

**THE UNITED STATES OF AMERICA  
BEFORE THE  
FEDERAL ENERGY REGULATORY COMMISSION**

**California Independent System            )**  
**Operator Corporation                    )**     **Docket No. ER00-\_\_\_\_ - \_\_\_\_**  
**)**

**Declaration of Kellan Fluckiger**

1           State of California    )  
2    )  
3           City of Folsom        )

4           I, Kellan Fluckiger, declare as follows:

5           1. My name is Kellan Fluckiger and I am the Chief Operations Officer for  
6 the California Independent System Operator Corporation (“ISO”). My business  
7 address is 151 Blue Ravine Road, Folsom, CA 95360. As the Chief Operations  
8 Officer, I am responsible for all aspects of ISO markets and operations, such as  
9 Dispatching, scheduling, operations engineering, market operations, system  
10 planning and outage coordination.

11          2. The purpose of this affidavit is to discuss the benefits that the ISO  
12 hopes to achieve by revising the manner in which resources participating in the  
13 ISO’s Imbalance Energy market are Dispatched and the manner in which  
14 obligations in that market are settled.<sup>1</sup> The ISO proposes to Dispatch those  
15 resources every ten minutes and also to settle Market Participants’ obligations  
16 with respect to the sale and purchase of Imbalance Energy on the same basis.  
17 The adoption of ten-minute markets for the Dispatch and settlement of  
18 Imbalance Energy is consistent with the original design of the ISO’s Imbalance

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<sup>1</sup> In this affidavit, I use capitalized terms as they are defined in the Master Definitions Supplement to the ISO Tariff.

1 Energy market, which was modified to overcome software limitations at the  
2 commencement of operations. I will also describe the ISO's considerations of  
3 the principal objections to the ten-minute market proposal and to certain  
4 alternatives that were proposed by stakeholders during the course of the ISO's  
5 discussion of the proposal with them.

## 6 **Background**

7 3. The ISO administers an Imbalance Energy market for the principal  
8 purpose of facilitating "Load following." That is, the Imbalance Energy market  
9 provides a means for Scheduling Coordinators to obtain the Energy required to  
10 serve Load in excess of the Load reflected in their final Schedules and, when  
11 they have surplus Energy after satisfying their Loads, to make that Energy  
12 available for purchase by other Scheduling Coordinators. From the standpoint  
13 of the ISO, a well-functioning Imbalance Energy market enables the ISO to meet  
14 its obligation as Control Area operator to match Loads and Generation on a  
15 continuous and reliable basis.

16 4. Under the original design for the ISO's Imbalance Energy market, it  
17 was intended that the ISO would issue Dispatch instructions to resources for  
18 each five-minute interval, based on the Energy bids it received in connection  
19 with Ancillary Service capacity and Supplemental Energy bids. Resources that  
20 produced unscheduled Energy in that interval would be paid the marginal  
21 clearing price, determined for each of these intervals. In this way, Scheduling  
22 Coordinators would have the incentive to deliver the Energy instructed by the  
23 ISO in its Dispatch instructions in the specific Dispatch interval for which the ISO  
24 needs the Energy. By the same token, any Scheduling Coordinator would be

1 free to sell excess Energy to the ISO and would receive a price reflecting the  
2 value of the Energy in the Dispatch interval in which it was delivered.

3 5. Software development problems, however, made it impossible for the  
4 ISO to implement five-minute Dispatch and settlement for Imbalance Energy at  
5 start-up. Instead, as modified by Amendment No. 6, the price paid for *Instructed*  
6 Imbalance Energy (i.e., real-time changes in output pursuant to Dispatch  
7 instructions from the ISO) was set to ten minutes while uninstructed deviations  
8 from Schedules would be paid hourly, based on the weighted average of the  
9 prices paid or charged to resources that are instructed during the hour's six ten-  
10 minute Dispatch intervals (called "BEEP Intervals" in reference to the ISO's  
11 Balancing Energy and Ex Post price software). Thus, while an instruction issued  
12 by the ISO for the delivery of Energy (in accordance with a Scheduling  
13 Coordinator's bid) was paid a ten-minute interval price (i.e., the BEEP Interval Ex  
14 Post Price), any uninstructed deviations were settled over the course of the  
15 hour. In effect, this allowed a Scheduling Coordinator to satisfy ISO instructions  
16 in the first or second BEEP Interval of an hour.

17 6. Also, while the ISO has the capability to issue Dispatch instructions to  
18 most resources supplying Imbalance Energy every ten minutes, calling upon  
19 them to adjust their output as the ISO's needs for Imbalance Energy increase or  
20 decrease, certain Imbalance Energy resources are less flexible. In particular,  
21 resources that are located outside of the ISO's Control Area, and which  
22 therefore must deliver Imbalance Energy over the inter-area ties, are pre-  
23 Dispatched before the start of the operating hour. This practice, which was  
24 adopted to conform to existing practices regarding inter-Control Area Energy

1 transactions, means that once an import of Imbalance Energy is Dispatched at  
2 the start of an hour, its output will not be reduced if the ISO's need for Imbalance  
3 Energy declines during the course of the hour. In addition, the ISO agreed to  
4 treat resources inside the Control Area that indicated a need (e.g., minimum run  
5 times on gas turbines) in a similar manner. That is, once Dispatched they would  
6 be left on for the hour.

### 7 **Problems Created by the Current Approach**

8 7. Based on the ISO's experience over the past two years, the current  
9 approach to the settlement of Imbalance Energy market obligations creates a  
10 number of serious problems, affecting both the efficiency of the Imbalance  
11 Energy market and the ability of the ISO to rely on that market as a tool to follow  
12 Load and thereby maintain reliability.

13 8. First, the hourly settlement of uninstructed deviations leaves  
14 Scheduling Coordinators with little or no incentive to deliver Energy in the  
15 specific BEEP (or ten-minute) Interval in which the ISO has a need for Imbalance  
16 Energy. As a result, the Imbalance Energy market fails to fulfill the Load  
17 following function for which it was designed. This has several adverse  
18 consequences:

- 19 • Because the ISO cannot rely on the Imbalance Energy market for  
20 Load following, it must increase the amount of Regulation capacity it  
21 acquires, so it can use that capacity to follow Loads as they change  
22 within an hour. This is not the intended purpose (or the historical use)  
23 of Regulation service. Regulation service is intended to respond to  
24 the moment-to-moment changes in system frequency, tieline loading

1 or both so as to maintain target system frequency and interchange.  
2 Using Regulation for Load following is highly inefficient, as it  
3 substitutes high-priced resources controlled via Automatic Generation  
4 Control for resources that can be Dispatched on a ten-minute basis. A  
5 substantial portion of the ISO's increased requirements for Regulation  
6 (compared to the quantities of Regulation that were required by the  
7 vertically integrated utilities before the initiation of ISO operations) and  
8 the associated increase in Ancillary Service costs are attributable to  
9 the ISO's inability to rely on the Imbalance Energy market for Load  
10 following. Currently, the ISO must procure an amount of Regulation  
11 that is between 5-12% of Load, whereas historically, the utilities that  
12 operated the principal California Control Areas procured Regulation  
13 equal to around 1.5% of their respective Loads. The implementation  
14 of ten-minute settlement and Dispatch will create a more efficient  
15 Imbalance Energy market that will serve the Load following function.

- 16 • As I noted earlier, the ISO intended to rely on the Imbalance Energy  
17 market to meet its obligation to match Loads and resources within the  
18 Control Area in accordance with the standards specified by North  
19 American Electric Reliability Council ("NERC") and the Western  
20 Systems Coordinating Council ("WSCC"). The ISO currently meets  
21 the NERC requirements, as measured by the Control Performance  
22 Standards (CPS1 and CPS2) that measure the Control Area's average  
23 Area Control Error against established benchmarks. However, it must  
24 rely on Regulation to an undue extent in order to do so.

1           9. Second, the use of a single hourly price for deviations from Schedules  
2 reduces the incentive for Scheduling Coordinators to submit bids in the ISO's  
3 Imbalance Energy market. A Scheduling Coordinator that expects to have  
4 excess Energy in real time can earn approximately the same payments for  
5 uninstructed deviations (i.e., excess generation) that it would earn by submitting  
6 bids and responding to the ISO's Dispatch instructions. Moreover, because the  
7 hourly price is influenced by the instructed price in each BEEP Interval, a high  
8 instructed price early in the hour sends a signal to Market Participants that there  
9 may be a high hourly price for uninstructed deviations, giving Market  
10 Participants the incentive to overgenerate later in the hour, when the ISO's need  
11 for the Energy may be diminished.

12           10. Third, because Market Participants receive an hourly price for  
13 uninstructed deviations, which can differ from the value of the Energy during the  
14 particular BEEP Interval in which it is supplied, they are encouraged to supply  
15 additional Energy when the ISO may not need it. The ISO's Imbalance Energy  
16 market should encourage Market Participants to supply additional Energy in  
17 response to price signals that reflect the ISO's need for Energy during the BEEP  
18 Interval when the Energy is supplied, but, as currently structured, it does not do  
19 so.

20           11. Fourth, this problem is exacerbated during some hours, when the  
21 ISO experiences a "stuck price." This occurs when the ISO Dispatches a  
22 Supplemental Energy bid from resources outside the ISO Control Area. As I  
23 noted earlier, these are pre-Dispatched and generally are not subject to  
24 adjustment during the hour. As a result, if the ISO's need for Imbalance Energy

1 declines during the hour, the price for incremental Energy remains “stuck” at the  
2 bid associated with the import, even though less costly resources would be  
3 sufficient to meet the ISO’s needs during the latter parts of the hour. This tends  
4 to inflate the hourly price for Imbalance Energy, encouraging more uninstructed  
5 generation, as Market Participants seek to receive the artificially high price. On  
6 average, the ISO experiences a stuck price approximately 3 to 5 hours each day.

7       12. Fifth, because of the lack of incentives for Market Participants to  
8 deliver Energy in the BEEP Interval for which the ISO has instructed its delivery,  
9 Market Participants often do not respond to those instructions. The ISO often  
10 must call on bids representing two to seven times as much Energy as is required  
11 to resolve a system imbalance to obtain the necessary response, requiring the  
12 ISO to call on resources with higher bids and thereby increasing the market  
13 clearing price.

#### 14           **Benefits of Ten-Minute Markets**

15       13. To address the problems created by the existing approach to  
16 Imbalance Energy settlements, focusing on the excessive uninstructed  
17 deviations from Schedules that the ISO was experiencing, the ISO made this  
18 issue the highest priority in discussions with stakeholders that commenced last  
19 summer regarding potential improvements to the ISO’s markets. (The ISO first  
20 raised concerns regarding large uninstructed deviations as part of its Ancillary  
21 Service redesign efforts in the Spring of 1999.) The ISO determined that a  
22 solution to the excessive uninstructed deviation problem should have the  
23 following characteristics:

- 1           • The solution must improve the efficiency of the Imbalance Energy  
2           market to provide the Load following function it was originally intended  
3           to fulfill, thereby enabling the ISO to reduce Regulation requirements  
4           and eliminating inefficiencies, including (but not limited to) the “stuck  
5           price” problem;
- 6           • The solution must create incentives for Market Participants to submit  
7           bids in the Imbalance Energy market and to respond to the ISO’s  
8           Dispatch instructions within the Dispatch interval;
- 9           • The solution must create incentives for Market Participants to deliver  
10          Instructed Imbalance Energy in the specific BEEP Interval for which it  
11          is Dispatched;
- 12          • The solution must create incentives for Market Participants supplying  
13          Imbalance Energy on an uninstructed basis to do so in the BEEP  
14          Intervals when the ISO needs the additional Energy;
- 15          • The solution must establish an incentive for smooth transitions  
16          between hourly Schedules; and
- 17          • The solution must mitigate existing disincentives to follow ISO  
18          instructions.

19           14. The solution proposed by the ISO to fulfill these objectives is to  
20          implement the originally intended market design, under which all resources  
21          supplying Imbalance Energy will be subject to ten-minute Dispatch and the  
22          obligations of Scheduling Coordinators participating in the Imbalance Energy  
23          market would be settled over the same interval in which resources supplying  
24          Imbalance Energy are Dispatched. As a result, both Instructed Imbalance



1 Energy and uninstructed deviations will be priced on the basis of the market  
2 clearing price during the BEEP Interval (currently, ten minutes) during which the  
3 Energy is supplied or the deviation occurs. The ISO's ten-minute market  
4 proposal also incorporates features designed to encourage Market Participants  
5 to effect smooth transitions, or "ramps" from their scheduled output levels in one  
6 hour to the scheduled level in the next hour. The rationale for and design of the  
7 ramping adjustment feature of the ten-minute market proposal is described in the  
8 example attached to my declaration as Exhibit 1. It also addresses potential  
9 disincentives to Market Participants that follow the ISO's Dispatch Instructions,  
10 who would otherwise be subject to the existing "no-pay" rule, approved as part of  
11 the Ancillary Service redesign. This aspect of the ten-minute market proposal,  
12 which addresses the treatment of "residual" Energy, is described in the example  
13 attached as Exhibit 2.

14 15. The ISO expects the adoption of ten-minute markets to provide the  
15 following benefits:

- 16 • First, by eliminating existing disincentives against the submission of  
17 Supplemental Energy bids, the ISO expects to reduce the volume of  
18 uninstructed deviations that must be accommodated in real time by  
19 adjustments to other resources.
- 20 • Second, by providing incentives for Market Participants to submit  
21 Supplemental Energy bids and to respond to the ISO's Dispatch  
22 Instructions, the ISO expects to improve the efficiency of the  
23 Imbalance Energy market so that it can be relied upon for Load  
24 following. This in turn will enable the ISO to reduce substantially its

1 requirements for Regulation capacity. The ISO estimates that this will  
2 result in annual savings of at least \$80 million to \$120 million. The  
3 basis for this estimate is described in the white paper prepared by ISO  
4 staff and attached to my declaration as Exhibit 3. Savings of this  
5 magnitude represent a reduction in the ISO's total annual Ancillary  
6 Service costs of about 25 to 33 percent. In addition, a reduction in the  
7 ISO's requirements for Regulation should make a portion of the  
8 capacity that is currently bid as Regulation available to increase the  
9 supply in other Ancillary Service markets, with a concomitant reduction  
10 in prices.

- 11 • Third, the ISO expects the ten-minute markets to create incentives for  
12 Market Participants to follow the ISO's Dispatch Instructions and to  
13 submit bids when they expect to have Energy available, as well as  
14 incentives for smooth ramps between hourly Schedules, will reduce  
15 the need to rely on Regulation capacity to avoid CPS2 violations.
- 16 • Fourth, by making all resources supplying Imbalance Energy –  
17 including imports – subject to Dispatch each BEEP Interval, the stuck  
18 price problem will be eliminated. The ISO estimates that elimination of  
19 this problem should reduce Imbalance Energy costs by approximately  
20 \$15 million per year, as shown in Exhibit 3.
- 21 • Fifth, improving the responsiveness of Market Participants to the ISO's  
22 Dispatch instructions should eliminate the ISO's need to call upon two  
23 to seven times more bids, at higher prices, to meet its Imbalance  
24 Energy needs. The ISO estimates, using conservative assumptions,

1           that this would produce annual reductions in Imbalance Energy costs  
2           of approximately \$67 million to \$84 million each year, as explained in  
3           Exhibit 3.

#### 4           **Consideration of Concerns Raised by Stakeholders**

5           16. During the meetings and workshops the ISO held with Market  
6 Participants and other stakeholders to discuss the ten-minute market proposal, a  
7 number of concerns were expressed. I will address the most significant issues  
8 that were raised in that process, though I will note that all issues that were raised  
9 by stakeholders were summarized by ISO management in materials presented to  
10 the ISO Governing Board when it approved the ten-minute market proposal.

11          17. A number of Market Participants expressed concern that mid-hour  
12 adjustments to imports of Energy from other Control Areas could not be  
13 accommodated by the scheduling practices of other Control Areas, with the  
14 result that implementing the ten-minute market proposal would reduce the supply  
15 of Supplemental Energy from external resources. The ISO carefully considered  
16 this issue and recognized that ten-minute Dispatch of Supplemental Energy  
17 resources would present an additional task for neighboring Control Areas, but  
18 concluded that while bid prices for imports of Supplemental Energy might rise,  
19 external resources would continue to supply real-time Energy. This conclusion  
20 was based on several factors. First, the ISO noted that external resources  
21 already supply a substantial portion of the ISO's Ancillary Service requirements.  
22 For capacity to qualify for participation in the ISO's Ancillary Services markets, it  
23 must be dispatchable on a ten-minute basis. Thus, concerns that it would be  
24 impossible for other Control Areas to accommodate the ten-minute Dispatch of

1 Energy resources appeared to be exaggerated, inasmuch as they have  
2 accommodated the ten-minute Dispatch of Ancillary Service resources. Second,  
3 the ISO noted, and explained to stakeholders, that an external resource could  
4 decline to follow a mid-hour Dispatch instruction for increased output if it could  
5 not arrange necessary transmission from its Control Area operator. Similarly, an  
6 external resource, once accepted to supply Supplemental Energy could decline  
7 to follow a mid-hour decremental Dispatch instruction, its excess Energy would  
8 be treated as an uninstructed deviation and receive the BEEP Interval Ex Post  
9 Price for decremental Energy. These risks could be evaluated by owners of  
10 external resources and reflected in their bid prices. Critically, however, an  
11 external resource that declined to follow a mid-hour decremental Dispatch  
12 instruction would no longer set the clearing price for subsequent BEEP Intervals  
13 in the hour. In other words, the stuck price phenomenon would be eliminated.

14 18. Although the ISO believed these concerns to be overstated, it  
15 nevertheless modified the ten-minute market proposal to address them.  
16 Specifically, the ISO's proposal will temporarily permit Scheduling Coordinators  
17 to specify that if an import of Supplemental Energy is not pre-Dispatched in the  
18 first BEEP Interval of an hour, it should be withdrawn for the balance of the hour.  
19 This will enable external resources that are not dispatchable on a ten-minute  
20 basis and are unwilling to incorporate in their bids the economic risks associated  
21 with mid-hour Dispatch instructions to continue to participate in the Imbalance  
22 Energy market when the ISO expects to require their bids for the full hour. The  
23 ISO expects that, after experience with ten-minute markets gives greater comfort  
24 to owners of external resources, it will be able to eliminate this temporary

1 modification. Working Group discussions with other Control Areas continue to  
2 explore alternative methods of implementing ten-minute Dispatch through  
3 procedures or automated approaches.

4 19. Some stakeholders expressed concern that mid-hour Dispatch  
5 adjustments would expose Participating Loads to undue risks under the no-pay  
6 rule if they also supply Ancillary Services. Here, too, the ISO believed that these  
7 risks could be ameliorated with appropriate bidding strategies. Nevertheless, to  
8 encourage participation by Loads in the ISO's Ancillary Service and Imbalance  
9 Energy markets, the ten-minute market proposal includes modifications to the  
10 no-pay rule for Participating Loads taking part in the ISO's Summer 2000 trial  
11 program for Load participation. The ISO approved this temporary change for the  
12 trial Summer 2000 Ancillary Service Load Program to accommodate Loads'  
13 difficulty in returning to their original Schedules in a short period of time after  
14 being Dispatched to reduce Load. When a Load is Dispatched to reduce Load  
15 in accordance with a bid, it will be subject to no-pay to the extent that it does not  
16 reduce Load. Under the no-pay provisions, that Load could also be subject to  
17 no-pay if it does not return to its original Load when it is directed to do so. This  
18 temporary accommodation would exempt Scheduling Coordinators from the no-  
19 pay provision related to their not returning to their scheduled Load for the hour  
20 of the original Dispatch and for two subsequent hours.

21 20. Some stakeholders were concerned that the implementation of ten-  
22 minute markets increased their exposure to risks from Imbalance Energy prices  
23 that would only be determined after the fact. To address this concern, the ISO  
24 intends to develop and implement the capability to provide price information

1 during the BEEP Interval and also to publish before each hour prices at which  
2 resources have been pre-Dispatched. The ISO will give a high priority to having  
3 this capability operational for the initial implementation of ten-minute markets on  
4 August 1 of this year.

5 21. Some stakeholders proposed that the ISO create separate real-time  
6 markets for resources that desire to supply Imbalance Energy on an hourly basis  
7 and those that can respond to ten-minute Dispatch instructions. The ISO  
8 believes that it is unnecessary to create additional hourly markets, since hourly  
9 markets already exist for Generation and Load resources that can supply Energy  
10 only on an hourly basis (due to minimum run times or other operating  
11 characteristics). These resources can be reflected in Schedules in the Day-  
12 Ahead and Hour-Ahead markets, which are hourly markets. Moreover, creating  
13 two real-time Energy markets would fragment the real-time market, creating  
14 inefficiencies and higher prices.

15 22. Some stakeholders advocated a delay in the implementation of ten-  
16 minute markets until after the summer peak season or the phasing of some  
17 elements of the proposal. The ISO concluded, however, that the substantial  
18 savings that the ten-minute market promises to deliver would be sacrificed if its  
19 implementation were delayed. However, to allow the Market Participants  
20 additional time to prepare, the ISO did adjust the implementation date from its  
21 original intended date of June 1, 2000, to August 1, 2000. For the same reason,  
22 the ISO determined that some of the ideas suggested by stakeholders, such as  
23 the aggregation of ten-minute market results in settlement statements, might  
24 represent worthwhile enhancements to the ten-minute market system, but that its

1 initial implementation should not be delayed to incorporate them. Rather, the  
2 ISO would explore those ideas for potential implementation after the initial ten-  
3 minute market system is installed.

4         23. Finally, some stakeholders presented alternative approaches to the  
5 operation of ten-minute markets, which were claimed to represent less  
6 complicated designs. The ISO explored these alternatives thoroughly, in one  
7 case meeting with the proponents to discuss their proposal in detail. Upon  
8 examination of these proposals, the ISO found that they were very similar to the  
9 ten-minute proposal developed by the ISO and that the claimed simplifications  
10 introduced hidden complications or other adverse results.

11         24. One proposal advocated by a number of stakeholders, was initially  
12 entitled the “One Price” proposal and described as using a single 10-minute  
13 price to settle all instructed and uninstructed Energy. When other conditions  
14 imposed

1 by the proponents were considered, however, it became apparent that this  
2 proposal was at least as complex as the ISO's approach to ten-minute markets.  
3 In most BEEP intervals, *both* approaches would use a single BEEP Interval price  
4 to settle Instructed Imbalance Energy. When the ISO issues both incremental  
5 and decremental instructions in an interval, *both* approaches would use separate  
6 BEEP Interval decremental and incremental prices to ensure that no resource is  
7 paid less than its bid. Unlike the ISO's approach, however, the "One Price"  
8 proposal would establish a separate hourly price for uninstructed deviations,  
9 which would both add complexity and reduce incentives for resources to follow  
10 the ISO's Dispatch instructions. The "One Price" proposal would thus require  
11 the use of more prices in settlement than the ISO's proposal. In other respects,  
12 the proposal was substantially similar to the ISO's proposal and the differences  
13 did not appear to offer any substantial advantages.

14         25. The ISO recognizes that the ten-minute market implementation  
15 originally envisioned in the ISO design is an additional burden on Scheduling  
16 Coordinators. This is a concern, however, that is overshadowed by the  
17 increased market efficiency resulting from the ISO's proposed change, and by  
18 the resulting cost savings to the California markets.

19         I declare under penalty of perjury that the foregoing is true and correct.  
20 Executed on April 26, 2000.

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Kellan Fluckiger