



Market Disruption Report Jun 16, 2021 to Jul 15, 2021

August 16, 2021

CAISO Market Analysis and Forecasting

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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.¹ Pursuant to Section 7.7.6 of the CAISO 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 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 7.7.6.²

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 June 16, 2021 through July 15, 2021

The CAISO’s report on Market Disruptions that occurred from June 16, 2021 through July 15, 2021, 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 during the time period covered by this report. As shown in Table 1, there were a total of 102 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	7
Fifteen Minute Market Interval 2	4
Fifteen Minute Market Interval 3	4
Fifteen Minute Market Interval 4	6
Real-Time Dispatch	81

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 53 to 81 in comparison to the report for the period of May 16, 2021 through June 15, 2021. RTD failures accounted for approximately 76 percent of all of the Market Disruptions during this reporting period.

Planned Maintenance occurred on June 24th, June 29th, and July 13th. On June 24th there were 7 (5 RTD, 2 FMM) disruptions due to IFM/RTN Fall Forward. On June 29th there were 6 (5 RTD, 1 FMM) disruptions and on July 13th there were 3 (RTD) disruptions due to IFM/RTN patching.

On June 24th there were 2 (RTD) disruptions due to an RTCD run for the loss of generation. On July 9th there were 4 (RTD) disruptions due to an RTCD run for the loss of transmission. On July 12th there were 3 (RTD) disruptions due to an RTCD run for solar and wind deviations.

On June 21st there were 40 (31 RTD, 9 FMM) disruptions due to issues with broadcasting because of an unresponsive market server. IFM/RTN had an emergency fallback to Lincoln control center until the issue was resolved.

On June 23rd the CAISO made a resource non-participating in RTD due to market failures. The resource was made non-participating strictly to resolve the RTD issue and not due to bidding concerns. On June 30th the CAISO made a resource non-participating in FMM due to market failures. The resource was made non-participating strictly to resolve the FMM issue and not due to bidding concerns. On July 14th the CAISO made a resource non-participating in FMM due to market failures. The resource was made non-participating strictly to resolve the FMM issue and not due to bidding concerns.

Market Disruption for Unique Pricing Feature

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

Table 2 captured below shows the dates and market in which the pricing feature was disabled between June 16, 2021 until July 15, 2021. The uniqueness feature was enabled 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 pricing feature was not disabled between June 16, 2021 and July 15, 2021.

ATTACHMENT A

**California Independent System Operator Corporation
Market Disruption Report
August 16, 2021**

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	6/17/2021	13	10	RTD	RTD results were blocked and previous solution used.
2	6/17/2021	24	2	RTD	RTD results were blocked and previous solution used.
3	6/19/2021	24	2	RTD	RTD results were blocked and previous solution used.
4	6/21/2021	15	12	RTD	RTD Broadcast failed. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
5	6/21/2021	16	4	FMM	FMM did not run due to application problem. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
6	6/21/2021	16	3	RTD	RTD did not run 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	6/21/2021	17	1	FMM	FMM did not run 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	6/21/2021	16	5	RTD	RTD failed due to application time-out. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
9	6/21/2021	16	6	RTD	RTD did not run due to application problem. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
10	6/21/2021	16	7	RTD	RTD failed due to application time-out. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
11	6/21/2021	16	8	RTD	RTD did not run 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	6/21/2021	17	2	RTD	RTD failed due to application time-out. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
13	6/21/2021	17	3	RTD	RTD failed due to application time-out. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
14	6/21/2021	17	4	FMM	FMM did not run due to application problem. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
15	6/21/2021	18	1	FMM	FMM did not run due to application problem. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
16	6/21/2021	17	4	RTD	RTD did not run 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
17	6/21/2021	17	5	RTD	RTD did not run due to application problem. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
18	6/21/2021	17	6	RTD	RTD did not run due to application problem. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
19	6/21/2021	17	7	RTD	RTD did not run due to application problem. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
20	6/21/2021	17	8	RTD	RTD did not run due to application problem. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
21	6/21/2021	17	9	RTD	RTD did not run due to application problem. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
22	6/21/2021	17	10	RTD	RTD did not run due to application problem. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
23	6/21/2021	17	11	RTD	RTD did not run due to application problem. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
24	6/21/2021	17	12	RTD	RTD did not run due to application problem. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
25	6/21/2021	18	2	HASP	HASP did not run 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
26	6/21/2021	18	1	RTD	RTD did not run due to application problem. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
27	6/21/2021	18	2	RTD	RTD did not run due to application problem. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
28	6/21/2021	18	3	RTD	RTD did not run due to application problem. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
29	6/21/2021	18	4	FMM	FMM did not run due to application problem. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
30	6/21/2021	19	1	FMM	FMM did not run due to application problem. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
31	6/21/2021	18	4	RTD	RTD did not run due to application problem. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
32	6/21/2021	18	5	RTD	RTD did not run due to application problem. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
33	6/21/2021	18	6	RTD	RTD did not run due to application problem. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
34	6/21/2021	18	7	RTD	RTD did not run 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
35	6/21/2021	18	8	RTD	RTD did not run due to application problem. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
36	6/21/2021	18	9	RTD	RTD did not run due to application problem. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
37	6/21/2021	18	10	RTD	RTD did not run due to application problem. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
38	6/21/2021	18	11	RTD	RTD did not run due to application problem. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
39	6/21/2021	18	12	RTD	RTD did not run due to application problem. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
40	6/21/2021	19	1	RTD	RTD did not run due to application problem. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
41	6/21/2021	19	2	HASP	HASP 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).
42	6/21/2021	19	2	RTD	RTD did not run due to application problem. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
43	6/21/2021	19	3	FMM	FMM did not run due to application problem.

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
44	6/22/2021	24	2	RTD	RTD results were blocked and previous solution used.
45	6/22/2021	24	10	RTD	RTD results were blocked and previous solution used.
46	6/23/2021	14	5	RTD	RTD Broadcast failed. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
47	6/23/2021	14	8	RTD	RTD Broadcast failed. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
48	6/23/2021	14	9	RTD	RTD Broadcast failed. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
49	6/24/2021	16	1	FMM	FMM did not run due to maintenance. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
50	6/24/2021	15	7	RTD	RTD did not run due to maintenance. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
51	6/24/2021	15	8	RTD	RTD did not run due to maintenance. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
52	6/24/2021	15	9	RTD	RTD did not run due to maintenance. 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
53	6/24/2021	15	10	RTD	RTD did not run due to maintenance. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
54	6/24/2021	15	11	RTD	RTD did not run due to maintenance. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
55	6/24/2021	16	2	HASP	HASP did not run due to maintenance. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
56	6/24/2021	16	7	RTD	RTD did not run due to RTCD. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
57	6/24/2021	16	8	RTD	RTD did not run due to RTCD. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
58	6/24/2021	24	2	RTD	RTD results were blocked and previous solution used.
59	6/26/2021	23	6	RTD	RTD results were blocked and previous solution used.
60	6/26/2021	23	7	RTD	RTD results were blocked and previous solution used.
61	6/26/2021	23	8	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
62	6/26/2021	24	2	RTD	RTD results were blocked and previous solution used.
63	6/27/2021	22	3	RTD	RTD results were blocked and previous solution used.
64	6/27/2021	22	4	RTD	RTD results were blocked and previous solution used.
65	6/27/2021	22	5	RTD	RTD results were blocked and previous solution used.
66	6/27/2021	22	6	RTD	RTD results were blocked and previous solution used.
67	6/27/2021	22	7	RTD	RTD results were blocked and previous solution used.
68	6/27/2021	22	8	RTD	RTD results were blocked and previous solution used.
69	6/27/2021	24	2	RTD	RTD results were blocked and previous solution used.
70	6/29/2021	23	1	FMM	FMM did not run due to application problem.
71	6/29/2021	22	7	RTD	RTD did not run due to patch related system issues. 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
72	6/29/2021	22	8	RTD	RTD did not run due to patch related system issues. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
73	6/29/2021	22	9	RTD	RTD did not run due to patch related system issues. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
74	6/29/2021	22	10	RTD	RTD did not run due to patch related system issues. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
75	6/29/2021	22	11	RTD	RTD did not run due to patch related system issues. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
76	6/29/2021	23	2	HASP	HASP did not run due to patch related system issues. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
77	6/29/2021	23	3	FMM	FMM did not run due to application problem.
78	6/30/2021	14	4	FMM	FMM did not run due to application problem.
79	7/4/2021	16	3	RTD	RTD Broadcast failed. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
80	7/7/2021	22	10	RTD	RTD Broadcast failed. 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
81	7/8/2021	11	3	FMM	FMM did not run due to application problem. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
82	7/8/2021	11	4	FMM	FMM did not run due to application problem. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
83	7/9/2021	13	3	FMM	FMM did not run due to application problem. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
84	7/9/2021	13	4	FMM	FMM did not run due to application problem. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
85	7/9/2021	14	1	FMM	FMM failed due to application time-out.
86	7/9/2021	17	1	RTD	RTD Broadcast failed due to RTCD. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
87	7/9/2021	17	2	RTD	RTD did not run due to RTCD. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
88	7/9/2021	17	3	RTD	RTD did not run due to RTCD. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
89	7/9/2021	17	4	RTD	RTD did not run due to RTCD. 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
90	7/9/2021	20	4	RTD	RTD results were blocked and previous solution used.
91	7/10/2021	19	12	RTD	RTD Broadcast failed. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
92	7/10/2021	20	1	RTD	RTD did not run due to application problem. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
93	7/10/2021	20	2	RTD	The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).RTD did not run due to application problem.
94	7/12/2021	7	1	RTD	RTD results were blocked and previous solution used.
95	7/12/2021	7	3	RTD	RTD Broadcast failed due to RTCD. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
96	7/12/2021	7	4	RTD	RTD did not run due to RTCD. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
97	7/12/2021	8	1	RTD	RTD did not run due to RTCD. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
98	7/13/2021	16	1	FMM	FMM did not run due to application problem.

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
99	7/13/2021	15	7	RTD	RTD did not run due to patch related system issues. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
100	7/13/2021	15	8	RTD	RTD did not run due to patch related system issues. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
101	7/13/2021	15	9	RTD	RTD did not run due to patch related system issues. The market results for this interval were filled based on the tariff sections 7.7.9 and 29.7(j).
102	7/13/2021	15	10	RTD	RTD Broadcast failed. 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 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.

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.

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.

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.

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.

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.