California Independent System Operator Corporation

**Compliance Assessment Relating to
Specified Control Room Operational Processes**

Report of Independent Accountants

November 30, 2012

Report of Independent Accountants

To the Board of Governors of the
California Independent System Operator Corporation:

We have examined management's assertion on Compliance with Selected Operating Procedures for the periods of August 6 through 15, 2012 and September 19 through 28, 2012 in accordance with the criteria set forth in Attachment I of management's assertion. The California Independent System Operator Corporation's (the "ISO") management is responsible for the assertion. Our responsibility is to express an opinion on the assertion based on our examination.

Our examination was conducted in accordance with attestation standards established by the American Institute of Certified Public Accountants and, accordingly, included examining, on a test basis, evidence supporting management's assertion and performing such other procedures as we considered necessary in the circumstances. We believe that our examination provides a reasonable basis for our opinion.

As described in management's assertion, ISO management has disclosed noncompliance with respect to one generating unit not being blocked from offering ancillary services to the day-ahead market for six hours within the twenty day scope of our examination.

In our opinion, except for the noncompliance set forth in management's assertion and as described in the above paragraph, the ISO complied in all material respects with the aforementioned compliance requirements for the periods of August 6 through 15, 2012 and September 19 through 28, 2012.

PricewaterhouseCoopers LLP

November 30, 2012

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Management Assertion Regarding Compliance with Selected Operating Procedures

November 30, 2012

To the Board of Governors of the
California Independent System Operator Corporation:

The management of the California Independent System Operator Corporation ("the ISO") is responsible for the implementation of procedures necessary to comply with the day-ahead market requirements of its California Independent System Operator Corporation Fifth Replacement FERC Electric Tariff ("Tariff"). The procedural elements described in Attachment I ("Procedural Elements") to this Management Assertion represent a subset of the Operating Procedures placed into operation by management to meet the requirements of the ISO's Tariff and to carry out its day-ahead market operational objectives. These Procedural Elements are not intended to represent the entire set of procedures placed into operation for management to meet its Tariff and day-ahead market operational objectives.

Scope of Management Assertion and Limitations

The overall objective of this Management Assertion is to report on compliance of the actual operating practices of ISO staff with the primary guidance for certain of its day-ahead market activities, the ISO's Day-Ahead Market Procedures. All of the Procedural Elements that are the subject of this Management Assertion are publicly available at www.caiso.com. They are contained in the Operating Procedures labeled Running the Day-Ahead Market, procedure #1210, and Ancillary Service Procurement and Availability Validation, procedure #1340, which are available through that public website.

This Management Assertion provides an assessment of actual practice occurring during the period of August 6 through 15, 2012 and September 19 through 28, 2012 ("Assessment Period") to the procedural guidelines for such activities during the Assessment Period. It is limited to the specific Procedural Elements included in this report which comprise day-ahead market functions.

The elements of the ISO's Operating Procedures included by management in this assertion were selected by management on the basis that they were integral to their day-ahead market function and could be objectively compared against actual operating practice.

The specific scope of this Management Assertion is presented in Attachment I which contains the day-ahead market Procedural Elements, criteria by which these Procedural Elements were assessed, and the ISO's self-assessment of compliance, whereby exception conditions, if present, are reported. Such exception conditions are identified when actual practice was not consistent with the Procedural Element's criteria. Attachment II is a narrative description of the day-ahead market functions covered by this Management Assertion.

Summary Assertion

This Management Assertion encompasses the specific day-ahead market activities described in Attachment I. The level of compliance of actual operating practices of ISO staff during the Assessment Period compared with the Procedural Element's criteria is set forth in Attachment I. Of the generation resources identified by the ISO to be blocked from offering ancillary services to the day-ahead market during the twenty day Assessment Period, one generating unit was not compliant with one of the criteria for procedural guidelines set forth in Attachment I for a six hour period. The ISO was in compliance with the criteria set forth in Attachment I for all other periods within the Assessment Period.

The scope of this Management Assertion is limited to the day-ahead market compliance requirements described herein and does not extend to any other procedures or functions of the ISO.

Mr. Steve Berberich, President and Chief Executive Officer

Mr. Eric Schmitt, Vice President Operations

Ref. No.	Operating Procedure Element	Criteria to Test Operating Procedure Element	Compliance Assessment

1.	**Running the Day-Ahead (DA) Market**
	Procedure No. 1210, Version No. 15.5, Effective Date 7/24/12
	3.1.4 Minimum On-line Commitment (MOC) Constraint Setup
	Step 2 If… There are MOC requirements that need to be enforced,
	Then… use the applicable procedure or Scheduling and Logging for ISO California (SLIC) card to determine the requirement(s).
	Step 3 Enter requirements into MOC display.
		MOC Integrated Forward Market (IFM) Resource Inputs
		For each day selected for the next Trade Day, the MOC input screen megawatt requirement, resources and resource shift factors agree to the megawatt requirement, resources and resource shift factors in:
		1. SLIC, and/or
		2. Operating Procedures inclusive of the following:
		    a. San Diego Area Generation Requirements No. 7810,
		    b. Orange County Area Requirements No. 7630,
		    c. Humboldt Area No. 7110, and/or
		    d. Both SONGS Units Off-Line (Summer Operations June 1-Oct 31) No. 7830 (Effective September 4, 2012).
			No Exceptions Noted.

2.	**Running the Day-Ahead Market** **Procedure No. 1210, Version No. 15.5, Effective Date 7/24/12** **3.1.5 Extremely Long Start Commitment (ELC) Process** **Step 2 – Verify** the following for the ELC units that were required to Start-Up yesterday for tomorrow: • The unit has been manually placed in the ELC determination section of the Integrated Forward Market (IFM) for the indicated date/time, and minimum Load MW. **Running the Day-Ahead Market** **Procedure No. 1210, Version No. 15.4, Effective Date 7/19/12** **3.2.5 D+2 & D+3 Determination** Step 5 Enter the required manual commitment (ELC) in the DA Market. Step 6 Log this activity in SLIC.	**ELC IFM Resource Inputs** For each day selected for each of the next three (3) Trade Days, resources listed in the ELC input screen agree to resources listed in SLIC. For the resources above, the following parameters included in the ELC input screen agree with SLIC parameter data and the Unit Commitment Request and Validation Document: 1. Time interval start, 2. Time interval end, and 3. Minimum scheduled megawatts (not included in Unit Commitment Request and Validation Document).	No Exceptions Noted.
3.	**Running the Day-Ahead Market** **Procedure No. 1210, Version No. 15.5, Effective Date 7/24/12** **3.1.6 Ancillary Services (AS) Determination** **Step 1 - Confirm** all input parameters for the AS Requirements display.	**AS IFM Input Requirements** For each day selected for the next Trade Day, the AS IFM Input screen for each hour displays: 1. An Operating Reserve quantity (in megawatts) greater than the: a. Most Severe Single Contingency defined in	No Exceptions Noted.

Ref. No.	Operating Procedure Element	Criteria to Test Operating Procedure Element	Compliance Assessment
	Ancillary Service Procurement and Availability Validation Procedure No. 1340, Version No. 1.2, Effective Date 2/1/12 **3.1 Operating Reserve (Spinning & Non- Spinning Reserves)** A minimum of 50% of the AS Operating Reserve requirement is made up of Spinning Reserve. The AS Operating Reserve requirement is calculated by taking the greater of the: • Most severe single Contingency • Sum of 5% of the Load responsibility served by Hydro Generation plus 7% of the Load responsibility served by other Generation.	Operating Procedure No. 2230 (Most Severe Single Contingency Designation), or b. Sum of 5% of the Load responsibility served by Hydro Generation plus 7% of the Load responsibility served by other Generation defined by the AS spreadsheet; and 2. A Spinning Reserve quantity (in megawatts) greater than or equal to 50% of the Operating Reserve quantity.	
4.	**Running the Day-Ahead Market Procedure No. 1210, Version No. 15.5, Effective Date 7/24/12** **3.1.6 Ancillary Services Determination** **Step 3** **If…** There is a transmission constraint, 　**Identify** the applicable Unit(s) associated with the constraint. 　**Limit** each applicable Unit(s) AS product availability in the AS Block display. 　**Log** the event in SLIC. 　**Post** a System Operating Message on Open-Access Same-Time Information System (OASIS). **If…** There is a Generation limitation (that is not due to congestion), including Delta Dispatch, air emissions, or Start-Up limitations, 　The **DA Operator** will not incorporate a generation limitation in to a DA run unless the limitation has been properly reflected in an approved SLIC card. 　SLIC card approval serves as **notification to the Generation Owner** of their unit's limitation.	**AS IFM Blocked Resource Input Requirements and Messages** For each day selected for the next Trade Day, the following AS data for transmission constraints and generation limitations listed in the AS IFM Blocked Resource Input screen agree with data entered in SLIC: 1. Generation resources, and 2. Respective operating dates and hours.	Exception Noted. Of the generation resources identified in SLIC to be blocked from offering ancillary services to the day-ahead market due to generation limitations, six out of 993 hours included one generation resource not included in the AS IFM Blocked Resource Input screen.

Ref. No.	Operating Procedure Element	Criteria to Test Operating Procedure Element	Compliance Assessment
		For each day selected for the next Trade Day, all approved SLIC outages received by the DA Market Operator limiting AS availability due to transmission constraints agree with the operating dates and hours, and transmission constraints listed in the posted OASIS message.	No Occurrences To Assess.

5.	**Running the Day-Ahead Market**
	Procedure No. 1210, Version No. 15.5, Effective Date 7/24/12
	3. 1.7 Constraint Enforcement
	Step 2 –Verify enforced contingency, flowgate and nomogram constraints in the market software.
		IFM Constraint Inputs
		For each day selected for the next Trade Day, the identified contingencies, flowgates and nomograms listed as enforced for transmission limits in the IFM input screen agree with:
		1. SLIC,
		2. Market Impact Report, and/or
		3. Operating Procedures inclusive of the following:
		    a. Nomograms, TCors, and Contingency Data No. 3610A, and/or
		    b. Default Enforcement Status of Flowgates No. 3610B.
			No Exceptions Noted.

6.	**Running the Day-Ahead Market**
	Procedure No. 1210, Version No. 15.5, Effective Date 7/24/12
	3.1.8 Closing the DA Market
	Step 2
	If... There is a disruption that prevents the DA Market from closing on time,
	Then... Send out a market message to inform market participants that the DA Market will close late.
		DA Market Close Delay Message and Log Requirements
		For each day selected for the next Trade Day when the DA market is held open beyond 10:00 am (as evidence by the Scheduling Infrastructure Business Rules Market Status Information screen), a:
		1. Market message is posted to OASIS, and
		2. SLIC is created that contained:
		    a. Log titled "DA Market Late Closing",
		    b. Time the Market was actually closed, and
		    c. Reason for the late close.
			No Occurrences To Assess.

7.	**Running the Day-Ahead Market** **Procedure No. 1210, Version No. 15.5, Effective Date 7/24/12** **3.1.8 Closing the DA Market** **Step 3** **Transfer** the DA Market input data via the User Interface (UI) transfer input process.	**DA Market Input Data Transfer** For each day selected for the next Trade Day, the IFM Market Execution Control display indicates successful transfer of inputs.	No Exceptions Noted.

Ref. No.	Operating Procedure Element	Criteria to Test Operating Procedure Element	Compliance Assessment
8.	**Running the Day-Ahead Market** **Procedure No. 1210, Version No. 15.5, Effective Date 7/24/12** **3. 2.1 Run Market Power Mitigation (MPM)** **Step 1** **Review** Unit Commitment Request and Validation document. **Adjust** <u>initial conditions</u> to reflect Exceptional Dispatch commitments issued after previous day results have been published.	**Setting Initial Unit Commitment Conditions For DA Market After Real-Time Exceptional Dispatch** For each day selected for the next Trade Day, units listed on the Unit Commitment Request and Validation Document that were dispatched through HE 24 are entered into the initial unit commitment DA Market software for the next Trade Day.	No Exceptions Noted.
9.	**Running the Day-Ahead Market** **Procedure No. 1210, Version No. 15.5, Effective Date 7/24/12** **3.2.1 Run Market Power Mitigation** **Step 3** **After...**Adjusting initial conditions, **Then...**Execute MPM.	**Confirm MPM Execution** For each day selected for the next Trade Day, MPM execution message logs indicate for each hour of the operating day successful MPM execution.	No Exceptions Noted.
10.	**Running the Day-Ahead Market** **Procedure No. 1210, Version No. 15.5, Effective Date 7/24/12** **3.2.2 Run IFM** **Step 1** Execute the IFM. **Step 2** **Determine** if the IFM has run properly (i.e. look at the execution messages for errors and warnings).	**Confirm IFM Execution** For each day selected for the next Trade Day, IFM execution message logs indicate for each hour of the operating day successful IFM execution.	No Exceptions Noted.
11.	**Running the Day-Ahead Market** **Procedure No. 1210, Version No. 15.5, Effective Date 7/24/12** **3.2.3 Run Residual Unit Commitment (RUC)** **Step 1** **Consider** adjusting the RUC target adjustment as necessary, taking the following into consideration: • Demand Response • Load Forecast errors – Risk Predictor • Fire dangers – Cal Fire and Participating Transmission Owner (PTO) updates • Weather changes – updated weather forecasts and PTO updates	**Manual RUC Adjustments** For each day selected for the next Trade Day, the reason listed in SLIC for the RUC manual adjustment agrees with one of the reasons listed in Step 1 in the column to the left. For the same day selected above for the next Trade Day, the RUC manual adjustment quantities listed in SLIC agree with the quantities in the RUC Net Short display.	No Occurrences To Assess.

Ref. No.	Operating Procedure Element	Criteria to Test Operating Procedure Element	Compliance Assessment
	• Reliability Coordinator next-day analysis – from the Western Electricity Coordinating Council (WECC) Reliability Coordinator (RC) • Potential loss of resources – test energy, update from PTOs, subsequent Outages • Stranded Capacity – potential for transmission Outages or overloads • Address reliability concerns **Step 2** **If** A RUC modification is required for any reason, **Insert** the appropriate values in the Manual Adjustment columns (MW or %) of the RUC Net Short screen, **Log** the event in SLIC.		
12.	**Running the Day-Ahead Market** **Procedure No. 1210, Version No. 15.5, Effective Date 7/24/12** **3.2.3 Run Residual Unit Commitment** **Step 2** **Execute** RUC.	**Confirm RUC Execution** For each day selected for the next Trade Day, RUC execution message logs indicate for each hour of the operating day successful RUC execution.	No Exceptions Noted.
13.	**Running the Day-Ahead Market** **Procedure No. 1210, Version No. 15.5, Effective Date 7/24/12** **3.2.3 Run Residual Unit Commitment** **Step 7** Verify DA Market results are successfully published.	**Confirm DA Market Results Transfer** For each day selected for the next Trade Day, the Market Participant Portal screen indicates a successful DA Market data transfer.	No Exceptions Noted.

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Narrative Description of the Day-Ahead Processes

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Overview

This narrative description of day-ahead market processes reflects those processes which occurred during the Assessment Period. As such, not all the processes contained in the California Independent System Operator Corporation's (ISO) Operating Procedures described below are covered in this narrative description.

While overall day-ahead market processes are set forth in ISO Operating Procedure No. 1210 (Version No. 15.5, Effective Date July 24, 2012) and Ancillary Service Procurement and Availability Validation Operating Procedure No. 1340 (Version No. 1.2, Effective Date February 1, 2012), additional ISO Operating Procedures may be used at times when day-ahead bulk power system operational characteristics are expected. When required these additional ISO Operating Procedures are relied on to execute day-ahead market processes.

Each day based on expected next-day bulk power system operational characteristics, the day-ahead operator performs the following actions in the following order when setting-up and executing the day-ahead market:

Minimum On-Line Commitment (MOC) Constraint Setup

Minimum on-line generation levels and resource shift factors for certain resources known as MOC generation constraints are entered by the day-ahead operator into the day-ahead market software based on constraints included by operating engineers/outage scheduling in Scheduling and Logging for ISO California (SLIC) logs, and/or determined by day-ahead operators in accordance with the following restricted access operating procedures:

- San Diego Area Generation Requirements No. 7810,

- Orange County Area Requirements No. 7630,

- Humboldt Area No. 7110, and/or

- Both SONGS Units Off-Line (Summer Operations June 1-Oct 31) No. 7830.

Extremely Long Start Commitment (ELC) Process and D+2 & D+3 Determination Setup

After the day-ahead market is run, the control room shift supervisor determines if there are any extremely long-start resource commitment requirements for reliability. Any ELCs selected for commitment that are expected to be online the upcoming Trade Day are added to the daily Exceptional Dispatch and ELC Unit Commitment Validation document (Validation Document) by the shift supervisor. ELCs are defined as those resource commitments that require more than 18 hours to start-up.

Based on the units listed on the Validation Document and SLIC log, the day-ahead operator enters the ELC into the day-ahead market software. As part of the information entered into the day-ahead market software, the SLIC log number is entered to link the two records together.

Ancillary Service (AS) Determination

The day-ahead operator compares a spreadsheet calculation of the AS Operating Reserve (e.g., Spinning and Non-Spinning Reserve) requirement for each hour of the next Trade Day to the requirements set by the day-ahead market software. The requirement is set at no less than (1) the greater of the most severe single contingency, or sum of 5 percent of the load responsibility served by hydro generation plus 7 percent of the load responsibility served by other generation, and (2) 50 percent Spinning Reserve.

Generation Resource AS Blocking Setup

The day-ahead operator blocks generation resources from offering AS into the day-ahead market for the next Trade Day based on known transmission limitations or generation resource limitations which are included on the No Call List. The No Call List is compiled during each day's operations meeting. The day-ahead market operator creates SLIC logs for generation resources blocked from offering AS into the day-ahead market. If generation resources are blocked from offering AS due to transmission limitations, the day-ahead operator posts messages on the Open-Access Same-Time Information System.

AS blocks, including generation resources and respective operating dates and hours, are entered into the day-ahead market software by the day-ahead market operator.

Constraint Enforcement Setup

Each day for the next Trade Day, the day-ahead market operator using three spreadsheet tools compares enforced transmission contingencies, flowgates, and nomograms included in the day-ahead market software to:

- Contingencies listed in Operating Procedure 3610 A, Nomograms, TCors, and Contingency,

- Flowgates listed in Operating Procedure 3610 B, Default Enforcement Status of Flowgates, and

- Nomograms listed in Operating Procedure 3610 B, Default Enforcement Status of Flowgates, respectfully.

Variances (if any) are shown in the spreadsheet tools and the day-ahead software input is modified if applicable. Additional contingencies, flowgates, and nomograms (if any) included in the Market Impact Report with SLIC logs are entered into the day-ahead market software by the day-ahead operator.

Closing the Day-Ahead Market and Transfer of Day-Ahead Market Data

When all day-ahead market software setup activities are completed, the day-ahead market operator transfers all day-ahead data, including offers and bids, to the day-ahead market software for later execution using the User Interface transfer input process. If the transfer is delayed past 10:00 a.m., the day-ahead market operator sends out a message to notify market participants that the day-ahead market will close late.

Market Power Mitigation (MPM) Setup

Prior to the day-ahead market being executed, the day-ahead market operator inputs the initial conditions of the resources listed on the Validation Document into the day-ahead market application to reflect Exceptional Dispatch commitments. This is done since the day-ahead market application needs to know

what units were committed the prior day in real-time so they can be considered in the day-ahead market run optimization. Once initial conditions have been adjusted as indicated on the Validation Document the DA market operator executes MPM.

Execute Integrated Forward Market (IFM)

Once MPM has executed successfully, the day-ahead market operator executes IFM. Once IFM has been executed, the day-ahead market operator determines whether IFM executed successfully by reviewing the execution messages for any errors or warnings.

Run Residual Unit Commitment (RUC)

Once IFM has executed successfully, the day-ahead market operator determines whether additional generation capacity is required due to criteria including demand response changes, load forecasting errors, fire dangers, weather changes, reliability coordinator next-day analysis changes, resource loss potential, Participating Transmission Owner updates, generation/transmission outages, stranded capacity due to transmission outages or overloads, and reliability concerns.

If additional capacity is required, the day-ahead market operator inputs the amount of capacity required into the day-ahead market software, and enters into SLIC the requirement.

Once any manual adjustments are made, the day-ahead market operator executes RUC.

Publishing Market Results

Once RUC has executed successfully, the DA market operator executes an automated process that publishes the final day-ahead market results to Scheduling Coordinators, and verifies that the day-ahead market results have been successfully published for the Trade Day.