



# **Market Disruption Report October 16, 2017 to November 15, 2017**

December 15, 2017

CAISO Market Quality and Renewable Integration

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## 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.<sup>1</sup> Pursuant to Section 7.7.6 of the CAISO Tariff, the California Independent System Operator Corporation (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 CAISO reports Market Disruption occurrence in any of the following circumstances:

- When any of the CAISO 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 CAISO manually overrides the closing of the Day-Ahead Market; or
- Any time that the CAISO 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 CAISO pursuant to Section 7.7.6;
- The nature of the Market Disruptions that caused the CAISO to take action, or the Market Disruptions that were successfully prevented or minimized by the CAISO as a result of taking action, and the CAISO'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 CAISO's rationale for its removal of Bids (including Self-Schedules) pursuant to Section 7.7.6.<sup>2</sup>

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<sup>1</sup> Section 7.6 and 7.7 of the CAISO Tariff refer to these system operation issues or System Emergencies, respectively. CAISO Tariff, Appendix A, definition of Market Disruption. Capitalized terms not otherwise defined herein have the meanings set forth in the CAISO Tariff.

<sup>2</sup> *Id.* at P 29 & n.29.

**II. Report on Market Disruptions Occurring from October 16, 2017 through November 15, 2017**

The CAISO’s report on Market Disruptions that occurred from October 16, 2017 through November 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 CAISO, 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 a total of 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)
<b>Day-Ahead</b>		
IFM	0	0
RUC	0	0
<b>Real-Time</b>		
Fifteen Minute Market Interval 1	1	0
Fifteen Minute Market Interval 2	3	0
Fifteen Minute Market Interval 3	1	0
Fifteen Minute Market Interval 4	5	0
Real-Time Dispatch	52	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 increased from 12 to 52 in comparison to the October 2017 Report. RTD failures accounted for approximately 84 percent of all of the Market Disruptions during this reporting period.

Planned Maintenance occurred on October 18<sup>th</sup>, October 24<sup>th</sup>, October 31<sup>st</sup>, and November 8<sup>th</sup>. On October 18<sup>th</sup> there were 4 (3 RTD, 1 FMM) disruptions, on October 24<sup>th</sup> there were 8 (5 RTD, 3 FMM) disruptions, on October 31<sup>st</sup> there were 3 (2 RTD, 1 FMM) disruptions, and on November 8<sup>th</sup> there were 4 (3 RTD, 1 FMM) disruptions due to IFM/RTN patching.

On October 23<sup>rd</sup> there were 2 contingency dispatches and 3 (RTD) disruptions due to the loss of a 500kV line. On October 24<sup>th</sup> there were 2 contingency dispatches and 9 (RTD) disruptions due to high flows on the California Oregon Intertie. On November 5<sup>th</sup> there was a contingency dispatch and 2 (RTD) disruptions due to the loss of a 500kV line.

On October 25<sup>th</sup> the CAISO made a resource non-participating for 2 intervals due to RTD failures. The resource was made non-participating to resolve the RTD issue.

On October 31<sup>st</sup> the CAISO made a resource non-participating in the day ahead market due to market failures. The resource was made non-participating to resolve the day ahead issue.

On November 5<sup>th</sup> the CAISO made a resource non-participating for 2 intervals due to RTD failures. The resource was made non-participating to resolve the RTD issue.

On November 9<sup>th</sup> the CAISO made a resource non-participating due to STUC failures. The resource was made non-participating to resolve the STUC issue.

## **ATTACHMENT A**

**California Independent System Operator Corporation  
Market Disruption Report  
December 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**

<b>Count</b>	<b>Date</b>	<b>Hour</b>	<b>Interval</b>	<b>Market</b>	<b>Nature of Actions, Nature of Market Disruption, Rationale and/or Market Disruption Prevented or Minimized as a Result of such Actions</b>
1	10/16/2017	16	9	RTD	RTD failed due to application time-out. Loss clearing payload and LMP filled from previous good interval.
2	10/16/2017	17	9	RTD	RTD failed due to application time-out. Loss clearing payload and LMP filled from previous good interval.
3	10/16/2017	19	11	RTD	RTD failed due to application time-out. Loss clearing payload and LMP filled from previous good interval.
4	10/18/2017	10	7	RTD	RTD failed due to application time-out. Loss clearing payload and LMP filled from previous good interval.
5	10/18/2017	16	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.
6	10/18/2017	16	7	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
7	10/18/2017	16	8	RTD	RTD did not run due to patch related system issues. Loss clearing payload and LMP filled from previous good interval.
8	10/18/2017	16	9	RTD	RTD did not run due to patch related system issues. Loss clearing payload and LMP filled from previous good interval.
9	10/18/2017	18	9	RTD	RTD failed due to application time-out. Loss clearing payload and LMP filled from previous good interval.
10	10/18/2017	19	9	RTD	RTD failed due to application time-out. Loss clearing payload and LMP filled from previous good interval.
11	10/20/2017	17	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.
12	10/23/2017	11	4	RTD	RTD Broadcast failed. Loss clearing payload and LMP filled from previous good interval.
13	10/23/2017	11	5	RTD	RTD did not run due to RTCD run. Loss clearing payload and LMP filled from previous good interval.
14	10/23/2017	11	6	RTD	RTD did not run due to RTCD run. Loss clearing payload and LMP filled from previous good interval.
15	10/23/2017	11	7	RTD	RTD did not run due to RTCD run. Loss clearing payload and LMP filled from previous good interval.
16	10/24/2017	11	11	RTD	RTD Broadcast failed. 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	10/24/2017	12	5	RTD	RTD failed due to application time-out. Loss clearing payload and LMP filled from previous good interval.
18	10/24/2017	12	9	RTD	RTD failed due to application time-out. Loss clearing payload and LMP filled from previous good interval.
19	10/24/2017	14	4	RTD	RTD failed due to application time-out. Loss clearing payload and LMP filled from previous good interval.
20	10/24/2017	15	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.
21	10/24/2017	15	7	RTD	RTD did not run due to application problem. Loss clearing payload and LMP filled from previous good interval.
22	10/24/2017	15	8	RTD	RTD did not run due to application problem. Loss clearing payload and LMP filled from previous good interval.
23	10/24/2017	15	9	RTD	RTD did not run due to application problem. Loss clearing payload and LMP filled from previous good interval.
24	10/24/2017	15	10	RTD	RTD did not run due to application problem. Loss clearing payload and LMP filled from previous good interval.
25	10/24/2017	15	11	RTD	RTD did not run due to application problem. Loss clearing payload and LMP filled from previous good interval.
26	10/24/2017	16	1	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.



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
27	10/24/2017	16	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.
28	10/24/2017	17	1	RTD	RTD failed due to application time-out. Loss clearing payload and LMP filled from previous good interval.
29	10/24/2017	18	9	RTD	RTD Broadcast failed. Loss clearing payload and LMP filled from previous good interval.
30	10/24/2017	18	10	RTD	RTD did not run due to RTCD run. Loss clearing payload and LMP filled from previous good interval.
31	10/24/2017	18	11	RTD	RTD did not run due to RTCD run. Loss clearing payload and LMP filled from previous good interval.
32	10/24/2017	18	12	RTD	RTD results were blocked and previous solution used.
33	10/24/2017	19	2	RTD	RTD Broadcast failed. Loss clearing payload and LMP filled from previous good interval.
34	10/24/2017	19	3	RTD	RTD did not run due to RTCD run. Loss clearing payload and LMP filled from previous good interval.
35	10/24/2017	19	4	RTD	RTD did not run due to RTCD run. Loss clearing payload and LMP filled from previous good interval.
36	10/24/2017	19	5	RTD	RTD did not run due to RTCD run. 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
37	10/24/2017	19	6	RTD	RTD did not run due to RTCD run. Loss clearing payload and LMP filled from previous good interval.
38	10/25/2017	14	10	RTD	RTD failed due to application time-out. Loss clearing payload and LMP filled from previous good interval.
39	10/25/2017	14	11	RTD	RTD did not run due to application problem. Loss clearing payload and LMP filled from previous good interval.
40	10/25/2017	15	4	RTD	RTD failed due to application time-out. Loss clearing payload and LMP filled from previous good interval.
41	10/28/2017	17	1	RTD	RTD results were blocked and previous solution used.
42	10/29/2017	17	1	RTD	RTD results were blocked and previous solution used.
43	10/31/2017	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.
44	10/31/2017	15	7	RTD	RTD did not run due to patch related system issues. Loss clearing payload and LMP filled from previous good interval.
45	10/31/2017	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
46	11/5/2017	23	11	RTD	RTD Broadcast failed. Loss clearing payload and LMP filled from previous good interval.
47	11/5/2017	23	12	RTD	RTD did not run due to RTCD run. Loss clearing payload and LMP filled from previous good interval.
48	11/6/2017	24	1	RTD	RTD did not run due to application problem. Loss clearing payload and LMP filled from previous good interval.
49	11/6/2017	24	2	RTD	RTD did not run due to application problem. Loss clearing payload and LMP filled from previous good interval.
50	11/6/2017	24	3	RTD	RTD did not run due to application problem. Loss clearing payload and LMP filled from previous good interval.
51	11/6/2017	24	4	RTD	RTD did not run due to application problem. Loss clearing payload and LMP filled from previous good interval.
52	11/6/2017	24	5	RTD	RTD did not run due to application problem. Loss clearing payload and LMP filled from previous good interval.
53	11/6/2017	24	6	RTD	RTD did not run due to application problem. Loss clearing payload and LMP filled from previous good interval.
54	11/8/2017	17	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.

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	11/8/2017	17	7	RTD	RTD did not run due to patch related system issues. Loss clearing payload and LMP filled from previous good interval.
56	11/8/2017	17	8	RTD	RTD did not run due to patch related system issues. Loss clearing payload and LMP filled from previous good interval.
57	11/8/2017	17	9	RTD	RTD did not run due to patch related system issues. Loss clearing payload and LMP filled from previous good interval.
58	11/9/2017	11	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.
59	11/15/2017	24	3	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.
60	11/15/2017	24	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.
61	11/15/2017	24	11	RTD	RTD did not run due to application problem. Loss clearing payload and LMP filled from previous good interval.
62	11/15/2017	24	12	RTD	RTD did not run due to application problem. Loss clearing payload and LMP filled from previous good interval.

Notes:

Integrated Forward Market (IFM): The Day-Ahead Market run in which the CAISO 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 CAISO conducts unit commitment of additional resources based on submitted availability bids and the forecast of demand for every hour of the next Trading Day.

<p>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 CAISO 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 CAISO also conducts the procurement of incremental Ancillary Services from internal resources and dynamic external resources.</p>
<p>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 CAISO conducts the HASP. In the HASP, the CAISO 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 CAISO 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.</p>
<p>Fifteen Minute Market (FMM) Interval 3: The third of a series of four market runs conducted every Trading Hour. During this interval the CAISO 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 CAISO also conducts the procurement of incremental Ancillary Services from internal resources and dynamic external resources for the given Trading Hour.</p>
<p>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 CAISO also conducts 15-minute Ancillary Service Awards for non-Hourly System Resources, internal resources and dynamic external resources for the given Trading Hour.</p>
<p>Real-Time Dispatch (RTD): The five-minute interval of any given Operating Hour during which the CAISO conducts the market for Energy based on submitted bids and the CAISO Forecast of CAISO Demand.</p>