacts.¹⁷ CAISO also proposes to not enforce physical flow constraints at interties for which it is subject to contractual arrangements that provide for the management of unscheduled flows using other procedures. For example, CAISO plans to maintain the current status quo modeling and enforcement of the scheduled flow limits for the California Oregon Intertie, where CAISO is the path operator.

11. The third major change CAISO proposes is to extend the modeling of the external interconnected grid beyond the CAISO-controlled grid to more accurately reflect the anticipated day-ahead and actual real-time system topology of other balancing authority areas in the West. CAISO states that this change will allow it to take other balancing authority areas into account in its Full Network Model used in its markets.

12. CAISO states that these modeling enhancements will reduce infeasible schedules in the day-ahead market, and thus reduce the need for expensive redispatch. Moreover, CAISO argues that calculating the unscheduled flows in the day-ahead timeframe will provide CAISO with more time to ensure that it can commit and dispatch the resources needed to address expected real-time conditions. CAISO states that this enhanced modeling framework will also be able to reflect the most recent information on outages, de-rates, and contingencies.

13. CAISO states that the modeling enhancements will also provide more accurate market pricing by incorporating congestion caused by unscheduled flow and respecting the flow limits of the interties in the day-ahead market. CAISO further states that the

¹⁵ *Id.* at 25.

¹⁶ *Id.* at 31-32 (citing tariff section 31.8.2).

¹⁷ *Id.* at 30-31.

pricing between the real-time and day-ahead markets for both physical and virtual bids will be more consistent as a result of its enhanced modeling.¹⁸

14. CAISO further states that the enhanced model will provide improved power flow solutions for the combined CAISO and Energy Imbalance Market footprint.¹⁹ CAISO states that it would have undertaken these modeling enhancements even if it were not launching its Energy Imbalance Market with PacifiCorp, but argues that its proposed modeling enhancements represent an important complement to the Energy Imbalance Market that will significantly improve the quality of market solutions.²⁰

15. CAISO states that it intends to apply a two-constraint approach to utilization of the enhanced Full Network Model in the day-ahead market, respecting both physical and scheduled flows. According to CAISO, the use of a two-constraint approach will result in consistent pricing for both physical and virtual bids on CAISO's system and is consistent with Commission-accepted tariff revisions in connection with CAISO's real-time market.²¹ CAISO states that the use of two constraints, along with improved modeling of day-ahead and real-time conditions, will help to minimize and manage unscheduled flows, as well as improving the alignment of the day-ahead and real-time markets.

16. CAISO states that there are three situations in which it proposes to not enforce the physical flow limits on interties in the day-ahead market. First, CAISO states that it will not enforce physical flow constraints at interties for which it is subject and privy to contractual arrangements that provide for the management of unscheduled flows using other procedures. Using the California Oregon intertie as an example, CAISO indicates that it will continue to adhere to previously agreed upon procedures in such an instance.²² Second, CAISO states that it proposes to have flexibility to not enforce the physical flow limits due to modeling inaccuracies, including inaccuracies in available data. CAISO indicates that it is concerned about the possibility that a neighboring control area may not provide accurate data, or that a disruption in the provision of data might occur.²³ Finally,

¹⁸ *Id.* at 29-30.

¹⁹ *Id.* at 5.

²⁰ *Id.* at 16.

²¹ *Id.* at 28-29 (citing *Cal. Indep. Sys. Operator Corp.*, 146 FERC ¶ 61,204, at P 102 (2014)).

²² *Id.* at 31.

²³ *Id.* at 32.

CAISO states that it proposes to not model power flow constraints if it has determined that enforcing the constraints could result in adverse reliability impacts.²⁴

17. CAISO acknowledges that some stakeholders requested additional analysis be undertaken to validate its proposed methodology. In response, CAISO proposes to analyze the results of its proposed approach to estimating unscheduled flows on the interties.²⁵ CAISO proposes to conduct a modeling assessment for a set of representative days for four of its interties and provide the results of its analysis in an informational filing to the Commission after submittal to CAISO's board and prior to the effective date for implementing the modeling of unscheduled flow and enforcement of power flow restraints in the day-ahead market.²⁶ CAISO states that it is not necessary to await the results of analysis before accepting its proposed tariff revisions because the flexibility provided in this proposal ensures that the proposal will not be implemented unless it is effective.

18. CAISO also proposes to implement tariff revisions that it describes as constituting minor clarifying changes. CAISO's proposed clarifying changes include revision to the definition of the term "intertie" in tariff appendix A to mean a transmission corridor that interconnects CAISO's balancing authority area with another balancing authority area. Additionally, CAISO proposes certain tariff revisions it describes as ministerial.²⁷

III. Notice of Filing and Responsive Pleadings

19. Notice of CAISO's filing was published in the *Federal Register*, 79 Fed. Reg. 31,933 (2014) with interventions or protests due on or before June 12, 2014. Timely motions to intervene were filed by the Northern California Power Agency, the Cities of Anaheim, Azusa, Banning, Colton, Pasadena and Riverside, California, Modesto Irrigation District, Transmission Agency of Northern California, NRG Companies, the California Municipal Utilities Association, the Balancing Authority of Northern California and the California Department of Water State Water Project. The Cities of Santa Clara and Redding, California and the M-S-R Public Power Agency filed a motion to intervene and the City of Santa Clara, California, doing business as Silicon Valley Power (SVP), submitted an amended motion to intervene that included comments. Motions to intervene and comments were filed by Pacific Gas and Electric Company

²⁴ *Id.*

²⁵ *Id.* at 38.

²⁶ *Id.* at 39.

²⁷ *Id.* at 37 (referencing attachment H to the filing).

(PG&E), Southern California Edison Company (SoCal Edison), Sacramento Municipal Utilities District (SMUD), Bonneville Power Authority (Bonneville) and Imperial Irrigation District (IID). Powerex Corporation (Powerex) submitted a motion to intervene, comments and limited protest. CAISO filed an answer to comments and limited protest. Powerex filed a motion for leave to answer and answer to CAISO's answer.

IV. Discussion

A. Procedural Matters

20. Pursuant to Rule 214 of the Commission's Rules of Practice and Procedure, 18 C.F.R. § 385.214 (2013), the timely, unopposed motions to intervene serve to make the entities that filed them parties to this proceeding.

21. Rule 213(a)(2) of the Commission's Rules of Practice and Procedure, 18 C.F.R. § 385.213(a)(2), prohibits an answer to a protest and an answer to an answer unless otherwise ordered by the decisional authority. We will accept CAISO's and Powerex's answers because they provided information that assisted us in our decision-making process.

B. Substantive Matters

1. Comments and Protest

22. PG&E supports CAISO's proposed full network model expansion. PG&E states that the Full Network Model expansion should improve CAISO's reliability by resulting in a more informed and feasible day-ahead schedule.²⁸ Several other commenters expressed general support for the expansion of CAISO's Full Network Model,²⁹ although each had concerns with some aspects of CAISO's proposal in the current docket.

23. A number of commenters were concerned about the ability of CAISO to model unscheduled flows in the day-ahead market with sufficient accuracy to improve grid

²⁸ PG&E June 12, 2014 Comments at 3.

²⁹ See SoCal Edison June 12, 2014 Comments (SoCal Edison Comments) at 3, IID June 12, 2014 Comments (IID Comments) at 2, Bonneville June 12, 2014 Comments (Bonneville Comments) at 2, SMUD June 12, 2014 Comments (SMUD Comments) at 1, Powerex June 12, 2014 Comments and Limited Protest (Powerex Protest) at 2 ("Powerex supports CAISO's objectives of ensuring that awards in its day-ahead market are physically feasible.").

reliability and market efficiency. SoCal Edison is concerned that CAISO's proposed tariff revisions do not include a metric to determine the acceptable level of accuracy needed to model unscheduled flows in the day-ahead market and explains that failing to address the accuracy of unscheduled flow modeling may result in the Full Network Model expansion doing more harm than good.³⁰

24. SoCal Edison proposes that CAISO only be given authority to model unscheduled flows in the day-ahead market if such modeling would improve the model. Specifically, SoCal Edison proposes that CAISO be required to monitor the accuracy of each intertie's modeling over a rolling two-week period. CAISO would only include the modeling in the day-ahead market if such modeling accuracy was superior to CAISO's current practice of not modeling the external balancing authority areas' detailed topology and the estimated unscheduled flows in the day-ahead market. Under SoCal Edison's proposal, in the event modeling unscheduled flows in the day-ahead market was not superior in any given two week period, CAISO would continue to model unscheduled flows, but would not include it in the day-ahead market until such time as the two-week rolling metric improved to be better than the "do nothing" alternative.³¹

25. Additionally, SoCal Edison argues that the Commission should order CAISO to publish the results of SoCal Edison's proposed accuracy metric daily for market participants to observe, as well as providing regular public reports to the Commission detailing the accuracy of modeling unscheduled flows in CAISO's market.

26. SMUD states that it is concerned that CAISO's filing is premature because CAISO does not know whether it will have adequate information to estimate unscheduled flows. SMUD notes that CAISO intends to analyze the impacts of modeling enhancements before implementation.³²

27. Bonneville points out that unscheduled flows are a regional issue and notes that CAISO's proposal would affect the entire interconnected system and Bonneville argues that the coordination of unscheduled flow solutions should be performed by Peak Reliability.³³

³⁰ SoCal Edison Comments at 3-5.

³¹ *Id.* at 6-7. SoCal Edison's Comments include a detailed description of its proposed accuracy requirement as an attachment.

³² SMUD Comments at 4.

³³ Bonneville Comments at 2.

28. Bonneville is also concerned that CAISO would be setting its day-ahead physical constraints based on incomplete data because CAISO proposes to use a 9:00 a.m. snapshot, six hours before the WECC prescheduled deadline.³⁴ According to Bonneville, CAISO's incomplete information could result in parties with sufficient transmission bidding into the market and not receiving awards due to inaccurately modeled constraints. Bonneville argues that CAISO should implement other recommendations from the September 2011 Blackout Report before it implements its modeling of unscheduled flows.³⁵

29. SVP is concerned that CAISO's proposed expansion of its Full Network Model does not anticipate modeling the integrated balancing authority areas.³⁶ According to SVP, the extent of parallel transmission facilities encompassed in the integrated balancing authority areas contradicts CAISO's objective of improving the modeling of the entire WECC.³⁷

30. SVP argues that omitting the integrated balancing authority areas from CAISO's expansion of its full network model will result in modeling errors that could have been avoided by their inclusion. According to SVP, CAISO's approach will cause pricing in different areas to be based on differing levels of information, causing unreliable prices for imports from certain areas.³⁸ SVP requests that the Commission direct CAISO to include the integrated balancing authority areas within CAISO's proposed expansion of its Full Network Model.

31. Powerex contends that CAISO's proposal is not fully developed, and so cannot show that it is just and reasonable.³⁹ Powerex further asserts that the unscheduled flow modeling CAISO proposes is not necessarily narrowly tailored to address infeasible day-ahead schedules and Real-Time Congestion Imbalance Offsets, and that the solution proposed by CAISO will not result in accurate forecasts because CAISO's model is not

³⁴ *Id.* at 4.

³⁵ *Id.* at 5-6.

³⁶ Integrated balancing authority areas are those balancing authorities that are not part of CAISO's balancing authority area but are closely interconnected or integrated with CAISO's system.

³⁷ SVP Comments at 3.

³⁸ *Id.* at 6.

³⁹ Powerex Protest at 6.

tested and does not account for generation and/or loads that deviate from scheduled quantities.⁴⁰ Powerex states that a WECC report endorses the fact that these deviations are an important component of unscheduled flow. Moreover, Powerex agrees with Bonneville that CAISO's proposal to obtain information regarding scheduled transactions as of 9 a.m. the day prior to delivery, while WECC does not receive day-ahead interchange schedules until 3 p.m., CAISO will not have all of the information necessary to model flows.

32. Furthering the argument that CAISO's filing is premature, Powerex also contends that the CAISO board required CAISO to conduct more analysis demonstrating the accuracy of the forecasts, and, according to Powerex, there is not enough time to ensure that the modeling is sufficiently fine-tuned before the October 1, 2014 "go-live" date. As a result, Powerex argues that there should be meaningful stakeholder process and Commission evaluation of any pre-implementation results before the modeling is used in CAISO's market.⁴¹

33. Powerex also states that the stakeholder process did not yield agreement on how to measure "success" of CAISO's unscheduled flow forecast proposal, so it is difficult to state whether the new proposal will necessarily be better than the existing state of affairs. Pointing to CAISO's request that it have significant discretion in how it forecasts unscheduled flows on a day-ahead basis as well as whether to include such forecasts in its market runs at all, Powerex asserts that the Commission cannot find such an undefined proposal to be just and reasonable.⁴²

34. In addition, Powerex asserts that CAISO's proposal overlooks the large volumes of financially binding bilateral transactions scheduled on a day-ahead basis throughout the rest of the region and does not work with other transmission providers. According to Powerex, the result is to effectively de-rate CAISO's interties, but only on the CAISO side, without coordinating with adjacent transmission providers. Powerex asserts that the result will be that CAISO will foreclose efficient and feasible transactions and create a chronic mismatch in transmission limits, with the CAISO side of an intertie appearing more restricted than the adjacent provider's side. According to Powerex, the mismatch in transmission limits will artificially create the appearance of greater congestion on the CAISO side of the interties and will result in a devaluation of transmission rights outside

⁴⁰ *Id.* at 10-12.

⁴¹ *Id.* at 19-21.

⁴² *Id.* at 23.

of CAISO while artificially increasing the financial value of congestion rights in CAISO's markets.⁴³

35. In addition to these seams issues, Powerex argues that CAISO's proposal is inconsistent with Commission policy regarding the coordination of available transmission capacity calculations by adjacent transmission providers. Powerex points to entities in the Eastern Interconnection that have entered into Joint Operating Agreements to address unscheduled flow issues, in contrast to CAISO's unilateral approach, and asserts that CAISO should make greater efforts to work with adjacent transmission providers.⁴⁴

36. IID expresses concern regarding the amount of discretion that CAISO proposes to have under the proposal. IID states that CAISO should not use its discretion to unduly discriminate against imports or place a reliability risk on a neighboring balancing authority area.⁴⁵ IID argues that, rather than acting unilaterally, CAISO should coordinate with neighboring balancing authority areas with respect to scheduling and physical flow limits at shared interties. IID is concerned that operational issues pertaining to physical flow limits might arise and suggests that any disputes be resolved by Peak Responsibility as the reliability coordinator.⁴⁶

37. SMUD shares IID's concern regarding the amount of discretion granted to CAISO under the proposal. SMUD argues that the decision to decide if and when to impose flow constraints is an issue that should be decided by the Commission, not CAISO.⁴⁷ SMUD further states that CAISO's proposal does not satisfy the requirements of FPA section 205, because implementation details involving the decision what type of information should be used to determine flow limits should be included in CAISO's tariff, not business practice manuals. Finally, SMUD argues that the grant of discretion to CAISO is inappropriate because CAISO has an interest in reducing uplift costs and minimizing the cost of imports and, therefore CAISO is not a neutral party.⁴⁸

⁴³ *Id.* at 31-35.

⁴⁴ *Id.* at 37-40.

⁴⁵ IID Comments at 8.

⁴⁶ *Id.*

⁴⁷ SMUD Comments at 5-6.

⁴⁸ *Id.* at 6.

38. SoCal Edison does not support the proposal that CAISO be given unilateral authority to include unscheduled flows in the day-ahead market without assessing the reasonableness of CAISO's modeling.

39. Additionally, IID states concerns regarding confidentiality of reliability data. IID requests that the Commission direct CAISO to provide information on how CAISO intends to comply with the provisions of the WECC universal non-disclosure Agreement and ensure that protected information will not be used by others to manipulate market prices.⁴⁹

2. CAISO's Answer

40. CAISO's answer argues that the Commission should accept its proposed tariff revisions with one change that CAISO proposes in response to the comments by SoCal Edison. Specifically, CAISO proposes to submit a compliance filing in which it would adopt, as a transitional mechanism to be used for a period after the October 1, 2014 go-live date, a refined version of the accuracy metric proposed by SoCal Edison that could cause CAISO to temporarily suspend modeling of unscheduled flow in the day-ahead market. According to CAISO, the refined metric will ensure that CAISO models unscheduled flow in the day-ahead market only when the modeling is sufficiently accurate and reliable. CAISO asserts that the addition of the accuracy metric will ensure that market outcomes are no worse than they would have been absent CAISO's modeling of unscheduled flows.

41. CAISO notes that the discretion it seeks in modeling unscheduled flows in the day-ahead market is no greater than that it has been granted to model unscheduled flows in the real-time market and argues that the discretion is consistent with that exercised by other RTOs and ISOs.⁵⁰ CAISO explains that, nevertheless, it is willing to adopt a proposed transitional measure under which it would continue enforcing the results from its modeling of unscheduled flows in the day-ahead market only if a regularly-computed metric indicates that CAISO's modeling of unscheduled flow is accurate. CAISO outlines how its proposed accuracy metric process would work as follows:

- An accuracy metric will be computed every day that will indicate whether, over a rolling three-week period, modeled unscheduled flows were more accurate than not estimating unscheduled flows.

⁴⁹ IID Comments at 10.

⁵⁰ CAISO June 27, 2014 Answer (CAISO Answer) at 7.

- If the accuracy metric shows that unscheduled flows have not been (over the rolling three-week period) more accurate than not modeling unscheduled flows, then consideration of unscheduled flows will be temporarily suspended.
- Once consideration of unscheduled flow is temporarily suspended, CAISO will not reintroduce consideration of unscheduled flows until its accuracy metric shows that modeling of such flows is accurate.
- CAISO will provide market participants with advance notice when it disables or enables the consideration of unscheduled flow in the day-ahead market.
- CAISO proposes to adopt the mechanism for a transitional period of one year after October 1, 2014, after which the mechanism will cease to be effective once the standard has been met for six consecutive months.

42. CAISO argues that the sunset mechanism is important to avoid significant administrative costs and will be unnecessary once the metric has been satisfied for six consecutive months at any time more than a year after CAISO's Full Network Model expansion has become effective. CAISO explains that SoCal Edison finds CAISO's proposed accuracy metric to be acceptable, other than the sunset provision.

43. CAISO argues that its proposal will not breach the WECC universal non-disclosure agreement, as suggested by IID. CAISO explains that the unscheduled flow data it proposes to disclose will be highly aggregated and that unscheduled flow data will only be disclosed to parties that have signed the WECC universal non-disclosure agreement.

44. CAISO argues that the WECC report cited by Powerex does not indicate that generation or load that deviate from scheduled quantities are an important cause of unscheduled flows, and is instead an analysis on the Reliability Based Control field trials, not unscheduled flow. CAISO also states that, contrary to SVP's assertions, CAISO has agreed to and will model integrated balancing authority areas under CAISO's proposal.

45. CAISO disagrees with commenters' suggestion that the only way to implement unscheduled flow modeling is on a regional basis or through joint operating agreements with other entities. CAISO argues that no Commission order mandates a regional approach to unscheduled flow issues.⁵¹ Additionally, CAISO states that it believes that it should implement its current proposal and also pursue further regional coordination measures. CAISO states that it does not make sense to wait until it has been able to

⁵¹ *Id.* at 23.

finalize such possible regional agreements before implementing a proposal that CAISO asserts will enhance reliability and promote market efficiency.⁵²

46. CAISO also defends its enforcement of physical flow constraints as just and reasonable. CAISO states that its filing, including the Market Surveillance Committee opinion, demonstrates that its enhancements are just and reasonable. CAISO notes that the Commission has already found it to be just and reasonable to enforce physical flow constraints within its system in the day-ahead market and both within its system and at the interties in real time. CAISO further states that the level of detail describing its enforcement of physical flow constraints compares favorably with its description of its enforcement of scheduling flow constraints and the level of detail in tariff provisions addressing unscheduled flow issues in tariffs of other ISOs.⁵³

47. CAISO argues that its enforcement of the physical flow constraint does not constitute a de-rate of interties. CAISO notes that, unlike the scheduling limit, the physical flow limit is not an absolute limit on net interchange on the interties. CAISO states that if the physical flow constraint binds, the price of imports scheduled on the interties will fall to reflect the cost of redispatch to manage these flows. CAISO states that this adjustment appropriately reflects the economic value of imported power.⁵⁴

48. CAISO also argues that its pre-implementation plan is appropriate. CAISO states that the pre-implementation plan was part of management's proposal and not an addition by CAISO's board due to concerns over the proposal. CAISO states that the pre-implementation analysis will be based on a wide sampling of data from four interties. CAISO moreover states that it will present the results of the analysis to the CAISO board, its stakeholders and the Commission, and will perform its own analysis at that time as to whether the enhancements should be allowed to go into effect and that the CAISO board will have the final decision. CAISO also argues that its plan to file an informational filing prior to implementation is consistent with CAISO's practice during the implementation of its new market design in 2009.⁵⁵

⁵² *Id.* at 24-26.

⁵³ *Id.* at 27.

⁵⁴ *Id.* at 29-30

⁵⁵ *Id.* at 33-34.

49. CAISO also states that its filing does not alter its practice in determining available transmission capacity. CAISO states that the available transmission capacity calculation is separate from the physical flow constraint that CAISO enforces on the interties to reflect actual congestion.

50. CAISO makes two clarifications in response to IID. First CAISO states in response to IID's question about how disputes about flow limits between balancing authorities would be resolved that these disputes would involve operational flows in real-time, and that it would follow existing procedures in managing real-time operational issues. Second, CAISO clarifies that transmission ownership rights have scheduling priority over transmission constraints, and thus CAISO's modeling enhancements would not result in schedules being cut.

3. Powerex Answer

51. Powerex argues that CAISO's offered accuracy metric is inadequate. Powerex argues that the accuracy metric will not offer a true assessment of whether unscheduled flows are being accurately modeled because it aggregates modeling errors on the interties. Powerex states that this approach might be defensible if modeling errors at one intertie offset modeling errors at another intertie. However, Powerex argues that unscheduled flow will have different effects at each location where it is modeled.⁵⁶

52. Powerex cites several other concerns with CAISO's offered accuracy metric. Powerex states that the metric does not measure unscheduled flow on an intertie resulting from transactions in the CAISO market itself. Powerex states that CAISO provides no explanation for its use of a three week rolling period. Powerex objects to CAISO excluding unforeseen real-time events from the accuracy metric. Powerex objects to CAISO's plan to weight the accuracy metric by the size of the intertie.

53. Powerex also argues that the accuracy metric should be developed through a stakeholder process. Powerex states that it would be inappropriate for the Commission to accept the proposed accuracy metric without giving all interested stakeholders an opportunity to comment on the proposal. Powerex states that the Commission should direct CAISO to implement a stakeholder process to develop an appropriate accuracy metric.

54. Powerex further argues that CAISO should be required to disclose information on its enforcement of unscheduled flows in a timely manner. Powerex notes that its tariff provision permits CAISO to take up to 30 days to disclose data on the day-ahead market. Powerex states that the disclosure of this information is critical to coordination between

⁵⁶ Powerex July 14, 2012 Answer (Powerex Answer) at 7.

balancing authority areas. Powerex proposes that CAISO should be required to post estimates of its modeling of unscheduled flows prior to the opening of CAISO's day-ahead market and to post its final results immediately after the results of the day-ahead market.

55. Powerex states that CAISO is incorrect that its proposal to file an informational filing in advance of implementation is consistent with prior procedure. Powerex notes that in approving CAISO's re-designed market structure, the Commission required CAISO to file a market readiness certification 60 days prior to implementation. Powerex also argues that contrary to CAISO's assertion, a WECC committee report did support Powerex's argument that CAISO was ignoring a major source of unscheduled flow by not taking area control error into account. Powerex states that the WECC report shows that area control error was a significant cause of unscheduled flow on the path studied.

4. Commission Determination

56. The Commission finds CAISO's proposed Full Network Model enhancement to be a just and reasonable enhancement of CAISO's modeling of its day-ahead and real-time markets. CAISO has proposed a forward-looking solution to its problems with unscheduled flows that will enhance its visibility of both day-ahead and real-time markets. CAISO's proposal will produce more accurate prices in the day-ahead market because CAISO would be able to better align its day-ahead forecast with expected real-time conditions; and therefore reduce unnecessary costs for market participants. CAISO's proposal also will enhance reliability by increasing CAISO's situational awareness and its ability to anticipate operational unscheduled flows.

57. While some commenters have argued that CAISO should delay implementation of these modeling enhancements to focus on a more regional solution, the Commission sees no reason why these concrete enhancements in modeling should be delayed for a hypothetical regional solution. These modeling enhancements, on their own, will improve the accuracy of CAISO's power flow modeling, pricing, and dispatch of resources. Thus, the Commission will accept CAISO's tariff provisions implementing its Full Network Model Enhancement, subject to certain conditions discussed below.

58. Several commenters argue that CAISO's filing does not do enough to ensure that its modeling will be sufficiently accurate to be effective prior to implementation. However, we find that CAISO has taken steps to ensure that the implemented modeling will be accurate. First, its pre-implementation plan will give CAISO the opportunity to demonstrate the accuracy of its modeling prior to implementation. CAISO has pledged to not implement its modeling of unscheduled flows if they are not able to produce accurate results. Second, CAISO's offer in its answer to implement an accuracy metric as a transitional measure will provide a further safeguard against inaccurate modeling once the consideration of unscheduled flows is implemented. CAISO has stated that its

accuracy metric will test the accuracy of its modeling of unscheduled flows and prevent the use of its unscheduled flow modeling during periods where that modeling is inaccurate.

59. We find that both of these steps should ensure that considered unscheduled flows produce a more accurate model of power flows in the day-ahead market. Thus, we direct CAISO to submit, in a compliance filing within 30 days of the date of this order, tariff revisions that include its offered accuracy metric, with detailed description of the proposed metric's characteristics. We also direct CAISO to file its offered informational report concerning its pre-implementation activities with the Commission prior to implementation.

60. We agree with CAISO that its accuracy metric need not be a permanent feature of the tariff. However, we direct CAISO to extend its proposal such that following the transitional period of one year after October 1, 2014, the mechanism will cease to be effective once the standard has been met for 12 consecutive months, rather than the six consecutive months that CAISO suggested in its answer. A 12-month requirement will provide a more robust basis to determine that CAISO's offered accuracy metric has performed consistently through a winter and a summer season before the feature expires. Much of commenters' concerns with CAISO's modeling come from CAISO's lack of experience with the new data and doubts about its ability to project unscheduled flows in the day-ahead market. To the extent CAISO is able to demonstrate consistently accurate performance over such a long period, CAISO's modeling of unscheduled flows should not be subject to more skepticism than any other feature of CAISO's market. Thus, we find that once the modeling meets this performance standard, the accuracy metric should be allowed to sunset.

61. Powerex raises a number of objections to CAISO's offered accuracy metric, and argues that CAISO should have developed its accuracy metric through a stakeholder process. First, we emphasize that CAISO has not filed a proposed accuracy metric with the Commission, it has only offered to develop one in its answer and has described the tentative outline of the proposal. The Commission cannot evaluate the specific technical elements of CAISO's accuracy metric until it is filed with the Commission as a complete proposal. When the accuracy metric is filed, parties will be free to object to specific elements of the proposal, including those that may have been previewed in CAISO's answer, and the Commission will evaluate the proposal at that time.

62. The Commission also finds that CAISO's proposal to provide it with discretion on how to use the data it receives through these enhancements to produce a model is just and reasonable, and we find that the level of detail in the tariff describing such discretion is appropriate. As CAISO explains, other ISOs and RTOs have similar discretion, and

CAISO has persuaded us that this discretion is warranted here.⁵⁷ Modeling the anticipated flows of electricity in the Full Network Model is a complex task and subject to changes as anticipated system conditions changes. Attempting to capture this nuance in the tariff may result in CAISO's modeling becoming overly rigid and ultimately less accurate. CAISO cites NYISO's tariff provision as an example of the discretion granted to other ISOs when modeling unscheduled flows. The Commission largely agrees with CAISO's assessment that NYISO's tariff allows a wide degree of discretion in modeling unscheduled flow. We agree with CAISO that further detail on its modeling constitute implementation details and are better left to its business practice manuals.⁵⁸

63. However, we do find that, with the wide degree of discretion we are granting here in the modeling of CAISO's system and the enforcement of physical flow constraints at the interties, additional transparency is needed. Section 6.5.10.1.5 of its tariff provides that CAISO will provide parties that have signed a non-disclosure agreement the hourly unscheduled flow at each intertie in the day-ahead and real-time market after the results of the respective markets are posted. As part of this report, CAISO should also include a summary of whether it enforced physical flow constraints on the interties pursuant to section 31.8.2 of its tariff, and, if it did not, a short description of the reasons for non-enforcement. CAISO should include this requirement in a tariff revision filed within 30 days from the date of this order.

64. We will not require the additional posting requirements requested by Powerex. We do not believe that such detailed modeling information is necessary for those bidding into CAISO's day-ahead market, nor is it necessary for proper coordination between balancing authority areas. As CAISO has emphasized, its modeling with respect to the day-ahead market will impact market prices in its own day-ahead market but does not constitute the imposition of new limits on available transmission capacity, nor does it constitute a de-rate of interties. Thus, we find that CAISO's current informational requirements with our additional requirement will adequately provide market participants with information on CAISO's modeling of physical flows.

65. Finally, we accept CAISO's ministerial tariff revisions as described in Attachment H to CAISO's transmittal.

⁵⁷ *See supra*, n.14.

⁵⁸ We clarify that our acceptance only extends to CAISO's filed proposal and tariff provisions and not elements marked "draft" that are awaiting the completion of a stakeholder process.

The Commission orders:

(A) CAISO's proposed tariff revisions are conditionally accepted, effective September 8, 2014 and October 1, 2014, as requested, subject to the submission of a compliance filing revising CAISO's proposed revised tariff provisions, as discussed in the body of this order and the filing of an informational report as discussed in the body of this order.

(B) Accordingly, CAISO is directed to submit compliance filings within 30 days of the date of this order, as discussed in the body of this order. CAISO is further directed to provide an informational report, prior to implementation of the tariff revisions, as discussed in the body of this order.

By the Commission.

(S E A L)

Kimberly D. Bose,
Secretary.