Market Disruption Report
August 16, 2023 to September 15, 2023

October 15, 2023

CAISO Market Analysis

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 CAISO Tariff, the California Independent System Operator Corporation (CAISO) can take one or more of several 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 the following circumstances:

- When 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 closing 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 under Section 7.7.6;

- The nature of the Market Disruptions that caused the CAISO to act, or the Market Disruptions successfully prevented or minimized by the CAISO by taking action, and the CAISO's rationale for taking such actions under Section 7.7.6;

- Information about the Bids (including Self-Schedules) removed under 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) under Section 7.7.6.[2]

---

[1] 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.

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

II. Report on Market Disruptions Occurring from August 16, 2023 through September 15, 2023

The CAISO provides a summary of Market Disruptions that occurred from August 16, 2023, through September 15, 2023, 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 CAISO Market in which the Market Disruption occurred; and

(4) A description 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 because of taking such actions.

For each of the CAISO Markets, Table 1 lists the number of Market Disruptions during the period covered by this report. As shown in Table 1, there were 65 Market Disruptions for the reporting period.

Table 1: Summary of Market Disruption Report

Type of CAISO Market	Market Disruption or Reportable Events
Day-Ahead	
IFM	0
RUC	0
Real-Time	
Fifteen Minute Market Interval 1	3
Fifteen Minute Market Interval 2	2
Fifteen Minute Market Interval 3	2
Fifteen Minute Market Interval 4	5
Real-Time Dispatch	53

The frequency of RTD failures decreased from 55 to 53 compared to the report for the period of July 16, 2023, through August 15, 2023. RTD failures accounted for approximately 82 percent of the Market Disruptions during this reporting period.

On September 3rd there were 14 (one FMM, 13 RTD) interval disruptions due to a server memory bug. On September 13th, there were 10 (two FMM, one

HASP, seven RTD) interval disruptions due to the implementation of a market patch and where the previous market solution was used. On August 23rd, there were nine (one DSTUC, one FMM, one HASP, six RTD) interval disruptions due to market failure.

The CAISO made resources non-participating in RTD due to market failures on the following days – August 16th, September 6th and September 11th. The resources were made non-participating strictly to resolve the RTD issues and not due to bidding concerns. Different resources were made non-participating for each day.

The CAISO made resources non-participating in FMM due to market failures on the following days – August 23rd, August 28th and September 13th. The resources were made non-participating strictly to resolve the FMM issues and not due to bidding concerns. Different resources were made non-participating for each day.

The CAISO made resources non-participating in RUC due to market failures on the following days – August 16th, August 17th and August 18th. The resources were made non-participating strictly to resolve the RUC issues and not due to bidding concerns. Different resources were made non-participating for each day.

There were market disruptions for a WEIM entity due to system integration issues. The first market disruption occurred on August 23rd, 2023 from HE 17 interval 1 to HE 18 interval 3 in the RTD market, and from HE 17 interval 1 to HE 18 interval 3 in the FMM market. The second market disruption occurred on August 27th, 2023 from HE 18 interval 3 to interval 6 in the RTD market, and HE 18 interval 4 in the FMM market. The third market disruption occurred on September 6th, 2023 from HE 10 interval 12 to HE 11 interval 11 in the RTD market, and from HE 11 interval 3 to HE 12 interval 1 in the FMM market. The disruptions were isolated to this WEIM entity only and did not impact any other WEIM entities.

Market Disruption for Unique Pricing Feature

The CAISO implemented a feature to ensure unique pricing under a degenerate condition in November 2015, which the CAISO implemented along with other pricing enhancements to improve market efficiency.

Table 2 captured below shows the dates and markets in which the pricing feature was disabled between August 16, 2023, and September 15, 2023. The CAISO enabled the uniqueness feature for all other intervals across all the markets for the timeframe captured in this report.

Table 2: Status of Unique Pricing Feature across Various Markets

The CAISO did not disable its pricing feature between August 16, 2023, and September 15, 2023, and, therefore, there is no data to populate Table 2.

ATTACHMENT A

	California Independent System Operator Corporation Market Disruption Report October 15, 2023				
Table 3: Market Disruptions, Nature of Actions Taken by the CAISO, 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	8/17/2023	3	2	RTD	RTD results were blocked and previous solution used.
2	8/17/2023	3	3	RTD	RTD results were blocked and previous solution used.
3	8/17/2023	3	4	RTD	RTD results were blocked and previous solution used. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
4	8/17/2023	3	5	RTD	RTD failed due to an invalid market solution. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
5	8/18/2023	17	5	RTD	RTD results were blocked and previous solution used.
6	8/23/2023	16	11	RTD	RTD failed due to application problem. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
7	8/23/2023	16	12	RTD	RTD failed due to application problem. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).

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	8/23/2023	17	1	RTD	RTD failed due to application problem. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
9	8/23/2023	17	1	DSTUC	DSTUC failed due to application problem.
10	8/23/2023	17	2	HASP	HASP failed due to application problem.
11	8/23/2023	17	2	RTD	RTD failed due to application problem. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
12	8/23/2023	17	3	RTD	RTD failed due to application problem. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
13	8/23/2023	17	3	FMM	RTD failed due to application problem. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
14	8/23/2023	20	1	RTD	RTD results were blocked and previous solution used.
15	8/24/2023	16	1	RTD	RTD results were blocked and previous solution used.
16	8/24/2023	18	1	RTD	RTD results were blocked and previous solution used.
17	8/24/2023	18	2	RTD	RTD Broadcast failed due to unintentional operator action after market threshold was exceeded. The market results for

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
					this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
18	8/25/2023	8	6	RTD	RTD results were blocked and previous solution used.
19	8/26/2023	23	9	RTD	RTD results were blocked and previous solution used.
20	8/28/2023	23	4	FMM	FMM did not run due to implementing a market patch.
21	8/28/2023	23	7	RTD	RTD did not run due to implementing a market patch. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
22	8/28/2023	23	8	RTD	RTD did not run due to implementing a market patch. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
23	8/29/2023	9	1	RTD	RTD results were blocked and previous solution used.
24	8/29/2023	14	1	RTD	RTD results were blocked and previous solution used.
25	8/30/2023	9	1	RTD	RTD results were blocked and previous solution used.
26	8/30/2023	24	1	DSTUC	DSTUC did not run due to model promotion.

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	8/30/2023	24	3	FMM	FMM did not run due to model promotion.
28	8/30/2023	24	4	FMM	FMM did not run due to model promotion.
29	8/30/2023	24	11	RTD	RTD did not run due to model promotion. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
30	8/30/2023	24	12	RTD	RTD did not run due to model promotion. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
31	8/31/2023	1	1	RTD	RTD results were blocked and previous solution used. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
32	8/31/2023	17	12	RTD	RTD results were blocked and previous solution used.
33	9/2/2023	17	3	RTD	RTD results were blocked and previous solution used.
34	9/3/2023	18	7	RTD	RTD failed due to server memory bug. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
35	9/3/2023	18	8	RTD	RTD failed due to server memory bug. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).

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	9/3/2023	18	9	RTD	RTD failed due to server memory bug. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
37	9/3/2023	18	10	RTD	RTD failed due to server memory bug. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
38	9/3/2023	18	11	RTD	RTD failed due to server memory bug. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
39	9/3/2023	18	12	RTD	RTD failed due to server memory bug. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
40	9/3/2023	19	1	RTD	RTD failed due to server memory bug. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
41	9/3/2023	19	2	RTD	RTD failed due to server memory bug. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
42	9/3/2023	19	3	RTD	RTD failed due to server memory bug. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
43	9/3/2023	19	4	FMM	FMM failed due to server memory bug.
44	9/3/2023	19	4	RTD	RTD failed due to server memory bug. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).

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
45	9/3/2023	19	5	RTD	RTD failed due to server memory bug. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
46	9/3/2023	19	6	RTD	RTD failed due to server memory bug. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
47	9/3/2023	19	7	RTD	RTD failed due to server memory bug. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
48	9/5/2023	17	1	RTD	RTD results were blocked and previous solution used.
49	9/5/2023	17	2	RTD	RTD results were blocked and previous solution used.
50	9/7/2023	15	4	FMM	FMM did not run due to implementing a market patch.
51	9/7/2023	15	7	RTD	RTD did not run due to implementing a market patch. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
52	9/7/2023	15	8	RTD	RTD did not run due to implementing a market patch. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
53	9/9/2023	14	1	RTD	RTD results were blocked and previous solution used.

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
54	9/13/2023	1	1	RTD	RTD results were blocked and previous solution used.
55	9/13/2023	15	4	FMM	FMM did not run due to implementing a market patch.
56	9/13/2023	15	7	RTD	RTD did not run due to implementing a market patch. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
57	9/13/2023	15	8	RTD	RTD did not run due to implementing a market patch. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
58	9/13/2023	15	9	RTD	RTD did not run due to implementing a market patch. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
59	9/13/2023	15	10	RTD	RTD did not run due to implementing a market patch. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
60	9/13/2023	15	11	RTD	RTD did not run due to implementing a market patch. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
61	9/13/2023	16	1	FMM	FMM did not run due to implementing a market patch. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
62	9/13/2023	16	2	HASP	HASP did not run due to implementing a market patch.

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
63	9/13/2023	19	3	RTD	RTD results were blocked and previous solution used.
64	9/14/2023	22	2	RTD	RTD did not run due to activating RTCD. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
65	9/14/2023	22	3	RTD	RTD did not run due to activating RTCD. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).

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 procures 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.
Fifteen Minute Market (FMM) Interval 1: The first of four market runs conducted every Trading Hour before the Operating Hour. In this market run, the CAISO conducts the Market Power Mitigation for submitted Bids, which applies to the Real-Time Market processes for the Trading Hour. In this interval the CAISO also procures incremental Ancillary Services from internal resources and dynamic external resources.
Fifteen Minute Market (FMM) Interval 2: The second of four market runs conducted every Trading Hour before 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 Trading Hour.
Fifteen Minute Market (FMM) Interval 3: The third of four market runs conducted every Trading Hour. During this interval, the CAISO commits 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 procures incremental Ancillary Services from internal resources and dynamic external resources for the Trading Hour.
Fifteen Minute Market (FMM) Interval 4: The fourth 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 Trading Hour.
Real-Time Dispatch (RTD): The five-minute interval of any Operating Hour during which the CAISO conducts the market for Energy based on submitted bids and the CAISO Forecast of CAISO Demand.