California Independent
System Operator Corporation

October 10, 2012

The Honorable Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Re: California Independent System Operator Corporation
Docket No. ER13- ___-000

Tariff Amendment to Implement Real-Time Disturbance Dispatch

Dear Secretary Bose:

The California Independent System Operator Corporation ("ISO") submits this amendment to its tariff to implement an alternative mode of the existing real-time contingency dispatch of resources in the ISO markets referred to as the real-time disturbance dispatch.[1] Pursuant to the new real-time disturbance dispatch mode, the ISO will have the ability to address large-scale contingency events (meaning those contingency events requiring 300 MW or more of generation to resolve) by prioritizing resources with awarded operating reserves over resources that do not have awarded operating reserves and by utilizing a merit order dispatch.[2] These features will enhance the ISO's ability to respond as quickly as possible to large-scale contingency events and thus to better ensure that the ISO satisfies the Reliability Standard on Disturbance Control Performance issued by the North American Electric Reliability Corporation ("NERC"). The ISO requests that the Commission accept these tariff changes effective as of December 11, 2012.

[1] The ISO submits this filing pursuant to Section 205 of the Federal Power Act, 16 U.S.C. § 824d. Capitalized terms not otherwise defined herein have the meanings set forth in the ISO tariff.

[2] "Operating reserve" is defined to include both spinning and non-spinning reserve.

I. Background

The ISO currently utilizes a market functionality known as the real-time contingency dispatch in order to resolve contingency events that may affect the ISO markets. Once activated, the existing real-time contingency dispatch converts contingency-only operating reserves into available capacity and considers energy bids from all resources in order to permit recovery from a contingency event. The real-time contingency dispatch considers and economically optimizes all energy bids, including energy bids from resources with certified and awarded operating reserve (including contingency-only operating reserves) and from resources that do not have certified and awarded operating reserves ("energy-only capacity"). The real-time contingency dispatch operates on a ten-minute basis instead of the normal five-minute dispatch interval.[3] Once the contingency is addressed, the ISO reverts to the five-minute real-time economic dispatch.

The ISO has become concerned that it may not always be able to access a sufficient amount of responsive capacity quickly enough to address large-scale contingency events on a system-wide or regional basis. In this regard, NERC's Reliability Standard on Disturbance Control Performance (Reliability Standard BAL-002-1) requires a balancing authority to recover its area control error within 15 minutes of the start of a Reportable Disturbance, which is defined in Reliability Standard BAL-002-1 as a contingency that is greater than or equal to 80 percent of the most severe single contingency.[4] Failure to comply with these requirements may result in NERC imposing substantial financial and regulatory penalties on the ISO.

Operating reserve capacity dispatched by the ISO (*i.e.*, awarded operating reserve) satisfies the 15-minute requirement under Reliability Standard BAL-002-1, because such capacity must reach the ISO's requested megawatt (MW) amount within ten minutes of receiving a dispatch instruction.[5] Further, resources must be certified to supply operating reserves and those resources are

---

[3] ISO tariff section 34.3.2. Operating reserve is defined in Appendix A to the ISO tariff as the combination of spinning reserve and non-spinning reserve required to meet NERC and Western Electricity Coordinating Council reliability standards.

[4] Reliability Standard BAL-002-1 is available on NERC's website at http://www.nerc.com/files/BAL-002-1.pdf. As discussed below, the ISO has determined that 80 percent of the most severe single contingency for the San Diego sub-region in California, which includes the service territory of San Diego Gas & Electric Company, equals approximately 300 MW. This is the smallest sub-region in California in which the ISO anticipates needing to deploy the new disturbance dispatch mode of the real-time contingency dispatch.

[5] ISO tariff sections 8.4.2(b), 8.4.3(a).

subject to performance audits and unannounced testing to ensure that they can respond within a ten-minute period.[6]

The ISO has observed that resources with energy-only capacity do not, as a whole, respond to real-time contingency dispatches as quickly or reliably as resources with certified and awarded operating reserves. This difference between the responsiveness of these two types of resources is discussed in the attached declaration of John Phipps, Shift Supervisor for the ISO. As Mr. Phipps explains, the ISO collected and analyzed data on the responsiveness of resources to the current mode of the real-time contingency dispatch for six days in 2011 and 2012 on which the ISO experienced major contingencies. Based on this data, the ISO determined that, on four of the six days studied, resources with certified and awarded operating reserves responded to the real-time contingency dispatches significantly better than resources with energy-only capacity. In almost all instances during these four days, resources with operating reserve responded to the ISO's dispatch instructions by providing 100 percent or more of the amount of requested response, but in most cases during those four days, energy-only resources responded to the ISO's dispatch instructions by providing less than 50 percent of the amount of requested response. On the other two days, the ISO did not see a significant difference between the level of performance of resources in their responses to the real-time contingency dispatches.[7]

This comparatively slow response or lack of response by energy-only resources can add to the contingency recovery time, jeopardizing the ISO's ability to complete its recovery from large-scale contingency events within 15 minutes as required by Reliability Standard BAL-002-1. Because the ISO cannot rely on all resources to respond timely to a real-time contingency dispatch, the ISO often overshoots its dispatch target (*i.e.,* dispatches more resources than would otherwise be needed) in an attempt to secure sufficient capacity to ensure that it meets the contingency recovery requirement.[8]

In addition, under the current mode of the real-time contingency dispatch, for a resource that is awarded operating reserves and is also providing energy for dispatch, the energy not associated with operating reserves is typically priced at or below the price of the energy associated with the operating reserves because the ISO assigns the awarded operating reserve capacity of a resource to the uppermost operating range of the resource. As a result, because the current mode of the contingency dispatch co-optimizes energy and ancillary services, the

---

6 ISO tariff sections 8.3.4, 8.9.10, 8.9.11, 8.10.2, 8.10.3.

7 Declaration of John Phipps, Attachment C to this filing, at PP 4-7 ("Phipps Declaration").

8 *Id.* at P 8.

real-time contingency dispatch is more likely to dispatch energy from resources not explicitly awarded operating reserve capacity. This creates the risk of having to rely on non-operating reserve capacity to recover from the contingency event. Further, the action under the real-time contingency dispatch of economically decrementing resources in response to the co-optimization may be undesirable, particularly during a contingency event, because at that time upward movement is critical to timely recovery.

The ISO is also concerned about how NERC might view a violation of Reliability Standard BAL-002-1 resulting from ISO dispatch of energy-only capacity rather than operating reserves. These concerns are underscored by a guidance document issued by NERC to balancing authorities and other entities regarding lessons learned from a recent failure to satisfy the 15-minute requirement during a contingency event in the Northeast Power Coordinating Council region. The guidance document recommends that a balancing authority not rely on economic dispatch (co-optimization) during the recovery period and only return to an economic electronic dispatch solution after the contingency event has been resolved.[9]

II. Proposed Tariff Revisions

To address the concerns discussed above, the ISO proposes to modify the provisions in tariff section 34.3.2 regarding the real-time contingency dispatch mode of operation to include an alternative real-time disturbance dispatch mode. This new option will enable the ISO to respond as quickly as possible to large-scale contingency events and thus enhance the ISO's ability to satisfy Reliability Standard BAL-002-1. The ISO also expects that, with the implementation of the real-time disturbance dispatch, it will no longer have to over-dispatch resources in order to make up for the lack of performance by energy-only resources illustrated by the analysis described in Mr. Phipps's declaration.[10]

Under new tariff section 34.3.2.2,[11] the real-time disturbance dispatch is defined as a special mode of the real-time contingency dispatch available to the ISO operator when 300 MW or more of capacity is needed to respond to a significant contingency event. As discussed in Mr. Phipps's declaration, the ISO determined that this 300 MW bright-line minimum threshold is approximately

---

[9] *NPCC – Lessons Learned; Area Control Error Event* at 2 (May 4, 2011). This guidance document is available on NERC's website at http://www.nerc.com/files/NPCC_Area_Control_Error_Event.pdf.

[10] Phipps Declaration at P 8.

[11] The ISO proposes to renumber existing tariff section 34.3.2, which includes provisions regarding the real-time contingency dispatch, as tariff section 34.3.2.1.

equal to 80 percent of the most severe single contingency for the San Diego sub-region in California, which includes the service territory of San Diego Gas & Electric Company. The ISO determined the 300 MW minimum threshold on a sub-regional basis because the ISO may perform the real-time disturbance dispatch more granularly than on a regional basis. Use of the 300 MW minimum threshold in tariff section 34.3.2.2 translates the 80 percent criterion of NERC Reliability Standard BAL-002-1 into a clear point above which ISO operations will have the ability to deploy the real-time disturbance dispatch mode of the real-time disturbance dispatch on either a system-wide or sub-regional basis.[12]

Tariff section 34.3.2.2 specifies that the real-time disturbance dispatch will not use the ISO's security constrained economic dispatch which co-optimizes all energy bids. Instead, the real-time disturbance dispatch will give dispatch priority to energy bids from operating reserve capacity over energy bids from non-operating reserve capacity. In addition, the real-time disturbance dispatch will dispatch energy bids from the operating reserve capacity in merit order and will then dispatch energy bids from non-operating reserve capacity in merit order based on available MW within the capacity's ten-minute ramping capability. As a result, no resource will be economically decremented during the disturbance dispatch mode of the contingency dispatch.

As with the real-time contingency dispatch mode, in the real-time disturbance dispatch mode, the ISO operator may activate operating reserves identified as contingency-only either on a resource-specific basis or for all such resources. This allows the ISO the ability to deploy the contingency dispatch mode on a system-wide or regional basis. The ISO also proposes to revise tariff section 34.3.2 to make clear that resources must respond to dispatch instructions for both modes of the contingency dispatch as soon as possible.

Because the disturbance mode of the contingency dispatch will not utilize the security constrained economic dispatch, it is necessary to specify the market price. During each ten-minute dispatch interval in which the real-time disturbance dispatch is employed, the energy bid of the highest-priced resource dispatched under the real-time disturbance dispatch will be used to set the market clearing price on a system-wide basis for all resources dispatched under the real-time disturbance dispatch.[13] The market clearing price will not reflect transmission losses or transmission constraints.

---

[12] Phipps Declaration at PP 9-11.

[13] The ISO anticipates that the priority given to operating reserves in the real-time contingency dispatch will generally not last more than two ten-minute intervals. Once recovery from the contingency event is completed, the ISO will revert either to the standard real-time contingency dispatch or to the real-time economic dispatch.

The ISO also proposes to clarify in tariff section 34.3.2.1 that the real-time contingency dispatch may consist of one or more 10 minute intervals. In addition, consistent with the provisions in tariff section 34.3.2.2, the ISO proposes to modify tariff section 34.5 to state that the ISO will not determine dispatch instructions through the use of security constrained economic dispatch when the ISO utilizes the real-time disturbance dispatch.

III. Stakeholder Process

The ISO initiated the stakeholder process for this tariff amendment on February 9, 2012. The stakeholder process included issuance by the ISO of an issue paper, a straw proposal, and a draft final proposal on the implementation of the real-time disturbance dispatch. The ISO held two conference calls with stakeholders to discuss these documents and provided an opportunity for written stakeholder comments. The ISO also held a third stakeholder conference call to discuss proposed tariff language that was posted by the ISO. No stakeholder provided comments on the proposed tariff language.[14] The ISO Board of Governors authorized the ISO to prepare and submit this tariff amendment at its May 16, 2012 meeting.[15]

In the stakeholder process for the tariff amendment, one party requested that the ISO report back to stakeholders in the future on how often the ISO has used the real-time contingency dispatch and what the response from participating generation has been. The ISO agreed to prepare such a report and to present it to stakeholders during the Market Performance and Planning Forum within 12-14 months after the real-time contingency dispatch is implemented.

IV. Effective Date

The ISO requests that the tariff revisions contained in this filing be made effective as of December 11, 2012. That is the date by which the ISO anticipates it will complete the software and other systems modifications required to implement the real-time disturbance dispatch.

---

[14] Materials related to the stakeholder process for this tariff amendment are posted on the ISO website at http://www.caiso.com/informed/Pages/StakeholderProcesses/ContingencyDispatchEnhancements.aspx. A list of key dates in the stakeholder process is provided in Attachment D to this filing.

[15] Materials related to the Board of Governors' approval are posted on the ISO website at http://www.caiso.com/informed/Pages/BoardCommittees/BoardGovernorsMeetings.aspx.

V. Communications

Correspondence and other communications regarding this filing should be directed to:

Nancy Saracino
General Counsel
Sidney M. Davies
Assistant General Counsel
California Independent System
Operator Corporation
250 Outcropping Way
Folsom, CA 95630
Tel: (916) 351-4400
Fax: (916) 608-7296
nsaracino@caiso.com
sdavies@caiso.com

Sean A. Atkins
Bradley R. Miliauskas
Alston & Bird LLP
The Atlantic Building
950 F Street, NW
Washington, DC 20004
Tel: (202) 239-3300
Fax: (202) 654-4875
sean.atkins@alston.com
bradley.miliauskas@alston.com

VI. Service

The ISO has served copies of this filing on the California Public Utilities Commission, the California Energy Commission, and all parties with Scheduling Coordinator Agreements under the ISO tariff. In addition, the ISO has posted a copy of the filing on the ISO website.

VII. Contents of this Filing

In addition to this transmittal letter, this filing includes the following attachments:

Attachment A	Clean ISO tariff sheets incorporating this tariff amendment
Attachment B	Red-lined document showing the revisions contained in this tariff amendment
Attachment C	Declaration of John Phipps on behalf of the ISO
Attachment D	List of key dates in the stakeholder process

VIII. Conclusion

The ISO respectfully requests that the Commission accept the tariff revisions proposed in this filing effective as of December 11, 2012.

Respectfully submitted,

/s/ Bradley R. Miliauskas

Nancy Saracino
General Counsel
Sidney M. Davies
Assistant General Counsel
California Independent System
Operator Corporation
250 Outcropping Way
Folsom, CA 95630

Sean A. Atkins
Bradley R. Miliauskas
Alston & Bird LLP
The Atlantic Building
950 F Street, NW
Washington, DC 20004

Counsel for the
California Independent System
Operator Corporation

Attachment A – Clean Tariff

Tariff Amendment to Implement Real-Time Disturbance Dispatch

California Independent System Operator Corporation

October 10, 2012

34.3.2 Real-Time Contingency Dispatch

34.3.2.1 RTCD Mode

RTCD mode of operation for RTD is run in response to a significant Contingency event, such that waiting until the next normal RTD run is not adequate and/or Operating Reserves identified as Contingency Only need to be activated in response to the event. The CAISO Operator may activate Operating Reserves identified as Contingency Only either on a resource specific-basis or for all such resources. When activating Contingency Only reserves in RTCD, the original Energy Bids associated with the resources providing Operating Reserve will be used for the RTCD. RTCD uses SCED to produce an optimized set of binding Dispatch Instructions for one (1) or more ten-minute Dispatch Intervals instead of a normal five-minute Dispatch Interval. Resources must respond to RTCD Dispatch Instructions as soon as possible. After being reviewed by the CAISO Operator, only binding Dispatch Instructions are communicated for the next Dispatch Interval in accordance with Section 6.3. When activating a RTCD and returning to normal RTED run after a RTCD run, five-minute Dispatch Interval LMPs will be produced for each PNode based on the last available price from either the RTCD or normal RTED run relative to a five-minute target Dispatch Interval.

34.3.2.2 RTDD Mode

RTDD is a special mode of the RTCD available to the CAISO Operator when 300 MW or more of capacity is needed to respond to a significant Contingency event. RTDD will not use SCED. Instead, RTDD will give Dispatch priority to Energy Bids from Operating Reserve capacity over Energy Bids from non-Operating Reserve capacity. RTDD will dispatch the Operating Reserve capacity in merit order and will then dispatch the non-Operating Reserve capacity in merit order based on available MW within the capacity's ten-minute ramping capability. As with the RTCD mode, in the RTDD mode, the CAISO Operator may activate Operating Reserves identified as Contingency Only either on a resource-specific basis or for all such resources. Resources must respond to RTDD Dispatch Instructions as soon as possible. During each ten-minute Dispatch Interval in which RTDD is employed, the Energy Bid of the highest-priced resource dispatched under RTDD will be used to set the Market Clearing Price on a system-wide basis for all resources dispatched under RTDD. The Market Clearing Price will not reflect Transmission Losses or Transmission Constraints.

* * *

34.5 General Dispatch Principles

The CAISO shall conduct all Dispatch activities consistent with the following principles:

(1) The CAISO shall issue AGC instructions electronically as often as every four (4) seconds from its Energy Management System (EMS) to resources providing Regulation and on Automatic Generation Control to meet NERC and WECC performance requirements;

(2) In each run of the RTED or RTCD the objective will be to meet the projected Energy requirements over the applicable forward-looking time period of that run, subject to transmission and resource operational constraints, taking into account the short term CAISO Forecast of CAISO Demand adjusted as necessary by the CAISO Operator to reflect scheduled changes to Interchange and non-dispatchable resources in subsequent Dispatch Intervals;

(3) Dispatch Instructions will be based on Energy Bids for those resources that are capable of intra-hour adjustments and will be determined through the use of SCED except when the CAISO must utilize the RTDD and RTMD;

(4) When dispatching Energy from awarded Ancillary Service capacity the CAISO will not differentiate between Ancillary Services procured by the CAISO and Submissions to Self-Provide an Ancillary Service;

(5) The Dispatch Instructions of a resource for a subsequent Dispatch Interval shall take as a point of reference the actual output obtained from either the State Estimator solution or the last valid telemetry measurement and the resource's operational ramping capability. For Multi-Stage Generating Resources the determination of the point of reference is further affected by the MSG Configuration and the information contained in the Transition Matrix;

(6) In determining the Dispatch Instructions for a target Dispatch Interval while at the same time achieving the objective to minimize Dispatch costs to meet the forecasted conditions of the entire forward-looking time period, the Dispatch for

the target Dispatch Interval will be affected by: (a) Dispatch Instructions in prior intervals, (b) actual output of the resource, (c) forecasted conditions in subsequent intervals within the forward-looking time period of the optimization, and (d) operational constraints of the resource, such that a resource may be dispatched in a direction for the immediate target Dispatch Interval that is different than the direction of change in Energy needs from the current Dispatch Interval to the next immediate Dispatch Interval, considering the applicable MSG Configuration;

(7) Through Start-Up Instructions the CAISO may instruct resources to start up or shut down, or may reduce Load for Participating Loads and Proxy Demand Resources, over the forward-looking time period for the RTM based on submitted Bids, Start-Up Costs and Minimum Load Costs, Pumping Costs and Pump Shut-Down Costs, as appropriate for the resource, or for Multi-Stage Generating Resource as appropriate for the applicable MSG Configuration, consistent with operating characteristics of the resources that the SCED is able to enforce. In making Start-Up or Shut-Down decisions in the RTM, the CAISO may factor in limitations on number of run hours or Start-Ups of a resource to avoid exhausting its maximum number of run hours or Start-Ups during periods other than peak loading conditions;

(8) The CAISO shall only start up resources that can start within the applicable time periods of the various CAISO Markets Processes that comprise the RTM;

(9) The RTM optimization may result in resources being shut down consistent with their Bids and operating characteristics provided that: (a) the resource does not need to be on-line to provide Energy, (b) the resource is able to start up within the applicable time periods of the processes that comprise the RTM, (c) the Generating Unit is not providing Regulation or Spinning Reserve, and (d) Generating Units online providing Non-Spinning Reserve may be shut down if

they can be brought up within ten (10) minutes as such resources are needed to be online to provide Non-Spinning Reserves;

(10) For resources that are both providing Regulation and have submitted Energy Bids for the RTM, Dispatch Instructions will be based on the Regulation Ramp Rate of the resource rather than the Operational Ramp Rate if the Dispatch Operating Point remains within the Regulating Range. The Regulating Range will limit the Ramping of Dispatch Instructions issued to resources that are providing Regulation;

(11) For Multi-Stage Generating Resources the CAISO will issue Dispatch Instructions by Resource ID and Configuration ID;

(12) The CAISO may issue Transition Instructions to instruct resources to transition from one MSG Configuration to another over the forward-looking time period for the RTM based on submitted Bids, Transition Costs and Minimum Load Costs, as appropriate for the MSG Configurations involved in the MSG Transition, consistent with Transition Matrix and operating characteristics of these MSG Configurations. The RTM optimization will factor in limitations on Minimum Up Time and Minimum Down Time defined for each MSG configuration and Minimum Up Time and Minimum Down Time at the Generating Unit or Dynamic Resource-Specific System Resource.

* * *

Appendix A
Master Definitions Supplement

- Real-Time Disturbance Dispatch (RTDD)
A mode of Real-Time Contingency Dispatch employed by the CAISO Operator pursuant to Section 34.3.2.2.

* * *

- RTDD
Real-Time Disturbance Dispatch

Attachment B – Marked Tariff

Tariff Amendment to Implement Real-Time Disturbance Dispatch

California Independent System Operator Corporation

October 10, 2012

34.3.2 Real-Time Contingency Dispatch

34.3.2.1 RTCD Mode

RTCD mode of operation for RTD is run in response to a significant Contingency event, such that waiting until the next normal RTD run is not adequate and/or Operating ReservesReserve identified as Contingency Only need to be activated in response to the event. The CAISO Operator may activate the Operating ReservesReserve identified as Contingency Only either on a resource specific--basis or for all such resources. When activating Contingency Only reserves in RTCD, the original Energy Bids associated with the resources providing Operating Reserve will be used for the RTCD. RTCD uses SCED to produce an optimized set of binding Dispatch Instructions for one (1) or morea single ten-minute Dispatch IntervalsInterval instead of a normal five-minute Dispatch Interval. Resources must respond to RTCD Dispatch Instructions as soon as possible. After being reviewed by the CAISO Operator, only binding Dispatch Instructions are communicated for the next Dispatch Interval in accordance with Section 6.3. When activating a RTCD and returning to normal RTED run after a RTCD run, five-minute Dispatch Interval LMPs will be produced for each PNode be based on the last available price from either the RTCD or normal RTED run relative to a five-minute target Dispatch Interval.

34.3.2.2 RTDD Mode

RTDD is a special mode of the RTCD available to the CAISO Operator when 300 MW or more of capacity is needed to respond to a significant Contingency event. RTDD will not use SCED. Instead, RTDD will give Dispatch priority to Energy Bids from Operating Reserve capacity over Energy Bids from non-Operating Reserve capacity. RTDD will dispatch the Operating Reserve capacity in merit order and will then dispatch the non-Operating Reserve capacity in merit order based on available MW within the capacity's ten-minute ramping capability. As with the RTCD mode, in the RTDD mode, the CAISO Operator may activate Operating Reserves identified as Contingency Only either on a resource-specific basis or for all such resources. Resources must respond to RTDD Dispatch Instructions as soon as possible. During each ten-minute Dispatch Interval in which RTDD is employed, the Energy Bid of the highest-priced resource dispatched under RTDD will be used to set the Market Clearing Price on a system-wide basis for all resources dispatched under RTDD. The Market Clearing Price will not reflect Transmission Losses or Transmission Constraints.

* * *

34.5 General Dispatch Principles

The CAISO shall conduct all Dispatch activities consistent with the following principles:

(1) The CAISO shall issue AGC instructions electronically as often as every four (4) seconds from its Energy Management System (EMS) to resources providing Regulation and on Automatic Generation Control to meet NERC and WECC performance requirements;

(2) In each run of the RTED or RTCD the objective will be to meet the projected Energy requirements over the applicable forward-looking time period of that run, subject to transmission and resource operational constraints, taking into account the short term CAISO Forecast of CAISO Demand adjusted as necessary by the CAISO Operator to reflect scheduled changes to Interchange and non-dispatchable resources in subsequent Dispatch Intervals;

(3) Dispatch Instructions will be based on Energy Bids for those resources that are capable of intra-hour adjustments and will be determined through the use of SCED except when the CAISO must utilize the RTDD and RTMD;

(4) When dispatching Energy from awarded Ancillary Service capacity the CAISO will not differentiate between Ancillary Services procured by the CAISO and Submissions to Self-Provide an Ancillary Service;

(5) The Dispatch Instructions of a resource for a subsequent Dispatch Interval shall take as a point of reference the actual output obtained from either the State Estimator solution or the last valid telemetry measurement and the resource's operational ramping capability. For Multi-Stage Generating Resources the determination of the point of reference is further affected by the MSG Configuration and the information contained in the Transition Matrix;

(6) In determining the Dispatch Instructions for a target Dispatch Interval while at the same time achieving the objective to minimize Dispatch costs to meet the forecasted conditions of the entire forward-looking time period, the Dispatch for

the target Dispatch Interval will be affected by: (a) Dispatch Instructions in prior intervals, (b) actual output of the resource, (c) forecasted conditions in subsequent intervals within the forward-looking time period of the optimization, and (d) operational constraints of the resource, such that a resource may be dispatched in a direction for the immediate target Dispatch Interval that is different than the direction of change in Energy needs from the current Dispatch Interval to the next immediate Dispatch Interval, considering the applicable MSG Configuration;

(7) Through Start-Up Instructions the CAISO may instruct resources to start up or shut down, or may reduce Load for Participating Loads and Proxy Demand Resources, over the forward-looking time period for the RTM based on submitted Bids, Start-Up Costs and Minimum Load Costs, Pumping Costs and Pump Shut-Down Costs, as appropriate for the resource, or for Multi-Stage Generating Resource as appropriate for the applicable MSG Configuration, consistent with operating characteristics of the resources that the SCED is able to enforce. In making Start-Up or Shut-Down decisions in the RTM, the CAISO may factor in limitations on number of run hours or Start-Ups of a resource to avoid exhausting its maximum number of run hours or Start-Ups during periods other than peak loading conditions;

(8) The CAISO shall only start up resources that can start within the applicable time periods of the various CAISO Markets Processes that comprise the RTM;

(9) The RTM optimization may result in resources being shut down consistent with their Bids and operating characteristics provided that: (a) the resource does not need to be on-line to provide Energy, (b) the resource is able to start up within the applicable time periods of the processes that comprise the RTM, (c) the Generating Unit is not providing Regulation or Spinning Reserve, and (d) Generating Units online providing Non-Spinning Reserve may be shut down if

they can be brought up within ten (10) minutes as such resources are needed to be online to provide Non-Spinning Reserves;

(10) For resources that are both providing Regulation and have submitted Energy Bids for the RTM, Dispatch Instructions will be based on the Regulation Ramp Rate of the resource rather than the Operational Ramp Rate if the Dispatch Operating Point remains within the Regulating Range. The Regulating Range will limit the Ramping of Dispatch Instructions issued to resources that are providing Regulation;

(11) For Multi-Stage Generating Resources the CAISO will issue Dispatch Instructions by Resource ID and Configuration ID;

(12) The CAISO may issue Transition Instructions to instruct resources to transition from one MSG Configuration to another over the forward-looking time period for the RTM based on submitted Bids, Transition Costs and Minimum Load Costs, as appropriate for the MSG Configurations involved in the MSG Transition, consistent with Transition Matrix and operating characteristics of these MSG Configurations. The RTM optimization will factor in limitations on Minimum Up Time and Minimum Down Time defined for each MSG configuration and Minimum Up Time and Minimum Down Time at the Generating Unit or Dynamic Resource-Specific System Resource.

* * *

Appendix A
Master Definitions Supplement

- Real-Time Disturbance Dispatch (RTDD)
A mode of Real-Time Contingency Dispatch employed by the CAISO Operator pursuant to Section 34.3.2.2.

* * *

- RTDD
Real-Time Disturbance Dispatch

Attachment C – Declaration of John Phipps

Tariff Amendment to Implement Real-Time Disturbance Dispatch

California Independent System Operator Corporation

October 10, 2012

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

DECLARATION OF JOHN PHIPPS ON BEHALF OF THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION

I, John Phipps, hereby declare as follows:

1. I am employed as Shift Supervisor for the California Independent System Operator Corporation (ISO). I have been employed by the ISO since January of 2000. My business address is 250 Outcropping Way, Folsom, CA 95630.

2. As Shift Supervisor, I supervise and direct the real-time operations staff in managing the ISO balancing authority area.

3. I am providing this declaration to address two subjects. First, I will discuss the fact that data collected by the ISO indicates that resources that supply energy-only capacity (*i.e.*, resources without certified and awarded operating reserves) do not, as a whole, respond to real-time contingency dispatches as quickly or reliably as resources with certified and awarded operating reserves. Next, I will explain why the ISO proposes to have the ability to deploy the real-time disturbance dispatch when 300 MW or more of capacity is needed to respond to a significant contingency event.

4. Regarding the first subject, the ISO collected and analyzed data on the responsiveness of resources to the current mode of the real-time contingency dispatch for six days in 2011 and 2012 – March 22, 24, and 26, and June 30, in 2011, and May 30 and September 3 in 2012. The ISO selected those particular days because they were days on which the ISO experienced major contingencies.

5. Based on its analysis of the data for those six days, the ISO determined that resources that supply energy-only capacity do not, as a whole, respond to real-time contingency dispatches as quickly or reliably as resources with certified and awarded operating reserves.

6. In particular, the ISO compared the difference between the dispatch operating targets of all those resources and their actual performance over the interval immediately prior to the real-time contingency dispatch and the first interval of the real-time contingency dispatch. This first ten-minute interval is critical with respect to the ISO's likelihood of recovering from a significant contingency.

7. The ISO determined that, on four of the six days studied, resources with certified and awarded operating reserves responded to the real-time contingency dispatches significantly better. In almost all instances during these four days, resources with awarded operating reserves responded to the ISO's dispatch instructions by providing 100 percent or more of the amount of requested response, but in most cases during these four days, resources that supplied energy-only capacity responded to the ISO's dispatch instructions by providing less than 50 percent of the amount of requested response. On the other two days, the ISO did not see a significant difference between the level of performance of resources in their responses to the real-time contingency dispatches.

8. As indicated by the fact that resources with operating reserves performed significantly better on four of the six days studied (and similarly as well on the other two days studied), prioritization of operating reserve in the event of a significant disturbance will increase the ability of the ISO to recover from a significant contingency within the time frame specified by the applicable mandatory

standards I will discuss next. Currently, the ISO cannot rely on all resources to respond in sufficient time to a real-time contingency dispatch, and therefore the ISO often dispatches more resources than will be needed in an attempt to secure sufficient capacity to ensure that it meets the contingency recovery requirement set forth in the mandatory standards. The ISO expects that, with the implementation of the real-time disturbance dispatch, it will no longer have to over-dispatch resources in order to make up for the lack of performance by energy-only resources illustrated by the analysis I have described.

9. I next turn to the ISO's proposal to have the ability to deploy the real-time disturbance dispatch mode of the real-time contingency dispatch available to the ISO operator when 300 MW or more of capacity is needed to respond to a significant contingency event. This proposal is based on how NERC Reliability Standard BAL-002-1 would apply to the San Diego sub-region. The proposal will sets a bright-line minimum threshold that will be straightforward for ISO operations to implement.

10. NERC Reliability Standard BAL-002-1 requires the ISO – on a system-wide basis – to recover its area control error within 15 minutes of the start of a Reportable Disturbance, which is defined in the NERC Reliability Standard as a contingency that is greater than or equal to 80 percent of the most severe single contingency. The ISO has determined that 80 percent of the most severe single contingency for the San Diego sub-region in California, which includes the service territory of San Diego Gas & Electric Company, is approximately equal to 300 MW. This is the smallest sub-region in California in which the ISO anticipates needing to deploy the new disturbance dispatch mode of the real-time contingency dispatch.

11. The ISO is proposing tariff authority to deploy the new disturbance dispatch mode of the real-time contingency dispatch on either a system-wide or sub-regional basis. Accordingly, the ISO looked at the San Diego sub-region to define the minimum threshold for the ISO to have the ability to deploy the new disturbance dispatch mode. The bright-line minimum threshold of 300 MW or more will provide a clear point above which ISO operations will have the ability to deploy the disturbance dispatch mode of the real-time contingency dispatch on either a system-wide or sub-regional basis.

I declare, under penalty of perjury, that the foregoing statements are true and correct.

Executed this 10th day of October, 2012, in Folsom, California.

/s/ John Phipps
John Phipps

Attachment D – List of Key Dates in Stakeholder Process

Tariff Amendment to Implement Real-Time Disturbance Dispatch

California Independent System Operator Corporation

October 10, 2012

Date	Event/Due Date
February 9, 2012	ISO issues paper entitled “Priority Use of Operating Reserves During Disturbance Control Standard (DCS) Events – Issue Paper and Straw Proposal”
February 16, 2012	ISO hosts stakeholder conference call that includes presentation entitled “Priority Use of Operating Reserves During Disturbance Control Standard (DCS) Events” and discussion of paper issued on February 9
February 24, 2012	Due date for written stakeholder comments on paper issued on February 9
March 14, 2012	ISO issues paper entitled “Priority Use of Operating Reserves During Disturbance Control Standard (DCS) Events – Draft Final Proposal”
March 21, 2012	ISO hosts stakeholder conference call that includes presentation entitled “Priority Use of Operating Reserves During Disturbance Control Standard (DCS) Events” and discussion of paper issued on March 14
March 30, 2012	Due date for written stakeholder comments on paper issued on March 14
June 28, 2012	ISO issues draft tariff language to implement contingency dispatch tariff amendment
July 13, 2012	Due date for written stakeholder comments on draft tariff language issued on June 28
July 19, 2012	ISO hosts stakeholder conference call that includes discussion of draft tariff language issued on June 28