UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

Settlement Intervals and Shortage Pricing in Markets Operated by Regional Transmission Organizations and Independent System Operators	**))))**	**Docket No. RM15-24-000**

COMMENTS OF THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION

The California Independent System Operator Corporation ("CAISO") submits these comments in response to the above-referenced Notice of Proposed Rulemaking regarding price formation in markets operated by regional transmission organizations ("RTOs") and independent system operators ("ISOs").[1] The CAISO respectfully requests that the Commission consider these comments and take them into account in connection with the issuance of any final rule in this proceeding.

I. Executive Summary

The CAISO supports the Commission's objectives in developing and issuing the Price Formation NOPR. Wholesale electricity markets should establish prices that accurately reflect actual system conditions and provide appropriate incentives to market participants. These objectives inform the appropriate alignment of settlement intervals for energy and reserves. Meeting these objectives also supports the use of shortage pricing when there is an actual shortage of capacity available to the market to meet system needs. The

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[1] 152 FERC ¶ 61,218, 80 Fed. Reg. 58393-01 (2015) ("Price Formation NOPR" or "NOPR").

CAISO strongly believes, however, that unless the Commission clarifies certain aspects of the requirements proposed in the NOPR, ISOs and RTOs will be unable to assess their compliance with the specific requirements of the final rule.

The CAISO supports the general proposal in the NOPR that each ISO and RTO should settle energy transactions in its real-time markets at the same time interval it dispatches energy, settle operating reserves transactions in its real-time markets at the same time interval it prices operating reserves, and trigger shortage pricing for any dispatch interval during which a shortage of energy or operating reserves occurs. Based on the information provided in the NOPR, the CAISO believes its existing market design complies with the requirements proposed in the NOPR. For example, the enhancements the CAISO implemented in its real time market in 2014, which included a new fifteen minute market as part of the CAISO's efforts to comply with Order No. 764, aligned settlement of all internal and external transactions in the fifteen minute and five-minute markets and eliminated market inefficiencies that existed under the CAISO's prior hourly settlement structure for supply. Under the new market design, operating reserves procured in the real-time market are procured in the fifteen minute market and are settled based on ancillary services marginal prices cleared in the same fifteen minute interval.[2] This enhanced market design achieves the settlement interval objectives identified by the Commission in the

[22] It is important to note that, in the CAISO tariff, the term "Operating Reserves" is defined as non-spinning and spinning reserves and do not include regulating reserves. In footnote 6 of the Price Formation NOPR, the Commission suggests that in most markets operating reserves include regulation. That is not the case in the CAISO markets. However, for purposes of these comments the reference to operating reserves will include regulating reserves.

Price Formation NOPR. The CAISO also has Commission-approved shortage or scarcity pricing mechanisms for energy and ancillary services that are triggered if there are insufficient resources available to be dispatched to meet operational needs in the next applicable market interval.

To provide the specificity needed to ensure compliance with the proposed requirements, the CAISO requests that the Commission confirm the following as part of the issuance of any final rule:

- The proposed settlement interval requirements in the NOPR only apply to the settlement of supply and not to non-dispatchable demand[3] as the costs of complying with these directives for such demand would far outweigh any potential benefit;

- Using approved market mechanisms such as the CAISO's market rules that allow hourly block intertie bids for intertie resources that elect the same schedule for all 15-minute intervals of an hour is consistent with the proposed settlement interval requirements in the NOPR; and

- The requirement to trigger shortage pricing does not apply to the next market interval solely due to the CAISO's dispatch of previously procured regulation or operating reserves, as the deployment of these ancillary services does not itself indicate actual scarcity conditions provided there is a full recovery of the ancillary services in the next applicable market interval.

Without these clarifications, it would be difficult or impossible for ISOs and RTOs to comply with the NOPR if it is adopted as a final rule, and the cost of implementing the final rule would outweigh any benefits.

The proposed requirement that each ISO or RTO submit compliance filings within four months of the effective date of the final rule in this proceeding, will pose a significant hurdle if the Commission does not grant the clarifications requested herein and proposes changes that will require significant system and

[3] The requested clarification only applies to non-dispatchable demand and does not apply to dispatchable demand response resources that are settled the same as other supply resources.

tariff changes. Depending on the scope of the changes the Commission ultimately directs, the Commission may need to allow up to twelve months from the effective date of the final rule for each ISO or RTO to submit its compliance filing. Further, to the extent compliance with any aspect of the final rule requires modifications to market systems and software, each ISO or RTO also should be allowed to propose in that compliance filing an implementation schedule that reflects the challenges associated with developing, testing, and implementing a significant market software modification.

II. Background

In June 2014, the Commission initiated a proceeding in Docket No. AD14-14-000 to evaluate issues regarding price formation in the energy and ancillary services markets operated by ISOs and RTOs. Later in 2014, Commission staff convened technical workshops and issued reports on four general price formation issues: (1) use of uplift payments; (2) offer price mitigation and offer price caps; (3) scarcity and shortage pricing; and (4) operator actions that affect prices.[4]

In January 2015, the Commission issued a notice inviting comments on specific questions that arose during the price formation technical workshops. The CAISO, along with other commenters, filed comments on price formation issues including issues related to appropriate market settlement intervals and shortage pricing.[5]

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[4] Price Formation NOPR at PP 6, 12.

[5] *Id.* at P 13 and Appendix A.

On September 17, 2015, the Commission issued the Price Formation NOPR as "the first step to advancing the goals of the Commission's price formation proceeding" and to "address two existing practices that may fail to compensate resources at prices the value of the service resources provide to the system, thereby distorting price signals."[6] The Commission requested comments on each of the issues discussed below.

The Commission proposes to revise its regulations in two respects. First, the proposed rule would require each ISO and RTO to settle internal energy transactions in its real-time markets at the same time interval it dispatches energy and to settle internal operating reserves transactions in its real-time markets at the same time interval it prices operating reserves.[7] The NOPR proposes to require ISOs and RTOs to implement this proposal within twelve months after they submit their filings to comply with the final rule issued in this proceeding.[8] Second, the proposed rule would require each ISO and RTO to trigger shortage pricing for any dispatch interval during which a shortage of energy or operating reserves occurs.[9] The NOPR proposes to require that ISOs and RTOs implement the shortage pricing proposal within four months after they submit their filings to comply with the final rule issued in this proceeding.[10]

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6 *Id.* at PP 1, 7.

7 *Id.* at PP 34, 39.

8 *Id.* at P 38.

9 *Id.* at P 51.

10 *Id.* at P 54.

The NOPR requests comments on whether: (1) settlement reforms are appropriate for intertie transactions that are scheduled on intervals different from the intervals on which RTOs/ISOs dispatch internal real-time energy; (2) it is necessary to align the settlement interval for intertie transactions with external scheduling intervals, *i.e.*, fifteen minutes; and (3) the Commission should require RTOs/ISOs to settle all real-time operating reserves transactions at the same time interval as real-time energy dispatch and settlement intervals.[11]

Lastly, the NOPR contemplates that ISOs and RTOs would submit filings to comply with the final rule issued in this proceeding four months following the effective date of the final rule.[12]

III. Comments

A. Settling Internal Energy and Operating Reserves Transactions in RTO/ISO Real-Time Markets

1. The CAISO Supports the Commission's Proposal for Settling Internal Energy and Operating Reserves Transactions in RTO/ISO Real-Time Markets.

The Commission requested comments on its proposal to "require that each RTO/ISO settle energy transactions in its real-time markets at the same time interval it dispatches energy and settle operating reserves transactions in its real-time markets at the same time interval it prices operating reserves."[13]

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[11] *Id.* at PP 39-40.

[12] *Id.* at PP 55-56.

[13] *Id.* at P 34. The Commission explained that in the Price Formation NOPR it "sometimes uses the term 'dispatch' as shorthand when describing how RTOs/ISOs acquire and price energy and operating reserves." *Id.* at P 1 n.1. In this regard, the Commission clarified that its "proposal with respect to operating reserves refers to the intervals at which they are acquired and priced." *Id.*

The CAISO agrees that the proposed requirements would improve market efficiency. Accurate price signals provide market participants with incentives to develop needed capabilities and offer those capabilities into the market. Moreover, the CAISO concurs that where settlement and dispatch intervals are aligned, resources dispatched economically during high-priced periods should receive those high prices, thereby reducing the need to make uplift payments resulting from non-alignment of the settlement and dispatch intervals.[14]

The Commission suggests that this requirement would provide incentives to build or maintain resources that can respond to an energy or operating reserve deficiency.[15] The CAISO agrees that pricing in accordance with this proposal would provide some incentives to support infrastructure development, but believes that spot market prices alone may not provide sufficient signals to fully support investment in new resources. Nevertheless, coupling these prices with products that compensate resources for providing the flexibility needed by the market operator would provide an incentive for resources to improve the performance of their operational attributes, such as ramp rates.

The CAISO's real-time market provides for 15-minute and 5-minute settlement intervals. The real-time market calculates prices for 15-minute granularity schedules based on conditions 37.5 minutes prior to each interval and calculates 5-minute interval schedules based on conditions 7.5 minutes prior to each interval. These scheduling and settlement timeframes provide a dynamic

[14] *See id.* at P 35.

[15] *See id.*

pricing signal to reflect actual grid conditions. As noted in the Price Formation NOPR, the CAISO's existing market design settles internal energy transactions in the CAISO's real-time market at the same 5-minute interval it dispatches energy.[16] The CAISO's existing market design also settles internal operating reserves transactions in the CAISO's real-time market in the same 15-minute interval it prices operating reserves.[17]

The CAISO implemented these features of its real-time market enhancements as part of its efforts to comply with Order No. 764.[18] The Commission found that the CAISO had complied with Order No. 764 and accepted the enhancements in 2014.[19] As a result of these enhancements, the CAISO settles energy in the fifteen minute market at 15-minute prices and settles 5-minute dispatch energy is settled at 5-minute prices. Consistent with the

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16 *Id.* at P 15 & nn. 19-21 (citing CAISO tariff sections 11.5 and 34.5 and the CAISO tariff appendix A definition of "Settlement Interval"), P 60 n.82 (recognizing that the CAISO "currently align[s] real-time energy settlement with [its] dispatch intervals").

17 *See* CAISO tariff sections 34.4, 34.4.1. The Commission explained that "operating reserves refer to certain ancillary services procured in the wholesale market that have different definitions in each RTO/ISO," and that operating reserves typically include: (a) regulating reserve, used to account for very short-term deviations between supply and demand (*e.g.*, 4 to 6 seconds); (b) spinning reserve, which is capacity held in reserve and synchronized to the grid and able to respond within a relatively short amount of time (*e.g.*, within 10 minutes), to be used in case of a contingency, such as the loss of a generator; and (c) non-spinning reserve, which is capacity that is not synchronized to the grid and which can take longer to respond (*e.g.*, within 10-30 minutes) in case of a contingency. Price Formation NOPR at P 5 n.6. These three types of operating reserves (as defined by the Commission) correspond to (a) Regulation, (b) Spinning Reserve, and (c) Non-Spinning Reserve, as those types of ancillary services are defined in appendix A to the CAISO tariff.

18 *Integration of Variable Energy Resources,* Order No. 764, FERC Stats. & Regs. ¶ 31,331, *order on reh'g,* Order No. 764-A, 141 FERC ¶ 61,232 (2012), *order on reh'g,* Order No. 764-B, 144 FERC ¶ 61,222 (2013).

19 *See Cal. Indep. Sys. Operator Corp.*, 146 FERC ¶ 61,204, *order on compliance filing*, 148 FERC ¶ 61,023 (2014); Commission letter order, Docket No. ER14-480-002 (Nov. 13, 2014) (accepting compliance filing); *Cal. Indep. Sys. Operator Corp.*, 146 FERC ¶ 61,205 (2014); Commission letter order, Docket No. ER14-495-001 (July 31, 2014) (accepting compliance filing).

direction in the NOPR, these enhancements have resulted in shorter settlement intervals, as opposed to the hourly pricing that existed previously, and provide the market with greater flexibility and options for settling transactions. The CAISO optimizes the entire market in the 15-minute intervals. The CAISO market also provides three options for scheduling imports and exports hourly: (1) economic bid hourly block, (2) economic bid hourly block with a single intra-hour schedule change that will be dispatched to zero within the hour if a 15-minute price is less than an import's bid price or greater than an export's bid price, and (3) self-scheduled hourly. The hourly economic bids and self-schedules are cleared in the hour-ahead scheduling process run, which is one of the fifteen minute market intervals conducted more than one hour ahead of the trading hour and produces schedules approximately 45 minutes before the trading hour.[20]

Prior to implementing these enhancements, the CAISO markets included a different hour-ahead scheduling process with hourly pricing followed by the real-time market, resulting in different prices for settlement of internal and external resources. The CAISO's previous dual real-time market structure

[20] The current hour-ahead scheduling process 15-minute interval itself does not produce settlement prices for energy or ancillary services, and the CAISO settles all bids accepted through the hour-ahead scheduling process based on schedules and awards produced in the fifteen minute market. This is because all internal and external transactions are re-optimized in the fifteen minute market and the prices produced by the fifteen minute market reflect the actual cost of redispatch to accommodate the fixed hourly schedule. If the hourly economic intertie bids clear because they are economic, they will be paid or charged based on the 15-minute price. Hourly block self-schedules always clear unless there is insufficient available transmission and all self-schedules must be curtailed. The hourly amounts are recognized in the fifteen minute market through a constraint that sets the schedule at the amount scheduled in the hour-ahead scheduling process run for the entire hour, *i.e.*, the same MWh amounts are to be scheduled in each 15-minute interval.

resulted in revenue imbalances that necessitated uplift charges to demand.[21] The bifurcated settlement structure under the CAISO's prior hour-ahead scheduling process resulted in a range of inefficiencies, including the mismatch created when the CAISO's market systems bought or sold intertie energy on an hourly basis based on predicted prices and then sold or bought the same quantity back from internal generation at 5 minute prices.[22] These inefficiencies were eliminated when the CAISO moved to the fifteen minute market and the current enhanced real-time market. The CAISO believes that these changes resulted in a market design that aligns with the Commission's proposal. The CAISO requests that the Commission, in its final rule in this proceeding, state that market designs like the CAISO's that provide for granular dispatch and settlement of energy in the real-time market are consistent with the reforms proposed in the NOPR. To the extent that the Commission intends to require further changes to the CAISO's real-time market to comply with the final rule, the CAISO respectfully submits that the record in this proceeding does not support a finding that the CAISO's current real-time market – approved by the Commission only last year – is no longer just and reasonable.

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21 Specifically, the uplift took the form of real-time imbalance energy offset, which is a real-time neutrality account used to reconcile settlement dollar values for all real-time energy charge codes for all energy bought and sold in the real-time market to ensure that, after all payments and charges have been calculated, there is neither a shortage nor a surplus in revenue. Surpluses or shortages were allocated to scheduling coordinators based on a pro rata share of their measured demand (*i.e.*, metered load and exports).

22 This bifurcated settlement structure also made it profitable for market participants – individually and collectively – to submit virtual bids for supply on interties that were offset by virtual demand bids at locations within the CAISO balancing authority area.

2. It Is Not Appropriate to Alter the Settlement Interval for Intertie Transactions.

The NOPR's proposed settlement interval requirements only apply to internal transactions and expressly do not apply to intertie transactions.[23] The Commission seeks comments on "whether settlement reforms are appropriate for intertie transactions that are scheduled on intervals different from the intervals on which RTOs/ISOs dispatch internal real-time energy."[24] The Commission further clarified that it did not propose to "modify the scheduling requirements adopted in Order No. 764."[25] In Order No. 764, the Commission required each public utility transmission provider – including the CAISO – to revise its open access transmission tariff to give customers the option of using intra-hour transmission scheduling at 15-minute intervals.[26] The requirement to implement 15-minute scheduling only applied to intertie transactions in organized wholesale energy markets like the CAISO markets.[27]

When the CAISO modified its tariff to comply with the Commission's directives in Order No. 764, it also amended its tariff through a separate and related filing under Section 205 of the Federal Power Act to incorporate the alignment of dispatch and settlement of internal and external resources.[28] As

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[23] Price Formation NOPR at P 39 (stating that the proposal concerns "settlement of internal transactions" and that "the Commission does not propose to extend the [proposal] to intertie transactions").

[24] *Id.*

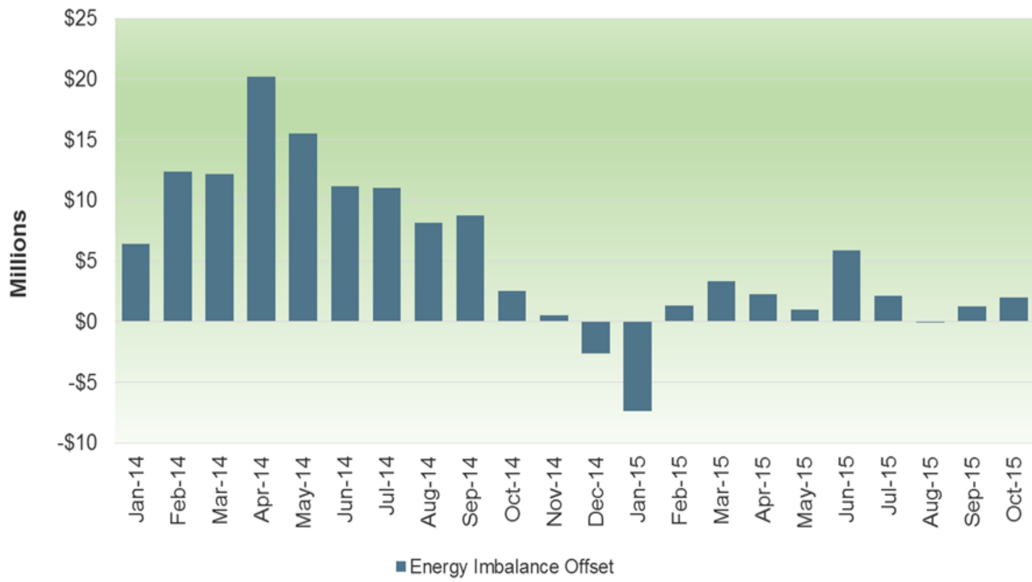
[25] *Id.* at P 39 n.55.

[26] Order No. 764, FERC Stats. & Regs. ¶ 31,331, at PP 97, 113, 373-74, Appendix B.

[27] *Id.* at P 113.

[28] *See supra* note 19 and accompanying text.

shown in the diagram below, the alignment of dispatch and settlement of internal and external transactions has resulted in a significant decline in real-time energy imbalance offset costs since the tariff revisions went into effect last year.



The CAISO does not believe any reforms are necessary with regard to the settlement of intertie transactions under the CAISO's current market design. As discussed above, the CAISO already schedules and settles intertie transactions and internal resources on 15-minute intervals. These scheduling and settlement timeframes provide a dynamic pricing signal to reflect grid conditions. Because intertie resources, with the exception of dynamically scheduled intertie resources, are not scheduled with 5-minute granularity, 15-minute scheduling and pricing enables the CAISO to price all resources, both internally and at the interties, on the same basis.[29]

Moreover, 15-minute schedules and prices provide variable energy resources an opportunity to schedule their output close to real-time but prior to the 5-minute market.[30] These scheduling timeframes also enable variable energy resources to earn revenues and benefit the system through downward economic dispatches from their 15-minute schedules in the 5-minute dispatch.

There is no justification for establishing additional requirements in the final rule that could change the CAISO's existing 15-minute settlement of intertie transactions. As the Commission recognized last year when it approved the CAISO's real-time market enhancements:

> CAISO's proposal to establish 15-minute scheduling and settlement for all transactions, both internal and at the interties, offers numerous benefits in addition to complying with the minimum requirements of Order No. 764. These benefits include: more efficient scheduling of all resources due to more granular forecasts and shortened lead times, consistent settlements of internal and intertie transactions in one market at one price, options for retaining hourly scheduling on the interties to avoid seams issues while other balancing authorities in the West transition to 15-minute scheduling, and more appropriate treatment of VERs [variable energy resources] than the existing participating intermittent resource program.
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[29] CAISO comments, Docket No. AD14-14-000, at 18 (Mar. 6, 2015).

[30] The CAISO notes that, when the Commission approved the CAISO's real-time market enhancements last year, it also approved "protective measures" that allow certain grandfathered variable energy resources to continue to benefit from legacy settlement rules for a period of up to three years. *Cal. Indep. Sys. Operator Corp.*, 146 FERC ¶ 61,204 at PP 77-80 (2014). The CAISO designed these measures to facilitate the transition to the new market rules, and the measures will expire by 2017.

> We find that the proposed market design should enhance price convergence between the markets due to the use of shorter lead times, more granular forecasts, and the elimination of the dual market settlement structure between the HASP [hour-ahead scheduling process] and real-time market.[31]

Given the numerous benefits of the CAISO's existing real-time market design, and its compliance with Order No. 764 (which the Commission intends to remain in effect), imposing additional settlement requirements for intertie transactions is unnecessary. In particular, a blanket requirement that the hourly intertie schedules revert to hourly pricing, as was previously the case under the CAISO's prior market design, would result in the same adverse market outcomes the CAISO resolved through its fifteen minute market enhancement. Such reversion and regression is not justified.

As part of the real-time market design enhancements approved by the Commission last year, CAISO market participants have the following six bidding and scheduling options for transactions on the interties: (1) self-scheduled hourly block; (2) self-scheduled variable energy resource forecast; (3) economic bid hourly block; (4) economic bid hourly block with a single intra-hour schedule change; (5) economic bid with participation in the fifteen minute market (which may or may not be linked to a variable energy resource forecast); and (6) dynamic transfer. These options allow market participants to transition to 15-minute scheduling, while continuing to provide options for hourly block bidding.

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[31] *Cal. Indep. Sys. Operator Corp.*, 146 FERC ¶ 61,204, at PP 53, 55. *See also id.* at PP 1-8, 15-25 (explaining why the CAISO proposed its enhanced real-time market design to address issues with the then-existing real-time market design and satisfy the requirements of Order No. 764).

In approving these options, the Commission noted that hourly block bidding for the interties would allow the CAISO to minimize seams with other balancing authority areas in the western United States.[32] It is important to note that the availability of hourly block intertie bidding options do not alter the fact that the CAISO dispatches and settles intertie transactions on a 15-minute basis (other than dynamically scheduled intertie resources, which are dispatched and settled on a 5-minute basis). Instead, this option allows market participants to elect the same intertie schedule for all 15-minute intervals of an hour. The Commission should therefore clarify in the final rule that the availability of hourly block intertie bidding options would not violate the settlement interval requirements of the NOPR. The Commission should also recognize that the CAISO's current market design is consistent with the goals and intent of the NOPR because it ensures all internal and external transactions are cleared and settled based on the fifteen minute market intervals that optimize all transactions in the CAISO markets.

The Commission "also seeks comment on whether it is necessary to align the settlement interval for intertie transactions with external scheduling intervals, *i.e.*, fifteen minutes."[33] As explained above, the CAISO's existing market design already includes a 15-minute settlement interval for intertie transactions, thus aligning both intervals. As discussed above, this alignment has proven to eliminate some of the inefficiencies previously observed in the CAISO markets.

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[32] *Id.* at P 53.

[33] Price Formation NOPR at P 39.

3. The CAISO Requests that the Commission Confirm that the Proposed Settlement Interval Requirements Only Concern the Settlement of Supply Resources, Not the Settlement of Non-Dispatchable Demand.

One of the key objectives of the Price Formation NOPR is to address "existing practices that may fail to compensate *resources* at prices that reflect the value of the *service* resources provide to the system, thereby distorting price signals."[34] The Commission uses the term resources throughout the Price Formation NOPR, suggesting that the proposed reforms are focused on supply.[35]

The CAISO understands that the proposed requirements in the NOPR apply to the settlement of supply resources, not the settlement of non-dispatchable demand.[36] There are numerous reasons why such demand should not be subject to the settlement interval requirements of the NOPR. Unlike supply, non-dispatchable demand does not provide a service to the CAISO market. Because such load itself is not dispatched, there is no dispatch interval to align its settlement with. Load is incurred and measured based on the metered amounts. The CAISO settles non-dispatchable demand on an hourly basis based on the load-weighted average price for the hour. This ensures that the price reflects the load incurred at the various intervals. Requiring a more incremental settlement of non-dispatchable demand would require significant additional costs to market participants in the form of new metering requirements

34 *Id.* at P 1 (emphasis added).

35 *See, e.g.*, *id.* at PP 2-5, 8-9, 15, 22, 27-32, 35-37.

36 In this context, the CAISO only seeks clarification that the proposed requirement does not apply to non-dispatchable demand and does not seek clarification with respect to dispatchable demand response resources that are settled the same as other supply resources.

and settlement systems. There is no record in this proceeding indicating that consumers would receive any benefit from applying the settlement interval requirements to non-dispatchable demand.

For all these reasons, the CAISO requests that the Commission clarify in the final rule that the settlement interval requirements do not apply to the settlement of non-dispatchable demand.

4. The CAISO Does Not Support Requiring RTOs/ISOs to Settle All Real-Time Operating Reserves Transactions at the Same Interval as Real-Time Energy Dispatch and Settlement Intervals.

The Commission "seeks comment on whether the Commission should require RTOs/ISOs to settle all real-time operating reserves transactions at the same time interval as real-time energy dispatch and settlement intervals or whether a settlement interval that differs from an RTO's/ISO's real-time energy dispatch interval would be appropriate for some operating reserves transactions."[37]

As explained above, the CAISO believes it is appropriate to maintain a 15-minute settlement interval for operating reserves transactions, which differs from the 5-minute real-time energy dispatch interval. The procurement of ancillary services in real-time, including operating reserves, constitutes a commitment of those ancillary services. Under the CAISO's market design, the CAISO operates a 15-minute market for energy that also commits internal generation and schedules intertie transactions and that aligns with real-time procurement of

[37] Price Formation NOPR at P 40.

ancillary services. It is appropriate to align the commitment of ancillary services with the commitment of internal generation and the scheduling of intertie transactions so that the market accurately reflects the overall amount of supply resources available to provide energy and ancillary services.[38]

B. The CAISO Supports the Commission's Proposal to Trigger Shortage Pricing for Any Dispatch Interval during Which a Shortage of Energy or Operating Reserves Occurs.

The Commission requested comments on its proposal to "require that RTOs/ISOs trigger shortage pricing for any dispatch interval during which a shortage of energy or operating reserves occurs," in lieu of triggering shortage pricing only for shortages that are due to certain causes or that exist for a certain amount of time.[39] The Commission explained that shortage pricing is triggered under two general scenarios: (1) "when the system operator does not have enough resources available to meet energy and operating reserve requirements"; and (2) "when an RTO or ISO establishes a price above which it will choose to be deficient of operating reserves rather than procure resources that may be available to meet the minimum requirement, but cost more than the established price."[40] The Commission's regulations define an operating reserve shortage as

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[38] If ancillary services are committed, it may be appropriate to resettle the ancillary services on a 5-minute basis. However, there is no need to make 5-minute resettlement mandatory.

[39] Price Formation NOPR at PP 46, 51. However, the Commission stated that it was "not at this time proposing to change the price paid by any RTO/ISO when it triggers shortage pricing." *Id.* at P 53.

[40] *Id.* at P 1 n.2.

"a period when the amount of available supply falls short of demand plus the operating reserve requirement."[41]

The CAISO agrees with the concept behind the Commission's proposal and supports its implementation, subject to certain necessary clarifications. The CAISO also concurs with the Commission's rationale that its proposal should ensure that a resource is compensated based on a price that reflects the value of the service the resource provides.[42]

First, the Commission explained that the general issues considered in its price formation proceeding include "scarcity and shortage pricing."[43] Although the Price Formation NOPR generally addresses "shortage pricing" rather than "scarcity pricing," the CAISO understands these terms to be interchangeable. The CAISO expects that its existing tariff provisions implementing scarcity pricing for energy and ancillary services already comply with the shortage pricing requirements of the NOPR.[44] The shortage pricing requirements proposed in the Price Formation NOPR should require the triggering of shortage pricing in the

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41 *Id.* at P 1 n.3 (quoting 18 C.F.R. § 35.28(b)(6)). The Commission does not propose to change this definition in the Price Formation NOPR.

42 *See* Price Formation NOPR at P 52.

43 *Id.* at P 12.

44 The CAISO tariff already includes pricing provisions to address shortages of energy and ancillary services, including the use of scarcity reserve demand curves for ancillary services and the triggering of price caps for energy with regard to scheduling and pricing parameters. See CAISO tariff sections 27.1.2, 27.4.3. In addition, by the end of 2015 the CAISO will begin its Stepped Transmission Constraint stakeholder initiative to consider whether the CAISO's transmission constraint parameter could be improved if the CAISO were to calibrate it to different levels depending on either the level of constraint relaxation, the voltage level of the constraint, or the system impact of the constraint. As part of that discussion, the CAISO and stakeholders may also consider the potential advantages and disadvantages of reducing the CAISO's $1,000/MWh price cap. See transmittal letter for CAISO tariff amendment to implement available balancing capacity mechanism in Energy Imbalance Market, Docket No. ER15-861-003, at 47 (Aug. 19, 2015).

event of an actual shortage. In any 15-minute interval of the fifteen minute market, the CAISO will co-optimize the procurement of energy or ancillary services based on submitted supply bids and the forecast of demand and its ancillary services requirements. In any given interval, if effective supply bids are insufficient to clear forecasted demand, scarcity pricing will trigger and thereby indicate a shortage of supply for that applicable interval. Similarly, if ancillary services bids are not sufficient to meet the ancillary services procurement target, ancillary services scarcity pricing will trigger for that interval. It is appropriate in such circumstances for the market to trigger shortage pricing for shortages resulting from an insufficiency of resources to meet operational needs (for energy or ancillary services). This approach ensures that any shortage pricing accurately reflects system conditions as opposed to creating prices based on a modeling error or some other artificial reason.

Within a 15-minute interval in which the CAISO clears energy and ancillary services, the CAISO may need to deploy operating reserves to address a contingency in the case of operating reserves, or in the case of regulation to continuously balance supply and demand. It is important that the final rule clarify that the deployment of operating reserves or regulation does not necessarily mean a shortage exists. The deployment of reserves is made through alternative deployment mechanisms and not in the co-optimization function of the market. The decision to deploy the resources is based on the criteria specified for their deployment and has nothing to do with whether or not there are sufficient supply bids to meet the demand and operating reserves requirements.

An example based on the deployment of operating reserves illustrates the need for this clarification. The CAISO establishes requirements for operating reserves heading into each operating hour. These requirements must, at a minimum, satisfy Western Electricity Coordinating Council ("WECC") reliability standard BAL-002-WECC-2 – Contingency Reserve. For purposes of this example, contingency reserves and operating reserves are synonymous. In the event of a contingency, the CAISO may dispatch energy from these operating reserves. Once dispatched, the WECC reliability standard allows the CAISO 60 minutes to fully recover its operating reserves. The CAISO, however, seeks to fully recover the operating reserves needed to meet its hourly requirements in advance of that time frame. When the CAISO seeks to replace contingency reserves that it has dispatched through real-time procurement and cannot obtain sufficient capacity, the CAISO market triggers scarcity pricing. The fifteen minute market in the next interval will attempt to procure the requisite operating reserves requirement and if there are insufficient ancillary services bids to serve those requirements, ancillary services scarcity pricing will trigger. Similarly, if there is an insufficiency of energy bids to cover the demand, energy shortage pricing will trigger. During each interval in which the resources were deployed, the system was not actually short of supply bids when the operating reserves for that interval were procured. The fact that there were operating reserves available to meet the contingency and address the issue means the system was not short of the reserves it procured to serve that process. Also, once the reserves are deployed, to the extent that the market allows for full recovery of the required reserves, the contingency event itself does not trigger scarcity pricing for ancillary services because there is no actual shortage of operating reserves unless there are insufficient resources to meet operational needs for operating reserves in the next applicable market interval.

Similarly, the CAISO procures and deploys regulation to match supply and demand on a real-time basis consistent with North American Electric Reliability Corporation ("NERC") and WECC reliability standards,[45] but any deployment of regulation alone does not indicate a shortage. As explained in the CAISO's technical bulletin on the use of regulation, the CAISO "procures Regulation for many reasons including load following, frequency response, Demand forecast inaccuracies, and market imbalance inaccuracies that occur between one Real Time Dispatch (RTD) period to the next. Through Automatic Generation Control, the ISO uses Regulation to balance all deviations continuously while the RTD corrects the 5 minute Energy imbalances."[46]

The CAISO continuously dispatches regulation to match supply with demand because actual real-time conditions vary within the 5-minute dispatch interval for energy. A shortage exists only when there are insufficient resources to meet operational needs for regulation in the next applicable market interval. For the reasons illustrated by these examples, the Commission should clarify in the final rule that deployment of ancillary services should not in and of itself be considered a condition that triggers shortage pricing.

[45] *See* CAISO tariff appendix A, definition of "Regulation".

[46] Technical bulletin, *AS Procurement – Regulation*, at 3 (Dec. 30, 2009), available on the CAISO website at www.caiso.com/Documents/TechnicalBulletin-ASProcurement-Regulation.pdf.

In any given market interval, if a shortage is observed, shortage pricing will trigger within that interval and the CAISO will not wait for the shortage to materialize beyond that interval before triggering shortage pricing. However, the CAISO does not believe all price signals triggered by "transient shortages" provide incentives to resources that have the capability to respond to brief-duration shortages. The energy prices, combined with well-tailored flexible resource adequacy requirements as well as real-time flexible ramping pricing, are also necessary to adequately compensate suppliers of such services.

The Price Formation NOPR references the comments filed by the New York Independent System Operator ("NYISO") in which the NYISO described its belief that all transient shortage events are indicative of actual system conditions and needs and it is therefore important to price such events and recognize the actual costs associated with the underlying shortage.[47] Based on its understanding of the NYISO's pricing of all scarcity events, the CAISO believes its scarcity pricing is aligned with the same principles and goals of the NYISO.

An important difference between the CAISO's current methodology for pricing energy shortages and the NYISO's is that that the CAISO does not have escalating prices based on the magnitude of the shortage events being priced. In its comments, the NYISO specifies that it seeks to properly balance pricing with event duration through the use of escalating prices for shortages and sub-hourly settlement intervals. The NYISO explains that this ensures that smaller magnitude shortage events are priced at lower levels than larger magnitude

[47] *See* Price Formation NOPR at P 42 & n.61.

shortages, while simultaneously ensuring that the pricing of shortage conditions properly reflects the value to the system of going short each product type.[48] The CAISO will be commencing a stakeholder process to consider whether graduated pricing approaches such at the NYISO's is more appropriate and understands that the prices when scarcity conditions are triggered is not within the scope of this Price Formation NOPR.

The Commission should clarify the statement in the NOPR that its proposal will ensure that resources have appropriate incentives to address energy or operating reserve shortages.[49] The Commission also states that the proposal "would further augment existing mechanisms in each RTO/ISO market that provide incentives to follow dispatch instructions, such as penalties for excessive or deficient energy and the allocation of commitment and dispatch costs to deviations from energy dispatch targets."[50]

As an initial matter, the CAISO notes that resources are already obligated to respond to dispatch instructions issued by their RTO/ISO.[51] The CAISO understands the NOPR to indicate that shortage pricing should be triggered so as to provide appropriate incentives for market participants to develop the capability to respond to an energy shortage. As noted above, the CAISO believes that spot market prices alone may not provide sufficient signals to fully

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48 NYISO comments, Docket No. AD14-14-000, at 28-29 (Mar. 6, 2015).

49 See Price Formation NOPR at P 52.

50 *Id.* at P 7 n.8.

51 For example, the CAISO's Rules of Conduct require market participants to comply with operating orders issued by the CAISO, which include dispatch instructions. CAISO tariff section 37.2.1.1. The Commission enforces this Rule of Conduct. CAISO tariff section 37.8.2.

support investments in new resources, but these prices can provide an incentive for resources to improve their operational attributes such as their ramp rates.

C. The Commission Should Allow ISOs and RTOs at Least Twelve Months to Submit a Filing in Compliance With the Final Rule and Allow ISOs and RTOs to Propose an Appropriate Implementation Schedule.

The Commission requested comments on its proposal that RTOs/ISOs submit filings to comply with the final rule issued in this proceeding four months following the effective date of the final rule.[52] The Commission also requested comments on the proposal that ISOs and RTOs implement the proposed settlement interval requirements within twelve months of submittal of their compliance filings and to implement the proposed shortage pricing requirements within four months of submittal of their compliance filings.[53]

The CAISO believes the proposed requirement that each ISO or RTO submit compliance filings within four months of the effective date of the final rule in this proceeding will not allow sufficient time for ISOs and RTOs to take the multiple steps needed to develop and submit a meaningful compliance filing.

If the Commission does not grant all the clarifications the CAISO requests, the CAISO will require additional time to consider how its systems would need to evolve to meet the Commission's directives. This may require significant changes to the CAISO systems. Additional time will then be needed to develop implementing tariff language and the supporting filing.

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[52] Price Formation NOPR at PP 55-56.

[53] *Id.* at P 38.

To allow time for these steps, the CAISO respectfully requests that the Commission permit twelve months from the effective date of the final rule for each ISO or RTO to submit its compliance filing.

As explained above, the CAISO believes it already complies with the requirements proposed in the NOPR. The additional detail and clarity requested in these comments is needed for the CAISO to fully assess its compliance with the final rule.

It is also important that the Commission consider that, to the extent compliance with any aspect of the final rule requires any modifications to market systems and software, the CAISO will require additional time after submitting its compliance filing to ensure it can reliably implement the requested changes. Therefore, the final rule should allow each ISO or RTO to determine what steps and timeline will be needed to develop, test, and implement any significant market systems or software modifications. The CAISO has, in recent years, implemented one annual market software release in the fall of each year for all significant market enhancements. The CAISO requests that the final rule provide sufficient flexibility for the CAISO to align its implementation schedule with this practice. This will allow for an orderly, efficient, and effective implementation of any market enhancements.

IV. Conclusion

The CAISO respectfully requests that the Commission consider these comments and issue a final rule in this proceeding that includes the clarifications and modifications identified in these comments.

Respectfully submitted,

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