

150 FERC ¶ 61,056  
UNITED STATES OF AMERICA  
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Cheryl A. LaFleur, Chairman;  
Philip D. Moeller, Tony Clark,  
Norman C. Bay, and Colette D. Honorable.

California Independent System Operator Corporation      Docket No. ER15-554-000

ORDER ACCEPTING TARIFF REVISIONS

(Issued January 30, 2015)

1. On December 2, 2014, the California Independent System Operator Corporation (CAISO) filed tariff revisions concerning its frequency regulation market design to (1) modify the monthly accuracy calculation for regulation resources from a simple average of accuracy measurements in 15-minute intervals to a weighted average of those measurements based on instructed mileage and (2) reduce the minimum performance threshold for regulation resources from a monthly accuracy measurement of 50 percent to 25 percent. The proposed tariff revisions are accepted, effective January 1, 2015, as requested. We also require CAISO to file informational reports no later than 18 months and 36 months from the effective date of the proposed tariff revisions, as discussed herein.

**I. Background**

2. In Order No. 755, the Commission required regional transmission organizations (RTOs) and independent system operators (ISOs) to revise their tariffs to compensate frequency regulation resources based on the actual service provided using a two-part, market-based payment system, and to account for a resource's accuracy in its compensation.<sup>1</sup> As part of its Order No. 755 compliance filing, CAISO proposed tariff revisions to incorporate a minimum performance threshold for resources providing

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<sup>1</sup> *Frequency Regulation Compensation in the Organized Wholesale Power Markets*, Order No. 755, FERC Stats. & Regs. ¶ 31,324 (2011), *reh'g denied*, Order No. 755-A, 138 FERC ¶ 61,123 (2012). As explained in Order No. 755, frequency regulation service “is the injection or withdrawal of real power by facilities capable of responding appropriately to a transmission system operator’s automatic generator control . . . signal.” Order No. 755, FERC Stats. & Regs. ¶ 31,324 at P 4.

regulation service to enhance its frequency regulation market design.<sup>2</sup> Under the proposal, CAISO would measure a resource's accuracy by sending control signals in four-second increments and averaging a resource's responses to those signals over 15-minute intervals during the calendar month. CAISO proposed requiring regulation resources to meet a minimum performance threshold of 50 percent accuracy each month for the resource to remain eligible to offer regulation services into the CAISO market. If a resource failed the minimum performance threshold, CAISO proposed requiring the resource to be recertified within 90 days from the date that CAISO provided notice of the resource's failure.

3. On September 20, 2012, the Commission conditionally accepted CAISO's Order No. 755 market design.<sup>3</sup> In the Order No. 755 Compliance Order, the Commission directed CAISO to conduct an operational review based on one year of data after the proposal's implementation. The Commission found that the review, among other things, should evaluate the appropriateness of the minimum performance threshold, and propose any software or market rule changes that are appropriate as a result of the review.<sup>4</sup> The Commission also provided specific direction to CAISO to file an informational report based on the operational review within 14 months of the effective date of the proposed tariff provisions.

4. Prior to completing this operational review, CAISO discovered that many resources certified to provide regulation service in CAISO's market had not met the 50 percent minimum performance threshold for at least one month. On January 10, 2014, CAISO requested a limited waiver of its tariff provisions requiring the minimum performance threshold until December 31, 2014, to avoid the market disruption that might occur if it required all resources that did not meet the threshold to recertify before providing regulation service or face disqualification. On May 19, 2014, the Commission granted CAISO's request for waiver.<sup>5</sup>

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<sup>2</sup> Order No. 755 did not require RTOs/ISOs to implement a minimum performance threshold.

<sup>3</sup> *Cal. Indep. Sys. Operator Corp.*, 140 FERC ¶ 61,206 (2012) (Order No. 755 Compliance Order), *additional order on compliance*, 142 FERC ¶ 61,233 (2013).

<sup>4</sup> Order No. 755 Compliance Order, 140 FERC ¶ 61,206 at P 75.

<sup>5</sup> *Cal. Indep. Sys. Operator Corp.*, 147 FERC ¶ 61,132 (2014).

5. On August 1, 2014, CAISO submitted its informational report to the Commission.<sup>6</sup> Based on its review and assessment of one year of operational data from June 1, 2013 through May 31, 2014, CAISO stated that resources providing regulation performed below the 50 percent minimum performance threshold in multiple calendar months during the first year of the Order No. 755 market design. Of the more than 90 resources providing regulation during the first year of operation, CAISO stated that every resource failed the minimum performance threshold for regulation up or regulation down in at least one calendar month.<sup>7</sup> CAISO also stated that it discovered that the resources' control and communications systems face challenges to accurately respond in each four second interval. According to CAISO, some scheduling coordinators reported physical and control limitations designed for safety purposes that caused delays in responding to CAISO's control signal, while others identified latency associated with the communication time of the control signal.<sup>8</sup> After collecting one year of operational data, CAISO stated it initiated a stakeholder process in September 2014 to examine potential changes to its Order No. 755 market design.

## II. Proposed Tariff Amendments

6. In the instant filing, CAISO proposes to revise tariff section 8.2.3.1.1 to state that, for purposes of the minimum performance threshold, it will use a monthly accuracy measurement that reflects a weighted average of 15-minute accuracy measurements, using instructed mileage<sup>9</sup> as the weight. CAISO states that it believes use of a weighted average is more appropriate for a minimum performance threshold because a simple average assumes the same reliability service for performance in intervals with lower instructed mileage as for performance in intervals with higher instructed mileage. CAISO states that the fact that higher instructed mileage occurs in a 15-minute interval

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<sup>6</sup> CAISO, *Report on CAISO 755 Market Design*, Docket Nos. ER12-1630 and ER14-971 (Aug. 1, 2014) (CAISO Report).

<sup>7</sup> CAISO Transmittal at 4; *see also* CAISO Report at 7-8.

<sup>8</sup> CAISO Transmittal at 5; *see also* CAISO Report at 8-9.

<sup>9</sup> CAISO has previously defined instructed mileage in this context as “the absolute change in automated generation control (AGC) set points between four-second intervals.” CAISO, *Pay for Performance Regulation (FERC Order 755)* (Feb. 2013), available at [http://www.aiso.com/Documents/Pay%2DPerformanceRegulationFERC\\_Order755Presentation.pdf](http://www.aiso.com/Documents/Pay%2DPerformanceRegulationFERC_Order755Presentation.pdf).

may be evidence of a greater reliability need because the CAISO Energy Management System (EMS) control signal is asking the resource to move a greater distance, and likely more frequently, from the resource's initial regulation point. According to CAISO, for resources that have limitations in responding to each four-second control signal, large movements in a sustained direction over multiple four-second intervals may increase their accuracy score. However, based on a representative sample of resources providing regulation service between June 1, 2013 and May 31, 2014, CAISO asserts that using a weighted average would have resulted in a six to eight percent improvement in the accuracy measurements for the sampled resources providing regulation during this period.<sup>10</sup> CAISO also maintains that stakeholders broadly support changing the monthly accuracy calculation from a simple average to a weighted average based upon a resource's instructed mileage.<sup>11</sup>

7. CAISO also proposes to modify tariff sections 8.2.3.1.1 and 8.4.1.1(h) to change the minimum performance threshold from 50 percent to 25 percent, and also modify Appendix K of its tariff, to establish a 25 percent accuracy requirement for resource certifications. CAISO states that maintaining the 50 percent threshold is not necessary to ensure reliable operations because balancing authorities do not need to instantaneously correct Area Control Error in each four-second interval. CAISO states that it monitors Area Control Error over multiple regulation intervals and over each five-minute dispatch interval to keep the value within certain limits to maintain the frequency of the interconnection. According to CAISO, a resource's performance over these multiple intervals is more important for purposes of maintaining reliability than the resource's performance over an individual four-second interval.

8. CAISO states that it tracked regulation performance by the following resource types: combined cycle, generator turbine, hydro pump turbine, hydro turbine, limited energy storage resource and steam turbine.<sup>12</sup> CAISO contends that reducing the minimum performance threshold from 50 percent to 25 percent is appropriate and necessary given that most, if not all, resources currently certified to provide regulation have failed, and likely will continue to fail a 50 percent minimum performance threshold.<sup>13</sup> CAISO also states that lowering the threshold will not alter its ability to

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<sup>10</sup> CAISO Transmittal at 5-6.

<sup>11</sup> *Id.* at 10.

<sup>12</sup> *Id.* at 4. CAISO states that the level of performance did not vary significantly based on the resource type. *See also* CAISO Report at 8.

<sup>13</sup> CAISO Transmittal at 7.

reliably operate the grid, but only establishes the threshold at which resources would need to undertake a recertification of their regulation capacity. Based on historical performance, CAISO asserts that the majority of resources offering regulation capacity into the CAISO market will not need to recertify based on a 25 percent minimum performance threshold. CAISO states that as the regulation fleet changes over time, it may be appropriate to reconsider the threshold as emerging technologies, such as energy storage, develop and participate as resources on the CAISO grid.<sup>14</sup>

9. CAISO further explains that reducing the minimum performance threshold to 25 percent will allow it to avoid potential market disruption. For instance, CAISO states that if some resource operators do not meet the 50 percent threshold and decline to recertify their regulation capacity due to business disruption, the fleet of resources offering regulation would be reduced, which could result in insufficient regulation capacity.<sup>15</sup> Moreover, CAISO notes that repeatedly undertaking a large recertification effort would be unduly burdensome. CAISO notes that, under a 50 percent minimum performance threshold, approximately 40 resources would have needed to recertify to provide regulation up and approximately 20 resources would have needed to recertify to provide regulation down.<sup>16</sup>

### **III. Notice of Filing and Responsive Pleadings**

10. Notice of CAISO's proposed tariff revisions were published in the *Federal Register*, 79 Fed. Reg. 73,059 (2014), with protests or motions to intervene due on or before December 23, 2014. Timely motions to intervene were filed by Southern California Edison Company; the City of Santa Clara, California; Modesto Irrigation District; the NRG Companies;<sup>17</sup> Northern California Power Agency; the California Department of Water Resources State Water Project; Exelon Corporation; and Pacific Gas and Electric Company. No protests or adverse comments were filed.

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<sup>14</sup> *Id.*

<sup>15</sup> *Id.* at 8.

<sup>16</sup> *Id.* at 10.

<sup>17</sup> For purposes of this proceeding, the NRG Companies are NRG Power Marketing LLC; GenOn Energy Management, LLC; Cabrillo Power I LLC; Cabrillo Power II LLC; El Segundo Power LLC; NRG Delta LLC; NRG Marsh Landing LLC; NRG California South LP; High Plains Ranch II, LLC; Long Beach Generation LLC; NRG Solar Alpine LLC; NRG Solar Borrego I LLC; NRG Solar Blythe LLC; NRG Solar Roadrunner LLC; and Avenal Solar Holdings LLC.

#### IV. Discussion

##### A. Procedural Matters

11. Pursuant to Rule 214 of the Commission's Rules of Practice and Procedure, 18 C.F.R. § 385.214 (2014), the timely, unopposed motions to intervene serve to make the entities that filed them parties to the proceeding.

##### B. Determination

12. In the Order No. 755 Compliance Order, the Commission directed CAISO to conduct an operational review of, among other things, the appropriateness of the minimum performance threshold based on one year of data and to file an informational report based on this operational review within 14 months of its implementation. In May 2014, the Commission also granted CAISO's request for waiver of the minimum performance threshold tariff provisions through December 31, 2014, in order to allow CAISO to continue its investigation into the efficacy of the threshold and propose any necessary modifications to its tariff with the Commission in a timely manner. Here, based on its investigation, CAISO proposes to refine resource accuracy measurements and the minimum performance threshold to more closely align with both operational realities and existing resource capability. We accept CAISO's proposed tariff revisions, effective January 1, 2015, as discussed below.

13. We agree with CAISO that use of a weighted average of 15-minute accuracy measurements is more appropriate for its minimum performance threshold than a simple average because it more accurately reflects the ability of existing resources to respond to CAISO EMS control signals. For example, CAISO has highlighted the operational limitations faced by scheduling coordinators in its balancing authority area in responding to control signals.<sup>18</sup> Moreover, we find that CAISO has demonstrated that the weighted average method more accurately accounts for a resource's performance when there is an increased need for regulation services.<sup>19</sup> We agree that adopting this method will better allow resources that respond accurately in intervals with higher instructed mileage to meet the minimum performance threshold. We also note that, according to CAISO, stakeholders broadly support this proposed revision and that no protests or adverse comments were filed regarding this tariff amendment.

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<sup>18</sup> CAISO Transmittal at 4-5.

<sup>19</sup> *Id.* at 6. CAISO examined the effect of adopting the weighted average method on a representative sample of resources providing regulation between June 1, 2013 and May 31, 2014, and found that the change resulted in an a range of six to eight percent accuracy improvement of the sampled resources.

14. We also find that CAISO's proposal to reduce the minimum performance threshold from 50 percent to 25 percent is just and reasonable. The Commission found that it was prudent that CAISO conduct an operational review based on one year of data in order to evaluate the appropriateness of the minimum performance threshold,<sup>20</sup> and CAISO has conducted this assessment.<sup>21</sup> We are persuaded by CAISO's argument that enforcing the minimum performance threshold for its regulation fleet at the current level and requiring recertification of a large number of resources could cause operational disruption. Based on CAISO's data for June 2014, for instance, approximately 76 percent of resources that would have needed to recertify under the 50 percent threshold would not need to recertify under the 25 percent threshold proposed here.<sup>22</sup> However, CAISO maintains that it is not experiencing reliability issues as a result of the current performance of its fleet of resources providing regulation service. We agree with CAISO that, given the existing limitations on the current fleet of resources providing regulation service, it is just and reasonable to modify the threshold in an effort to avoid the unnecessary disqualification of a large number of current resources.

15. We also find good cause to grant waiver of the 60-day prior notice requirement, under 18 C.F.R. § 35.11 (2014), in order to allow the proposed tariff revisions to go into effect on January 1, 2015. CAISO states that this effective date coincides with the expiration of a waiver granted by the Commission relieving CAISO from enforcement of its minimum performance threshold, and accordingly, will provide certainty to market participants that the minimum performance threshold remains consistent.

16. However, we note that maintaining a reduced minimum performance threshold based on the limitations of current resources for an extended period of time may not account for the potential entrance of faster-responding technologies into CAISO's regulation market in the future. Therefore, consistent with CAISO's commitment in its filing,<sup>23</sup> we will require CAISO to file an informational report to review the minimum performance threshold no later than 18 months from January 1, 2015.<sup>24</sup> Consistent with the analysis provided in CAISO's recent report on its Order No. 755 market design, the informational report should evaluate the appropriateness of the minimum performance threshold, as revised here, considering the accuracy of resources providing regulation

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<sup>20</sup> See *Cal. Indep. Sys. Operator Corp.*, 140 FERC ¶ 61,206, at P 75 (2012).

<sup>21</sup> See CAISO Report at 6-11.

<sup>22</sup> CAISO Transmittal at 10.

<sup>23</sup> *Id.*

<sup>24</sup> This report will not be noticed for comment or require Commission action.

capacity based on historical data. The informational report should include a study of how resources' accuracy measurements changed as the minimum performance threshold was reduced from 50 percent to 25 percent, while also taking into consideration the level of recertification that would be needed at various threshold percentage levels, and any other analysis CAISO deems appropriate. Further, CAISO offers to evaluate the performance of new technologies that CAISO expects to join its regulation fleet over the next few years. Because the data collected for the initial informational report to be filed no later than 18 months from January 1, 2015 may not be ripe in considering emerging technologies, we will also require CAISO to file a second, subsequent informational report no later than 36 months from January 1, 2015.<sup>25</sup> The second informational report should include an analysis of how the entrance of new and faster-responding technologies potentially influenced overall resource accuracy measurements in CAISO's regulation market.

The Commission orders:

(A) CAISO's proposed tariff revisions are hereby accepted, effective January 1, 2015, as discussed in the body of this order.

(B) CAISO's request for waiver of the prior notice requirement is hereby granted, as discussed in the body of this order.

(C) CAISO is hereby directed to file an informational report reviewing the minimum performance threshold no later than 18 months from January 1, 2015 in Docket No. ER15-554-000, as discussed in the body of this order.

(D) CAISO is hereby directed to file a second, subsequent informational report reviewing the entrance of new and faster-responding technologies in its regulation market no later than 36 months from January 1, 2015 in Docket No. ER15-554-000, as discussed in the body of this order.

By the Commission.

( S E A L )

Kimberly D. Bose,  
Secretary.

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<sup>25</sup> This report will not be noticed for comment or require Commission action.