California ISO

May 15, 2017

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

> **Re:** **California Independent System Operator Corporation**
> **Docket Nos. ER06-615-_____ and ER07-1257-_____**
> **Market Disruption Report**

Dear Secretary Bose:

The California Independent System Operator Corporation (CAISO) hereby submits its January/February report covering Market Disruption reportable events under Section 7.7.6 of the CAISO Tariff that occurred from March 16, 2017 to April 15, 2017.[1]

Please contact the undersigned with any questions.

Respectfully submitted,

By: */s/ Anna A. McKenna*
Roger E. Collanton
General Counsel
Anna A. McKenna
Assistant General Counsel
California Independent System
Operator Corporation
250 Outcropping Way
Folsom, CA 95630
Tel: (916) 608-7182
Fax: (916) 608-7222
amckenna@caiso.com

---

[1] The CAISO submits the Market Disruption report pursuant to *California Independent System Operator Corp.*, 126 FERC ¶ 61,211 (2009), and Section 7.7.6(d) of the CAISO Tariff (CAISO Tariff Section 7.7.15 was moved into Section 7.7.6 in the CAISO's Administrative Pricing tariff amendment, *see Cal. Indep. Sys. Operator Corp.,* 158 FERC ¶ 61,085 (2016)).

Market Disruption Report
March 16, 2017 to April 15, 2017

May 15, 2017

CAISO Market Quality and Renewable Integration

I.   Background

A Market Disruption is an action or event that causes a failure of a CAISO Market, related to system operation issues or System Emergencies.[1] Pursuant to Section 7.7.6 of the ISO Tariff, the California Independent System Operator Corporation (ISO or CAISO) can take one or more of a number of specified actions in the event of a Market Disruption, to prevent a Market Disruption, or to minimize the extent of a Market Disruption. The ISO reports Market Disruption occurrence in any of the following circumstances:

- When any of the ISO market processes fail to publish, including the Integrated Forward Market (IFM), Residual Unit Commitment (RUC), the Real-Time Market, which includes the Hour-Ahead Scheduling Process (HASP), Fifteen Minute Market (FMM), and the Real-Time Dispatch (RTD) processes;

- When the ISO manually overrides the closing of the Day-Ahead Market; or

- Any time that the ISO removes Bids from a CAISO Market to prevent a Market Disruption or to minimize the extent of a Market Disruption.

The Market Disruption report contains the following information:

- The frequency and types of actions taken by the ISO pursuant to Section 7.7.6;

- The nature of the Market Disruptions that caused the ISO to take action, or the Market Disruptions that were successfully prevented or minimized by the ISO as a result of taking action, and the ISO's rationale for taking such actions pursuant to Section 7.7.6;

- Information about the Bids (including Self-Schedules) removed pursuant to Section 7.7.6 (*i.e.*, megawatt quantity, point of interconnection, specification of the Day-Ahead versus Real-Time Bid, and Energy or Ancillary Services Bid); and

- The ISO's rationale for its removal of Bids (including Self-Schedules) pursuant to Section 7.7.6.[2]

---

[1]   These system operation issues or System Emergencies are referred to in Sections 7.6 and 7.7, respectively, of the ISO Tariff. ISO Tariff, Appendix A, definition of Market Disruption. Capitalized terms not otherwise defined herein have the meanings set forth in the ISO Tariff.

[2]   *Id.* at P 29 & n.29.

II. Report on Market Disruptions Occurring from March 16, 2017 through April 15, 2017

The ISO's report on Market Disruptions that occurred from March 16, 2017 through April 15, 2017, is provided in Table 1 and Attachment A below. Attachment A includes an entry for each reportable Market Disruption event and each indicates:

(1) The date of the Market Disruption;

(2) The hour and Dispatch Interval when the Market Disruption ended;

(3) The type of CAISO Market in which the Market Disruption occurred; and

(4) A description of the nature of the Market Disruption, the nature of any actions taken by the ISO, the rationale for such actions, and the Market Disruption prevented or minimized as a result of taking such actions.

For each of the CAISO Markets, Table 1 lists the number of Market Disruptions and the number of times that the CAISO removed Bids (including Self-Schedules) during the time period covered by this report. As shown in Table 1, there were 62 Market Disruptions for the reporting period. Table 1 also indicates that the CAISO did not remove any Bids (including Self-Schedules) in any of its markets during the reporting period.

Table 1: Summary of Market Disruption Report

Type of CAISO Market	Market Disruption or Reportable Events	Removal of Bids (including Self-Schedules)
Day-Ahead		
IFM	0	0
RUC	0	0
Real-Time		
Fifteen Minute Market Interval 1	1	0
Fifteen Minute Market Interval 2	3	0
Fifteen Minute Market Interval 3	2	0
Fifteen Minute Market Interval 4	6	0
Real-Time Dispatch	50	0

Table 1 above shows the market disruptions in the real time market in order to incorporate the FMM binding intervals.

The frequency of RTD failures decreased from 58 to 50 failures in comparison to the March 2017 Report. RTD failures accounted for approximately 80 percent of all of the Market Disruptions during this reporting period.

Planned Maintenance occurred on March 23, March 30, April 4, and April 10. On March 23rd there were 3 (2 RTD, 1 FMM) disruptions, on March 30th 3 (2 RTD, 1 FMM) disruptions, and on April 4th 3 (2 RTD, 1 FMM) disruptions due to IFM/RTN patching. On April 10 there were 6 (3 FMM, 3 RTD) market disruptions due to IFM/RTN and SIBR Fall Forward.

On March 22, there was a contingency dispatch and 3 RTD disruptions due to renewable deviation. On March 25, there was a contingency dispatch and 3 RTD disruptions due to renewable deviation. On March 30, there were two RTCD runs and 6 RTD disruptions due to ACE excursion and California-Oregon Interchange overload. On April 5, there was a contingency dispatch and 3 RTD disruptions due to system wide under-generation and ACE deviation. On April 6, there was a contingency dispatch and 6 RTD disruptions due to loss of generation in the Pacific North-West and loss of a transmission line. On April 7, there were two contingency dispatches and 4 RTD disruptions due to renewable deviation. On April 14, there was a contingency dispatch and 4 RTD disruptions due to the loss of a 500kV line.

On April 12 there were 5 (4 FMM, 1 RTD) disruptions due to a SIBR issue and 1 RTD disruption due to a Real-Time Market (RTM, which includes the HASP, FMM and RTD) server issue.

The CAISO declared an interruption of the NV Energy Balancing Authority Area (BAA) participation in the RTM pursuant to Section 29.7 (j) of the CAISO tariff. The market interruption necessary because the RTM was producing results in the NV Energy BAA that were in danger of causing an abnormal system conditions in the NV Energy BAA due to transmission outages that were separating NV Energy north and south areas. The market interruption for NV Energy started on March 6 hour ending 18 interval 9 for the RTD and hour ending 18 interval 3 for the FMM market and ended on March 10 hour ending 18 interval 12 for the RTD and in hour ending 18 interval 4 in the FMM.

The CAISO declared an interruption of the Arizona Public Service Company (APS) Balancing Authority Area (BAA) participation in the RTM pursuant to Section 29.7(j) of the CAISO tariff. The interruption was necessary because communications between the CAISO and the APS EIM Entity were disrupted, which prevented the APS EIM Entity from accessing CAISO systems to submit or receive information. The market interruption for APS BAA started on March 17 hour ending 1 interval 1 for both RTD and the FMM and ended on March 17 hour ending 15 interval 4 in the FMM and hour ending 15 interval 12 in the RTD.

ATTACHMENT A

California Independent System Operator Corporation Market Disruption Report May 15, 2017
Table 3: Market Disruptions, Nature of Actions Taken by the California ISO, Rationale and/or Market Disruption Prevented or Minimized as a Result of such Actions

Count	Date	Hour	Interval	Market	Nature of Actions, Nature of Market Disruption, Rationale and/or Market Disruption Prevented or Minimized as a Result of such Actions
1	3/16/2017	16	4	FMM	FMM did not run due to application problem. This interval was filled either automatically or interactively. MQS published Pnode clearing and resource awards for this interval.
2	3/16/2017	16	7	RTD	RTD did not run due to application problem. Loss clearing payload and LMP filled from previous good interval.
3	3/16/2017	16	8	RTD	RTD did not run due to application problem. Loss clearing payload and LMP filled from previous good interval.
4	3/16/2017	16	9	RTD	RTD did not run due to application problem. Loss clearing payload and LMP filled from previous good interval.
5	3/22/2017	15	10	RTD	RTD did not run due to RTCD. Loss clearing payload and LMP filled from previous good interval.
6	3/22/2017	15	11	RTD	RTD did not run due to RTCD. Loss clearing payload and LMP filled from previous good interval.
7	3/22/2017	15	12	RTD	RTD did not run due to RTCD. Loss clearing payload and LMP filled from previous good interval.

Count	Date	Hour	Interval	Market	Nature of Actions, Nature of Market Disruption, Rationale and/or Market Disruption Prevented or Minimized as a Result of such Actions
8	3/23/2017	21	4	FMM	FMM did not run due to patch related system issues. This interval was filled either automatically or interactively. MQS published Pnode clearing and resource awards for this interval.
9	3/23/2017	21	7	RTD	RTD did not run due to patch related system issues. Loss clearing payload and LMP filled from previous good interval.
10	3/23/2017	21	8	RTD	RTD did not run due to patch related system issues. Loss clearing payload and LMP filled from previous good interval.
11	3/25/2017	9	3	RTD	RTD did not run due to RTCD. Loss clearing payload and LMP filled from previous good interval.
12	3/25/2017	9	4	RTD	RTD did not run due to RTCD. Loss clearing payload and LMP filled from previous good interval.
13	3/25/2017	9	5	RTD	RTD did not run due to RTCD. Loss clearing payload and LMP filled from previous good interval.
14	3/30/2017	11	5	RTD	RTD did not run due to RTCD. Loss clearing payload and LMP filled from previous good interval.
15	3/30/2017	11	6	RTD	RTD did not run due to RTCD. Loss clearing payload and LMP filled from previous good interval.
16	3/30/2017	11	7	RTD	RTD did not run due to RTCD. Loss clearing payload and LMP filled from previous good interval.

Count	Date	Hour	Interval	Market	Nature of Actions, Nature of Market Disruption, Rationale and/or Market Disruption Prevented or Minimized as a Result of such Actions
17	3/30/2017	15	4	FMM	FMM did not run due to patch related system issues. This interval was filled either automatically or interactively. MQS published Pnode clearing and resource awards for this interval.
18	3/30/2017	15	7	RTD	RTD did not run due to RTCD. Loss clearing payload and LMP filled from previous good interval.
19	3/30/2017	15	8	RTD	RTD did not run due to RTCD. Loss clearing payload and LMP filled from previous good interval.
20	3/30/2017	15	9	RTD	RTD did not run due to RTCD. Loss clearing payload and LMP filled from previous good interval.
21	3/30/2017	15	11	RTD	RTD did not run due to patch related system issues. Loss clearing payload and LMP filled from previous good interval.
22	3/30/2017	15	12	RTD	RTD did not run due to patch related system issues. Loss clearing payload and LMP filled from previous good interval.
23	4/4/2017	15	4	FMM	FMM did not run due to patch related system issues. This interval was filled either automatically or interactively. MQS published Pnode clearing and resource awards for this interval.
24	4/4/2017	15	7	RTD	RTD did not run due to patch related system issues. Loss clearing payload and LMP filled from previous good interval.
25	4/4/2017	15	8	RTD	RTD did not run due to patch related system issues. Loss clearing payload and LMP filled from previous good interval.

Count	Date	Hour	Interval	Market	Nature of Actions, Nature of Market Disruption, Rationale and/or Market Disruption Prevented or Minimized as a Result of such Actions
26	4/5/2017	1	3	RTD	RTD Broadcast failed due to RTCD. Loss clearing payload and LMP filled from previous good interval.
27	4/5/2017	1	4	RTD	RTD did not run due to RTCD. Loss clearing payload and LMP filled from previous good interval.
28	4/5/2017	1	5	RTD	RTD did not run due to RTCD. Loss clearing payload and LMP filled from previous good interval.
29	4/6/2017	7	5	RTD	RTD results were blocked and previous solution used.
30	4/6/2017	7	7	RTD	RTD results were blocked and previous solution used.
31	4/6/2017	7	8	RTD	RTD results were blocked and previous solution used.
32	4/6/2017	24	3	RTD	RTD did not run due to RTCD. Loss clearing payload and LMP filled from previous good interval.
33	4/6/2017	24	4	RTD	RTD did not run due to RTCD. Loss clearing payload and LMP filled from previous good interval.
34	4/6/2017	24	5	RTD	RTD did not run due to RTCD. Loss clearing payload and LMP filled from previous good interval.
35	4/6/2017	24	6	RTD	RTD did not run due to RTCD. Loss clearing payload and LMP filled from previous good interval.

Count	Date	Hour	Interval	Market	Nature of Actions, Nature of Market Disruption, Rationale and/or Market Disruption Prevented or Minimized as a Result of such Actions
36	4/6/2017	24	7	RTD	RTD did not run due to RTCD. Loss clearing payload and LMP filled from previous good interval.
37	4/6/2017	24	8	RTD	RTD did not run due to RTCD. Loss clearing payload and LMP filled from previous good interval.
38	4/6/2017	24	9	RTD	RTD results were blocked and previous solution used.
39	4/6/2017	24	10	RTD	RTD results were blocked and previous solution used.
40	4/7/2017	9	4	RTD	RTD did not run due to RTCD. Loss clearing payload and LMP filled from previous good interval.
41	4/7/2017	9	5	RTD	RTD did not run due to RTCD. Loss clearing payload and LMP filled from previous good interval.
42	4/7/2017	9	6	RTD	RTD did not run due to RTCD. Loss clearing payload and LMP filled from previous good interval.
43	4/7/2017	9	7	RTD	RTD did not run due to RTCD. Loss clearing payload and LMP filled from previous good interval.
44	4/10/2017	13	2	HASP	HASP did not run due to SIBR Fall Forward. This interval was filled either automatically or interactively. MQS published Pnode clearing and resource awards for this interval.
45	4/10/2017	13	3	FMM	FMM did not run due to SIBR Fall Forward. This interval was filled either automatically or interactively. MQS published Pnode clearing and resource awards for this interval.

Count	Date	Hour	Interval	Market	Nature of Actions, Nature of Market Disruption, Rationale and/or Market Disruption Prevented or Minimized as a Result of such Actions
46	4/10/2017	15	4	FMM	FMM did not run due to IFM Fall Forward. This interval was filled either automatically or interactively. MQS published Pnode clearing and resource awards for this interval.
47	4/10/2017	15	7	RTD	RTD did not run due to IFM Fall Forward. Loss clearing payload and LMP filled from previous good interval.
48	4/10/2017	15	8	RTD	RTD did not run due to IFM Fall Forward. Loss clearing payload and LMP filled from previous good interval.
49	4/10/2017	15	9	RTD	RTD did not run due to IFM Fall Forward. Loss clearing payload and LMP filled from previous good interval.
50	4/12/2017	3	2	HASP	HASP did not run due to SIBR issues. This interval was filled either automatically or interactively. MQS published Pnode clearing and resource awards for this interval.
51	4/12/2017	3	3	FMM	FMM did not run due to SIBR issues. This interval was filled either automatically or interactively. MQS published Pnode clearing and resource awards for this interval.
52	4/12/2017	3	4	FMM	FMM did not run due to SIBR issues. This interval was filled either automatically or interactively. MQS published Pnode clearing and resource awards for this interval.
53	4/12/2017	3	10	RTD	RTD failed due to SIBR issues. Loss clearing payload and LMP filled from previous good interval.
54	4/12/2017	4	1	FMM	FMM did not run due to SIBR issues. This interval was filled either automatically or interactively. MQS published Pnode clearing and resource awards for this interval.

Count	Date	Hour	Interval	Market	Nature of Actions, Nature of Market Disruption, Rationale and/or Market Disruption Prevented or Minimized as a Result of such Actions
55	4/12/2017	13	7	RTD	RTD did not run due to a server issue. Loss clearing payload and LMP filled from previous good interval.
56	4/12/2017	14	2	HASP	HASP did not run due to application problem. This interval was filled either automatically or interactively. MQS published Pnode clearing and resource awards for this interval.
57	4/14/2017	10	10	RTD	RTD did not run due to RTCD. Loss clearing payload and LMP filled from previous good interval.
58	4/14/2017	10	11	RTD	RTD did not run due to RTCD. Loss clearing payload and LMP filled from previous good interval.
59	4/14/2017	10	12	RTD	RTD did not run due to RTCD. Loss clearing payload and LMP filled from previous good interval.
60	4/14/2017	11	1	RTD	RTD did not run due to RTCD. Loss clearing payload and LMP filled from previous good interval.
61	4/14/2017	11	2	RTD	RTD results were blocked and previous solution used.
62	4/14/2017	11	3	RTD	RTD Broadcast failed. Loss clearing payload and LMP filled from previous good interval.

Notes:
Integrated Forward Market (IFM): The Day-Ahead Market run in which the ISO conducts the market for purchases and sales of Energy for all hours of the next Trading Day based on submitted supply and demand bids, and performs the procurement of Ancillary Services.
Residual Unit Commitment (RUC): The Day-Ahead Market run in which the ISO conducts unit commitment of additional resources based on submitted availability bids and the forecast of demand for every hour of the next Trading Day.

Fifteen Minute Market (FMM) Interval 1: The first of a series of four market runs conducted every Trading Hour in advance of the Operating Hour. In this run the ISO conducts the Market Power Mitigation for submitted Bids, which applies to all of the Real-Time Market processes for the given Trading Hour. In this interval the ISO also conducts the procurement of incremental Ancillary Services from internal resources and dynamic external resources.
Fifteen Minute Market (FMM) Interval 2: The second of a series of four market runs conducted every Trading Hour in advance of the Operating Hour during which the ISO conducts the HASP. In the HASP, the ISO conducts the procurement and sale of Energy and Ancillary services from non-dynamic System Resources based on submitted Bids and the CAISO Forecast of CAISO Demand. In this interval the ISO also conducts the advisory procurement of incremental Ancillary Services from internal resources and dynamic external resources from T to T+60 minutes and procurement for the given Trading Hour.
Fifteen Minute Market (FMM) Interval 3: The third of a series of four market runs conducted every Trading Hour. During this interval the ISO conducts the commitment of internal Short-Start and Fast Start Units for the Time Horizon of T-30 minutes to T+240 minutes. In this interval the ISO also conducts the procurement of incremental Ancillary Services from internal resources and dynamic external resources for the given Trading Hour.
Fifteen Minute Market (FMM) Interval 4: The fourth of a series of four market runs conducted every Trading Hour. This interval is for the Fifteen Minute Market for the T-105 minutes to T+60 minutes time horizon. In this interval the ISO also conducts 15-minute Ancillary Service Awards for non-Hourly System Resources, internal resources and dynamic external resources for the given Trading Hour.
Real-Time Dispatch (RTD): The five-minute interval of any given Operating Hour during which the ISO conducts the market for Energy based on submitted bids and the CAISO Forecast of CAISO Demand.

CERTIFICATE OF SERVICE

I certify that I have served the foregoing document upon the parties listed on the official service list in the captioned proceedings, in accordance with the requirements of Rule 2010 of the Commission's Rules of Practice and Procedure (18 C.F.R. § 385.2010).

Dated at Folsom, California this 15th day of May 2017.

/s/ Grace Clark
Grace Clark