



Exceptional Dispatch Report

Table 2: July 2018

Market Quality and Renewable Integration

October 30, 2018

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Introduction

This report is filed pursuant to FERC's September 2, 2009, and May 4, 2010, orders in ER08-1178. These orders require two monthly Exceptional Dispatch reports—one issued on the 15th of each month and one issued on the 30th of each month. This report provides data on the frequency, reasons and costs for Exceptional Dispatches issued in July 2018.

This report contains a price impact analysis as prescribed by FERC in its September 2 order. The price impact analysis for the month of July is presented in Appendix B. This report also includes mitigation analysis for July 2018 required by section 34.11.4 of the CAISO tariff. This analysis compares those Exceptional Dispatches subject to bid mitigation (i.e. Exceptional Dispatches to address noncompetitive constraints and Delta Dispatch), and determines the cost difference between the Exceptional Dispatch bid mitigation settlement rules and what the settlement amount would have been had the Exceptional Dispatches not been subject to bid mitigation. The Exceptional Dispatch bid mitigation analysis for July is presented in Appendix C.

The Nature of Exceptional Dispatch

The CAISO can issue exceptional dispatch instructions for a resource as a pre-day-ahead unit commitment, a post day-ahead unit commitment or a real-time exceptional dispatch. A pre-day-ahead unit commitment is an exceptional dispatch instruction committing a resource at or above its physical minimum (Pmin) operating level in the day-ahead market. A post-day-ahead unit commitment is an exceptional dispatch instruction committing a resource at or above its (Pmin) operating level in the real-time market. A real-time exceptional dispatch instructs a resource to operate at or above its physical minimum operating point. A real-time exceptional dispatch above the resource's day-ahead award is an incremental exceptional dispatch instruction and a real-time exceptional dispatch below the day-ahead award is considered a decremental dispatch instruction. The CAISO issues exceptional dispatch instructions to maintain the reliability of the grid when the market software cannot do so. Whenever the CAISO issues an exceptional dispatch instruction, the operator logs the dispatch and the associated reason. Reliability requirements are calculated for both local area and the system wide needs, and are classified into various requirements including local generation, transmission management, non-modeled transmission outages, ramping and intertie emergency assistance. Whenever the CAISO issues an exceptional dispatch instruction, the operators log these instructions and the associated reason for each instruction.

Most of the generation procedures are internal to the CAISO and not available publicly on the CAISO website; however, all of the transmission procedures are available on the CAISO website.¹

The following additional reason for exceptional dispatch instructions in 2018 includes Software Limitation. When an exceptional dispatch instruction was used to bridge schedules across days for resources with a minimum down time of 24 hours, as the CAISO software does not handle multi day commitment. For instance, a resource has a day-ahead schedule from 0600 till 2300, and then is shut down in 2400. If this resource had a minimum down time of 24 hours and it is required the following day, then the CAISO issues an exceptional dispatch to commit this resource in 2400 so it can be dispatched economically in the following day. Software limitation reason was also used for exceptional dispatches to manually issue shut down instructions to a resource because of a temporary Automatic Dispatch System (“ADS”) failure, or similar issues. There were a few other reasons used to explain exceptional dispatch instructions in July, which are self explanatory.

The data in Table 1 is based on a template specified in the September 2009 order.² This table contains all the information published in Table 1 of the first report for July 2018. In addition, it contains volume (MWh) and cost information. Each entry in Table 1 is a summary of exceptional dispatches classified by (1) the reason for the exceptional dispatch; (2) the location of the resource by Participating Transmission Owner (PTO) service area; (3) the Local Reliability Area (LRA) where applicable; (4) the market in which the exceptional dispatch occurred (day-ahead vs. real-time); and (5) the date of the exceptional dispatch. For each classification the following information is provided: (1) Megawatts (MW); (2) Commitment; (3) Inc or Dec; (4) Hours; (5) Begin Time; (6) End Time; (7) Total Volume (MWh); (8) Min Load Cost; (9) Start Up Cost; (10) CC6470; (11) ED Volume (MWh INC/DEC); (12) CC6470 INC; (13) CC6470 DEC; (14) CC6482; (15) CC6488; and (16) CC6620. Each column is defined:

- The MW column shows the range of exceptional dispatch instruction in MW for the classification.
- The Commitment column specifies if there was a unit commitment for the classification.
- The INC/DEC/NA column specifies if there was an incremental dispatch (INC), a decremental dispatch (DEC), or only a unit commitment (NA). The Begin Time and End Time columns show the start and end time of exceptional dispatch for the classification respectively.

¹ A list of all of the CAISO’s Operating Procedures and all the publicly available Operating Procedures are available at the following link:

<http://www.caiso.com/thegrid/operations/opsdoc/index.html>

² The data in Table 1 is principally SLIC information supplemented with data from the Market Quality System (MQS) and Settlements database. The volume and cost information is based on t+51B Recalculation Statements.

- The Hours column is the time difference between begin time and end time rounded up to the next hour.
- The total volume column shows the total MWh dispatch quantity dispatched for that classification. This quantity includes the minimum load quantity, the imbalance energy quantity, and the exceptional dispatch quantity.
- The Min-Load Cost column shows eligible minimum load cost for the classification.
- The Start-Up Cost column shows the eligible start up cost for the classification. The CAISO does not explicitly pay resources for its start up and minimum load costs; however, it ensures that resources are compensated adequately through its bid cost recovery.³
- The CC6470 column shows the total imbalance energy costs for the classification. This cost contains the portion of exceptional dispatch instruction settled as optimal energy due to its bid price being less than the LMP in the relevant settlement interval.
- The ED Volume MWh (MWh INC/DEC) column shows the incremental or the decremental portion of the real-time exceptional dispatch MWh for the classification. The CC6470-INC shows that portion of incremental exceptional dispatch instruction settled at the resource LMP.
- The CC6470-DEC column shows that portion of decremental exceptional dispatch instruction settled at the resource specific LMP. Both these charge codes are portions of the real-time instructed imbalance energy charge code (6470).⁴
- The CC6482 column shows the real-time excess cost for the classification.⁵
- The CC6488 column shows the real-time exceptional dispatch uplift settlement for the classification.⁶ The CC6620 shows the bid cost recovery payment for the classification. This cost is shown for all pre-day-ahead unit commitments only.

Charge codes 6470, 6470 INC, 6470 DEC, 6482 and 6488 are shown in Table 1 because all these charge codes pertain to real-time exceptional dispatch MWh quantities. The classification of data is further explained for example in Attachment A. Many of the exceptional dispatches with the reason “Other Reliability Requirement” were due to Real Time Contingency Analysis.

³ For further details regarding the Bid Cost Recovery process please refer to section 11.8 of the CAISO tariff.

⁴ For further details please refer to the BPM configuration Guide: Real-Time Instructed Imbalance Energy Settlement published on the CAISO’s website.

⁵ For further details please refer to the BPM configuration Guide: Real Time Excess Cost for Instructed Energy Settlement published on the CAISO’s website.

⁶ For further details please refer to the BPM configuration Guide: Real Time Exceptional Dispatch Uplift Settlement published on the CAISO’s website.

Table 1: Exceptional Dispatches in July 2018

**California Independent System Operator Corporation
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Chart 2: Table of Exceptional Dispatches for Period 01/July/2018 - 31/July/2018

Number	Market Type	Reason	Location	Local Reliability Area	Trade Date	MW	Commitment	INC_DEC	Hours	Begin Time	End Time	Total MWH	Min Load Cost	Start Up Cost	CC6470	ED MWH (INC/DEC)	CC6470 INC	CC6470 DEC	CC6482	CC6488	CC6620
1	RT	Bridging Schedules	SCE	Big Creek-Ventura	7/6/2018	100	No	INC	2	22:00	23:59	-51.32	38056.31	0.00	3275.97	0.00	0.00	0.00	0.00	0.00	0.00
2	RT	Bridging Schedules	SCE	Big Creek-Ventura	7/7/2018	100	No	INC	15	0:00	14:59	-316.86	254262.60	0.00	-4455.56	0.00	0.00	0.00	0.00	0.00	0.00
3	RT	Bridging Schedules	SCE	Big Creek-Ventura	7/23/2018	150	No	INC	2	22:00	23:59	133.16	146618.87	0.00	-11054.80	0.00	0.00	0.00	0.00	0.00	0.00
4	RT	Bridging Schedules	SCE	LA Basin	7/4/2018	10-30	Yes	INC	2	22:00	23:59	1.44	6220.56	0.00	-177.73	0.00	0.00	0.00	0.00	0.00	0.00
5	RT	Contingency Dispatch	Intertie	N/A	7/15/2018	7	Yes	INC	1	6:00	6:59	60.00	0.00	0.00	-4338.73	7.00	-506.19	0.00	-543.81	0.00	0.00
6	RT	Contingency Dispatch	SCE	Big Creek-Ventura	7/15/2018	47	No	INC	1	6:05	6:49	30.15	792.67	98.08	-2532.98	0.00	0.00	0.00	0.00	0.00	0.00
7	RT	Contingency Dispatch	SCE	LA Basin	7/15/2018	140	No	INC	1	6:05	6:49	71.12	2879.91	224.28	-5457.78	0.00	0.00	0.00	0.00	0.00	0.00
8	RT	Contingency Dispatch	SCE	LA Basin	7/18/2018	420-800	No	DEC	1	15:58	16:19	-7.32	0.00	0.00	410.75	-6.07	0.00	322.39	0.00	0.00	0.00
9	RT	Contingency Dispatch	SDG&E	San Diego-IV	7/15/2018	150-168	No	INC	1	6:05	6:49	71.41	4252.05	52.00	-5234.67	0.00	0.00	0.00	0.00	0.00	0.00
10	RT	Fast Start Unit Management	PG&E	Bay Area	7/20/2018	0	No	INC	2	3:15	4:19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	RT	Fast Start Unit Management	SCE	Big Creek-Ventura	7/8/2018	0	No	INC	1	1:15	2:14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	RT	Fast Start Unit Management	SCE	Big Creek-Ventura	7/14/2018	0	No	DEC	1	18:25	19:19	-11.78	-792.67	0.00	0.16	-11.78	0.00	0.00	0.00	0.00	0.00
13	RT	Fast Start Unit Management	SCE	Big Creek-Ventura	7/17/2018	0	No	DEC	1	21:45	22:44	-11.78	0.00	0.00	0.00	-11.78	0.00	0.00	0.00	0.00	0.00
14	RT	Fast Start Unit Management	SCE	Big Creek-Ventura	7/20/2018	0	No	INC	1	1:45	2:44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	RT	Fast Start Unit Management	SCE	Big Creek-Ventura	7/25/2018	0	No	DEC	1	2:15	3:14	-23.55	0.00	0.00	0.00	-23.55	0.00	0.00	0.00	0.00	0.00
16	RT	Fast Start Unit Management	SCE	Big Creek-Ventura	7/26/2018	0	No	DEC	1	1:40	2:39	-27.48	0.00	0.00	0.00	-27.48	0.00	0.00	0.00	0.00	0.00
17	RT	Fast Start Unit Management	SCE	LA Basin	7/7/2018	0	No	INC	1	2:30	3:29	-11.22	0.00	0.00	0.00	-11.22	0.00	0.00	0.00	0.00	0.00

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Number	Market Type	Reason	Location	Local Reliability Area	Trade Date	MW	Commitment	INC_DEC	Hours	Begin Time	End Time	Total MWH	Min Load Cost	Start Up Cost	CC6470	ED MWH (INC/DEC)	CC6470 INC	CC6470 DEC	CC6482	CC6488	CC6620
18	RT	Fast Start Unit Management	SCE	LA Basin	7/17/2018	0	No	DEC	1	22:00	22:24	0.00	-3255.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	RT	Fast Start Unit Management	SCE	LA Basin	7/17/2018	0	No	INC	1	22:45	23:44	-11.72	0.00	0.00	0.00	-11.72	0.00	0.00	0.00	0.00	0.00
20	RT	Fast Start Unit Management	SDG&E	San Diego-IV	7/15/2018	0	No	INC	8	5:20	12:29	-16.58	966.25	0.00	0.00	-16.58	0.00	0.00	0.00	0.00	0.00
21	RT	Incomplete or Inaccurate Transmission	PG&E	Kern	7/24/2018	37	No	DEC	2	20:35	21:59	1.50	0.00	0.00	-85.75	0.00	0.00	0.00	0.00	0.00	0.00
22	RT	Incomplete or Inaccurate Transmission	PG&E	N/A	7/20/2018	30	Yes	DEC	5	17:00	21:59	2.09	0.00	0.00	-97.50	0.00	0.00	0.00	0.00	0.00	0.00
23	RT	Incomplete or Inaccurate Transmission	PG&E	N/A	7/20/2018	30	Yes	INC	5	17:00	21:59	8.61	1800.00	0.00	-420.66	2.50	-118.52	0.00	0.00	-725.41	0.00
24	RT	Incomplete or Inaccurate Transmission	PG&E	Stockton	7/11/2018	16	No	DEC	2	10:20	11:59	-0.33	0.00	0.00	10.07	-1.33	0.00	46.37	0.00	-91.58	0.00
25	RT	Incomplete or Inaccurate Transmission	SCE	Big Creek-Ventura	7/14/2018	47-94	No	INC	8	10:44	17:44	18.44	38048.00	0.00	-441.18	0.00	-0.11	0.00	0.00	-3.77	0.00
26	RT	Incomplete or Inaccurate Transmission	SDG&E	San Diego-IV	7/14/2018	25-35	No	INC	9	12:46	20:59	16.20	12561.25	0.00	-530.68	10.03	-330.12	0.00	0.00	-2378.71	0.00
27	RT	Load Forecast Uncertainty	PG&E	Bay Area	7/18/2018	240-480	No	INC	1	15:37	16:27	229.84	7186.08	2666.91	-6910.60	0.00	0.00	0.00	0.00	0.00	0.00
28	RT	Load Forecast Uncertainty	PG&E	Bay Area	7/24/2018	120-258	No	DEC	11	11:10	21:59	352.74	-5222.08	0.00	-14517.55	26.31	-909.02	0.00	-241.63	0.00	0.00
29	RT	Load Forecast Uncertainty	PG&E	Bay Area	7/25/2018	46	No	DEC	6	16:55	21:59	27.07	0.00	550.78	-1970.86	0.00	0.00	0.00	0.00	0.00	0.00
30	RT	Load Forecast Uncertainty	PG&E	Bay Area	7/25/2018	47	No	INC	1	16:50	16:54	3.95	0.00	9.03	-289.18	0.00	0.00	0.00	0.00	0.00	0.00
31	RT	Load Forecast Uncertainty	PG&E	Bay Area	7/26/2018	120-384	No	DEC	16	6:10	21:59	14.37	-42292.45	0.00	1384.36	0.00	0.00	0.00	0.00	0.00	0.00
32	RT	Load Forecast Uncertainty	PG&E	Fresno	7/18/2018	83	No	INC	1	15:37	15:54	24.46	0.00	0.00	-683.16	0.00	0.00	0.00	0.00	0.00	0.00
33	RT	Load Forecast Uncertainty	PG&E	Fresno	7/24/2018	35	No	INC	4	6:45	9:59	0.00	4803.12	377.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00
34	RT	Load Forecast Uncertainty	PG&E	Fresno	7/30/2018	83-166	Yes	INC	7	13:50	19:59	30.24	122400.67	0.00	-191.42	0.00	0.00	0.00	0.00	0.00	0.00
35	RT	Load Forecast Uncertainty	PG&E	N/A	7/14/2018	47	No	DEC	1	16:15	17:14	48.44	-11556.60	0.00	-1539.62	0.00	0.00	0.00	0.00	0.00	0.00

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36	RT	Load Forecast Uncertainty	PG&E	N/A	7/18/2018	6	No	DEC	1	17:00	17:02	0.47	-23.04	0.00	-12.67	0.00	0.00	0.00	0.00	0.00	0.00
37	RT	Load Forecast Uncertainty	PG&E	N/A	7/24/2018	47	No	DEC	14	7:30	20:59	-34.46	-81151.51	0.00	-24.81	0.00	0.00	0.00	0.00	0.00	0.00
38	RT	Load Forecast Uncertainty	PG&E	N/A	7/25/2018	20	No	DEC	16	6:40	21:59	-72.38	0.00	73.61	3480.22	0.00	0.00	0.00	0.00	0.00	0.00
39	RT	Load Forecast Uncertainty	PG&E	N/A	7/25/2018	20	No	INC	16	6:40	21:59	-0.07	3612.00	17.91	1.79	0.00	0.00	0.00	0.00	0.00	0.00
40	RT	Load Forecast Uncertainty	PG&E	N/A	7/26/2018	47-67	No	DEC	14	9:10	22:29	-249.33	-55082.57	2849.48	10545.30	0.00	0.00	0.00	0.00	0.00	0.00
41	RT	Load Forecast Uncertainty	PG&E	N/A	7/27/2018	47	No	DEC	6	15:55	20:59	-15.07	-21702.37	0.00	-1220.62	0.00	0.00	0.00	0.00	0.00	0.00
42	RT	Load Forecast Uncertainty	PG&E	N/A	7/31/2018	47	No	DEC	15	5:55	19:59	75.71	-93314.34	0.00	-4755.84	0.00	0.00	0.00	0.00	0.00	0.00
43	RT	Load Forecast Uncertainty	SCE	Big Creek-Ventura	7/5/2018	50	No	INC	6	18:00	23:59	470.00	96455.76	0.00	-13249.15	30.00	-2093.18	0.00	0.00	0.00	0.00
44	RT	Load Forecast Uncertainty	SCE	Big Creek-Ventura	7/6/2018	50	No	INC	18	0:00	17:59	70.64	271018.43	0.00	-2752.61	12.50	-1119.74	0.00	0.00	0.00	0.00
45	RT	Load Forecast Uncertainty	SCE	Big Creek-Ventura	7/7/2018	50	No	INC	2	22:00	23:59	56.63	22646.27	0.00	-3098.98	0.00	0.00	0.00	0.00	0.00	0.00
46	RT	Load Forecast Uncertainty	SCE	Big Creek-Ventura	7/8/2018	50-150	No	INC	24	0:00	23:59	57.62	354047.92	0.00	-3873.54	6.81	-218.45	0.00	0.00	0.00	0.00
47	RT	Load Forecast Uncertainty	SCE	Big Creek-Ventura	7/9/2018	100-820	No	INC	24	0:00	23:59	-12.15	1030807.36	0.00	1065.70	0.00	0.00	0.00	-18176.99	0.00	0.00
48	RT	Load Forecast Uncertainty	SCE	Big Creek-Ventura	7/10/2018	100-820	No	INC	24	0:00	23:59	238.52	975495.43	0.00	-5347.94	150.92	-0.55	0.00	-20636.08	0.00	0.00
49	RT	Load Forecast Uncertainty	SCE	Big Creek-Ventura	7/18/2018	33	No	INC	1	15:37	15:54	4.72	0.00	0.00	-356.11	0.00	0.00	0.00	0.00	0.00	0.00
50	RT	Load Forecast Uncertainty	SCE	Big Creek-Ventura	7/19/2018	401	No	INC	8	13:00	20:59	-209.84	414193.74	0.00	18712.14	0.00	0.00	0.00	-6903.33	0.00	0.00
51	RT	Load Forecast Uncertainty	SCE	Big Creek-Ventura	7/20/2018	50-820	No	INC	24	0:00	23:59	-5.03	1389333.72	0.00	-251384.52	0.00	0.00	0.00	-21332.63	0.00	0.00
52	RT	Load Forecast Uncertainty	SCE	Big Creek-Ventura	7/21/2018	50-820	No	INC	24	0:00	23:59	-139.78	1188849.08	0.00	2085.16	2.21	-198.98	0.00	-25336.81	0.00	0.00

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Number	Market Type	Reason	Location	Local Reliability Area	Trade Date	MW	Commitment	INC_DEC	Hours	Begin Time	End Time	Total MWH	Min Load Cost	Start Up Cost	CC6470	ED MWH (INC/DEC)	CC6470 INC	CC6470 DEC	CC6482	CC6488	CC6620
53	RT	Load Forecast Uncertainty	SCE	Big Creek-Ventura	7/22/2018	50-1640	No	INC	24	0:00	23:59	594.48	1839357.78	0.00	-16214.11	0.38	-24.64	0.00	-24156.40	0.00	0.00
54	RT	Load Forecast Uncertainty	SCE	Big Creek-Ventura	7/24/2018	100-1203	No	INC	23	0:00	22:29	-55.24	1241960.39	0.00	-1555.15	0.82	-61.32	0.00	-20.25	0.00	0.00
55	RT	Load Forecast Uncertainty	SCE	Big Creek-Ventura	7/24/2018	401	No	DEC	10	13:00	22:29	14.45	0.01	0.00	-3236.60	0.00	0.00	0.00	0.00	0.00	0.00
56	RT	Load Forecast Uncertainty	SCE	Big Creek-Ventura	7/25/2018	100	No	INC	1	23:00	23:59	0.00	46635.72	0.00	-0.16	0.00	0.00	0.00	0.00	0.00	0.00
57	RT	Load Forecast Uncertainty	SCE	Big Creek-Ventura	7/26/2018	50-401	No	INC	12	12:00	23:59	1868.37	85139.79	0.00	-180251.02	173.19	-15931.13	0.00	-16464.72	0.00	0.00
58	RT	Load Forecast Uncertainty	SCE	Big Creek-Ventura	7/26/2018	401	No	DEC	9	12:00	20:59	1488.76	-368.25	0.00	-115769.28	125.80	-10357.72	0.00	-95.98	0.00	0.00
59	RT	Load Forecast Uncertainty	SCE	Big Creek-Ventura	7/27/2018	50-802	No	INC	24	0:00	23:59	198.03	1116795.14	0.00	-9442.89	42.51	-2689.98	0.00	-8380.79	0.00	0.00
60	RT	Load Forecast Uncertainty	SCE	Big Creek-Ventura	7/28/2018	50	No	INC	24	0:00	23:59	173.79	589007.66	0.00	-12668.91	63.28	-8938.41	0.00	0.00	0.00	0.00
61	RT	Load Forecast Uncertainty	SCE	Big Creek-Ventura	7/29/2018	50-802	No	INC	24	0:00	23:59	389.98	965818.94	0.00	-56526.99	134.83	-10463.63	0.00	-8591.65	0.00	0.00
62	RT	Load Forecast Uncertainty	SCE	Big Creek-Ventura	7/30/2018	50	No	INC	5	0:00	4:59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
63	RT	Load Forecast Uncertainty	SCE	LA Basin	7/4/2018	10	Yes	INC	2	22:00	23:59	10.00	6987.64	0.00	-276.90	0.00	0.00	0.00	0.00	0.00	0.00
64	RT	Load Forecast Uncertainty	SCE	LA Basin	7/5/2018	10-140	Yes	INC	24	0:00	23:59	70.63	61725.99	0.00	-22713.89	0.00	0.00	0.00	0.00	0.00	0.00
65	RT	Load Forecast Uncertainty	SCE	LA Basin	7/6/2018	130-320	Yes	INC	24	0:00	23:59	1537.89	321326.64	0.00	-40898.63	0.00	0.00	0.00	0.00	0.00	0.00
66	RT	Load Forecast Uncertainty	SCE	LA Basin	7/7/2018	320	Yes	INC	24	0:00	23:59	-161.17	1181169.03	0.00	-132859.41	17.80	-4516.28	0.00	0.00	0.00	0.00
67	RT	Load Forecast Uncertainty	SCE	LA Basin	7/8/2018	70-90	No	INC	24	0:00	23:59	371.35	294844.86	0.00	-73583.39	333.08	-72165.49	0.00	0.00	0.00	0.00
68	RT	Load Forecast Uncertainty	SCE	LA Basin	7/9/2018	90-760	No	INC	24	0:00	23:59	53.43	533404.01	0.00	1827.24	144.40	-6217.02	0.00	-185491.10	0.00	0.00

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Number	Market Type	Reason	Location	Local Reliability Area	Trade Date	MW	Commitment	INC_DEC	Hours	Begin Time	End Time	Total MWH	Min Load Cost	Start Up Cost	CC6470	ED MWH (INC/DEC)	CC6470 INC	CC6470 DEC	CC6482	CC6488	CC6620
69	RT	Load Forecast Uncertainty	SCE	LA Basin	7/10/2018	699	No	INC	7	15:00	21:59	-13.25	0.00	0.00	582.35	0.00	0.00	0.00	-313243.61	0.00	0.00
70	RT	Load Forecast Uncertainty	SCE	LA Basin	7/11/2018	70-634	Yes	INC	9	15:00	23:59	364.94	55706.07	0.00	-22179.44	23.06	-5635.86	0.00	-108393.05	0.00	0.00
71	RT	Load Forecast Uncertainty	SCE	LA Basin	7/11/2018	250-634	No	DEC	6	15:00	20:59	-46.55	-57547.10	0.00	66627.18	49.98	-2594.10	0.00	0.00	0.00	0.00
72	RT	Load Forecast Uncertainty	SCE	LA Basin	7/12/2018	190-384	No	DEC	8	14:00	21:59	-198.75	0.00	0.00	34516.23	0.00	0.00	0.00	0.00	0.00	0.00
73	RT	Load Forecast Uncertainty	SCE	LA Basin	7/12/2018	240-1054	Yes	INC	24	0:00	23:59	243.58	573913.80	0.00	-13052.91	0.00	0.00	0.00	-212699.13	0.00	0.00
74	RT	Load Forecast Uncertainty	SCE	LA Basin	7/13/2018	70-694	No	INC	24	0:00	23:59	39.00	326931.28	0.00	-9958.27	57.08	-4259.23	0.00	-286738.56	0.00	0.00
75	RT	Load Forecast Uncertainty	SCE	LA Basin	7/13/2018	210	No	DEC	8	14:15	21:59	-340.87	0.00	0.00	12425.47	0.00	0.00	0.00	0.00	0.00	0.00
76	RT	Load Forecast Uncertainty	SCE	LA Basin	7/14/2018	90-894	No	INC	24	0:00	23:59	-561.23	440369.95	0.00	21235.12	3.65	-122.56	0.00	-346861.02	0.00	0.00
77	RT	Load Forecast Uncertainty	SCE	LA Basin	7/15/2018	90-160	Yes	INC	24	0:00	23:59	1488.05	462189.68	0.00	-89573.64	1162.89	-52579.31	0.00	-562212.63	0.00	0.00
78	RT	Load Forecast Uncertainty	SCE	LA Basin	7/16/2018	20-160	No	INC	24	0:00	23:59	-22.02	441791.74	0.00	-12027.88	50.46	-15669.15	0.00	0.00	0.00	0.00
79	RT	Load Forecast Uncertainty	SCE	LA Basin	7/18/2018	130	No	INC	1	15:37	15:54	26.62	0.00	0.00	-2263.41	0.00	0.00	0.00	0.00	0.00	0.00
80	RT	Load Forecast Uncertainty	SCE	LA Basin	7/19/2018	80-194	Yes	INC	11	13:00	23:59	-35.24	84171.86	0.00	9170.96	0.00	0.00	0.00	-91519.76	0.00	0.00
81	RT	Load Forecast Uncertainty	SCE	LA Basin	7/19/2018	241-913	No	DEC	9	13:00	21:59	435.45	-90890.25	0.00	-35742.49	0.25	-12.63	0.00	-0.30	0.00	0.00
82	RT	Load Forecast Uncertainty	SCE	LA Basin	7/20/2018	210-1430	Yes	INC	24	0:00	23:59	79.40	1124892.33	0.00	-117008.36	71.27	-9600.14	0.00	-207130.15	0.00	0.00
83	RT	Load Forecast Uncertainty	SCE	LA Basin	7/20/2018	250-440	No	DEC	7	15:00	21:59	423.86	-75483.90	0.00	-176279.37	14.80	-553.35	0.00	-661.68	0.00	0.00

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84	RT	Load Forecast Uncertainty	SCE	LA Basin	7/21/2018	210-1516	No	INC	24	0:00	23:59	-280.99	2694263.35	0.00	8774.18	189.29	-7970.53	0.00	-490087.55	0.00	0.00
85	RT	Load Forecast Uncertainty	SCE	LA Basin	7/22/2018	280-1790	Yes	INC	24	0:00	23:59	98.09	3307929.68	49387.85	-8566.70	204.18	-8944.56	0.00	-807971.46	0.00	0.00
86	RT	Load Forecast Uncertainty	SCE	LA Basin	7/23/2018	140-230	Yes	INC	24	0:00	23:59	-203.89	1012381.89	0.00	7893.05	34.30	-20223.63	0.00	0.00	0.00	0.00
87	RT	Load Forecast Uncertainty	SCE	LA Basin	7/24/2018	70-2091	Yes	INC	24	0:00	23:59	6638.78	295672.11	0.00	1677471.91	899.52	176414.75	0.00	-173385.202	0.00	0.00
88	RT	Load Forecast Uncertainty	SCE	LA Basin	7/24/2018	502-1566	No	DEC	13	9:25	21:59	1063.98	1006045.46	75855.68	-546230.38	39.42	-6883.62	0.00	-1931.92	0.00	0.00
89	RT	Load Forecast Uncertainty	SCE	LA Basin	7/25/2018	10	Yes	INC	2	22:00	23:59	0.00	14812.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90	RT	Load Forecast Uncertainty	SCE	LA Basin	7/25/2018	152	No	DEC	6	16:45	21:59	-34.98	-48454.55	18576.67	5235.12	3.25	-369.45	0.00	-99.69	0.00	0.00
91	RT	Load Forecast Uncertainty	SCE	LA Basin	7/26/2018	147-669	No	DEC	14	8:55	22:29	610.93	-117818.66	0.00	-63755.42	2.42	-157.20	0.00	-113.01	0.00	0.00
92	RT	Load Forecast Uncertainty	SCE	LA Basin	7/26/2018	200-1494	Yes	INC	24	0:00	23:59	208.85	2151367.94	0.00	-11299.06	171.37	-14711.48	0.00	-284545.66	0.00	0.00
93	RT	Load Forecast Uncertainty	SCE	LA Basin	7/27/2018	40-1608	No	INC	24	0:00	23:59	1424.73	997050.08	0.00	-164386.21	1034.71	-80653.89	0.00	100649.676	0.00	0.00
94	RT	Load Forecast Uncertainty	SCE	LA Basin	7/27/2018	241	No	DEC	10	12:25	21:29	-28.74	0.00	0.00	2700.66	0.00	0.00	0.00	0.00	0.00	0.00
95	RT	Load Forecast Uncertainty	SCE	LA Basin	7/28/2018	40	No	INC	24	0:00	23:59	-30.13	292773.07	0.00	26.08	0.00	-0.73	0.00	0.00	0.00	0.00
96	RT	Load Forecast Uncertainty	SCE	LA Basin	7/29/2018	20-996	No	INC	24	0:00	23:59	1325.88	301146.75	0.00	-141637.79	773.99	-47603.05	0.00	-421954.53	0.00	0.00
97	RT	Load Forecast Uncertainty	SCE	LA Basin	7/30/2018	10-680	No	INC	15	9:00	23:59	-692.76	145097.84	26487.81	95398.15	0.02	-1.83	0.00	-30331.80	0.00	0.00
98	RT	Load Forecast Uncertainty	SCE	LA Basin	7/30/2018	450-700	No	DEC	5	15:00	19:59	579.01	-62081.21	0.00	-124212.56	0.00	0.00	0.00	0.00	0.00	0.00

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99	RT	Load Forecast Uncertainty	SCE	LA Basin	7/31/2018	10-910	Yes	INC	9	15:00	23:59	349.32	278433.13	0.00	-37777.49	42.75	-3649.07	0.00	-60443.84	0.00	0.00
100	RT	Load Forecast Uncertainty	SCE	LA Basin	7/31/2018	400	No	DEC	6	15:00	20:59	-560.38	0.00	0.00	54648.54	0.00	0.00	0.00	0.00	0.00	0.00
101	RT	Load Forecast Uncertainty	SCE	LA Basin	8/1/2018	10	No	INC	24	0:00	23:59	96.78	89159.52	0.00	-47901.53	0.00	0.00	0.00	0.00	0.00	0.00
102	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	7/6/2018	29	No	DEC	4	18:20	21:29	0.74	0.00	700.44	-10305.59	0.00	0.00	0.00	0.00	0.00	0.00
103	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	7/6/2018	29	No	INC	4	18:20	21:29	13.54	0.00	131.33	-1108.39	2.00	-161.43	0.00	-30.57	0.00	0.00
104	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	7/8/2018	20	No	INC	24	0:00	23:59	-0.03	96109.92	0.00	1.64	0.00	0.00	0.00	0.00	0.00	0.00
105	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	7/9/2018	68	No	INC	7	15:00	21:59	-65.85	0.00	0.00	1781.86	0.00	0.00	0.00	0.00	0.00	0.00
106	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	7/10/2018	63-131	No	INC	7	15:00	21:59	13.63	0.00	0.00	-1013.65	0.00	0.00	0.00	0.00	0.00	0.00
107	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	7/12/2018	20-136	No	INC	14	10:00	23:59	211.46	111096.57	0.00	-26378.09	0.00	0.00	0.00	0.00	0.00	0.00
108	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	7/13/2018	63-131	No	INC	7	15:15	21:59	10.07	34721.04	0.00	-599.60	0.10	-6.14	0.00	-1.59	0.00	0.00
109	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	7/13/2018	68	No	DEC	7	15:15	21:59	-105.62	-62.56	0.00	5020.86	0.00	0.00	0.00	0.00	0.00	0.00
110	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	7/14/2018	20-126	No	INC	16	6:00	21:59	0.05	103947.07	22913.81	-2.00	0.00	0.00	0.00	-2.23	0.00	0.00
111	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	7/15/2018	20	No	INC	18	6:00	23:59	-103.45	121385.10	22797.14	5562.64	0.05	-1.82	0.00	-2.22	0.00	0.00
112	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	7/16/2018	20	No	INC	24	0:00	23:59	-208.10	128905.24	0.00	12027.01	0.03	-2.03	0.00	0.00	0.00	0.00
113	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	7/17/2018	20	No	INC	1	0:00	0:44	0.02	0.00	0.00	-32.35	0.00	0.00	0.00	0.00	0.00	0.00
114	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	7/18/2018	30	No	INC	1	15:37	16:27	18.84	2310.00	61.15	-1489.66	0.00	0.00	0.00	0.00	0.00	0.00
115	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	7/20/2018	20-131	No	INC	18	4:00	21:59	-50.73	107139.67	0.00	-40640.47	0.00	0.00	0.00	0.00	0.00	0.00
116	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	7/20/2018	68	No	DEC	7	15:00	21:59	-63.13	0.00	0.00	-20856.06	0.00	0.00	0.00	0.00	0.00	0.00

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117	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	7/22/2018	65	No	INC	13	9:30	21:59	-0.13	191609.50	0.00	3.05	0.00	0.00	0.00	-215.18	0.00	0.00
118	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	7/23/2018	40	Yes	INC	12	6:00	17:59	-2.94	178198.40	42171.07	1324.76	0.00	0.00	0.00	0.00	0.00	0.00
119	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	7/24/2018	20-262	Yes	INC	17	7:00	23:59	-78.88	212275.13	37059.16	-41343.30	0.00	0.00	0.00	0.00	0.00	0.00
120	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	7/24/2018	68-131	No	DEC	11	12:00	22:29	91.20	-0.01	0.00	-30403.32	0.00	0.00	0.00	0.00	0.00	0.00
121	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	7/25/2018	20-420	Yes	INC	17	7:00	23:59	-26.23	340744.41	97190.96	617.67	0.00	0.00	0.00	0.00	0.00	0.00
122	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	7/26/2018	20-420	Yes	INC	17	7:00	23:59	30.74	237507.55	98201.71	-4294.93	0.10	-7.43	0.00	-14.86	0.00	0.00
123	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	7/26/2018	131-155	No	DEC	9	13:10	21:29	-906.60	0.00	0.00	70605.68	0.00	0.00	0.00	0.00	0.00	0.00
124	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	7/27/2018	20-262	No	INC	17	7:00	23:59	-79.04	389337.64	82362.15	7758.39	0.12	-6.12	0.00	-17.40	0.00	0.00
125	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	7/27/2018	68	No	DEC	9	12:20	20:59	-56.27	0.00	0.00	2546.63	0.00	0.00	0.00	0.00	0.00	0.00
126	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	7/28/2018	20-83	No	INC	22	2:00	23:54	6.62	176875.89	0.00	-675.64	0.03	-3.63	0.00	-3.08	0.00	0.00
127	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	7/29/2018	20	No	INC	22	2:00	23:59	15.06	98319.48	28169.69	-2764.29	0.00	0.00	0.00	0.00	0.00	0.00
128	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	7/30/2018	20-70	Yes	INC	24	0:00	23:59	-399.31	88948.86	0.00	33282.48	0.00	0.00	0.00	-7.76	0.00	0.00
129	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	7/30/2018	70	No	DEC	5	15:00	19:59	-11.88	0.00	0.00	697.77	0.00	0.00	0.00	0.00	0.00	0.00
130	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	7/31/2018	20-60	No	INC	23	1:00	23:59	-33.70	51890.15	17742.64	1214.39	0.00	0.00	0.00	0.00	0.00	0.00
131	RT	Load Pull	PG&E	N/A	7/14/2018	47	No	DEC	5	16:15	20:59	41.26	-44138.69	0.00	-1297.64	0.00	0.00	0.00	0.00	0.00	0.00
132	RT	Load Pull	SCE	Big Creek-Ventura	7/4/2018	400	No	INC	4	17:35	20:59	19.89	15971.78	0.00	-993.56	14.62	-919.86	0.00	0.00	0.00	0.00
133	RT	Load Pull	SCE	Big Creek-Ventura	7/5/2018	800	No	INC	7	14:30	20:59	309.45	81180.20	0.00	-13427.12	182.96	-8781.53	0.00	0.00	0.00	0.00
134	RT	Load Pull	SCE	Big Creek-Ventura	7/6/2018	400	No	DEC	6	15:00	20:59	-107.25	0.00	0.00	1037.08	0.00	0.00	0.00	0.00	0.00	0.00

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135	RT	Load Pull	SCE	Big Creek-Ventura	7/6/2018	400-800	No	INC	6	15:00	20:59	-176.79	222537.21	0.00	2747.60	12.50	-1119.74	0.00	0.00	0.00	0.00
136	RT	Load Pull	SCE	Big Creek-Ventura	7/7/2018	400	No	DEC	4	17:30	20:59	128.10	-2770.21	0.00	-4664.95	0.00	0.00	0.00	0.00	0.00	0.00
137	RT	Load Pull	SCE	Big Creek-Ventura	7/7/2018	400	No	INC	5	16:00	20:59	-87.10	21116.24	0.00	5189.54	0.00	0.00	0.00	0.00	0.00	0.00
138	RT	Load Pull	SCE	Big Creek-Ventura	7/8/2018	400	No	INC	6	15:00	20:59	-41.10	194608.72	0.00	2460.76	6.81	-218.45	0.00	0.00	0.00	0.00
139	RT	Load Pull	SCE	Big Creek-Ventura	7/17/2018	401	No	INC	5	15:20	19:59	31.27	12822.25	0.00	-2287.00	16.96	-1368.97	0.00	-123.95	0.00	0.00
140	RT	Load Pull	SCE	Big Creek-Ventura	7/18/2018	400	No	DEC	6	14:00	19:59	-146.41	7584.31	0.00	10346.69	0.00	0.00	0.00	0.00	0.00	0.00
141	RT	Load Pull	SCE	Big Creek-Ventura	7/18/2018	400	No	INC	6	14:00	19:59	48.97	-8004.15	0.00	-3542.64	0.00	0.00	0.00	0.00	0.00	0.00
142	RT	Load Pull	SCE	Big Creek-Ventura	7/23/2018	401-802	No	DEC	8	14:00	21:59	-656.81	-34396.61	0.00	80445.34	0.10	-11.71	0.00	0.00	0.00	0.00
143	RT	Load Pull	SCE	Big Creek-Ventura	7/23/2018	401-802	No	INC	8	14:00	21:59	-217.44	85988.17	0.00	32546.41	0.53	-176.83	0.00	0.00	0.00	0.00
144	RT	Load Pull	SCE	Big Creek-Ventura	7/25/2018	802	No	DEC	9	13:00	21:59	-643.39	-63078.84	0.00	54489.33	0.00	0.00	0.00	0.00	0.00	0.00
145	RT	Load Pull	SCE	Big Creek-Ventura	7/25/2018	802	No	INC	9	13:00	21:59	-25.68	-3228.73	0.00	2396.92	1.24	-233.05	0.00	0.00	0.00	0.00
146	RT	Load Pull	SCE	LA Basin	7/3/2018	384	No	INC	4	17:05	20:59	49.73	0.00	0.00	-5957.80	56.47	-6119.83	0.00	0.00	0.00	0.00
147	RT	Load Pull	SCE	LA Basin	7/4/2018	384	No	INC	4	17:40	20:59	49.32	0.00	0.00	-7270.11	56.24	-7461.70	0.00	0.00	0.00	0.00
148	RT	Load Pull	SCE	LA Basin	7/5/2018	65-305	No	DEC	7	14:00	20:59	20.53	-26310.40	0.00	-10612.13	14.77	-5627.11	0.00	0.00	0.00	0.00
149	RT	Load Pull	SCE	LA Basin	7/5/2018	194-739	No	INC	7	14:00	20:59	109.36	51818.20	0.00	-45011.91	81.04	-19195.88	0.00	0.00	0.00	0.00
150	RT	Load Pull	SCE	LA Basin	7/6/2018	240-480	No	DEC	7	14:30	20:59	-57.24	0.00	0.00	39580.85	0.00	0.00	0.00	0.00	0.00	0.00
151	RT	Load Pull	SCE	LA Basin	7/6/2018	240-720	No	INC	7	14:30	20:59	-466.82	206811.06	0.00	63151.74	13.82	-4378.09	0.00	0.00	0.00	0.00
152	RT	Load Pull	SCE	LA Basin	7/7/2018	190	No	DEC	5	16:00	20:59	-39.69	0.00	0.00	3994.27	0.00	0.00	0.00	0.00	0.00	0.00

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Chart 2: Table of Exceptional Dispatches for Period 01/July/2018 - 31/July/2018

Number	Market Type	Reason	Location	Local Reliability Area	Trade Date	MW	Commitment	INC_DEC	Hours	Begin Time	End Time	Total MWH	Min Load Cost	Start Up Cost	CC6470	ED MWH (INC/DEC)	CC6470 INC	CC6470 DEC	CC6482	CC6488	CC6620
153	RT	Load Pull	SCE	LA Basin	7/7/2018	240-430	No	INC	5	16:00	20:59	-10.47	67927.04	0.00	-3518.38	0.00	0.00	0.00	0.00	0.00	0.00
154	RT	Load Pull	SCE	LA Basin	7/8/2018	384	No	DEC	8	13:00	20:59	5.79	0.00	0.00	-174.71	0.00	0.00	0.00	0.00	0.00	0.00
155	RT	Load Pull	SCE	LA Basin	7/8/2018	384-864	No	INC	8	13:00	20:59	370.31	106267.89	0.00	-74348.81	352.30	-73413.21	0.00	0.00	0.00	0.00
156	RT	Load Pull	SCE	LA Basin	7/14/2018	65	No	INC	5	16:10	20:59	1.87	30308.29	0.00	-60.37	0.00	0.00	0.00	0.00	0.00	0.00
157	RT	Load Pull	SCE	LA Basin	7/16/2018	305-689	No	INC	9	11:05	19:59	-213.84	161540.33	0.00	3286.22	35.27	-9752.89	0.00	0.00	0.00	0.00
158	RT	Load Pull	SCE	LA Basin	7/16/2018	384	No	DEC	9	11:15	19:59	-500.43	0.00	0.00	23353.49	0.00	0.00	0.00	0.00	0.00	0.00
159	RT	Load Pull	SCE	LA Basin	7/17/2018	546	No	INC	5	15:00	19:59	44.99	150995.41	0.00	-9101.60	93.09	-12424.13	0.00	-17933.66	0.00	0.00
160	RT	Load Pull	SCE	LA Basin	7/18/2018	240-241	No	DEC	7	13:20	19:59	-93.12	-5751.68	0.00	6455.19	13.62	-709.23	0.00	0.00	0.00	0.00
161	RT	Load Pull	SCE	LA Basin	7/18/2018	370-610	No	INC	7	13:20	19:59	246.46	224206.91	0.00	-67742.08	18.33	-3222.18	0.00	0.00	0.00	0.00
162	RT	Load Pull	SCE	LA Basin	7/23/2018	65-1237	No	INC	12	11:00	22:29	-668.80	391486.44	0.00	51635.09	62.54	-36548.31	0.00	0.00	0.00	0.00
163	RT	Load Pull	SCE	LA Basin	7/23/2018	240-1479	No	DEC	12	11:00	22:29	4572.29	-634989.97	0.00	-616093.83	278.71	-54130.39	0.00	0.00	0.00	0.00
164	RT	Load Pull	SCE	LA Basin	7/25/2018	241-1850	No	DEC	13	9:05	21:29	623.58	-589922.37	55831.37	-232354.43	1280.62	-282302.18	0.00	0.00	0.00	0.00
165	RT	Load Pull	SCE	LA Basin	7/25/2018	384-1107	No	INC	13	9:05	21:29	416.97	-67340.64	0.00	-101756.62	446.74	-102949.86	0.00	0.00	0.00	0.00
166	RT	Load Pull	SCE	LA Basin	7/26/2018	190-384	No	INC	10	12:15	21:29	-18.69	0.00	0.00	-3587.37	20.25	-7688.20	0.00	0.00	0.00	0.00
167	RT	Load Pull	SCE	LA Basin	7/26/2018	194-384	No	DEC	10	12:15	21:29	-117.16	0.00	0.00	15870.23	0.00	0.00	0.00	0.00	0.00	0.00
168	RT	Load Pull	SDG&E	San Diego-IV	7/16/2018	68	No	INC	9	11:00	19:59	-184.71	64386.93	0.00	10041.13	0.03	-2.03	0.00	0.00	0.00	0.00
169	RT	Load Pull	SDG&E	San Diego-IV	7/23/2018	63-131	No	INC	12	11:00	22:29	-67.94	102737.32	0.00	6988.56	0.00	0.00	0.00	0.00	0.00	0.00

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Number	Market Type	Reason	Location	Local Reliability Area	Trade Date	MW	Commitment	INC_DEC	Hours	Begin Time	End Time	Total MWH	Min Load Cost	Start Up Cost	CC6470	ED MWH (INC/DEC)	CC6470 INC	CC6470 DEC	CC6482	CC6488	CC6620
170	RT	Load Pull	SDG&E	San Diego-IV	7/23/2018	68-131	No	DEC	12	11:00	22:29	-681.41	0.00	0.00	87123.84	0.00	0.00	0.00	0.00	0.00	0.00
171	RT	Market Disruption	PG&E	Fresno	7/7/2018	83-166	No	INC	4	13:47	16:59	-3.09	-5674.88	0.00	-197.38	0.00	0.00	0.00	0.00	0.00	0.00
172	RT	Market Disruption	SCE	LA Basin	7/7/2018	990	No	DEC	1	13:44	14:24	98.55	-28290.56	6384.01	-5447.89	0.00	0.00	0.00	0.00	0.00	0.00
173	RT	Operating Procedure Number and Constraint (6410)	SCE	Big Creek-Ventura	7/28/2018	401	No	INC	9	12:35	21:29	140.67	372815.70	0.00	-10553.12	63.28	-8938.41	0.00	0.00	0.00	0.00
174	RT	Operating Procedure Number and Constraint (6410)	SCE	LA Basin	7/6/2018	384	No	DEC	9	12:45	20:59	-173.89	0.00	0.00	35665.11	19.88	-2264.17	0.00	0.00	0.00	0.00
175	RT	Operating Procedure Number and Constraint (6410)	SCE	LA Basin	7/6/2018	384	No	INC	9	12:45	20:59	-11.33	0.00	0.00	-895.23	2.69	-428.60	0.00	0.00	0.00	0.00
176	RT	Operating Procedure Number and Constraint (6410)	SCE	LA Basin	7/7/2018	100-200	No	INC	6	15:45	20:59	123.49	15047.87	0.00	-79841.05	35.60	-8481.37	0.00	0.00	0.00	0.00
177	RT	Operating Procedure Number and Constraint (6410)	SCE	LA Basin	7/11/2018	490	No	INC	3	17:25	19:59	224.60	-19003.91	0.00	-16452.24	73.04	-8229.96	0.00	0.00	0.00	0.00
178	RT	Operating Procedure Number and Constraint (6410)	SCE	LA Basin	7/11/2018	800	No	DEC	3	17:40	19:59	584.58	-72300.16	6134.03	-109302.49	0.00	0.00	0.00	0.00	0.00	0.00
179	RT	Operating Procedure Number and Constraint (6410)	SCE	LA Basin	7/15/2018	502	No	INC	3	18:30	20:59	1125.36	0.00	0.00	-63766.12	0.17	-6.53	0.00	0.00	0.00	0.00
180	RT	Operating Procedure Number and Constraint (6410)	SCE	LA Basin	7/28/2018	482-612	No	INC	10	12:30	21:59	98.29	217435.53	0.00	-13134.53	61.53	-9404.21	0.00	0.00	0.00	0.00
181	RT	Operating Procedure Number and Constraint (6410)	SDG&E	San Diego-IV	7/28/2018	68	No	INC	10	12:30	21:59	6.60	102625.69	0.00	-674.55	0.03	-3.63	0.00	0.00	0.00	0.00
182	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	7/7/2018	45	No	INC	1	23:00	23:59	28.34	-163.37	0.00	-1114.39	2.25	-86.41	0.00	0.00	0.00	0.00
183	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	7/8/2018	15	No	DEC	7	0:00	6:59	20.74	0.00	0.00	-1361.28	0.00	0.00	0.00	0.00	0.00	0.00
184	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	7/8/2018	15	No	INC	3	21:38	23:59	6.63	0.00	0.00	-332.73	0.24	-12.38	0.00	0.00	0.00	0.00
185	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	7/9/2018	15-32	No	DEC	18	6:45	23:59	3.49	0.00	0.00	-80.31	0.00	0.00	0.00	0.00	0.00	0.00
186	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	7/9/2018	15-32	No	INC	24	0:00	23:59	12.28	0.00	0.00	-349.22	3.08	-87.49	0.00	0.00	0.00	0.00
187	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	7/10/2018	32-81	No	INC	22	0:00	21:59	-1.33	0.00	0.00	68.17	5.91	-200.93	0.00	0.00	0.00	0.00

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Number	Market Type	Reason	Location	Local Reliability Area	Trade Date	MW	Commitment	INC_DEC	Hours	Begin Time	End Time	Total MWH	Min Load Cost	Start Up Cost	CC6470	ED MWH (INC/DEC)	CC6470 INC	CC6470 DEC	CC6482	CC6488	CC6620
188	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	7/10/2018	32-162	No	DEC	15	7:55	21:59	6.16	-11386.08	0.00	-393.70	-0.12	0.00	1.43	0.00	0.00	0.00
189	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	7/11/2018	15-30	No	DEC	16	8:15	23:59	-3.78	-725.66	0.00	95.10	0.00	0.00	0.00	0.00	0.00	0.00
190	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	7/11/2018	15-30	No	INC	16	8:15	23:59	8.36	-660.98	0.00	-475.02	1.00	-63.00	0.00	0.00	0.00	0.00
191	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	7/12/2018	30	No	DEC	8	0:00	7:59	1.10	0.00	0.00	-29.18	0.00	0.00	0.00	0.00	0.00	0.00
192	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	7/12/2018	30	No	INC	8	0:00	7:59	-4.79	0.00	0.00	1038.48	0.00	0.00	0.00	0.00	0.00	0.00
193	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	7/13/2018	16-32	No	DEC	2	22:45	23:59	1.11	-274.60	0.00	-27.09	0.00	0.00	0.00	0.00	0.00	0.00
194	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	7/13/2018	32	No	INC	2	22:45	23:59	11.44	-659.04	0.00	-460.21	0.00	0.00	0.00	0.00	0.00	0.00
195	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	7/14/2018	15	No	INC	3	21:15	23:59	2.22	0.00	0.00	-95.16	0.00	0.00	0.00	0.00	0.00	0.00
196	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	7/14/2018	16	No	DEC	7	0:00	6:59	7.97	0.00	0.00	-317.65	0.00	0.00	0.00	0.00	0.00	0.00
197	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	7/15/2018	80	No	DEC	3	19:25	21:59	-0.84	-1852.90	0.00	-7.02	-2.86	0.00	26.66	0.00	0.00	0.00
198	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	7/18/2018	42	No	INC	3	21:15	23:59	-0.82	0.00	0.00	-151.16	-5.05	0.00	0.00	0.00	0.00	0.00
199	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	7/19/2018	28	No	INC	1	0:00	0:14	-3.50	0.00	0.00	123.82	0.00	0.00	0.00	0.00	0.00	0.00
200	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	7/20/2018	32	No	DEC	13	11:48	23:59	4.57	0.00	0.00	-112.50	0.00	0.00	0.00	0.00	0.00	0.00
201	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	7/20/2018	32	No	INC	13	11:48	23:59	4.24	0.00	0.00	-308.23	6.77	-291.61	0.00	0.00	0.00	0.00
202	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	7/21/2018	130	No	DEC	7	13:40	19:59	7.55	-7507.67	0.00	-382.21	-0.09	0.00	1.11	0.00	0.00	0.00
203	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	7/24/2018	30-80	No	DEC	15	9:25	23:59	-2.13	-40789.40	0.00	-165.56	-4.48	0.00	34.27	0.00	0.00	0.00
204	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	7/25/2018	32-48	No	DEC	5	0:00	4:44	-2.34	-1766.33	0.00	-50.75	-3.59	0.00	24.00	0.00	0.00	0.00
205	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	7/25/2018	32-64	No	INC	5	0:00	4:44	97.36	-1857.32	0.00	-4633.73	85.79	-4039.62	0.00	0.00	0.00	0.00

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Number	Market Type	Reason	Location	Local Reliability Area	Trade Date	MW	Commitment	INC_DEC	Hours	Begin Time	End Time	Total MWH	Min Load Cost	Start Up Cost	CC6470	ED MWH (INC/DEC)	CC6470 INC	CC6470 DEC	CC6482	CC6488	CC6620
206	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	7/30/2018	16-64	No	DEC	12	6:55	18:04	-4.59	-3237.06	0.00	-20.52	-6.22	0.00	23.79	0.00	0.00	0.00
207	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	7/30/2018	32-64	No	INC	6	6:55	12:14	6.92	-1197.53	0.00	-259.12	6.91	-258.79	0.00	0.00	0.00	0.00
208	RT	Operating Procedure Number and Constraint (7240)	PG&E	Fresno	7/16/2018	70	No	DEC	4	20:20	23:59	-13.81	0.00	0.00	27.26	-13.17	0.00	0.00	0.00	0.00	0.00
209	RT	Operating Procedure Number and Constraint (7240)	PG&E	Fresno	7/16/2018	70	No	INC	4	20:20	23:59	-1.31	0.00	0.00	235.99	0.00	0.00	0.00	0.00	0.00	0.00
210	RT	Operating Procedure Number and Constraint (7430)	PG&E	Fresno	7/14/2018	70	No	INC	3	21:50	23:59	2.38	0.00	0.00	-95.31	0.00	0.00	0.00	0.00	0.00	0.00
211	RT	Operating Procedure Number and Constraint (7430)	PG&E	Fresno	7/15/2018	70	No	INC	4	3:25	6:59	-22.58	0.00	0.00	2422.78	0.00	0.00	0.00	0.00	0.00	0.00
212	RT	Operating Procedure Number and Constraint (7430)	PG&E	Fresno	7/18/2018	44-119	No	INC	4	20:55	23:59	88.27	22538.42	2812.80	-3149.49	0.67	-15.90	0.00	0.00	0.00	0.00
213	RT	Operating Procedure Number and Constraint (7430)	PG&E	Fresno	7/19/2018	75-119	No	INC	2	0:00	1:14	-1.37	8925.13	0.00	31.04	0.00	0.00	0.00	0.00	0.00	0.00
214	RT	Operating Procedure Number and Constraint (7430)	PG&E	Fresno	7/24/2018	70	No	DEC	9	13:25	21:59	9.15	0.00	0.00	-998.36	0.00	0.00	0.00	0.00	-679.78	0.00
215	RT	Operating Procedure Number and Constraint (7430)	PG&E	Fresno	7/24/2018	70-75	No	INC	21	1:40	21:59	-54.26	0.00	0.00	1578.69	0.00	0.00	0.00	0.00	0.00	0.00
216	RT	Operating Procedure Number and Constraint (7430)	PG&E	Fresno	7/25/2018	75	No	DEC	20	4:35	23:59	-9.77	0.00	0.00	73.80	0.00	0.00	0.00	0.00	0.00	0.00
217	RT	Operating Procedure Number and Constraint (7430)	PG&E	Fresno	7/25/2018	75	No	INC	20	4:35	23:59	-11.41	0.00	0.00	-187.75	0.00	0.00	0.00	0.00	0.00	0.00
218	RT	Operating Procedure Number and Constraint (7430)	PG&E	Fresno	7/27/2018	70	No	DEC	5	19:15	23:59	-11.97	0.00	0.00	381.72	-1.86	0.00	0.00	0.00	0.00	0.00
219	RT	Operating Procedure Number and Constraint (7430)	PG&E	Fresno	7/27/2018	70	No	INC	5	19:15	23:59	-8.36	0.00	0.00	-211.47	0.00	0.00	0.00	0.00	0.00	0.00
220	RT	Operating Procedure Number and Constraint (7430)	PG&E	N/A	7/15/2018	280	No	DEC	9	13:15	21:59	1.00	0.00	0.00	-6.28	0.00	0.00	0.00	0.00	0.00	0.00
221	RT	Operating Procedure Number and Constraint (7430)	PG&E	N/A	7/15/2018	280-630	No	INC	16	6:50	21:59	118.31	95751.74	0.00	-3126.63	66.62	-1529.13	0.00	0.00	0.00	0.00
222	RT	Operating Procedure Number and Constraint (7450)	PG&E	Kern	7/19/2018	32	No	INC	7	17:17	23:59	7.29	12949.31	5880.01	-180.01	0.00	0.00	0.00	0.00	0.00	0.00
223	RT	Operating Procedure Number and Constraint (7630)	SCE	LA Basin	7/9/2018	65	No	INC	12	10:40	21:59	12.83	74532.58	0.00	1547.43	0.00	0.00	0.00	0.00	0.00	0.00

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Number	Market Type	Reason	Location	Local Reliability Area	Trade Date	MW	Commitment	INC_DEC	Hours	Begin Time	End Time	Total MWH	Min Load Cost	Start Up Cost	CC6470	ED MWH (INC/DEC)	CC6470 INC	CC6470 DEC	CC6482	CC6488	CC6620
224	RT	Operating Procedure Number and Constraint (7820)	SDG&E	San Diego-IV	7/8/2018	20	No	INC	8	2:00	9:59	0.00	30207.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
225	RT	Operating Procedure Number and Constraint (7820)	SDG&E	San Diego-IV	7/24/2018	25-45	No	DEC	10	12:45	21:59	3.38	0.00	0.00	-1404.18	0.00	0.00	0.00	0.00	0.00	0.00
226	RT	Operating Procedure Number and Constraint (7820)	SDG&E	San Diego-IV	7/24/2018	25-45	No	INC	10	12:45	21:59	13.32	0.00	0.00	-3020.41	10.07	-1646.23	0.00	0.00	0.00	0.00
227	RT	Other Reliability Requirement	PG&E	Bay Area	7/24/2018	120	No	DEC	6	0:40	5:59	-274.74	0.00	0.00	-6330.21	-278.64	0.00	-6463.39	0.00	0.00	0.00
228	RT	Other Reliability Requirement	PG&E	Bay Area	7/26/2018	25	No	INC	6	2:15	7:59	62.62	0.00	0.00	10997.45	0.00	0.00	0.00	0.00	0.00	0.00
229	RT	Other Reliability Requirement	PG&E	Fresno	7/11/2018	0	No	DEC	1	7:00	7:14	1.55	0.00	0.00	-47.03	0.00	0.00	0.02	0.00	0.00	0.00
230	RT	Other Reliability Requirement	PG&E	Fresno	7/13/2018	83	Yes	INC	2	22:00	23:29	80.83	3701.01	0.00	-3528.92	0.00	0.00	0.00	0.00	0.00	0.00
231	RT	Other Reliability Requirement	PG&E	Fresno	7/15/2018	30	No	DEC	3	12:15	14:29	26.16	0.00	0.00	-56.01	9.94	0.00	0.00	0.00	0.00	0.00
232	RT	Other Reliability Requirement	PG&E	Fresno	7/24/2018	45	No	INC	1	9:25	9:29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
233	RT	Other Reliability Requirement	PG&E	Humboldt	7/24/2018	45	No	DEC	21	1:40	21:59	-0.22	-6393.85	0.00	-3065.42	-3.45	0.00	43.64	0.00	0.00	0.00
234	RT	Other Reliability Requirement	PG&E	Humboldt	7/24/2018	45	No	INC	7	1:40	7:59	7.27	-2737.86	0.00	-164.23	4.50	-107.09	0.00	0.00	0.00	0.00
235	RT	Other Reliability Requirement	PG&E	Kern	7/13/2018	42	Yes	INC	8	5:00	12:29	-3.84	14532.45	5700.15	102.36	0.00	0.00	0.00	0.00	0.00	0.00
236	RT	Other Reliability Requirement	PG&E	Kern	7/17/2018	32	Yes	INC	5	19:45	23:59	1.26	8642.55	5810.28	-175.54	0.00	0.00	0.00	0.00	0.00	0.00
237	RT	Other Reliability Requirement	PG&E	Kern	7/19/2018	41-81	Yes	INC	2	22:10	23:59	-0.43	1553.92	5880.01	11.23	0.04	-1.35	0.00	0.00	0.00	0.00
238	RT	Other Reliability Requirement	PG&E	Kern	7/20/2018	32	Yes	INC	8	16:30	23:59	6.58	12722.52	5385.01	-283.29	0.00	0.00	0.00	0.00	0.00	0.00
239	RT	Other Reliability Requirement	PG&E	Kern	7/21/2018	32	Yes	INC	2	0:00	1:59	6.22	3525.66	0.00	-370.69	0.00	0.00	0.00	0.00	0.00	0.00
240	RT	Other Reliability Requirement	PG&E	N/A	7/10/2018	0	No	INC	5	14:15	18:44	-1.50	0.00	0.00	61.60	0.00	0.00	0.00	0.00	0.00	0.00
241	RT	Other Reliability Requirement	PG&E	N/A	7/10/2018	10-111	No	DEC	5	14:10	18:44	-20.73	0.00	0.00	-501.36	-49.84	0.00	1327.59	0.00	0.00	0.00

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Chart 2: Table of Exceptional Dispatches for Period 01/July/2018 - 31/July/2018

Number	Market Type	Reason	Location	Local Reliability Area	Trade Date	MW	Commitment	INC_DEC	Hours	Begin Time	End Time	Total MWH	Min Load Cost	Start Up Cost	CC6470	ED MWH (INC/DEC)	CC6470 INC	CC6470 DEC	CC6482	CC6488	CC6620
242	RT	Other Reliability Requirement	PG&E	N/A	7/11/2018	0	No	DEC	1	7:00	7:14	-1.52	0.00	0.00	44.16	0.00	0.00	0.00	0.00	0.00	0.00
243	RT	Other Reliability Requirement	PG&E	N/A	7/15/2018	38	No	INC	9	10:10	18:59	-0.15	0.00	0.00	0.62	-0.42	0.00	0.18	0.00	0.00	0.00
244	RT	Other Reliability Requirement	PG&E	Sierra	7/11/2018	0	No	INC	1	7:00	7:14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
245	RT	Other Reliability Requirement	PG&E	Stockton	7/27/2018	75	No	DEC	2	6:20	7:59	-8.74	0.00	0.00	222.77	-10.23	0.00	274.17	0.00	0.00	0.00
246	RT	Other Reliability Requirement	PG&E	Stockton	7/27/2018	75	No	INC	2	6:20	7:59	-10.60	0.00	0.00	376.67	0.00	0.00	0.00	0.00	0.00	0.00
247	RT	Other Reliability Requirement	SCE	LA Basin	7/24/2018	400	No	INC	4	17:30	20:59	50.73	0.00	0.00	-73746.16	39.85	-39748.82	0.00	0.00	0.00	0.00
248	RT	Other Reliability Requirement	SDG&E	San Diego-IV	7/30/2018	25	No	DEC	7	11:40	17:59	-24.26	0.00	0.00	2312.83	0.00	0.00	0.00	0.00	0.00	0.00
249	RT	Other Reliability Requirement	SDG&E	San Diego-IV	7/30/2018	25	No	INC	7	11:40	17:59	44.37	0.00	0.00	-6257.14	0.16	-16.89	0.00	0.00	0.00	0.00
250	RT	Planned Transmission Outage	PG&E	Bay Area	7/3/2018	175	No	INC	11	9:00	19:44	15.48	126394.31	0.00	-1033.61	0.00	0.00	0.00	0.00	0.00	0.00
251	RT	Planned Transmission Outage	PG&E	Bay Area	7/26/2018	25	No	INC	1	2:10	2:14	1.63	0.00	0.00	398.95	0.00	0.00	0.00	0.00	0.00	0.00
252	RT	Planned Transmission Outage	PG&E	Fresno	7/10/2018	83	Yes	INC	1	23:00	23:59	75.27	0.00	0.00	-3427.02	0.00	0.00	0.00	0.00	0.00	0.00
253	RT	Planned Transmission Outage	PG&E	Fresno	7/11/2018	166	Yes	INC	1	0:00	0:44	46.25	5277.37	0.00	-1800.53	0.00	0.00	0.00	0.00	0.00	0.00
254	RT	Planned Transmission Outage	PG&E	Fresno	7/24/2018	25-50	No	DEC	5	9:35	13:44	-31.44	0.00	0.00	670.49	-45.62	0.00	1321.33	0.00	-7889.56	0.00
255	RT	Planned Transmission Outage	PG&E	Humboldt	7/1/2018	32-80	No	INC	20	4:05	23:59	21.39	-12903.89	0.00	189.31	2.50	-32.31	0.00	0.00	-98.86	0.00
256	RT	Planned Transmission Outage	PG&E	Humboldt	7/2/2018	14	No	DEC	3	0:45	2:59	6.27	-328.07	0.00	-148.00	0.00	0.00	0.00	0.00	0.00	0.00
257	RT	Planned Transmission Outage	PG&E	Humboldt	7/2/2018	14-75	No	INC	24	0:00	23:59	55.38	-11482.28	0.00	-1430.24	4.87	-109.27	0.00	0.00	0.00	0.00
258	RT	Planned Transmission Outage	PG&E	Humboldt	7/3/2018	30-75	No	INC	24	0:00	23:59	85.49	-13131.89	0.00	-2183.51	21.39	-544.81	0.00	0.00	-10.59	0.00
259	RT	Planned Transmission Outage	PG&E	Humboldt	7/4/2018	43-86	No	INC	24	0:00	23:59	86.72	-18675.78	0.00	-1832.63	4.83	-124.04	0.00	0.00	0.00	0.00

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Number	Market Type	Reason	Location	Local Reliability Area	Trade Date	MW	Commitment	INC_DEC	Hours	Begin Time	End Time	Total MWH	Min Load Cost	Start Up Cost	CC6470	ED MWH (INC/DEC)	CC6470 INC	CC6470 DEC	CC6482	CC6488	CC6620
260	RT	Planned Transmission Outage	PG&E	Humboldt	7/10/2018	32	No	INC	1	8:35	8:59	8.77	0.00	0.00	-296.19	1.08	-36.63	0.00	0.00	0.00	0.00
261	RT	Planned Transmission Outage	PG&E	Humboldt	7/15/2018	128	No	DEC	3	15:40	18:14	-1.94	-3583.65	0.00	-13.36	0.00	0.00	0.00	0.00	-255.77	0.00
262	RT	Planned Transmission Outage	PG&E	Humboldt	7/25/2018	45-64	No	INC	20	4:25	23:59	3.19	-6472.49	0.00	-127.55	1.23	-52.95	0.00	0.00	0.00	0.00
263	RT	Planned Transmission Outage	PG&E	Humboldt	7/25/2018	64-77	No	DEC	20	4:25	23:59	2.77	-36739.77	0.00	-74.32	0.00	0.00	0.00	0.00	-	54562.55
264	RT	Planned Transmission Outage	PG&E	Humboldt	7/26/2018	32-90	No	DEC	24	0:00	23:59	8.16	-25753.95	0.00	-348.45	0.00	0.00	0.00	0.00	-	13917.58
265	RT	Planned Transmission Outage	PG&E	Humboldt	7/26/2018	45	No	INC	24	0:00	23:59	-0.07	-6884.30	0.00	1.90	0.00	0.00	0.00	0.00	-8.45	0.00
266	RT	Planned Transmission Outage	PG&E	Humboldt	7/27/2018	30-135	No	DEC	24	0:00	23:59	-8.40	-63434.40	0.00	92.50	-5.30	0.00	112.67	0.00	-	39863.09
267	RT	Planned Transmission Outage	PG&E	Humboldt	7/27/2018	45-90	No	INC	21	0:00	20:59	7.35	-33639.59	0.00	-525.25	11.40	-653.95	16.53	0.00	-16.53	0.00
268	RT	Planned Transmission Outage	PG&E	Humboldt	7/28/2018	45	No	INC	24	0:05	23:59	-7.65	-1025.80	0.00	247.07	-0.95	0.00	31.45	0.00	-385.76	0.00
269	RT	Planned Transmission Outage	PG&E	Humboldt	7/28/2018	64-102	No	DEC	24	0:00	23:59	0.40	-52824.44	0.00	-14.05	-14.40	0.00	448.46	0.00	-	21593.35
270	RT	Planned Transmission Outage	PG&E	Humboldt	7/29/2018	42-74	No	INC	24	0:00	23:59	0.68	-15396.76	0.00	-11.65	3.42	-104.53	0.00	0.00	-41.33	0.00
271	RT	Planned Transmission Outage	PG&E	Humboldt	7/29/2018	45-108	No	DEC	24	0:00	23:59	6.39	-36901.68	0.00	-171.27	-11.19	0.00	484.80	0.00	-	17242.30
272	RT	Planned Transmission Outage	PG&E	Humboldt	7/30/2018	16-80	No	DEC	24	0:00	23:59	-17.04	-9555.99	0.00	614.04	-10.76	0.00	412.32	0.00	-	17892.11
273	RT	Planned Transmission Outage	PG&E	Humboldt	7/30/2018	48-80	No	INC	24	0:00	23:59	26.34	-855.38	0.00	-2534.22	10.00	-885.08	0.00	0.00	0.00	0.00
274	RT	Planned Transmission Outage	PG&E	Humboldt	7/31/2018	16-80	No	INC	24	0:00	23:59	99.37	-4666.48	0.00	-3470.71	34.13	-1168.96	0.00	0.00	0.00	0.00
275	RT	Planned Transmission Outage	PG&E	Humboldt	7/31/2018	30-190	No	DEC	9	15:20	23:59	-13.62	-19220.05	0.00	652.70	-13.46	0.00	672.44	0.00	-	13388.85
276	RT	Planned Transmission Outage	PG&E	Humboldt	8/1/2018	30-94	No	INC	8	0:00	7:44	0.64	-1733.19	0.00	-11.24	2.00	-28.25	0.00	0.00	-185.38	0.00
277	RT	Planned Transmission Outage	PG&E	Kern	7/13/2018	32	No	INC	5	17:55	21:59	-1.04	7912.11	5476.61	42.47	0.00	0.00	0.00	0.00	0.00	0.00

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278	RT	Planned Transmission Outage	PG&E	N/A	7/10/2018	24	No	INC	4	14:50	18:44	22.77	0.00	0.00	-643.41	0.00	0.00	0.00	0.00	0.00	0.00	
279	RT	Planned Transmission Outage	PG&E	NCNB	7/17/2018	183-203	No	DEC	9	4:55	12:59	-22.60	0.00	0.00	513.36	-31.67	0.00	603.48	0.00	-	12444.71	0.00
280	RT	Planned Transmission Outage	PG&E	NCNB	7/18/2018	62	No	INC	8	5:10	12:59	2.94	0.00	0.00	-71.30	0.00	0.00	0.00	0.00	0.00	0.00	
281	RT	Planned Transmission Outage	PG&E	NCNB	7/18/2018	124-192	No	DEC	10	3:45	12:59	-17.79	0.00	0.00	341.74	-22.75	0.00	452.38	0.00	-8417.84	0.00	
282	RT	Planned Transmission Outage	PG&E	NCNB	7/19/2018	60	No	INC	8	4:00	11:44	10.43	0.00	0.00	-432.31	-4.72	0.00	91.72	0.00	-214.00	0.00	
283	RT	Planned Transmission Outage	PG&E	NCNB	7/19/2018	120	No	DEC	8	4:00	11:44	16.52	0.00	0.00	-554.12	-2.73	0.00	53.18	0.00	-644.45	0.00	
284	RT	Planned Transmission Outage	PG&E	NCNB	7/20/2018	186	No	DEC	10	3:30	12:59	-19.26	0.00	0.00	516.03	-18.48	0.00	492.39	0.00	-	15047.03	0.00
285	RT	Planned Transmission Outage	SDG&E	San Diego-IV	7/2/2018	20-136	No	INC	17	5:00	21:59	104.27	118718.55	0.00	-11755.77	0.12	-2.84	0.00	0.00	-2.40	0.00	
286	RT	Planned Transmission Outage	SDG&E	San Diego-IV	7/5/2018	40	No	INC	2	10:25	12:24	-2.00	0.00	0.00	47.96	0.00	0.00	0.00	0.00	0.00	0.00	
287	RT	Planned Transmission Outage	SDG&E	San Diego-IV	7/8/2018	63	No	INC	2	22:20	23:59	5.36	7511.66	0.00	-195.82	0.00	0.00	0.00	0.00	0.00	0.00	
288	RT	Planned Transmission Outage	SDG&E	San Diego-IV	7/9/2018	38-63	Yes	INC	24	0:00	23:59	6.40	9732.70	0.00	-189.97	0.00	0.00	0.00	0.00	0.00	0.00	
289	RT	Planned Transmission Outage	SDG&E	San Diego-IV	7/10/2018	38	No	INC	7	0:00	6:44	6.54	27478.24	0.00	-769.21	0.00	0.00	0.00	0.00	0.00	0.00	
290	RT	Planned Transmission Outage	SDG&E	San Diego-IV	7/18/2018	63	No	INC	7	13:10	19:59	75.13	60212.98	0.00	-30331.02	0.04	-2.74	0.00	0.00	-1.86	0.00	
291	RT	Planned Transmission Outage	SDG&E	San Diego-IV	7/22/2018	20	No	INC	14	6:00	19:59	-0.03	186886.42	0.00	0.37	0.00	0.00	0.00	-206.18	0.00	0.00	
292	RT	Planned Transmission Outage	SDG&E	San Diego-IV	7/31/2018	18	No	INC	5	15:45	19:59	1.44	19292.74	0.00	-157.26	0.00	0.00	0.00	0.00	0.00	0.00	
293	RT	Pump Management	PG&E	Fresno	7/29/2018	0	No	INC	1	2:00	2:14	-68.05	0.00	0.00	8558.21	0.00	0.00	0.00	0.00	0.00	0.00	
294	RT	Pump Management	PG&E	Kern	7/29/2018	0	No	INC	1	1:55	2:24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
295	RT	Software Limitation	PG&E	Bay Area	7/27/2018	644	No	DEC	1	23:00	23:59	-48.65	-6015.93	0.00	167.71	-45.59	0.00	0.00	0.00	0.00	0.00	

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296	RT	Software Limitation	PG&E	Fresno	7/18/2018	0	No	INC	1	19:05	20:04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
297	RT	Software Limitation	PG&E	Humboldt	7/4/2018	48	No	INC	1	13:45	14:14	1.31	-326.69	0.00	-28.34	0.25	-5.38	0.00	0.00	0.00	0.00
298	RT	Software Limitation	PG&E	N/A	7/5/2018	0	No	DEC	1	20:45	21:14	0.00	-65.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
299	RT	Software Limitation	PG&E	N/A	7/5/2018	0	No	INC	1	20:45	21:14	-0.63	0.00	0.00	18.16	0.00	0.00	0.00	0.00	0.00	0.00
300	RT	Software Limitation	SCE	Big Creek-Ventura	7/15/2018	0	No	INC	1	10:30	11:29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
301	RT	Software Limitation	SCE	Big Creek-Ventura	7/22/2018	0	No	DEC	1	21:30	22:29	-0.01	-4210.26	0.00	0.28	0.00	0.00	0.00	0.00	0.00	0.00
302	RT	Software Limitation	SCE	Big Creek-Ventura	7/23/2018	0	No	DEC	1	23:10	23:59	-11.78	-792.67	0.00	0.00	-11.78	0.00	0.00	0.00	0.00	0.00
303	RT	Software Limitation	SCE	Big Creek-Ventura	7/24/2018	0	No	DEC	1	0:00	0:09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
304	RT	Software Limitation	SCE	LA Basin	7/15/2018	0	No	INC	14	10:30	23:59	-23.45	687.88	0.00	0.00	-23.45	0.00	0.00	0.00	0.00	0.00
305	RT	Software Limitation	SCE	LA Basin	7/16/2018	0	No	INC	24	0:00	23:59	-23.45	0.00	0.00	0.00	-23.45	0.00	0.00	0.00	0.00	0.00
306	RT	Software Limitation	SCE	LA Basin	7/17/2018	0	No	INC	1	0:00	0:14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
307	RT	Software Limitation	SCE	LA Basin	7/18/2018	0	No	DEC	4	20:30	23:59	-6.33	-35788.00	0.00	566.56	0.00	0.00	0.00	0.00	0.00	0.00
308	RT	Software Limitation	SCE	LA Basin	7/18/2018	0	No	INC	4	20:30	23:59	-5.76	0.00	0.00	498.80	0.00	0.00	0.00	0.00	0.00	0.00
309	RT	Software Limitation	SCE	LA Basin	7/19/2018	11	No	INC	15	0:15	14:59	10.00	0.00	0.00	-708.98	0.00	0.00	0.00	0.00	0.00	0.00
310	RT	Software Limitation	SCE	LA Basin	7/23/2018	0	No	INC	1	23:05	23:59	-11.72	0.00	0.00	0.00	-11.72	0.00	0.00	0.00	0.00	0.00
311	RT	Software Limitation	SCE	LA Basin	7/24/2018	0	No	INC	1	0:00	0:04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
312	RT	Software Limitation	SCE	N/A	7/19/2018	227	No	DEC	2	2:10	3:59	47.51	0.00	0.00	-1105.51	7.47	-170.58	0.00	0.00	0.00	0.00
313	RT	Software Limitation	SDG&E	San Diego-IV	7/9/2018	0	No	INC	1	16:45	17:14	-3.43	1025.00	0.00	0.00	-3.43	0.00	0.00	0.00	0.00	0.00

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314	RT	Software Limitation	SDG&E	San Diego-IV	7/28/2018	0	No	INC	1	23:55	23:59	-1.25	462.71	0.00	43.68	0.00	0.00	0.00	0.00	0.00	0.00
315	RT	Software Limitation	SDG&E	San Diego-IV	7/29/2018	0	No	INC	3	0:00	2:59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
316	RT	Unit Testing	Intertie	N/A	7/4/2018	50	No	INC	1	22:17	22:59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
317	RT	Unit Testing	Intertie	N/A	7/5/2018	50	Yes	INC	1	22:00	22:59	50.00	0.00	0.00	-1082.74	50.00	-1082.74	0.00	0.00	0.00	0.00
318	RT	Unit Testing	Intertie	N/A	7/12/2018	50	No	INC	1	11:10	11:59	41.67	0.00	0.00	-1465.72	41.67	-1465.72	0.00	0.00	0.00	0.00
319	RT	Unit Testing	Intertie	N/A	7/31/2018	1-20	No	INC	24	0:00	23:59	261.95	0.00	0.00	-11404.82	261.55	-11195.58	0.00	0.00	0.00	0.00
320	RT	Unit Testing	Intertie	N/A	8/1/2018	1	No	INC	6	0:00	5:29	5.50	0.00	0.00	-263.15	5.50	-263.15	0.00	0.00	0.00	0.00
321	RT	Unit Testing	SCE	LA Basin	7/12/2018	22	No	INC	1	16:10	17:09	2.19	0.00	0.00	-63.96	1.02	-42.02	0.00	0.00	0.00	0.00
322	RT	Unit Testing	SDG&E	San Diego-IV	7/12/2018	47	No	INC	2	16:09	17:09	2.32	0.00	0.00	-134.89	3.74	-213.77	0.00	0.00	0.00	0.00
323	RT	Unplanned Outage	PG&E	Bay Area	7/17/2018	357	No	DEC	3	16:45	18:59	-143.88	0.00	0.00	4792.42	0.00	0.00	0.00	0.00	0.00	0.00
324	RT	Unplanned Outage	PG&E	Bay Area	7/17/2018	357	No	INC	3	16:45	18:59	103.14	0.00	0.00	-2546.64	19.02	-422.27	0.00	-125.80	0.00	0.00
325	RT	Unplanned Outage	PG&E	Humboldt	7/23/2018	15-32	No	DEC	10	14:15	23:59	-5.54	-25979.40	0.00	62.60	-6.06	0.00	29.57	0.00	0.00	0.00
326	RT	Unplanned Outage	PG&E	Humboldt	7/23/2018	45	No	INC	1	23:00	23:59	0.09	0.00	0.00	-3.38	0.00	0.00	0.00	0.00	0.00	0.00
327	RT	Unplanned Outage	PG&E	Humboldt	7/24/2018	15	No	DEC	8	0:00	7:59	-1.34	-9500.61	0.00	37.38	0.00	0.00	0.00	0.00	0.00	0.00
328	RT	Unplanned Outage	PG&E	Humboldt	7/24/2018	45	No	INC	3	0:00	2:14	1.56	0.00	0.00	-46.39	1.50	-44.92	0.00	0.00	0.00	0.00
329	RT	Unplanned Outage	PG&E	NCNB	7/28/2018	146-176	No	DEC	2	22:40	23:59	-43.95	0.00	0.00	-1451.46	-55.92	0.00	-	1454.65	0.00	0.00
330	RT	Unplanned Outage	PG&E	NCNB	7/29/2018	70-156	No	DEC	21	0:00	20:59	10.71	0.00	0.00	-3110.93	-57.38	0.00	-	1492.20	0.00	0.00

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Chart 2: Table of Exceptional Dispatches for Period 01/July/2018 - 31/July/2018

Number	Market Type	Reason	Location	Local Reliability Area	Trade Date	MW	Commitment	INC_DEC	Hours	Begin Time	End Time	Total MWH	Min Load Cost	Start Up Cost	CC6470	ED MWH (INC/DEC)	CC6470 INC	CC6470 DEC	CC6482	CC6488	CC6620
331	RT	Unplanned Outage	SCE	Big Creek-Ventura	7/17/2018	50-401	No	INC	11	13:00	23:59	336.39	12822.25	0.00	-18140.45	74.06	-4339.40	0.00	-1881.50	0.00	0.00
332	RT	Unplanned Outage	SCE	Big Creek-Ventura	7/18/2018	50	No	DEC	24	0:00	23:59	-89.83	10165.83	0.00	3902.99	0.00	0.00	0.00	0.00	0.00	0.00
333	RT	Unplanned Outage	SCE	Big Creek-Ventura	7/18/2018	50	No	INC	24	0:00	23:59	693.78	39442.03	0.00	-87764.71	0.00	0.00	0.00	0.00	0.00	0.00
334	RT	Unplanned Outage	SCE	Big Creek-Ventura	7/19/2018	50	No	INC	24	0:00	23:59	95.97	675094.00	0.00	-19411.13	0.00	0.00	0.00	-6903.33	0.00	0.00
335	RT	Unplanned Outage	SCE	LA Basin	7/15/2018	30-825	Yes	INC	18	6:20	23:59	891.57	345577.73	29138.45	-57077.22	995.01	-42178.60	0.00	-828499.85	0.00	0.00
336	RT	Unplanned Outage	SCE	LA Basin	7/16/2018	10-30	No	DEC	18	0:00	17:59	-397.31	-40090.27	0.00	20523.15	0.00	0.00	0.00	0.00	0.00	0.00
337	RT	Unplanned Outage	SCE	LA Basin	7/16/2018	10-90	Yes	INC	24	0:00	23:59	35.77	133952.24	0.00	-11291.91	0.00	0.00	0.00	0.00	0.00	0.00
338	RT	Unplanned Outage	SCE	LA Basin	7/17/2018	110-382	Yes	INC	24	0:00	23:59	193.71	620862.19	0.00	-42069.74	172.32	-18438.65	0.00	-71225.51	0.00	0.00
339	RT	Unplanned Outage	SCE	LA Basin	7/18/2018	150-170	Yes	INC	24	0:00	23:59	855.95	958924.06	0.00	-338828.29	10.03	-2041.32	0.00	0.00	0.00	0.00
340	RT	Unplanned Outage	SCE	LA Basin	7/19/2018	30	Yes	INC	24	0:00	23:59	249.56	141892.34	0.00	-48183.46	0.00	0.00	0.00	-89021.86	0.00	0.00
341	RT	Unplanned Outage	SDG&E	San Diego-IV	7/15/2018	68	No	INC	15	7:30	21:59	-103.49	106915.77	7599.05	5566.21	0.05	-1.82	0.00	-2.22	0.00	0.00
342	RT	Unplanned Outage	SDG&E	San Diego-IV	7/16/2018	20	Yes	INC	12	12:00	23:59	-19.83	33723.00	21782.39	-122.06	0.00	0.00	0.00	0.00	0.00	0.00
343	RT	Unplanned Outage	SDG&E	San Diego-IV	7/17/2018	20	No	INC	18	0:00	17:14	10.97	46516.87	0.00	-7796.92	0.00	0.00	0.00	0.00	0.00	0.00
344	RT	Unplanned Outage	SDG&E	San Diego-IV	7/18/2018	40-60	Yes	INC	24	0:00	23:59	-183.03	311252.54	18108.70	-32374.55	0.04	-2.74	0.00	0.00	-1.86	0.00
345	RT	Unplanned Outage	SDG&E	San Diego-IV	7/19/2018	20	Yes	INC	24	0:00	23:59	188.27	99798.00	0.00	-46946.39	0.00	0.00	0.00	0.00	0.00	0.00
346	RT	Voltage Support	PG&E	Humboldt	7/21/2018	14	No	DEC	1	23:30	23:59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
347	RT	Voltage Support	PG&E	N/A	7/20/2018	125	No	INC	4	18:10	21:59	425.68	18780.50	0.00	-17769.43	0.00	0.00	0.00	0.00	0.00	0.00

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Chart 2: Table of Exceptional Dispatches for Period 01/July/2018 - 31/July/2018

Number	Market Type	Reason	Location	Local Reliability Area	Trade Date	MW	Commitment	INC_DEC	Hours	Begin Time	End Time	Total MWH	Min Load Cost	Start Up Cost	CC6470	ED MWH (INC/DEC)	CC6470 INC	CC6470 DEC	CC6482	CC6488	CC6620
348	RT	Voltage Support	PG&E	Stockton	7/19/2018	23	No	INC	4	0:15	3:59	0.38	0.00	0.00	-9.78	0.00	0.00	0.00	0.00	0.00	0.00

Appendix A: Explanation by Example

All examples listed below are based on fictitious data. Many simplified assumptions are made to explain settlement charge codes, and not all assumptions are explicitly stated in these examples.

For instance settlement charge codes are calculated based on metered quantities, whereas, in these examples the dispatch quantities are assumed to be equal to metered quantities. These assumptions have been made to simplify the understanding of settlements calculations.

Example 1: Exceptional Dispatch Instructions Prior to DAM

In this fictitious example, the CAISO issued an exceptional dispatch instruction for resource A to be committed at its Pmin of 50 MW from hours ending 5 through 10 for a generation procedure 7630. Similarly, the CAISO issued additional instructions to resources B and C for the same reason in Table 2. Exceptional dispatches prior to the day-ahead market are commitments to minimum load. Here the dispatch levels are all at minimum load. Table 2 below also shows the commitment costs and the total volume (MWh) of exceptional dispatch instruction for each resource. The minimum load costs and start up costs, shown in Table 2 are the eligible minimum load and start up costs different from the bid-in minimum load and start up costs⁷. Only those quantities which relate to pre-day-ahead unit commitments are shown in this table.

Table 2: Instructions Prior to Day-Ahead Market

Date	Market	Resource	Location	Local Reliability Area (LRA)	Begin Time	End Time	Dispatch level (MW)	Reason	Total Volume (MWh)	Min-Load Cost	Start- Up Cost	CC6620 (BCR)
01-Jul-09	DA	A	SCE	LA BASIN	05:00	10:00	50	7630	300	\$5000	\$0	0
01-Jul-09	DA	B	SCE	LA BASIN	08:00	20:00	30	7630	390	\$6000	\$500	\$4000
01-Jul-09	DA	C	SCE	LA BASIN	09:00	23:00	20	7630	300	\$400	\$1000	\$1000

This data is summarized as shown in Table 3, which is the prescribed format specified in the FERC order on September 02, 2009. This summary classifies the data by reason, resource location, local reliability area, and trade date. The MW column in Table 3 is the range of MW; in this case the minimum instruction MW is 20 MW for resource C which occurs from hours ending 21 through 23. The maximum instruction occurs in hour ending 10. In this hour resource A is committed at 50 MW, resource B is committed at 30 MW and resource C is committed at 20 MW. This adds up to 100 MW. The MW column shows the minimum and maximum of the overlaps of all the exceptional dispatch instructions. The Commitment column shows whether a resource was committed between the begin time and end time. Commitments are broken out separately from energy dispatches. In the day-ahead however, the exceptional dispatches are nearly always just commitments, as in this example. The Begin Time column shows hour ending 5 as this was the hour ending for first dispatch of the day, and the End Time column shows hour ending 23, as this was the hour with last dispatch. It is also possible there might be hours between the begin time and the end time where there might not be exceptional dispatch instructions for the reason, meaning that the range between the begin time and end time can include null hours with no dispatch. The total volume (MWh) is the MWh quantity for each resource, which adds up to 990 MWh. Similarly, all cost information is sum of individual resource costs. Some resources bid-in zero start-up cost; as seen in this example, resource A bid in zero for its start up cost. Since the CAISO does not explicitly pay a resource for bid-in minimum load costs and start-up costs; these costs are recovered through the charge code CC6620 (Bid Cost Recovery), this table shows the summary of CC6620 for the classification. Here, it is the CC6620 for all three resources which adds up to \$5000. This column shows the impact of exceptional dispatch on bid cost recovery for all pre-day-ahead exceptional dispatch commitments.

Table 3: FERC Summary of Instructions Prior to DAM

Number	Market Type	Reason	Location	Local Reliability Area (LRA)	Trade Date	MW	Commitment	INC/DEC	Hour	Begin Time	End Time	Total Volume (MWh)	Min-Load Cost	Start-Up Cost	CC6620
1	DA	7630	SCE	LA Basin	1-Jul-09	20-100	Yes	N/A	19	05:00	23:00	990	\$11,400	\$1,500	\$5000

Example 2: Incremental Exceptional Dispatch Instructions in RTM

In this fictitious example the CAISO issued an exceptional dispatch instruction to resource A to be committed at its Pmin of 30 MW from hours 6:00 through 11:00 after completion of the day-ahead market for the transmission procedure 7110. This resource had no day-ahead award in those hours. The CAISO issued another exceptional dispatch instruction to resource B, to be dispatched at 40 MW from hours 7:00 through

⁷ Please refer to the BPM configuration Guide: Bid Cost Recovery Settlements published on the CAISO's website for details about eligible minimum load and start up costs.

9:00 in real-time for the transmission procedure 7110. This resource had a day-ahead schedule of 20 MW from the day-ahead market, which implies this exceptional dispatch instruction was an incremental instruction and the exceptional dispatch MW was 20 MW. Similarly, the details of exceptional dispatch (ED) instruction for resource C are shown in Table 4. This table also shows volume (MWh) and various real-time charge codes associated with the exceptional dispatch instructions. The total MWh column for each resource shows all types of imbalance energy quantities for this resource between the begin time and end time which includes both the exceptional dispatch energy quantities and optimal energy quantities.

Resource A was committed at its Pmin so its total volume (MWh) is equal to its Pmin times the number of hours, which is calculated as 30 MW times 6 hours and is equal to 180 MWh. The resource Minimum load costs and the start up costs are its eligible commitment costs for that period. LMP at this resource is \$10/MWh, so the charge code CC6470 is calculated at (180 MWh * \$10/MWh) and is equal to \$1,800. Since this resource is not dispatched above its Pmin, it has a zero volume (MWh) of exceptional dispatch. All charge codes associated with the exceptional dispatch increment or decrement quantities are zero.

Resource B is dispatched 20 MW above its day-ahead schedule, so its total volume (MWh) is calculated as 20 MW times 3 hours which is equal to 60 MWh. Since the resource was committed in the Day-Ahead Market there are no minimum load quantity and start up costs associated with this resource. The resource had a bid price of \$100/MWh and the LMP at that resource was \$10/MWh. All of 60 MWh is considered as exceptional dispatch incremental quantity shown in ED Volume (MWH INC/DEC) column. The charge code CC6470 INC is calculated as 60 MWh * resource LMP (\$10/MWh) which is equal to \$600. Since the only imbalance energy in this timeframe was the exceptional dispatch volume, the charge code CC6470 is equal to CC6470 INC. The charge code CC6488 is calculated as MWH quantity *(bid price – LMP), which is equal to \$5400 (60 MWh *(\$10/MWh-\$100/MWh)). Similarly, volumes and real-time charge codes are calculated for resource C.

Table 4: Incremental Exceptional Dispatch Instructions in RTM

Date	Market	Resource	Location	Local Reliability Area (LRA)	Begin Time	End Time	Dispatch level (MW)	Day-Ahead Award (MW)	Commitment	INC/DEC	ED (MW)	Reason	Total MWH	Min Load Cost	Start Up Cost	CC6470	ED MWH (INC/DEC)	CC6470 INC	CC6470 DEC	CC6482	CC6488
1-Jul-09	RT	A	PG&E	Humboldt	6:00	11:00	30	0	Yes	INC	30	7110	180	1000	50	1800	0	0	0	0	0
1-Jul-09	RT	B	PG&E	Humboldt	7:00	9:00	40	20	No	INC	20	7110	60	0	0	600	60	600	0	0	5400
1-Jul-09	RT	C	PG&E	Humboldt	12:00	15:00	50	50	No	INC	0	7110	0	0	0	0	0	0	0	0	0
1-Jul-09	RT	C	PG&E	Humboldt	16:00	20:00	50	40	No	INC	10	7110	50	0	0	300	20	300	0	0	200

This data is summarized as shown in Table 5 and is classified by reason, resource location, local reliability area, and trade date. The MW column in Table 5 is the range of MW; in this case the minimum instruction MW is 0 MW for resource C which occurs from hours ending 13 through 15. The maximum instruction occurs in hours ending 8 & 9, as during these two hours both resources A and B have an ED MW of 30MW and 20MW, respectively. This adds up to 50 MW. The MW column shows the minimum and maximum of the overlaps of all the exceptional dispatch instructions. The Commitment column shows whether a resource was committed between the begin time and end time. This column shows a commitment if there was a single commitment in the entire interval of exceptional dispatch. The Begin Time column shows the time of the first dispatch of the day. This is a time not a range. Similarly, the End Time column shows a time and not a range. Exceptional dispatches occurred between these two times. Since there was a commitment between the begin time and end time then the Commitment column displays yes for the summary. Similarly, the INC/DEC column shows an INC as there was an incremental dispatch between the begin time and end time. As mentioned in the previous example it is possible there might be hours between the begin time and end time where there were no exceptional dispatch instructions for the reason. Both volume and cost information columns are the summation for all the respective columns for resource A, B and C. For instance the Total volume (MWh) column is calculated as summation of 180,60,0 and 50 which are the individual volumes (MWh) for resources A, B and C for time periods shown in Table 4.

Table 5: FERC Summary of ED Instructions in RTM

Number	Market Type	Reason	Location	Local Reliability Area (LRA)	Trade Date	MW	Commitment	INC/DEC	Hour	Begin Time	End Time	Total MWH	Min Load Cost	Start Up Cost	CC6470	ED MWH (INC/DEC)	CC6470 INC	CC6470 DEC	CC6482	CC6488
1	RT	7110	PG&E	Humboldt	1-Jul-09	0-50	Yes	INC	15	6:00	20:00	290	1000	50	1700	140	1500	0	0	11000

It is possible that the CAISO would dispatch a particular resource for instance at 10 MW from hours ending 1 through 4, and all or part of its energy might settle as optimal energy. This situation occurs when the LMP at the resource pricing node is above the resource bid price. This cost will only be captured in charge code 6470. It is also possible that CAISO issues an exceptional dispatch for the resource to operate at a minimum of 10 MW which is its Pmin; however the market application might dispatch this resource above Pmin because the resource is economical. When this occurs, the charge code CC6470 and the total MWh quantity might overstate the actual exceptional dispatch MWh quantities. So, to best estimate the cost and volume (MWh) of exceptional dispatch it is appropriate to consider only the following columns: ED MWh (INC/DEC), CC6470 INC, CC6470 DEC, CC6482, CC6488.

Example 3: Decremental Exceptional Dispatch Instructions in RTM

This example highlights decremental exceptional dispatch instructions in the real-time market. In this fictitious example the CAISO issued an exceptional dispatch instruction to resource A to be committed at its Pmin of 20 MW from hours ending 15 through 20 after completion of the day-ahead market for the transmission procedure 7430. The CAISO issued additional exceptional dispatch instructions for resources B and C; details of those instructions are shown in Table 6. This table also includes volume (MWh) and cost information.

Resource A is committed in real-time at its Pmin, its total volume (MWh) is 20MW *6 hours which is equal to 120 MWh. This resource has a zero MW of incremental dispatch in all hours, so all other relevant cost and volume columns result in zeros. Resource B has a decremental MW of 20 MW in 3 hours, which results in 60 MWh of decremental volume. Since this resource is not committed in real-time, both the minimum load cost and start up costs are zero. This resource had a bid price of \$50/MWh and LMP at the resource pricing node is \$10/ MWh. Based on this information CC6470-Dec is calculated as 60 MWh *\$10/MWh which is equal to \$600. Since this resource has its ED volume (MWh) equal to its Total volume, CC6470 is equal to CC6470- DEC. The CC6488 is calculated as (60 MWh * (\$50/MWh - \$10/MWh)) which is equal to \$2400. Resource C had a bid price of \$10/MWh and the LMP at its pricing node is \$50/MWh. Based on this information, volume and cost information is calculated for resource C.

Table 6: Decremental Exceptional Dispatch Instructions in RTM

Date	Market Type	Resource	Location	Local Reliability Area (LRA)	Begin Time	End Time	Dispatch level (MW)	Day-Ahead Award (MW)	Commitment	INC/DEC	ED (MW)	Reason	Total MWH	Min Load Cost	Start Up Cost	CC6470	ED MWH (INC/DEC)	CC6470 INC	CC6470 DEC	CC6482	CC6488
1-Jul-09	RT	A	PG&E	Fresno	15:00	20:00	20	0	Yes	INC	20	7430	120	\$ 120	\$ 100	\$ -	0	\$ -	\$ -	\$ -	\$ -
1-Jul-09	RT	B	PG&E	Fresno	7:00	9:00	40	60	No	DEC	20	7430	(60)	\$ -	\$ -	\$ 600	-60	\$ -	\$ 600	\$ -	\$2,400
1-Jul-09	RT	C	PG&E	Fresno	10:00	14:00	40	50	No	DEC	10	7430	(50)	\$ -	\$ -	\$ 500	-50	\$ -	\$ 500	\$ -	\$2,000

This data is summarized according to FERC convention in Table 7. This summary classifies the data by reason, resource location, local reliability area, and trade date. Incs and decs are broken out separately. The inc entry is self-explanatory and similar to the previous example. Regarding the dec entry the MW column is the range of MW; in this case the minimum dec instruction is 10 MW (actually -10MW as it is a dec) for resource C which occurs from hours ending 10 through 14. The maximum instruction occurs from hours ending 7 through 9, when resource B was issued a dec instruction of 20 MW. The MW column shows the minimum and maximum of the overlaps of all the exceptional dispatch instructions. The Commitment column shows whether a resource was committed between the begin time and end time. The volume and cost information are summarized by INC and DEC classification.

Table 7: FERC Summary of Decremental ED Instructions in RTM

Number	Market Type	Reason	Location	Local Reliability Area (LRA)	Trade Date	MW	Commitment	INC/DEC	Hour	Begin Time	End Time	Total MWH	Min Load Cost	Start Up Cost	CC6470	ED MWH (INC/DEC)	CC6470 INC	CC6470 DEC	CC6482	CC6488
1	RT	7430	PG&E	Fresno	1-Jul-09	20	Yes	INC	6	15:00	20:00	120	\$ 120	\$ 100	\$ -	0	\$ -	\$ -	\$ -	\$ -
2	RT	7430	PG&E	Fresno	1-Jul-09	10-20	Yes	DEC	8	7:00	14:00	(110)	\$ -	\$ -	\$ (1,100)	\$ (110)	\$ -	\$ (1,100)	\$ -	\$ (4,400)

Appendix B: Price Impact Analysis

In the September 2 FERC order, FERC requested the CAISO to perform price impact analysis on two distinct pricing nodes for the entire reporting period. The order also mentioned that the CAISO must pick two pricing nodes for the entire reporting period that are most affected by the exceptional dispatch instructions, and the two pricing nodes must belong to two load aggregation points (LAPs).

Based on this requirement the CAISO implemented a methodology to perform price impact analysis. First, the CAISO identified a heavily affected pricing node from each of the Pacific Gas & Electric (PG&E) LAP and Southern California Edison (SCE) LAP. These two pricing nodes had the maximum amount of exceptional dispatch volume (MWh) in their respective LAP. Point A is in PG&E LAP and point B is in SCE LAP. Please note these two points correspond to an actual pricing node in the CAISO system. Only one resource was connected to each of these pricing nodes. For each resource the following input parameters were obtained to perform the analysis:

Exceptional dispatch information: constrained level, constraint type, start of exceptional dispatch instruction and end of exceptional dispatch instruction.
 Real-Time LMPs for each of the five minute intervals for the month.
 Real-Time hourly bid set for each trade hour.
 Day-Ahead award for the resources.

The exceptional dispatch intervals have a begin time and an end time which can span as small as one minute to as large as 24 hours. Since the market application dispatches resources on five-minute basis, the exceptional dispatch instructions for each of these resources were broken down into five-minute intervals. If the begin time or end time for an instruction was in the middle of the five-minute interval, that instruction was rounded up to the next five-minute interval. These five-minute intervals were then coupled with resource five-minute LMPs calculated by the real-time market application. Also, the hourly bid information and the hourly day-ahead schedule were put together to create a dataset that had all the information to perform price impact analysis.

An exceptional dispatch instruction can be classified as a start up instruction, an instruction to be dispatched at or above the constrained level, an instruction to be dispatched at or below a constrained level, an instruction to be dispatched at a fixed constrained level, or a shut down instruction. The Locational Marginal Price (LMP) is set by a resource which can provide the next incremental MW of energy. Based on this definition of LMP and the classification of exceptional dispatches based on constraint type, a resource may set the LMP in only those intervals in which the resource is eligible to move either up or down from its constrained level. Hence, in those intervals in which the resource was constrained up at its Pmax or the resource was exceptionally dispatched to its Pmax and forced to generate at that level, the resource was ineligible to set the price as it had no room to move up. Similarly, if the resource was constrained down at its Pmin, then the resource was not eligible to set the price. All those intervals in which the resource was ineligible to set the price were dropped from the dataset under consideration. From this dataset of only eligible intervals, for both pricing nodes A and B, LMPs were calculated for all intervals based on the resource dispatch level and the its bid set. The calculated LMP is equal to that bid price corresponding to the constrained MW segment.

Table 8 shows the price impact analysis information for node A, which is in the PG&E area. This table shows all the five minute intervals in which the resource at PNode A was issued an exceptional dispatch instruction. Out of the 8,064 five-minute intervals in July, this resource was issued exceptional dispatch instructions in 620 five-minute intervals. This resource was eligible to set the LMP in 319 intervals. Out of the 319 intervals, resource calculated LMP was larger than the market LMP in 13 intervals. In the 13 intervals, the average increase in five minute LMP was \$10.51/MWh. Out of the 319 intervals, resource calculated LMP was less than the market LMP in 306 intervals. In the 306 intervals, the average decrease in five minute LMP was \$30.63/MWh. This implies that if the CAISO could model the constraint for this exceptional dispatch, then this resource and all other pricing nodes associated with that constraint would observe an average decrease of \$28.96/MWh

Table 9 shows the price impact analysis information for node B, which is in the SCE area. This table shows all the five minute intervals in which the resource at PNode B was issued an exceptional dispatch instruction. Out of the 8,064 five-minute intervals in July, this resource was issued exceptional dispatch instructions in 535 five-minute intervals. This resource was eligible to set the LMP in 316 intervals. Out of the 316 intervals, resource calculated LMP was larger than the market LMP in 232 intervals. In the 232 intervals, the average increase in five minute LMP was \$172.47/MWh. Out of the 316 intervals, resource calculated LMP was less than the market LMP in 84 intervals. In the 84 intervals, the average decrease in five minute LMP was \$124.61/MWh. This implies that if the CAISO could model the constraint for this exceptional dispatch, then this resource and all other pricing nodes associated with that constraint would observe an average increase of \$93.49/MWh

Table 8: Price Impact Analysis Information for Pricing Node A in PG&E LAP

Number	Trade Date	Trade Hour	Interval	Market LMP	Eligible Flag	Calculated LMP	Change in LMP
1	7/2/2018	2	2	24.93	Yes	12.12	-12.81
2	7/2/2018	2	3	24.98	Yes	12.12	-12.86
3	7/2/2018	2	4	23.97	Yes	12.12	-11.85
4	7/2/2018	2	5	24.72	Yes	12.12	-12.60
5	7/2/2018	2	6	23.49	Yes	12.12	-11.37
6	7/2/2018	2	7	24.59	Yes	12.12	-12.47
7	7/2/2018	2	8	23.67	Yes	12.12	-11.55
8	7/2/2018	2	9	23.72	Yes	12.12	-11.60
9	7/2/2018	2	10	24.19	Yes	12.12	-12.07
10	7/2/2018	2	11	23.29	Yes	12.12	-11.17
11	7/2/2018	2	12	24.19	Yes	12.12	-12.07
12	7/3/2018	2	4	22.42	Yes	12.08	-10.34
13	7/3/2018	2	5	22.44	Yes	12.08	-10.36
14	7/3/2018	2	6	22.18	Yes	12.08	-10.10
15	7/3/2018	2	7	21.71	Yes	12.08	-9.63
16	7/3/2018	2	8	21.28	Yes	12.08	-9.20
17	7/3/2018	2	9	20.88	Yes	12.08	-8.80
18	7/3/2018	2	10	20.65	Yes	12.08	-8.57
19	7/3/2018	2	11	20.07	Yes	12.08	-7.99
20	7/3/2018	9	1	22.94	No	12.08	-10.86
21	7/3/2018	9	1	22.94	Yes	12.08	-10.86
22	7/3/2018	9	2	22.34	No	12.08	-10.26
23	7/3/2018	9	2	22.34	Yes	12.08	-10.26
24	7/3/2018	9	3	24.48	No	12.08	-12.40
25	7/3/2018	9	3	24.48	Yes	12.08	-12.40
26	7/3/2018	9	4	22.19	Yes	12.08	-10.11
27	7/3/2018	9	5	21.41	Yes	12.08	-9.33
28	7/3/2018	9	6	22.80	Yes	12.08	-10.72
29	7/3/2018	9	7	22.30	Yes	12.08	-10.22
30	7/3/2018	9	8	23.16	Yes	12.08	-11.08
31	7/3/2018	9	9	21.99	Yes	12.08	-9.91
32	7/3/2018	9	10	21.45	Yes	12.08	-9.37
33	7/3/2018	9	11	20.19	Yes	12.08	-8.11
34	7/3/2018	9	12	20.22	Yes	12.08	-8.14

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35	7/3/2018	16	1	27.28	Yes	12.08	-15.20
36	7/3/2018	16	2	26.51	Yes	12.08	-14.43
37	7/3/2018	16	3	27.28	Yes	12.08	-15.20
38	7/3/2018	16	4	25.74	Yes	12.08	-13.66
39	7/3/2018	16	5	26.85	Yes	12.08	-14.77
40	7/3/2018	16	6	27.34	Yes	12.08	-15.26
41	7/3/2018	16	7	26.84	Yes	12.08	-14.76
42	7/3/2018	16	8	27.05	Yes	12.08	-14.97
43	7/3/2018	16	9	27.35	Yes	12.08	-15.27
44	7/3/2018	16	10	27.74	Yes	12.08	-15.66
45	7/3/2018	16	11	29.39	Yes	12.08	-17.31
46	7/3/2018	16	12	28.32	Yes	12.08	-16.24
47	7/8/2018	1	5	45.98	No	12.08	-33.90
48	7/8/2018	1	6	39.19	No	12.08	-27.11
49	7/8/2018	1	7	36.85	No	12.08	-24.77
50	7/8/2018	1	8	36.75	No	12.08	-24.67
51	7/8/2018	1	9	35.68	No	12.08	-23.60
52	7/8/2018	1	10	34.73	No	12.08	-22.65
53	7/8/2018	1	11	34.26	No	12.08	-22.18
54	7/8/2018	1	12	35.43	No	12.08	-23.35
55	7/8/2018	2	1	33.42	Yes	12.08	-21.34
56	7/8/2018	2	2	38.84	Yes	12.08	-26.76
57	7/8/2018	2	3	40.16	Yes	12.08	-28.08
58	7/8/2018	2	4	37.52	Yes	12.08	-25.44
59	7/8/2018	2	5	37.73	Yes	12.08	-25.65
60	7/8/2018	2	6	36.78	Yes	12.08	-24.70
61	7/8/2018	2	7	36.09	Yes	12.08	-24.01
62	7/8/2018	2	8	33.72	Yes	12.08	-21.64
63	7/8/2018	2	9	32.03	Yes	12.08	-19.95
64	7/8/2018	2	10	33.24	Yes	12.08	-21.16
65	7/8/2018	2	11	33.16	Yes	12.08	-21.08
66	7/8/2018	2	12	33.50	Yes	12.08	-21.42
67	7/10/2018	18	1	25.26	Yes	12.28	-12.98
68	7/10/2018	18	2	25.25	Yes	12.28	-12.97
69	7/10/2018	18	3	23.17	Yes	12.28	-10.89
70	7/10/2018	18	4	23.66	Yes	12.28	-11.38
71	7/10/2018	18	5	24.07	Yes	12.28	-11.79
72	7/10/2018	18	6	25.19	Yes	12.28	-12.91

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73	7/10/2018	18	7	25.43	Yes	12.28	-13.15
74	7/10/2018	18	8	26.51	Yes	12.28	-14.23
75	7/10/2018	18	9	27.19	Yes	12.28	-14.91
76	7/10/2018	18	10	30.57	Yes	12.28	-18.29
77	7/10/2018	18	11	29.49	Yes	12.28	-17.21
78	7/10/2018	18	12	29.98	Yes	12.28	-17.70
79	7/10/2018	19	1	26.90	Yes	12.28	-14.62
80	7/10/2018	19	2	28.44	Yes	12.28	-16.16
81	7/10/2018	19	3	30.81	Yes	12.28	-18.53
82	7/10/2018	19	4	32.94	Yes	12.28	-20.66
83	7/10/2018	19	5	33.93	Yes	12.28	-21.65
84	7/10/2018	19	6	33.58	Yes	12.28	-21.30
85	7/10/2018	19	7	33.66	Yes	12.28	-21.38
86	7/10/2018	19	8	42.56	Yes	12.28	-30.28
87	7/10/2018	19	9	42.18	Yes	12.28	-29.90
88	7/10/2018	19	10	43.66	Yes	12.28	-31.38
89	7/10/2018	19	11	45.94	Yes	12.28	-33.66
90	7/10/2018	19	12	48.55	Yes	12.28	-36.27
91	7/10/2018	20	1	43.13	Yes	12.28	-30.85
92	7/10/2018	20	2	40.96	Yes	12.28	-28.68
93	7/10/2018	20	3	40.94	Yes	12.28	-28.66
94	7/10/2018	20	4	37.87	Yes	12.28	-25.59
95	7/10/2018	20	5	38.40	Yes	12.28	-26.12
96	7/10/2018	20	6	38.22	Yes	12.28	-25.94
97	7/10/2018	20	7	35.84	Yes	12.28	-23.56
98	7/10/2018	20	8	37.49	Yes	12.28	-25.21
99	7/10/2018	20	9	32.45	Yes	12.28	-20.17
100	7/10/2018	20	10	32.10	Yes	12.28	-19.82
101	7/10/2018	20	11	30.28	Yes	12.28	-18.00
102	7/10/2018	20	12	31.73	Yes	12.28	-19.45
103	7/11/2018	23	1	57.34	Yes	12.21	-45.13
104	7/11/2018	23	2	60.78	Yes	12.21	-48.57
105	7/11/2018	23	3	57.30	Yes	12.21	-45.09
106	7/11/2018	23	4	60.77	Yes	12.21	-48.56
107	7/11/2018	23	5	63.88	Yes	12.21	-51.67
108	7/11/2018	23	6	56.98	Yes	12.21	-44.77
109	7/11/2018	23	7	46.85	Yes	12.21	-34.64
110	7/11/2018	23	8	45.77	Yes	12.21	-33.56

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111	7/11/2018	23	10	35.18	Yes	12.21	-22.97
112	7/11/2018	23	11	37.52	Yes	12.21	-25.31
113	7/11/2018	23	12	39.81	Yes	12.21	-27.60
114	7/13/2018	23	1	30.31	No	12.18	-18.13
115	7/13/2018	23	2	30.37	No	12.18	-18.19
116	7/13/2018	23	3	31.70	No	12.18	-19.52
117	7/13/2018	23	4	39.86	No	12.18	-27.68
118	7/13/2018	23	5	42.51	No	12.18	-30.33
119	7/13/2018	23	6	38.92	No	12.18	-26.74
120	7/13/2018	23	7	36.26	No	12.18	-24.08
121	7/13/2018	23	10	26.12	No	12.18	-13.94
122	7/13/2018	23	11	25.95	No	12.18	-13.77
123	7/13/2018	23	12	25.35	No	12.18	-13.17
124	7/14/2018	1	2	41.78	Yes	12.15	-29.63
125	7/14/2018	1	3	48.67	Yes	12.15	-36.52
126	7/14/2018	1	4	46.35	Yes	12.15	-34.20
127	7/14/2018	1	5	52.58	Yes	12.15	-40.43
128	7/14/2018	1	6	50.83	Yes	12.15	-38.68
129	7/14/2018	1	7	46.67	Yes	12.15	-34.52
130	7/14/2018	1	8	42.50	Yes	12.15	-30.35
131	7/14/2018	1	9	36.53	Yes	12.15	-24.38
132	7/14/2018	1	10	34.18	Yes	12.15	-22.03
133	7/14/2018	1	11	34.26	Yes	12.15	-22.11
134	7/14/2018	1	12	61.25	Yes	12.15	-49.10
135	7/15/2018	16	1	17.17	Yes	12.16	-5.01
136	7/15/2018	16	2	16.95	Yes	12.16	-4.79
137	7/15/2018	16	3	15.75	Yes	12.16	-3.59
138	7/15/2018	16	4	12.97	Yes	12.16	-0.81
139	7/15/2018	16	5	13.45	Yes	12.16	-1.29
140	7/15/2018	16	6	10.80	Yes	12.16	1.36
141	7/15/2018	16	7	14.18	Yes	12.16	-2.02
142	7/15/2018	16	8	-1.65	Yes	12.16	13.81
143	7/15/2018	16	9	1.04	Yes	12.16	11.12
144	7/15/2018	16	10	1.79	Yes	12.16	10.37
145	7/15/2018	16	11	1.74	Yes	12.16	10.42
146	7/15/2018	16	12	1.15	Yes	12.16	11.01
147	7/15/2018	17	1	2.51	Yes	12.16	9.65
148	7/15/2018	17	2	0.24	Yes	12.16	11.92

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149	7/15/2018	17	3	-1.45	Yes	12.16	13.61
150	7/15/2018	17	4	0.90	Yes	12.16	11.26
151	7/15/2018	17	5	0.97	Yes	12.16	11.19
152	7/15/2018	17	6	2.37	Yes	12.16	9.79
153	7/15/2018	17	7	12.87	Yes	12.16	-0.71
154	7/15/2018	17	8	15.01	Yes	12.16	-2.85
155	7/15/2018	17	9	14.76	Yes	12.16	-2.60
156	7/15/2018	17	10	20.05	Yes	12.16	-7.89
157	7/15/2018	17	11	20.59	Yes	12.16	-8.43
158	7/15/2018	17	12	20.59	Yes	12.16	-8.43
159	7/15/2018	19	1	19.85	Yes	12.16	-7.69
160	7/15/2018	19	2	18.58	Yes	12.16	-6.42
161	7/15/2018	19	3	14.99	Yes	12.16	-2.83
162	7/15/2018	20	1	17.26	No	12.16	-5.10
163	7/15/2018	20	2	17.89	No	12.16	-5.73
164	7/15/2018	20	3	17.33	No	12.16	-5.17
165	7/15/2018	20	4	18.46	No	12.16	-6.30
166	7/15/2018	20	5	18.46	No	12.16	-6.30
167	7/15/2018	20	6	18.46	No	12.16	-6.30
168	7/15/2018	20	7	19.26	No	12.16	-7.10
169	7/15/2018	20	8	17.68	Yes	12.16	-5.52
170	7/15/2018	20	9	18.57	Yes	12.16	-6.41
171	7/15/2018	20	10	19.09	Yes	12.16	-6.93
172	7/15/2018	20	11	18.22	Yes	12.16	-6.06
173	7/15/2018	20	12	25.63	Yes	12.16	-13.47
174	7/20/2018	23	1	22.80	No	12.19	-10.61
175	7/20/2018	23	2	39.71	No	12.19	-27.52
176	7/20/2018	23	3	26.16	No	12.19	-13.97
177	7/20/2018	23	4	40.92	No	12.19	-28.73
178	7/20/2018	23	5	40.89	No	12.19	-28.70
179	7/20/2018	23	6	24.85	No	12.19	-12.66
180	7/20/2018	23	7	24.13	No	12.19	-11.94
181	7/20/2018	23	8	23.45	No	12.19	-11.26
182	7/20/2018	23	9	23.33	No	12.19	-11.14
183	7/20/2018	23	10	16.46	No	12.19	-4.27
184	7/20/2018	23	11	19.54	No	12.19	-7.35
185	7/20/2018	23	12	24.37	No	12.19	-12.18
186	7/21/2018	14	1	24.24	Yes	12.32	-11.92

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187	7/21/2018	14	2	24.37	Yes	12.32	-12.05
188	7/21/2018	14	3	23.89	Yes	12.32	-11.57
189	7/21/2018	14	4	20.90	Yes	12.32	-8.58
190	7/21/2018	14	5	23.66	Yes	12.32	-11.34
191	7/21/2018	14	6	24.95	Yes	12.32	-12.63
192	7/21/2018	14	7	28.82	Yes	12.32	-16.50
193	7/21/2018	14	8	28.78	Yes	12.32	-16.46
194	7/21/2018	14	9	23.86	Yes	12.32	-11.54
195	7/21/2018	14	10	24.40	Yes	12.32	-12.08
196	7/21/2018	14	11	27.39	Yes	12.32	-15.07
197	7/21/2018	14	12	34.99	Yes	12.32	-22.67
198	7/21/2018	15	1	33.75	Yes	12.32	-21.43
199	7/21/2018	15	2	40.00	Yes	12.32	-27.68
200	7/21/2018	15	3	38.00	Yes	12.32	-25.68
201	7/21/2018	15	4	38.00	Yes	12.32	-25.68
202	7/21/2018	15	5	42.15	Yes	12.32	-29.83
203	7/21/2018	15	6	125.69	Yes	12.32	-113.37
204	7/21/2018	15	7	49.33	Yes	12.32	-37.01
205	7/21/2018	15	8	41.85	Yes	12.32	-29.53
206	7/21/2018	15	9	36.70	Yes	12.32	-24.38
207	7/21/2018	15	10	41.69	Yes	12.32	-29.37
208	7/21/2018	15	11	40.04	Yes	12.32	-27.72
209	7/21/2018	15	12	45.17	Yes	12.32	-32.85
210	7/21/2018	24	7	28.60	No	12.32	-16.28
211	7/21/2018	24	8	28.60	No	12.32	-16.28
212	7/21/2018	24	9	27.85	No	12.32	-15.53
213	7/21/2018	24	10	28.10	No	12.32	-15.78
214	7/21/2018	24	11	28.10	No	12.32	-15.78
215	7/21/2018	24	12	28.10	No	12.32	-15.78
216	7/23/2018	15	1	54.12	No	12.35	-41.77
217	7/23/2018	15	2	54.81	No	12.35	-42.46
218	7/23/2018	15	3	57.00	No	12.35	-44.65
219	7/23/2018	15	4	49.33	No	12.35	-36.98
220	7/23/2018	15	5	51.03	No	12.35	-38.68
221	7/23/2018	15	6	76.71	Yes	12.35	-64.36
222	7/23/2018	15	7	47.97	Yes	12.35	-35.62
223	7/23/2018	15	8	51.62	Yes	12.35	-39.27
224	7/23/2018	15	9	56.92	Yes	12.35	-44.57

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225	7/23/2018	15	10	81.67	Yes	12.35	-69.32
226	7/23/2018	15	11	51.10	Yes	12.35	-38.75
227	7/23/2018	15	12	70.17	Yes	12.35	-57.82
228	7/23/2018	16	1	47.41	No	12.35	-35.06
229	7/23/2018	16	2	49.36	No	12.35	-37.01
230	7/23/2018	16	3	50.28	No	12.35	-37.93
231	7/23/2018	16	4	50.64	Yes	12.35	-38.29
232	7/23/2018	16	5	51.26	Yes	12.35	-38.91
233	7/23/2018	16	6	55.66	Yes	12.35	-43.31
234	7/23/2018	16	7	77.12	Yes	12.35	-64.77
235	7/23/2018	16	8	66.09	Yes	12.35	-53.74
236	7/23/2018	16	9	82.75	Yes	12.35	-70.40
237	7/23/2018	16	10	67.73	Yes	12.35	-55.38
238	7/23/2018	16	11	78.00	Yes	12.35	-65.65
239	7/23/2018	16	12	70.90	Yes	12.35	-58.55
240	7/23/2018	18	1	47.36	Yes	12.35	-35.01
241	7/23/2018	18	2	47.30	Yes	12.35	-34.95
242	7/23/2018	18	3	40.22	Yes	12.35	-27.87
243	7/23/2018	18	4	46.88	Yes	12.35	-34.53
244	7/23/2018	18	5	44.54	Yes	12.35	-32.19
245	7/23/2018	18	6	44.85	Yes	12.35	-32.50
246	7/23/2018	18	7	51.53	Yes	12.35	-39.18
247	7/23/2018	18	8	46.02	Yes	12.35	-33.67
248	7/23/2018	18	9	48.31	Yes	12.35	-35.96
249	7/23/2018	18	10	111.89	Yes	12.35	-99.54
250	7/23/2018	18	11	66.55	Yes	12.35	-54.20
251	7/23/2018	18	12	81.56	Yes	12.35	-69.21
252	7/23/2018	19	1	70.90	Yes	12.35	-58.55
253	7/23/2018	19	2	69.81	Yes	12.35	-57.46
254	7/23/2018	19	3	70.90	Yes	12.35	-58.55
255	7/23/2018	19	4	105.92	Yes	12.35	-93.57
256	7/23/2018	19	5	127.42	Yes	12.35	-115.07
257	7/23/2018	19	6	149.75	Yes	12.35	-137.40
258	7/23/2018	19	7	141.71	Yes	12.35	-129.36
259	7/23/2018	19	8	149.54	Yes	12.35	-137.19
260	7/23/2018	19	9	143.31	Yes	12.35	-130.96
261	7/23/2018	19	10	137.33	Yes	12.35	-124.98
262	7/23/2018	19	11	154.71	Yes	12.35	-142.36

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263	7/23/2018	19	12	162.40	Yes	12.35	-150.05
264	7/24/2018	10	1	16.26	No	12.64	-3.62
265	7/24/2018	10	1	16.26	Yes	12.64	-3.62
266	7/24/2018	10	2	16.26	No	12.64	-3.62
267	7/24/2018	10	2	16.26	Yes	12.64	-3.62
268	7/24/2018	10	3	16.45	No	12.64	-3.81
269	7/24/2018	10	3	16.45	Yes	12.64	-3.81
270	7/24/2018	10	4	15.28	No	12.64	-2.64
271	7/24/2018	10	5	16.10	No	12.64	-3.46
272	7/24/2018	10	6	21.73	No	12.64	-9.09
273	7/24/2018	10	7	21.85	No	12.64	-9.21
274	7/24/2018	10	8	19.99	No	12.64	-7.35
275	7/24/2018	10	8	19.99	Yes	12.64	-7.35
276	7/24/2018	10	9	23.00	No	12.64	-10.36
277	7/24/2018	10	9	23.00	Yes	12.64	-10.36
278	7/24/2018	10	10	22.74	No	12.64	-10.10
279	7/24/2018	10	10	22.74	Yes	12.64	-10.10
280	7/24/2018	10	11	25.19	No	12.64	-12.55
281	7/24/2018	10	11	25.19	Yes	12.64	-12.55
282	7/24/2018	10	12	25.10	No	12.64	-12.46
283	7/24/2018	10	12	25.10	Yes	12.64	-12.46
284	7/24/2018	11	1	29.70	Yes	12.64	-17.06
285	7/24/2018	11	2	29.78	Yes	12.64	-17.14
286	7/24/2018	11	3	29.95	Yes	12.64	-17.31
287	7/24/2018	11	4	25.32	Yes	12.64	-12.68
288	7/24/2018	11	5	26.57	Yes	12.64	-13.93
289	7/24/2018	11	6	29.04	Yes	12.64	-16.40
290	7/24/2018	11	7	23.23	Yes	12.64	-10.59
291	7/24/2018	11	8	24.89	Yes	12.64	-12.25
292	7/24/2018	11	9	29.57	Yes	12.64	-16.93
293	7/24/2018	11	10	39.27	Yes	12.64	-26.63
294	7/24/2018	11	11	55.41	Yes	12.64	-42.77
295	7/24/2018	11	12	63.48	Yes	12.64	-50.84
296	7/24/2018	23	1	58.98	Yes	12.64	-46.34
297	7/24/2018	23	2	57.37	Yes	12.64	-44.73
298	7/24/2018	23	3	71.23	Yes	12.64	-58.59
299	7/24/2018	23	4	84.98	Yes	12.64	-72.34
300	7/24/2018	23	5	86.88	Yes	12.64	-74.24

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Number	Trade Date	Trade Hour	Interval	Market LMP	Eligible Flag	Calculated LMP	Change in LMP
301	7/24/2018	23	6	77.94	Yes	12.64	-65.30
302	7/24/2018	23	7	75.02	Yes	12.64	-62.38
303	7/24/2018	23	8	76.89	Yes	12.64	-64.25
304	7/24/2018	23	9	63.66	Yes	12.64	-51.02
305	7/24/2018	23	10	63.18	Yes	12.64	-50.54
306	7/24/2018	23	11	58.71	Yes	12.64	-46.07
307	7/24/2018	23	12	62.09	Yes	12.64	-49.45
308	7/25/2018	24	1	42.74	No	12.47	-30.27
309	7/25/2018	24	2	48.42	No	12.47	-35.95
310	7/25/2018	24	3	51.04	No	12.47	-38.57
311	7/25/2018	24	4	42.22	No	12.47	-29.75
312	7/25/2018	24	5	42.25	No	12.47	-29.78
313	7/25/2018	24	6	38.45	No	12.47	-25.98
314	7/25/2018	24	7	35.93	No	12.47	-23.46
315	7/25/2018	24	8	33.94	No	12.47	-21.47
316	7/25/2018	24	9	30.42	No	12.47	-17.95
317	7/25/2018	24	10	28.81	No	12.47	-16.34
318	7/25/2018	24	11	29.35	No	12.47	-16.88
319	7/25/2018	24	12	29.67	No	12.47	-17.20
320	7/26/2018	21	7	41.99	No	12.71	-29.28
321	7/26/2018	21	8	40.18	No	12.71	-27.47
322	7/26/2018	21	9	39.66	No	12.71	-26.95
323	7/26/2018	21	10	39.52	No	12.71	-26.81
324	7/26/2018	21	11	39.52	No	12.71	-26.81
325	7/26/2018	21	12	39.52	No	12.71	-26.81
326	7/26/2018	24	1	35.75	No	12.71	-23.04
327	7/26/2018	24	2	53.83	No	12.71	-41.12
328	7/26/2018	24	3	66.26	No	12.71	-53.55
329	7/26/2018	24	4	63.16	No	12.71	-50.45
330	7/26/2018	24	5	65.37	No	12.71	-52.66
331	7/26/2018	24	6	40.43	No	12.71	-27.72
332	7/26/2018	24	7	38.04	No	12.71	-25.33
333	7/26/2018	24	8	30.41	No	12.71	-17.70
334	7/26/2018	24	9	28.60	No	12.71	-15.89
335	7/26/2018	24	10	24.20	No	12.71	-11.49
336	7/26/2018	24	11	24.38	No	12.71	-11.67
337	7/26/2018	24	12	24.20	No	12.71	-11.49
338	7/27/2018	22	1	41.59	No	12.63	-28.96

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Number	Trade Date	Trade Hour	Interval	Market LMP	Eligible Flag	Calculated LMP	Change in LMP
339	7/27/2018	22	2	49.69	No	12.63	-37.06
340	7/27/2018	22	3	49.54	No	12.63	-36.91
341	7/27/2018	22	4	44.25	No	12.63	-31.62
342	7/27/2018	22	5	41.01	No	12.63	-28.38
343	7/27/2018	22	6	41.72	No	12.63	-29.09
344	7/27/2018	22	7	38.64	No	12.63	-26.01
345	7/27/2018	22	8	38.43	No	12.63	-25.80
346	7/27/2018	22	9	36.12	No	12.63	-23.49
347	7/27/2018	22	10	34.08	No	12.63	-21.45
348	7/27/2018	22	11	35.25	No	12.63	-22.62
349	7/27/2018	22	12	36.44	No	12.63	-23.81
350	7/27/2018	24	1	46.95	No	12.63	-34.32
351	7/27/2018	24	8	2.56	No	12.63	10.07
352	7/27/2018	24	9	10.90	No	12.63	1.73
353	7/27/2018	24	10	26.21	No	12.63	-13.58
354	7/27/2018	24	11	25.98	No	12.63	-13.35
355	7/27/2018	24	12	25.43	No	12.63	-12.80
356	7/28/2018	1	1	21.25	No	12.62	-8.63
357	7/28/2018	1	2	24.37	No	12.62	-11.75
358	7/28/2018	1	3	25.34	No	12.62	-12.72
359	7/28/2018	1	4	27.20	No	12.62	-14.58
360	7/28/2018	1	5	32.21	No	12.62	-19.59
361	7/28/2018	1	6	30.88	No	12.62	-18.26
362	7/28/2018	1	7	32.45	No	12.62	-19.83
363	7/28/2018	1	8	32.44	No	12.62	-19.82
364	7/28/2018	1	9	33.14	No	12.62	-20.52
365	7/28/2018	1	10	29.14	No	12.62	-16.52
366	7/28/2018	1	11	29.25	No	12.62	-16.63
367	7/28/2018	1	12	29.14	No	12.62	-16.52
368	7/28/2018	8	1	26.70	No	12.62	-14.08
369	7/28/2018	8	2	26.70	No	12.62	-14.08
370	7/28/2018	8	3	24.34	No	12.62	-11.72
371	7/28/2018	8	4	23.71	No	12.62	-11.09
372	7/28/2018	8	5	23.50	No	12.62	-10.88
373	7/28/2018	8	6	22.21	No	12.62	-9.59
374	7/28/2018	8	7	21.49	No	12.62	-8.87
375	7/28/2018	8	8	21.49	No	12.62	-8.87
376	7/28/2018	8	9	20.53	No	12.62	-7.91

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Number	Trade Date	Trade Hour	Interval	Market LMP	Eligible Flag	Calculated LMP	Change in LMP
377	7/28/2018	8	10	21.25	No	12.62	-8.63
378	7/28/2018	8	11	21.55	No	12.62	-8.93
379	7/28/2018	8	12	21.40	No	12.62	-8.78
380	7/28/2018	19	12	67.27	No	12.62	-54.65
381	7/28/2018	20	1	47.66	No	12.62	-35.04
382	7/28/2018	20	2	40.32	No	12.62	-27.70
383	7/28/2018	20	3	39.37	No	12.62	-26.75
384	7/28/2018	20	4	42.96	No	12.62	-30.34
385	7/28/2018	20	5	37.55	No	12.62	-24.93
386	7/28/2018	20	6	38.26	No	12.62	-25.64
387	7/28/2018	20	7	42.60	No	12.62	-29.98
388	7/28/2018	20	8	42.37	No	12.62	-29.75
389	7/28/2018	20	9	37.99	No	12.62	-25.37
390	7/28/2018	20	10	35.88	No	12.62	-23.26
391	7/28/2018	20	11	33.79	No	12.62	-21.17
392	7/28/2018	20	12	31.78	No	12.62	-19.16
393	7/28/2018	23	1	34.63	No	12.62	-22.01
394	7/28/2018	23	2	54.93	No	12.62	-42.31
395	7/28/2018	23	9	33.76	No	12.62	-21.14
396	7/28/2018	23	10	31.35	No	12.62	-18.73
397	7/28/2018	23	11	29.10	No	12.62	-16.48
398	7/28/2018	23	12	28.23	No	12.62	-15.61
399	7/28/2018	24	1	33.35	No	12.62	-20.73
400	7/28/2018	24	2	39.55	No	12.62	-26.93
401	7/28/2018	24	3	55.53	No	12.62	-42.91
402	7/28/2018	24	4	52.35	No	12.62	-39.73
403	7/28/2018	24	5	39.95	No	12.62	-27.33
404	7/28/2018	24	6	39.90	No	12.62	-27.28
405	7/28/2018	24	7	31.07	No	12.62	-18.45
406	7/28/2018	24	8	29.43	No	12.62	-16.81
407	7/28/2018	24	9	29.40	No	12.62	-16.78
408	7/28/2018	24	10	28.39	No	12.62	-15.77
409	7/28/2018	24	11	28.43	No	12.62	-15.81
410	7/28/2018	24	12	32.59	No	12.62	-19.97
411	7/29/2018	1	1	43.79	No	12.63	-31.16
412	7/29/2018	1	2	52.57	No	12.63	-39.94
413	7/29/2018	1	3	41.09	No	12.63	-28.46
414	7/29/2018	1	4	51.94	No	12.63	-39.31

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Number	Trade Date	Trade Hour	Interval	Market LMP	Eligible Flag	Calculated LMP	Change in LMP
415	7/29/2018	1	5	51.94	No	12.63	-39.31
416	7/29/2018	1	6	51.92	No	12.63	-39.29
417	7/29/2018	1	7	39.98	No	12.63	-27.35
418	7/29/2018	1	8	34.76	No	12.63	-22.13
419	7/29/2018	1	9	32.68	No	12.63	-20.05
420	7/29/2018	1	10	29.57	No	12.63	-16.94
421	7/29/2018	1	11	29.57	No	12.63	-16.94
422	7/29/2018	1	12	29.31	No	12.63	-16.68
423	7/29/2018	19	9	43.64	No	12.63	-31.01
424	7/29/2018	19	10	46.94	No	12.63	-34.31
425	7/29/2018	19	11	51.39	No	12.63	-38.76
426	7/29/2018	19	12	50.44	No	12.63	-37.81
427	7/29/2018	20	1	47.43	No	12.63	-34.80
428	7/29/2018	20	2	46.60	No	12.63	-33.97
429	7/29/2018	20	3	48.09	No	12.63	-35.46
430	7/29/2018	20	4	47.87	No	12.63	-35.24
431	7/29/2018	20	5	58.03	No	12.63	-45.40
432	7/29/2018	20	6	61.24	No	12.63	-48.61
433	7/29/2018	20	7	61.54	No	12.63	-48.91
434	7/29/2018	20	8	61.54	No	12.63	-48.91
435	7/29/2018	20	9	44.27	No	12.63	-31.64
436	7/29/2018	20	10	41.24	No	12.63	-28.61
437	7/29/2018	20	11	40.05	No	12.63	-27.42
438	7/29/2018	20	12	40.54	No	12.63	-27.91
439	7/29/2018	21	11	35.22	No	12.63	-22.59
440	7/29/2018	21	12	32.22	No	12.63	-19.59
441	7/29/2018	22	1	38.00	No	12.63	-25.37
442	7/29/2018	22	2	43.87	No	12.63	-31.24
443	7/29/2018	22	3	44.04	No	12.63	-31.41
444	7/29/2018	22	4	42.16	No	12.63	-29.53
445	7/29/2018	22	5	41.30	No	12.63	-28.67
446	7/29/2018	22	6	33.60	No	12.63	-20.97
447	7/29/2018	22	7	30.73	No	12.63	-18.10
448	7/29/2018	22	8	28.65	No	12.63	-16.02
449	7/29/2018	22	9	27.92	No	12.63	-15.29
450	7/29/2018	22	10	26.17	No	12.63	-13.54
451	7/29/2018	22	11	26.30	No	12.63	-13.67
452	7/29/2018	22	12	28.09	No	12.63	-15.46

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Number	Trade Date	Trade Hour	Interval	Market LMP	Eligible Flag	Calculated LMP	Change in LMP
453	7/29/2018	23	1	29.21	No	12.63	-16.58
454	7/29/2018	23	2	36.53	No	12.63	-23.90
455	7/29/2018	23	3	49.70	No	12.63	-37.07
456	7/29/2018	23	4	43.16	No	12.63	-30.53
457	7/29/2018	23	5	35.56	No	12.63	-22.93
458	7/29/2018	23	6	32.68	No	12.63	-20.05
459	7/29/2018	23	7	19.57	No	12.63	-6.94
460	7/29/2018	23	8	26.87	No	12.63	-14.24
461	7/29/2018	23	9	29.45	No	12.63	-16.82
462	7/29/2018	23	10	25.20	No	12.63	-12.57
463	7/29/2018	23	11	25.54	No	12.63	-12.91
464	7/29/2018	23	12	26.04	No	12.63	-13.41
465	7/29/2018	24	1	40.82	No	12.63	-28.19
466	7/29/2018	24	2	45.39	No	12.63	-32.76
467	7/29/2018	24	3	39.15	No	12.63	-26.52
468	7/29/2018	24	4	39.45	No	12.63	-26.82
469	7/29/2018	24	5	37.86	No	12.63	-25.23
470	7/29/2018	24	6	32.31	No	12.63	-19.68
471	7/29/2018	24	7	30.66	No	12.63	-18.03
472	7/29/2018	24	8	28.82	No	12.63	-16.19
473	7/29/2018	24	9	27.78	No	12.63	-15.15
474	7/29/2018	24	10	26.70	No	12.63	-14.07
475	7/29/2018	24	11	26.98	No	12.63	-14.35
476	7/29/2018	24	12	27.05	No	12.63	-14.42
477	7/30/2018	1	1	29.28	No	12.63	-16.65
478	7/30/2018	1	2	35.94	No	12.63	-23.31
479	7/30/2018	1	3	37.43	No	12.63	-24.80
480	7/30/2018	1	4	29.75	No	12.63	-17.12
481	7/30/2018	1	5	35.21	No	12.63	-22.58
482	7/30/2018	1	6	36.02	No	12.63	-23.39
483	7/30/2018	1	7	28.09	No	12.63	-15.46
484	7/30/2018	1	8	27.68	No	12.63	-15.05
485	7/30/2018	1	9	26.74	No	12.63	-14.11
486	7/30/2018	1	10	27.72	No	12.63	-15.09
487	7/30/2018	1	11	27.72	No	12.63	-15.09
488	7/30/2018	1	12	27.66	No	12.63	-15.03
489	7/30/2018	5	1	32.04	Yes	12.63	-19.41
490	7/30/2018	5	2	32.63	Yes	12.63	-20.00

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491	7/30/2018	5	3	32.63	Yes	12.63	-20.00
492	7/30/2018	5	4	32.75	Yes	12.63	-20.12
493	7/30/2018	5	5	32.86	Yes	12.63	-20.23
494	7/30/2018	5	6	33.17	Yes	12.63	-20.54
495	7/30/2018	5	7	30.74	No	12.63	-18.11
496	7/30/2018	5	8	30.74	No	12.63	-18.11
497	7/30/2018	5	9	31.16	No	12.63	-18.53
498	7/30/2018	5	10	32.41	No	12.63	-19.78
499	7/30/2018	5	11	37.08	No	12.63	-24.45
500	7/30/2018	5	12	39.93	No	12.63	-27.30
501	7/30/2018	7	1	28.90	No	12.63	-16.27
502	7/30/2018	7	2	27.01	No	12.63	-14.38
503	7/30/2018	7	3	27.02	No	12.63	-14.39
504	7/30/2018	7	4	27.19	No	12.63	-14.56
505	7/30/2018	7	5	27.19	No	12.63	-14.56
506	7/30/2018	7	6	28.66	No	12.63	-16.03
507	7/30/2018	7	7	29.29	No	12.63	-16.66
508	7/30/2018	7	8	29.50	No	12.63	-16.87
509	7/30/2018	7	9	29.32	No	12.63	-16.69
510	7/30/2018	7	10	29.94	No	12.63	-17.31
511	7/30/2018	7	11	30.43	No	12.63	-17.80
512	7/30/2018	7	12	37.35	No	12.63	-24.72
513	7/30/2018	13	1	31.22	No	12.63	-18.59
514	7/30/2018	13	2	32.44	No	12.63	-19.81
515	7/30/2018	13	3	37.07	No	12.63	-24.44
516	7/30/2018	13	4	33.07	No	12.63	-20.44
517	7/30/2018	13	5	33.98	No	12.63	-21.35
518	7/30/2018	13	6	40.78	No	12.63	-28.15
519	7/30/2018	13	7	41.51	No	12.63	-28.88
520	7/30/2018	13	8	49.09	No	12.63	-36.46
521	7/30/2018	13	9	52.82	No	12.63	-40.19
522	7/30/2018	13	10	49.18	No	12.63	-36.55
523	7/30/2018	13	11	48.20	No	12.63	-35.57
524	7/30/2018	13	12	49.18	No	12.63	-36.55
525	7/30/2018	17	1	21.20	No	12.63	-8.57
526	7/30/2018	17	2	24.65	No	12.63	-12.02
527	7/30/2018	17	3	24.26	No	12.63	-11.63
528	7/30/2018	17	4	25.71	No	12.63	-13.08

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Number	Trade Date	Trade Hour	Interval	Market LMP	Eligible Flag	Calculated LMP	Change in LMP
529	7/30/2018	17	5	25.68	No	12.63	-13.05
530	7/30/2018	17	6	23.19	No	12.63	-10.56
531	7/30/2018	17	7	38.08	No	12.63	-25.45
532	7/30/2018	17	8	29.47	No	12.63	-16.84
533	7/30/2018	17	9	48.72	No	12.63	-36.09
534	7/30/2018	17	10	40.78	No	12.63	-28.15
535	7/30/2018	17	11	36.98	No	12.63	-24.35
536	7/30/2018	17	12	24.92	No	12.63	-12.29
537	7/30/2018	18	1	35.49	No	12.63	-22.86
538	7/30/2018	18	2	32.56	No	12.63	-19.93
539	7/30/2018	18	3	36.33	No	12.63	-23.70
540	7/30/2018	18	4	36.16	No	12.63	-23.53
541	7/30/2018	18	5	36.23	No	12.63	-23.60
542	7/30/2018	18	6	74.53	No	12.63	-61.90
543	7/30/2018	18	7	93.53	No	12.63	-80.90
544	7/30/2018	18	8	99.75	No	12.63	-87.12
545	7/30/2018	18	9	103.38	No	12.63	-90.75
546	7/30/2018	18	10	497.47	No	12.63	-484.84
547	7/30/2018	18	11	238.08	No	12.63	-225.45
548	7/30/2018	18	12	131.13	No	12.63	-118.50
549	7/30/2018	23	1	29.93	Yes	12.63	-17.30
550	7/30/2018	23	2	32.71	Yes	12.63	-20.08
551	7/30/2018	23	3	37.48	Yes	12.63	-24.85
552	7/30/2018	23	4	27.18	Yes	12.63	-14.55
553	7/30/2018	23	5	20.16	Yes	12.63	-7.53
554	7/30/2018	23	6	21.71	Yes	12.63	-9.08
555	7/30/2018	23	7	27.23	Yes	12.63	-14.60
556	7/30/2018	23	8	19.74	Yes	12.63	-7.11
557	7/30/2018	23	9	36.48	Yes	12.63	-23.85
558	7/30/2018	23	10	13.93	Yes	12.63	-1.30
559	7/30/2018	23	11	18.83	Yes	12.63	-6.20
560	7/30/2018	23	12	1.50	Yes	12.63	11.13
561	7/31/2018	16	1	55.35	Yes	12.61	-42.74
562	7/31/2018	16	2	41.50	Yes	12.61	-28.89
563	7/31/2018	16	3	43.40	Yes	12.61	-30.79
564	7/31/2018	16	4	38.41	Yes	12.61	-25.80
565	7/31/2018	16	5	36.05	Yes	12.61	-23.44
566	7/31/2018	16	6	35.99	Yes	12.61	-23.38

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Number	Trade Date	Trade Hour	Interval	Market LMP	Eligible Flag	Calculated LMP	Change in LMP
567	7/31/2018	16	7	34.01	Yes	12.61	-21.40
568	7/31/2018	16	8	34.19	Yes	12.61	-21.58
569	7/31/2018	16	9	38.64	Yes	12.61	-26.03
570	7/31/2018	16	10	44.20	Yes	12.61	-31.59
571	7/31/2018	16	11	44.72	Yes	12.61	-32.11
572	7/31/2018	16	12	44.14	Yes	12.61	-31.53
573	7/31/2018	17	1	38.26	Yes	12.61	-25.65
574	7/31/2018	17	2	39.94	Yes	12.61	-27.33
575	7/31/2018	17	3	37.81	Yes	12.61	-25.20
576	7/31/2018	17	4	39.11	Yes	12.61	-26.50
577	7/31/2018	17	5	49.80	Yes	12.61	-37.19
578	7/31/2018	17	6	49.80	Yes	12.61	-37.19
579	7/31/2018	17	7	69.54	Yes	12.61	-56.93
580	7/31/2018	17	8	47.52	Yes	12.61	-34.91
581	7/31/2018	17	9	45.72	Yes	12.61	-33.11
582	7/31/2018	17	10	53.90	Yes	12.61	-41.29
583	7/31/2018	17	11	50.05	Yes	12.61	-37.44
584	7/31/2018	17	12	50.05	Yes	12.61	-37.44
585	7/31/2018	18	1	42.75	Yes	12.61	-30.14
586	7/31/2018	18	2	41.53	Yes	12.61	-28.92
587	7/31/2018	18	3	42.41	Yes	12.61	-29.80
588	7/31/2018	18	4	43.14	Yes	12.61	-30.53
589	7/31/2018	18	5	40.04	Yes	12.61	-27.43
590	7/31/2018	18	6	45.53	Yes	12.61	-32.92
591	7/31/2018	18	7	45.58	Yes	12.61	-32.97
592	7/31/2018	18	8	77.83	Yes	12.61	-65.22
593	7/31/2018	18	9	122.17	Yes	12.61	-109.56
594	7/31/2018	18	10	64.16	Yes	12.61	-51.55
595	7/31/2018	18	11	64.16	Yes	12.61	-51.55
596	7/31/2018	18	12	64.16	Yes	12.61	-51.55
597	7/31/2018	20	1	54.72	Yes	12.61	-42.11
598	7/31/2018	20	2	55.05	Yes	12.61	-42.44
599	7/31/2018	20	3	54.68	Yes	12.61	-42.07
600	7/31/2018	20	4	72.50	Yes	12.61	-59.89
601	7/31/2018	20	5	62.89	Yes	12.61	-50.28
602	7/31/2018	20	6	57.27	Yes	12.61	-44.66
603	7/31/2018	20	7	52.77	Yes	12.61	-40.16
604	7/31/2018	20	8	47.02	Yes	12.61	-34.41

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Number	Trade Date	Trade Hour	Interval	Market LMP	Eligible Flag	Calculated LMP	Change in LMP
605	7/31/2018	20	9	43.12	Yes	12.61	-30.51
606	7/31/2018	20	10	37.80	Yes	12.61	-25.19
607	7/31/2018	20	11	40.58	Yes	12.61	-27.97
608	7/31/2018	20	12	50.44	Yes	12.61	-37.83
609	7/31/2018	21	1	91.19	Yes	12.61	-78.58
610	7/31/2018	21	2	77.29	Yes	12.61	-64.68
611	7/31/2018	21	3	64.71	Yes	12.61	-52.10
612	7/31/2018	21	4	77.94	Yes	12.61	-65.33
613	7/31/2018	21	5	76.62	Yes	12.61	-64.01
614	7/31/2018	21	6	71.52	Yes	12.61	-58.91
615	7/31/2018	21	7	50.89	Yes	12.61	-38.28
616	7/31/2018	21	8	50.80	Yes	12.61	-38.19
617	7/31/2018	21	9	47.14	Yes	12.61	-34.53
618	7/31/2018	21	10	45.69	Yes	12.61	-33.08
619	7/31/2018	21	11	45.55	Yes	12.61	-32.94
620	7/31/2018	21	12	45.56	Yes	12.61	-32.95

Table 9: Price Impact Analysis Information for Pricing Node B in SCE LAP

Number	Trade Date	Trade Hour	Interval	Market LMP	Eligible Flag	Calculated LMP	Change in LMP
1	7/5/2018	15	1	28.32	No	450.00	421.68
2	7/5/2018	15	2	30.09	No	450.00	419.91
3	7/5/2018	15	3	28.94	No	450.00	421.06
4	7/5/2018	15	4	27.86	No	450.00	422.14
5	7/5/2018	15	5	29.18	No	450.00	420.82
6	7/5/2018	15	6	32.23	No	450.00	417.77
7	7/5/2018	15	7	31.87	No	450.00	418.13
8	7/5/2018	15	8	31.08	No	450.00	418.92
9	7/5/2018	15	9	33.81	No	450.00	416.19
10	7/5/2018	15	10	34.55	No	450.00	415.45
11	7/5/2018	15	11	33.98	No	450.00	416.02
12	7/5/2018	15	12	38.32	No	450.00	411.68
13	7/5/2018	20	12	36.39	Yes	262.65	226.26
14	7/5/2018	21	1	35.39	Yes	262.65	227.26
15	7/5/2018	21	2	34.26	Yes	262.65	228.39
16	7/5/2018	21	3	33.42	Yes	262.65	229.23
17	7/5/2018	21	4	32.65	Yes	262.65	230.00
18	7/5/2018	21	5	33.13	Yes	262.65	229.52
19	7/5/2018	21	6	34.20	Yes	262.65	228.45
20	7/5/2018	21	7	34.34	Yes	262.65	228.31
21	7/5/2018	21	8	34.39	Yes	262.65	228.26
22	7/5/2018	21	9	33.18	Yes	262.65	229.47
23	7/5/2018	21	10	31.98	Yes	262.65	230.67
24	7/5/2018	21	11	30.83	Yes	262.65	231.82
25	7/5/2018	21	12	29.76	Yes	262.65	232.89
26	7/6/2018	15	1	96.89	No	91.86	-5.03
27	7/6/2018	15	2	98.09	No	91.86	-6.23
28	7/6/2018	15	3	108.03	No	91.86	-16.17
29	7/6/2018	15	4	109.95	No	91.86	-18.09
30	7/6/2018	15	5	98.80	No	91.86	-6.94
31	7/6/2018	15	6	97.76	No	91.86	-5.90
32	7/6/2018	15	7	1111.79	No	91.86	-1019.93
33	7/6/2018	15	8	1012.80	No	91.86	-920.94
34	7/6/2018	15	9	1012.41	No	91.86	-920.55

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Number	Trade Date	Trade Hour	Interval	Market LMP	Eligible Flag	Calculated LMP	Change in LMP
35	7/6/2018	15	10	1029.39	No	91.86	-937.53
36	7/6/2018	15	11	1033.73	No	91.86	-941.87
37	7/6/2018	15	12	1029.23	No	91.86	-937.37
38	7/6/2018	24	1	58.91	No	160.00	101.09
39	7/6/2018	24	2	58.72	No	160.00	101.28
40	7/6/2018	24	3	58.73	No	160.00	101.27
41	7/6/2018	24	4	54.24	No	160.00	105.76
42	7/6/2018	24	5	90.79	No	160.00	69.21
43	7/6/2018	24	6	58.87	No	160.00	101.13
44	7/6/2018	24	7	60.96	No	160.00	99.04
45	7/6/2018	24	8	58.66	No	160.00	101.34
46	7/6/2018	24	9	58.82	No	160.00	101.18
47	7/6/2018	24	10	85.58	No	160.00	74.42
48	7/6/2018	24	11	85.74	No	160.00	74.26
49	7/6/2018	24	12	85.76	No	160.00	74.24
50	7/7/2018	15	1	55.14	No	220.22	165.08
51	7/7/2018	15	2	105.94	No	220.22	114.28
52	7/7/2018	15	3	106.94	No	220.22	113.28
53	7/7/2018	15	4	106.94	No	220.22	113.28
54	7/7/2018	15	5	106.94	No	220.22	113.28
55	7/7/2018	15	6	99.47	No	220.22	120.75
56	7/7/2018	15	7	78.24	No	220.22	141.98
57	7/7/2018	15	8	1035.12	No	220.22	-814.90
58	7/7/2018	15	9	1035.12	No	220.22	-814.90
59	7/7/2018	15	10	1035.12	No	220.22	-814.90
60	7/7/2018	15	11	99.51	No	220.22	120.71
61	7/7/2018	15	12	131.35	No	220.22	88.87
62	7/7/2018	16	1	53.30	No	68.44	15.14
63	7/7/2018	16	2	41.51	No	68.44	26.93
64	7/7/2018	16	3	79.25	No	68.44	-10.81
65	7/7/2018	16	4	69.67	No	68.44	-1.23
66	7/7/2018	16	5	72.64	No	68.44	-4.20
67	7/7/2018	16	6	75.73	No	68.44	-7.29
68	7/7/2018	16	7	36.65	No	68.44	31.79
69	7/7/2018	16	8	49.74	No	68.44	18.70
70	7/7/2018	16	9	33.84	No	68.44	34.60
71	7/7/2018	16	10	52.49	No	68.44	15.95
72	7/7/2018	16	11	57.18	No	68.44	11.26

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Number	Trade Date	Trade Hour	Interval	Market LMP	Eligible Flag	Calculated LMP	Change in LMP
73	7/7/2018	16	12	1125.52	No	68.44	-1057.08
74	7/7/2018	18	1	55.50	Yes	63.00	7.50
75	7/7/2018	18	2	45.84	Yes	63.00	17.16
76	7/7/2018	18	3	40.40	Yes	63.00	22.60
77	7/7/2018	18	4	40.40	Yes	63.00	22.60
78	7/7/2018	18	5	65.49	Yes	63.00	-2.49
79	7/7/2018	18	6	60.01	Yes	63.00	2.99
80	7/7/2018	18	7	73.77	Yes	63.00	-10.77
81	7/7/2018	18	8	105.31	Yes	63.00	-42.31
82	7/7/2018	18	9	1026.91	Yes	63.00	-963.91
83	7/7/2018	18	10	379.70	Yes	63.00	-316.70
84	7/7/2018	18	11	352.35	Yes	63.00	-289.35
85	7/7/2018	18	12	105.99	Yes	63.00	-42.99
86	7/8/2018	14	1	36.22	Yes	220.00	183.78
87	7/8/2018	14	2	33.35	Yes	220.00	186.65
88	7/8/2018	14	3	32.71	Yes	220.00	187.29
89	7/8/2018	14	4	38.73	Yes	220.00	181.27
90	7/8/2018	14	5	39.62	Yes	220.00	180.38
91	7/8/2018	14	6	41.18	Yes	220.00	178.82
92	7/8/2018	14	7	41.91	Yes	220.00	178.09
93	7/8/2018	14	8	45.78	Yes	220.00	174.22
94	7/8/2018	14	9	45.78	Yes	220.00	174.22
95	7/8/2018	14	10	46.06	Yes	220.00	173.94
96	7/8/2018	14	11	46.04	Yes	220.00	173.96
97	7/8/2018	14	12	46.06	Yes	220.00	173.94
98	7/8/2018	15	1	46.17	Yes	112.17	66.00
99	7/8/2018	15	2	41.77	Yes	112.17	70.40
100	7/8/2018	15	3	30.11	Yes	112.17	82.06
101	7/8/2018	15	4	32.98	Yes	112.17	79.19
102	7/8/2018	15	5	32.78	Yes	112.17	79.39
103	7/8/2018	15	6	32.98	Yes	112.17	79.19
104	7/8/2018	15	7	34.16	Yes	112.17	78.01
105	7/8/2018	15	8	39.73	Yes	112.17	72.44
106	7/8/2018	15	9	36.12	Yes	112.17	76.05
107	7/8/2018	15	10	32.96	No	63.00	30.04
108	7/8/2018	15	11	32.46	No	63.00	30.54
109	7/8/2018	15	12	33.30	No	63.00	29.70
110	7/8/2018	16	7	34.83	Yes	244.23	209.40

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Number	Trade Date	Trade Hour	Interval	Market LMP	Eligible Flag	Calculated LMP	Change in LMP
111	7/8/2018	16	8	36.42	Yes	244.23	207.81
112	7/8/2018	16	9	31.45	Yes	244.23	212.78
113	7/8/2018	16	10	32.91	Yes	244.23	211.32
114	7/8/2018	16	11	34.64	Yes	244.23	209.59
115	7/8/2018	16	12	32.91	Yes	244.23	211.32
116	7/9/2018	16	1	402.24	Yes	53.79	-348.45
117	7/9/2018	16	2	91.79	Yes	53.79	-38.00
118	7/9/2018	16	3	69.79	Yes	53.79	-16.00
119	7/9/2018	16	4	92.78	Yes	53.79	-38.99
120	7/9/2018	16	5	85.24	Yes	53.79	-31.45
121	7/9/2018	16	6	70.53	Yes	53.79	-16.74
122	7/9/2018	16	7	67.31	Yes	53.79	-13.52
123	7/9/2018	16	8	71.06	Yes	53.79	-17.27
124	7/9/2018	16	9	77.52	Yes	53.79	-23.73
125	7/9/2018	16	10	68.44	Yes	53.79	-14.65
126	7/9/2018	16	11	73.56	Yes	53.79	-19.77
127	7/9/2018	16	12	33.34	Yes	53.79	20.45
128	7/10/2018	16	1	38.82	Yes	42.82	4.00
129	7/10/2018	16	2	32.68	Yes	42.82	10.14
130	7/10/2018	16	3	29.43	Yes	42.82	13.39
131	7/10/2018	16	4	72.77	Yes	42.82	-29.95
132	7/10/2018	16	5	75.70	Yes	42.82	-32.88
133	7/10/2018	16	6	75.56	Yes	42.82	-32.74
134	7/10/2018	16	7	29.32	Yes	42.82	13.50
135	7/10/2018	16	8	28.26	Yes	42.82	14.56
136	7/10/2018	16	9	29.26	Yes	42.82	13.56
137	7/10/2018	16	10	32.25	Yes	42.82	10.57
138	7/10/2018	16	11	30.86	Yes	42.82	11.96
139	7/10/2018	16	12	32.25	Yes	42.82	10.57
140	7/11/2018	22	1	50.78	No	58.17	7.39
141	7/11/2018	22	2	49.44	No	58.17	8.73
142	7/11/2018	22	3	45.81	No	58.17	12.36
143	7/11/2018	22	4	43.50	No	58.17	14.67
144	7/11/2018	22	5	43.81	No	58.17	14.36
145	7/11/2018	22	6	40.75	No	58.17	17.42
146	7/11/2018	22	7	40.37	No	58.17	17.80
147	7/11/2018	22	8	41.10	No	58.17	17.07
148	7/11/2018	22	9	40.47	No	58.17	17.70

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Number	Trade Date	Trade Hour	Interval	Market LMP	Eligible Flag	Calculated LMP	Change in LMP
149	7/11/2018	22	10	37.72	No	58.17	20.45
150	7/11/2018	22	11	37.72	No	58.17	20.45
151	7/11/2018	22	12	43.14	No	58.17	15.03
152	7/12/2018	15	1	421.65	Yes	75.54	-346.11
153	7/12/2018	15	2	351.68	Yes	75.54	-276.14
154	7/12/2018	15	3	192.21	Yes	75.54	-116.67
155	7/12/2018	15	4	92.37	Yes	75.54	-16.83
156	7/12/2018	15	5	107.58	Yes	75.54	-32.04
157	7/12/2018	15	6	88.30	Yes	75.54	-12.76
158	7/12/2018	15	7	144.86	Yes	75.54	-69.32
159	7/12/2018	15	8	118.58	Yes	75.54	-43.04
160	7/12/2018	15	9	107.96	Yes	75.54	-32.42
161	7/12/2018	15	10	389.99	Yes	75.54	-314.45
162	7/12/2018	15	11	112.10	Yes	75.54	-36.56
163	7/12/2018	15	12	147.37	Yes	75.54	-71.83
164	7/12/2018	17	1	30.78	No	220.93	190.15
165	7/12/2018	17	2	59.15	No	220.93	161.78
166	7/12/2018	17	3	51.30	No	220.93	169.63
167	7/12/2018	17	4	70.43	No	220.93	150.50
168	7/12/2018	17	5	80.36	No	220.93	140.57
169	7/12/2018	17	6	129.74	No	220.93	91.19
170	7/12/2018	17	7	130.84	No	220.93	90.09
171	7/12/2018	17	8	269.44	No	220.93	-48.51
172	7/12/2018	17	9	92.04	No	220.93	128.89
173	7/12/2018	17	10	473.84	No	220.93	-252.91
174	7/12/2018	17	11	115.66	No	220.93	105.27
175	7/12/2018	17	12	142.51	No	220.93	78.42
176	7/13/2018	13	1	65.10	Yes	140.76	75.66
177	7/13/2018	13	2	66.80	Yes	140.76	73.96
178	7/13/2018	13	3	76.70	Yes	140.76	64.06
179	7/13/2018	13	4	74.72	Yes	140.76	66.04
180	7/13/2018	13	5	121.93	Yes	140.76	18.83
181	7/13/2018	13	6	102.17	Yes	140.76	38.59
182	7/13/2018	13	7	109.11	Yes	140.76	31.65
183	7/13/2018	13	8	70.52	Yes	140.76	70.24
184	7/13/2018	13	9	79.27	Yes	140.76	61.49
185	7/13/2018	13	10	128.18	Yes	140.76	12.58
186	7/13/2018	13	11	103.13	Yes	140.76	37.63

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Number	Trade Date	Trade Hour	Interval	Market LMP	Eligible Flag	Calculated LMP	Change in LMP
187	7/13/2018	13	12	234.64	Yes	140.76	-93.88
188	7/14/2018	1	1	30.66	No	236.11	205.45
189	7/14/2018	1	2	36.75	No	236.11	199.36
190	7/14/2018	1	3	42.82	No	236.11	193.29
191	7/14/2018	1	4	39.75	No	236.11	196.36
192	7/14/2018	1	5	42.23	No	236.11	193.88
193	7/14/2018	1	6	41.65	No	236.11	194.46
194	7/14/2018	1	7	39.51	No	236.11	196.60
195	7/14/2018	1	8	36.50	No	236.11	199.61
196	7/14/2018	1	9	31.80	No	236.11	204.31
197	7/14/2018	1	10	28.87	No	140.76	111.89
198	7/14/2018	1	11	28.78	No	140.76	111.98
199	7/14/2018	1	12	24.81	No	140.76	115.95
200	7/14/2018	16	1	32.30	Yes	236.00	203.70
201	7/14/2018	16	2	32.30	Yes	236.00	203.70
202	7/14/2018	16	3	36.08	Yes	236.00	199.92
203	7/14/2018	16	4	38.79	Yes	236.00	197.21
204	7/14/2018	16	5	36.87	Yes	236.00	199.13
205	7/14/2018	16	6	40.26	Yes	236.00	195.74
206	7/14/2018	16	7	40.98	Yes	236.00	195.02
207	7/14/2018	16	8	40.31	Yes	236.00	195.69
208	7/14/2018	16	9	40.25	Yes	236.00	195.75
209	7/14/2018	16	10	40.11	Yes	236.00	195.89
210	7/14/2018	16	11	40.34	Yes	236.00	195.66
211	7/14/2018	16	12	40.40	Yes	236.00	195.60
212	7/14/2018	17	1	31.61	Yes	236.00	204.39
213	7/14/2018	17	2	31.99	Yes	236.00	204.01
214	7/14/2018	17	3	32.03	No	140.76	108.73
215	7/14/2018	17	4	31.60	No	140.76	109.16
216	7/14/2018	17	5	31.60	No	140.76	109.16
217	7/14/2018	17	6	32.05	No	140.76	108.71
218	7/14/2018	17	7	36.26	No	140.76	104.50
219	7/14/2018	17	8	36.26	No	140.76	104.50
220	7/14/2018	17	9	36.29	No	140.76	104.47
221	7/14/2018	17	10	38.70	No	140.76	102.06
222	7/14/2018	17	11	38.35	No	140.76	102.41
223	7/14/2018	17	12	37.67	No	140.76	103.09
224	7/15/2018	1	1	31.37	No	236.26	204.89

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Number	Trade Date	Trade Hour	Interval	Market LMP	Eligible Flag	Calculated LMP	Change in LMP
225	7/15/2018	1	2	36.88	No	236.26	199.38
226	7/15/2018	1	3	51.12	No	236.26	185.14
227	7/15/2018	1	4	42.48	No	236.26	193.78
228	7/15/2018	1	5	37.01	No	236.26	199.25
229	7/15/2018	1	6	34.14	No	236.26	202.12
230	7/15/2018	1	7	33.17	No	236.26	203.09
231	7/15/2018	1	8	32.28	No	236.26	203.98
232	7/15/2018	1	9	31.50	No	236.26	204.76
233	7/15/2018	1	10	31.08	No	118.49	87.41
234	7/15/2018	1	11	31.04	No	118.49	87.45
235	7/15/2018	1	12	31.04	No	118.49	87.45
236	7/15/2018	8	1	58.01	No	0.00	-58.01
237	7/15/2018	8	2	52.79	No	0.00	-52.79
238	7/15/2018	8	3	50.82	No	0.00	-50.82
239	7/15/2018	8	4	45.15	No	0.00	-45.15
240	7/15/2018	8	5	37.30	No	0.00	-37.30
241	7/15/2018	8	6	49.12	Yes	118.49	69.37
242	7/15/2018	8	7	33.54	Yes	118.49	84.95
243	7/15/2018	8	8	35.12	Yes	118.49	83.37
244	7/15/2018	8	9	34.01	Yes	118.49	84.48
245	7/15/2018	8	10	56.96	Yes	118.49	61.53
246	7/15/2018	8	11	37.43	Yes	118.49	81.06
247	7/15/2018	8	12	36.43	Yes	118.49	82.06
248	7/15/2018	17	1	59.82	No	65.57	5.75
249	7/15/2018	17	2	57.62	No	65.57	7.95
250	7/15/2018	17	3	59.56	No	65.57	6.01
251	7/15/2018	17	4	54.52	No	65.57	11.05
252	7/15/2018	17	5	61.83	No	65.57	3.74
253	7/15/2018	17	6	60.96	No	65.57	4.61
254	7/15/2018	17	7	62.18	No	65.57	3.39
255	7/15/2018	17	8	60.12	No	65.57	5.45
256	7/15/2018	17	9	62.18	No	65.57	3.39
257	7/15/2018	17	10	62.11	No	65.57	3.46
258	7/15/2018	17	11	62.22	No	65.57	3.35
259	7/15/2018	17	12	62.18	No	65.57	3.39
260	7/16/2018	16	1	33.96	No	118.49	84.53
261	7/16/2018	16	2	40.69	No	118.49	77.80
262	7/16/2018	16	3	33.96	No	118.49	84.53

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Number	Trade Date	Trade Hour	Interval	Market LMP	Eligible Flag	Calculated LMP	Change in LMP
263	7/16/2018	16	4	38.35	No	118.49	80.14
264	7/16/2018	16	5	256.08	No	118.49	-137.59
265	7/16/2018	16	6	36.10	No	118.49	82.39
266	7/16/2018	16	7	48.57	No	118.49	69.92
267	7/16/2018	16	8	43.94	No	118.49	74.55
268	7/16/2018	16	9	37.26	No	118.49	81.23
269	7/16/2018	16	10	47.66	No	118.49	70.83
270	7/16/2018	16	11	46.03	No	118.49	72.46
271	7/16/2018	16	12	46.98	No	118.49	71.51
272	7/16/2018	17	1	38.59	No	118.49	79.90
273	7/16/2018	17	2	41.31	No	118.49	77.18
274	7/16/2018	17	3	42.72	No	118.49	75.77
275	7/16/2018	17	4	41.74	No	118.49	76.75
276	7/16/2018	17	5	43.96	No	118.49	74.53
277	7/16/2018	17	6	51.01	No	118.49	67.48
278	7/16/2018	17	7	39.51	No	118.49	78.98
279	7/16/2018	17	8	57.46	No	118.49	61.03
280	7/16/2018	17	9	58.11	No	118.49	60.38
281	7/16/2018	17	10	57.64	No	118.49	60.85
282	7/16/2018	17	11	57.61	No	118.49	60.88
283	7/16/2018	17	12	57.47	No	118.49	61.02
284	7/17/2018	15	3	40.49	Yes	87.59	47.10
285	7/17/2018	15	4	56.38	Yes	87.59	31.21
286	7/17/2018	15	5	56.38	Yes	87.59	31.21
287	7/17/2018	15	6	56.36	Yes	87.59	31.23
288	7/17/2018	15	7	56.41	Yes	87.59	31.18
289	7/17/2018	15	8	56.29	Yes	87.59	31.30
290	7/17/2018	15	9	56.28	Yes	87.59	31.31
291	7/17/2018	15	10	56.28	Yes	87.59	31.31
292	7/17/2018	15	11	49.78	Yes	87.59	37.81
293	7/17/2018	15	12	58.51	Yes	87.59	29.08
294	7/17/2018	16	1	40.31	No	87.59	47.28
295	7/17/2018	16	1	40.31	No	93.76	53.45
296	7/17/2018	16	2	43.77	No	87.59	43.82
297	7/17/2018	16	2	43.77	No	93.76	49.99
298	7/17/2018	16	3	45.37	No	87.59	42.22
299	7/17/2018	16	3	45.37	No	93.76	48.39
300	7/17/2018	16	4	54.91	No	87.59	32.68

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301	7/17/2018	16	4	54.91	No	93.76	38.85
302	7/17/2018	16	5	64.63	No	87.59	22.96
303	7/17/2018	16	5	64.63	No	93.76	29.13
304	7/17/2018	16	6	58.27	No	87.59	29.32
305	7/17/2018	16	6	58.27	No	93.76	35.49
306	7/17/2018	16	7	56.32	No	87.59	31.27
307	7/17/2018	16	7	56.32	No	93.76	37.44
308	7/17/2018	16	8	58.42	No	87.59	29.17
309	7/17/2018	16	8	58.42	No	93.76	35.34
310	7/17/2018	16	9	57.45	No	87.59	30.14
311	7/17/2018	16	9	57.45	No	93.76	36.31
312	7/17/2018	16	10	65.29	No	87.59	22.30
313	7/17/2018	16	10	65.29	No	93.76	28.47
314	7/17/2018	16	11	81.85	No	87.59	5.74
315	7/17/2018	16	11	81.85	No	93.76	11.91
316	7/17/2018	16	12	74.88	No	87.59	12.71
317	7/17/2018	16	12	74.88	No	93.76	18.88
318	7/18/2018	1	1	51.55	Yes	141.40	89.85
319	7/18/2018	1	2	41.95	Yes	141.40	99.45
320	7/18/2018	1	3	41.54	Yes	141.40	99.86
321	7/18/2018	1	4	29.33	Yes	141.40	112.07
322	7/18/2018	1	5	31.37	Yes	141.40	110.03
323	7/18/2018	1	6	34.13	Yes	141.40	107.27
324	7/18/2018	1	7	31.38	Yes	141.40	110.02
325	7/18/2018	1	8	30.99	Yes	141.40	110.41
326	7/18/2018	1	9	30.84	Yes	141.40	110.56
327	7/18/2018	1	10	58.53	Yes	141.40	82.87
328	7/18/2018	1	11	34.17	Yes	141.40	107.23
329	7/18/2018	1	12	34.17	Yes	141.40	107.23
330	7/18/2018	14	1	39.34	Yes	69.54	30.20
331	7/18/2018	14	2	53.14	Yes	69.54	16.40
332	7/18/2018	14	3	43.05	Yes	69.54	26.49
333	7/18/2018	14	4	65.06	Yes	69.54	4.48
334	7/18/2018	14	5	55.82	Yes	69.54	13.72
335	7/18/2018	14	6	65.80	Yes	69.54	3.74
336	7/18/2018	14	7	85.91	Yes	69.54	-16.37
337	7/18/2018	14	8	1002.90	Yes	69.54	-933.36
338	7/18/2018	14	9	1002.92	Yes	69.54	-933.38

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339	7/18/2018	14	10	1002.90	Yes	69.54	-933.36
340	7/18/2018	14	11	1145.91	Yes	69.54	-1076.37
341	7/18/2018	14	12	100.12	Yes	69.54	-30.58
342	7/18/2018	15	1	54.14	Yes	69.54	15.40
343	7/18/2018	15	2	54.77	Yes	69.54	14.77
344	7/18/2018	15	3	49.86	Yes	69.54	19.68
345	7/18/2018	15	4	41.24	Yes	69.54	28.30
346	7/18/2018	15	5	52.96	Yes	69.54	16.58
347	7/18/2018	15	6	51.59	Yes	69.54	17.95
348	7/18/2018	15	7	73.81	Yes	69.54	-4.27
349	7/18/2018	15	8	76.97	Yes	69.54	-7.43
350	7/18/2018	15	9	73.76	Yes	69.54	-4.22
351	7/18/2018	15	10	75.41	Yes	69.54	-5.87
352	7/18/2018	15	11	76.70	Yes	69.54	-7.16
353	7/18/2018	15	12	85.48	Yes	69.54	-15.94
354	7/19/2018	16	1	91.00	Yes	55.50	-35.50
355	7/19/2018	16	2	56.25	Yes	55.50	-0.75
356	7/19/2018	16	3	60.47	Yes	55.50	-4.97
357	7/19/2018	16	4	70.61	Yes	55.50	-15.11
358	7/19/2018	16	5	88.97	Yes	55.50	-33.47
359	7/19/2018	16	6	70.61	Yes	55.50	-15.11
360	7/19/2018	16	7	60.83	Yes	55.50	-5.33
361	7/19/2018	16	8	90.08	Yes	55.50	-34.58
362	7/19/2018	16	9	91.39	Yes	55.50	-35.89
363	7/19/2018	16	10	77.53	Yes	55.50	-22.03
364	7/19/2018	16	11	57.03	Yes	55.50	-1.53
365	7/19/2018	16	12	89.28	Yes	55.50	-33.78
366	7/20/2018	16	7	94.44	Yes	225.79	131.35
367	7/20/2018	16	8	90.91	Yes	225.79	134.88
368	7/20/2018	16	9	39.82	Yes	225.79	185.97
369	7/20/2018	16	10	46.67	Yes	225.79	179.12
370	7/20/2018	16	11	44.83	Yes	225.79	180.96
371	7/20/2018	16	12	55.89	Yes	225.79	169.90
372	7/21/2018	2	1	192.79	No	69.54	-123.25
373	7/21/2018	2	2	191.25	No	69.54	-121.71
374	7/21/2018	2	3	208.23	No	69.54	-138.69
375	7/21/2018	2	4	152.44	No	69.54	-82.90
376	7/21/2018	2	5	129.52	No	69.54	-59.98

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377	7/21/2018	2	6	84.86	No	69.54	-15.32
378	7/21/2018	2	7	82.36	Yes	247.24	164.88
379	7/21/2018	2	8	45.70	Yes	247.24	201.54
380	7/21/2018	2	9	45.29	Yes	247.24	201.95
381	7/21/2018	2	10	44.90	Yes	247.24	202.34
382	7/21/2018	2	11	39.62	Yes	247.24	207.62
383	7/21/2018	2	12	32.36	Yes	247.24	214.88
384	7/21/2018	17	2	33.07	Yes	302.34	269.27
385	7/21/2018	17	3	32.30	Yes	302.34	270.04
386	7/21/2018	17	4	32.88	Yes	302.34	269.46
387	7/21/2018	17	5	29.03	Yes	302.34	273.31
388	7/21/2018	17	6	32.78	Yes	302.34	269.56
389	7/21/2018	17	7	34.12	Yes	302.34	268.22
390	7/21/2018	17	8	34.12	Yes	302.34	268.22
391	7/21/2018	17	9	58.32	Yes	302.34	244.02
392	7/21/2018	17	10	141.16	Yes	302.34	161.18
393	7/21/2018	17	11	128.70	Yes	302.34	173.64
394	7/21/2018	17	12	83.99	Yes	302.34	218.35
395	7/22/2018	1	1	29.51	Yes	407.09	377.58
396	7/22/2018	1	2	29.30	Yes	407.09	377.79
397	7/22/2018	1	3	29.11	Yes	407.09	377.98
398	7/22/2018	1	4	23.66	Yes	407.09	383.43
399	7/22/2018	1	5	22.92	Yes	407.09	384.17
400	7/22/2018	1	6	25.16	Yes	407.09	381.93
401	7/22/2018	1	7	25.10	Yes	407.09	381.99
402	7/22/2018	1	8	24.30	Yes	407.09	382.79
403	7/22/2018	1	9	24.99	Yes	407.09	382.10
404	7/22/2018	1	10	23.42	Yes	407.09	383.67
405	7/22/2018	1	11	24.07	Yes	407.09	383.02
406	7/22/2018	1	12	27.07	Yes	407.09	380.02
407	7/22/2018	16	2	29.82	Yes	330.39	300.57
408	7/22/2018	16	3	30.96	Yes	330.39	299.43
409	7/22/2018	16	4	30.61	Yes	330.39	299.78
410	7/22/2018	16	5	30.67	Yes	330.39	299.72
411	7/22/2018	16	6	34.47	Yes	330.39	295.92
412	7/22/2018	16	7	34.65	Yes	330.39	295.74
413	7/22/2018	16	8	37.39	Yes	330.39	293.00
414	7/22/2018	16	9	40.57	Yes	330.39	289.82

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415	7/22/2018	16	10	32.37	Yes	330.39	298.02
416	7/22/2018	16	11	32.10	Yes	330.39	298.29
417	7/22/2018	16	12	34.67	Yes	330.39	295.72
418	7/23/2018	14	8	96.49	Yes	330.39	233.90
419	7/23/2018	14	9	127.07	Yes	330.39	203.32
420	7/23/2018	14	10	126.93	Yes	330.39	203.46
421	7/23/2018	14	11	127.82	Yes	330.39	202.57
422	7/23/2018	14	12	99.30	Yes	330.39	231.09
423	7/24/2018	13	5	197.33	Yes	471.61	274.28
424	7/24/2018	13	6	214.13	Yes	471.61	257.48
425	7/24/2018	13	7	333.29	Yes	471.61	138.32
426	7/24/2018	13	8	240.22	Yes	471.61	231.39
427	7/24/2018	13	9	240.22	Yes	471.61	231.39
428	7/24/2018	13	10	240.04	Yes	471.61	231.57
429	7/24/2018	13	11	251.13	Yes	471.61	220.48
430	7/24/2018	13	12	240.09	Yes	471.61	231.52
431	7/24/2018	15	1	153.84	Yes	409.49	255.65
432	7/24/2018	15	2	158.84	Yes	409.49	250.65
433	7/24/2018	15	3	159.17	Yes	409.49	250.32
434	7/24/2018	15	4	221.59	Yes	409.49	187.90
435	7/24/2018	15	5	102.35	Yes	409.49	307.14
436	7/24/2018	15	6	152.49	Yes	409.49	257.00
437	7/24/2018	15	7	157.32	Yes	409.49	252.17
438	7/24/2018	15	8	158.56	Yes	409.49	250.93
439	7/24/2018	15	9	157.42	Yes	409.49	252.07
440	7/24/2018	15	10	156.03	Yes	409.49	253.46
441	7/24/2018	15	11	151.64	Yes	409.49	257.85
442	7/24/2018	15	12	151.46	Yes	409.49	258.03
443	7/24/2018	16	1	191.83	Yes	90.50	-101.33
444	7/24/2018	16	2	197.12	Yes	90.50	-106.62
445	7/24/2018	16	3	193.58	Yes	90.50	-103.08
446	7/24/2018	16	4	182.42	Yes	90.50	-91.92
447	7/24/2018	16	5	181.29	Yes	90.50	-90.79
448	7/24/2018	16	6	184.53	Yes	90.50	-94.03
449	7/24/2018	16	7	174.69	Yes	90.50	-84.19
450	7/24/2018	16	8	157.40	Yes	90.50	-66.90
451	7/24/2018	16	9	160.53	Yes	90.50	-70.03
452	7/24/2018	16	10	189.80	Yes	90.50	-99.30

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453	7/24/2018	16	11	177.25	Yes	90.50	-86.75
454	7/24/2018	16	12	184.05	Yes	90.50	-93.55
455	7/24/2018	24	1	143.58	No	250.00	106.42
456	7/24/2018	24	2	126.61	No	250.00	123.39
457	7/24/2018	24	3	133.09	No	250.00	116.91
458	7/24/2018	24	4	106.12	No	250.00	143.88
459	7/24/2018	24	5	99.59	No	250.00	150.41
460	7/24/2018	24	6	105.88	No	250.00	144.12
461	7/24/2018	24	7	141.28	Yes	684.94	543.66
462	7/24/2018	24	8	130.19	Yes	684.94	554.75
463	7/24/2018	24	9	96.14	Yes	684.94	588.80
464	7/24/2018	24	10	41.74	Yes	684.94	643.20
465	7/24/2018	24	11	48.91	Yes	684.94	636.03
466	7/24/2018	24	12	76.30	Yes	684.94	608.64
467	7/26/2018	14	7	67.10	Yes	352.57	285.47
468	7/26/2018	14	8	83.41	Yes	352.57	269.16
469	7/26/2018	14	9	98.01	Yes	352.57	254.56
470	7/26/2018	14	10	128.07	Yes	352.57	224.50
471	7/26/2018	14	11	137.27	Yes	352.57	215.30
472	7/26/2018	14	12	161.53	Yes	352.57	191.04
473	7/27/2018	14	2	59.50	Yes	221.92	162.42
474	7/27/2018	14	3	41.82	Yes	221.92	180.10
475	7/27/2018	14	4	41.69	Yes	221.92	180.23
476	7/27/2018	14	5	57.04	Yes	221.92	164.88
477	7/27/2018	14	6	60.57	Yes	221.92	161.35
478	7/27/2018	14	7	59.09	Yes	221.92	162.83
479	7/27/2018	14	8	58.95	Yes	221.92	162.97
480	7/27/2018	14	9	50.54	Yes	221.92	171.38
481	7/27/2018	14	10	58.70	Yes	221.92	163.22
482	7/27/2018	14	11	67.59	Yes	221.92	154.33
483	7/27/2018	14	12	67.64	Yes	221.92	154.28
484	7/28/2018	13	1	25.58	No	0.00	-25.58
485	7/28/2018	13	2	25.67	No	0.00	-25.67
486	7/28/2018	13	3	26.69	No	0.00	-26.69
487	7/28/2018	13	4	27.80	No	0.00	-27.80
488	7/28/2018	13	5	29.09	No	0.00	-29.09
489	7/28/2018	13	6	35.43	No	0.00	-35.43
490	7/28/2018	13	7	55.58	No	0.00	-55.58

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491	7/28/2018	13	8	54.42	No	0.00	-54.42
492	7/28/2018	13	9	58.25	No	0.00	-58.25
493	7/28/2018	13	10	65.74	No	0.00	-65.74
494	7/28/2018	13	11	55.56	No	0.00	-55.56
495	7/28/2018	13	12	56.46	No	0.00	-56.46
496	7/28/2018	14	9	27.53	Yes	143.83	116.30
497	7/28/2018	14	10	27.43	Yes	143.83	116.40
498	7/28/2018	14	11	27.54	Yes	143.83	116.29
499	7/28/2018	14	12	27.53	Yes	143.83	116.30
500	7/29/2018	14	6	89.39	Yes	154.99	65.60
501	7/29/2018	14	7	91.34	Yes	154.99	63.65
502	7/29/2018	14	8	105.76	Yes	154.99	49.23
503	7/29/2018	14	9	104.82	Yes	154.99	50.17
504	7/29/2018	14	10	349.08	Yes	154.99	-194.09
505	7/29/2018	14	11	473.92	Yes	154.99	-318.93
506	7/29/2018	14	12	92.76	Yes	154.99	62.23
507	7/30/2018	16	1	174.71	Yes	50.50	-124.21
508	7/30/2018	16	2	106.34	Yes	50.50	-55.84
509	7/30/2018	16	3	101.11	Yes	50.50	-50.61
510	7/30/2018	16	4	141.49	Yes	50.50	-90.99
511	7/30/2018	16	5	117.26	Yes	50.50	-66.76
512	7/30/2018	16	6	155.14	Yes	50.50	-104.64
513	7/30/2018	16	7	96.34	Yes	50.50	-45.84
514	7/30/2018	16	8	90.39	Yes	50.50	-39.89
515	7/30/2018	16	9	100.69	Yes	50.50	-50.19
516	7/30/2018	16	10	99.63	Yes	50.50	-49.13
517	7/30/2018	16	11	137.50	Yes	50.50	-87.00
518	7/30/2018	16	12	140.47	Yes	50.50	-89.97
519	7/31/2018	16	8	48.98	Yes	143.83	94.85
520	7/31/2018	16	9	71.93	Yes	143.83	71.90
521	7/31/2018	16	10	81.15	Yes	143.83	62.68
522	7/31/2018	16	11	75.44	Yes	143.83	68.39
523	7/31/2018	16	12	81.92	Yes	143.83	61.91
524	7/31/2018	23	1	55.08	No	96.56	41.48
525	7/31/2018	23	2	50.29	No	96.56	46.27
526	7/31/2018	23	3	58.39	No	96.56	38.17
527	7/31/2018	23	4	60.43	No	96.56	36.13
528	7/31/2018	23	5	60.43	No	96.56	36.13

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Number	Trade Date	Trade Hour	Interval	Market LMP	Eligible Flag	Calculated LMP	Change in LMP
529	7/31/2018	23	6	75.35	No	96.56	21.21
530	7/31/2018	23	7	44.58	No	96.56	51.98
531	7/31/2018	23	8	56.67	No	96.56	39.89
532	7/31/2018	23	9	55.12	No	96.56	41.44
533	7/31/2018	23	10	51.78	Yes	213.06	161.28
534	7/31/2018	23	11	44.48	Yes	213.06	168.58
535	7/31/2018	23	12	39.84	Yes	213.06	173.22

Appendix C: Exceptional Dispatch Bid Mitigation Analysis

In July 2018, the ISO applied the exceptional dispatch bid mitigation to the exceptional dispatches. **Error! Reference source not found.** shows the costs by instruction type in July. With exceptional dispatch bid mitigation, the costs for these types of exceptional dispatches were \$ 254,916. Without the exceptional dispatch bid mitigation, the costs for these types of exceptional dispatches would be \$ 1,003,272. The cost saving from the exceptional dispatch bid mitigation was \$ 748,356.

Table 10: Bid Mitigation Analysis for July 2018

Type	Number of Resources	Costs without Bid Mitigation	Costs with Bid Mitigation	Cost Saving
NONTMOD	11	\$ 1,003,272	\$ 254,916	\$ 748,356
Total	11	\$ 1,003,272	\$ 254,916	\$ 748,356