



# **Exceptional Dispatch Report**

## **Table 2: October 2018**

Market Quality and Renewable Integration

January 30, 2019

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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 15<sup>th</sup> of each month and one issued on the 30<sup>th</sup> of each month. This report provides data on the frequency, reasons and costs for Exceptional Dispatches issued in October 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 October is presented in Appendix B. This report also includes mitigation analysis for October 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 October 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.<sup>1</sup>

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 October, which are self explanatory.

The data in Table 1 is based on a template specified in the September 2009 order.<sup>2</sup> This table contains all the information published in Table 1 of the first report for October 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.

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<sup>1</sup> 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>

<sup>2</sup> 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.<sup>3</sup>
- 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).<sup>4</sup>
- The CC6482 column shows the real-time excess cost for the classification.<sup>5</sup>
- The CC6488 column shows the real-time exceptional dispatch uplift settlement for the classification.<sup>6</sup> 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.

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

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

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

<sup>6</sup> 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 October 2018**

California Independent System Operator Corporation Exceptional Dispatch Report January 30, 2019																					
Chart 2: Table of Exceptional Dispatches for Period 01/October/2018 - 31/October/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	Fast Start Unit Management	PGAE	Fresno	10/28/2018	20	No	INC	11	9:40	20:00	-5.84	18005.12	402.33	549.63	0.00	0.00	0.00	0.00	0.00	0.00
2	RT	Fast Start Unit Management	SCE	LA Basin	10/30/2018	0	No	INC	1	22:55	23:55	-11.72	0.00	0.00	0.00	-11.72	0.00	0.00	0.00	0.00	0.00
3	RT	Fast Start Unit Management	SDGE	San Diego-IV	10/3/2018	0	No	INC	1	1:30	2:00	-14.20	1862.00	0.00	0.00	-14.20	0.00	0.00	0.00	0.00	0.00
4	RT	Incomplete or Inaccurate Transmission	PGAE	Stockton	10/17/2018	200	No	DEC	5	15:30	20:30	-1.23	-13074.34	0.00	131.81	-8.63	0.00	425.04	0.00	-2697.85	0.00
5	RT	Incomplete or Inaccurate Transmission	PGAE	Stockton	10/17/2018	250	No	INC	2	14:00	15:30	-19.12	0.00	0.00	1013.46	-5.45	0.00	293.45	0.00	-68.86	0.00
6	RT	Load Forecast Uncertainty	Intertie	NA	10/1/2018	125 - 331	No	INC	1	18:00	19:00	300.00	0.00	0.00	-7971.76	300.00	-7971.76	0.00	-75247.06	0.00	0.00
7	RT	Load Forecast Uncertainty	Intertie	NA	10/16/2018	100 - 125	No	INC	1	18:00	19:00	125.00	0.00	0.00	-4854.67	125.00	-4854.67	0.00	-15270.32	0.00	0.00
8	RT	Load Forecast Uncertainty	PGAE	Bay Area	10/11/2018	24	No	DEC	4	17:40	21:00	57.90	-10003.49	0.00	-2066.81	0.00	0.00	0.00	0.00	0.00	0.00
9	RT	Load Forecast Uncertainty	PGAE	Bay Area	10/12/2018	175	No	INC	6	16:00	22:00	-335.83	53869.68	0.00	10612.44	0.00	0.00	0.00	0.00	0.00	0.00
10	RT	Load Forecast Uncertainty	PGAE	Bay Area	10/15/2018	175	No	INC	16	8:00	0:00	42.07	246787.57	36196.08	1188.08	0.00	0.00	0.00	0.00	0.00	0.00
11	RT	Load Forecast Uncertainty	PGAE	Bay Area	10/22/2018	175	No	INC	7	14:00	21:00	-228.30	115740.35	0.00	7615.31	0.00	0.00	0.00	0.00	0.00	0.00
12	RT	Load Forecast Uncertainty	PGAE	Bay Area	10/31/2018	24	No	INC	7	10:50	17:00	-35.66	11036.60	495.70	1638.45	0.57	-19.48	0.00	-16.75	0.00	0.00
13	RT	Load Forecast Uncertainty	PGAE	Fresno	10/5/2018	83	No	INC	1	16:35	17:00	-2.77	0.00	0.00	74.35	0.00	0.00	0.00	0.00	0.00	0.00
14	RT	Load Forecast Uncertainty	PGAE	NA	10/2/2018	110	No	DEC	1	16:00	17:00	5.93	0.00	0.00	-81.85	6.38	-99.68	0.00	0.00	0.00	0.00
15	RT	Load Forecast Uncertainty	PGAE	NA	10/2/2018	110 - 205	No	INC	4	12:15	16:00	133.62	22940.92	0.00	-2974.45	42.46	-715.21	0.00	-397.54	0.00	0.00
16	RT	Load Forecast Uncertainty	PGAE	NA	10/3/2018	105	No	DEC	5	16:00	21:00	-177.07	-13596.51	0.00	5611.44	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 (\$)
17	RT	Load Forecast Uncertainty	PGAE	NA	10/3/2018	105	No	INC	2	14:25	16:00	24.76	8051.90	0.00	-932.69	0.00	0.00	0.00	0.00	0.00	0.00
18	RT	Load Forecast Uncertainty	PGAE	NA	10/4/2018	301	No	DEC	1	18:00	19:00	299.07	0.00	0.00	-7285.90	49.71	-1127.02	0.00	-94.81	0.00	0.00
19	RT	Load Forecast Uncertainty	SCE	LA Basin	10/1/2018	65 - 190	No	DEC	6	14:00	20:00	-105.38	0.00	0.00	5970.00	0.00	0.00	0.00	0.00	0.00	0.00
20	RT	Load Forecast Uncertainty	SCE	LA Basin	10/1/2018	65 - 194	No	INC	11	9:35	20:00	-179.13	19177.14	0.00	8644.97	15.76	-463.59	0.00	-113475.85	0.00	0.00
21	RT	Load Forecast Uncertainty	SCE	LA Basin	10/2/2018	20 - 194	No	INC	24	0:00	0:00	-355.18	141191.20	0.00	-110081.57	2.72	-155.15	0.00	-179536.09	0.00	0.00
22	RT	Load Forecast Uncertainty	SCE	LA Basin	10/3/2018	65 - 194	No	INC	22	0:00	22:00	-257.69	102663.33	0.00	4491.16	0.00	0.00	0.00	-49197.85	0.00	0.00
23	RT	Load Forecast Uncertainty	SCE	LA Basin	10/16/2018	20	No	INC	8	16:00	0:00	26.70	16512.76	23992.02	-1813.19	0.00	0.00	0.00	0.00	0.00	0.00
24	RT	Load Forecast Uncertainty	SCE	LA Basin	10/17/2018	10 - 20	Yes	INC	24	0:00	0:00	1.67	54752.34	0.00	-65.70	0.00	0.00	0.00	0.00	0.00	0.00
25	RT	Load Forecast Uncertainty	SCE	LA Basin	10/20/2018	65	No	INC	3	17:20	20:00	21.21	5164.71	0.00	-2087.83	0.00	-0.12	0.00	-0.16	0.00	0.00
26	RT	Load Forecast Uncertainty	SCE	LA Basin	10/31/2018	20	No	INC	7	17:15	0:00	99.17	0.00	0.00	-2953.73	0.00	0.00	0.00	0.00	0.00	0.00
27	RT	Load Forecast Uncertainty	SDGE	San Diego-IV	10/1/2018	68	No	INC	3	17:00	20:00	-434.34	3150.91	0.00	20713.41	-176.00	0.00	0.00	0.00	0.00	0.00
28	RT	Load Forecast Uncertainty	SDGE	San Diego-IV	10/2/2018	20	No	INC	22	2:00	0:00	-451.09	42089.45	0.00	16572.30	0.00	0.00	0.00	0.00	0.00	0.00
29	RT	Load Forecast Uncertainty	SDGE	San Diego-IV	10/9/2018	20	No	INC	10	14:00	0:00	108.00	17024.54	0.00	-2954.22	0.00	0.00	0.00	0.00	0.00	0.00
30	RT	Load Forecast Uncertainty	SDGE	San Diego-IV	10/10/2018	20	No	INC	3	0:00	3:00	0.00	8921.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	RT	Load Forecast Uncertainty	SDGE	San Diego-IV	10/15/2018	20 - 290	No	INC	15	9:00	0:00	2713.77	45174.39	0.00	-56104.62	0.00	0.00	0.00	0.00	0.00	0.00
32	RT	Load Forecast Uncertainty	SDGE	San Diego-IV	10/17/2018	20 - 290	No	INC	9	15:00	0:00	-155.96	172337.04	58133.39	5911.98	0.00	0.00	0.00	0.00	0.00	0.00
33	RT	Load Forecast Uncertainty	SDGE	San Diego-IV	10/18/2018	20 - 156	No	INC	14	10:00	0:00	-43.66	202480.65	0.00	-11312.55	0.78	3.19	0.00	-122.76	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 (\$)
34	RT	Load Forecast Uncertainty	SDGE	San Diego-IV	10/22/2018	20	No	INC	10	14:00	0:00	118.02	16114.06	0.00	-3710.24	0.00	0.00	0.00	0.00	0.00	0.00
35	RT	Load Forecast Uncertainty	SDGE	San Diego-IV	10/29/2018	20 - 63	No	INC	10	13:00	23:00	34.31	42004.78	29674.61	-909.13	0.03	-0.67	0.00	-1.90	0.00	0.00
36	RT	Load Pull	SCE	LA Basin	10/16/2018	20	No	DEC	2	18:00	20:00	-28.50	0.00	34.73	1852.70	0.00	0.00	0.00	0.00	0.00	0.00
37	RT	Load Pull	SCE	LA Basin	10/16/2018	20 - 194	No	INC	6	16:45	22:00	65.46	23655.69	13534.58	-3784.37	46.22	-2987.06	0.00	0.00	0.00	0.00
38	RT	Load Pull	SCE	LA Basin	10/17/2018	65 - 194	No	INC	8	14:00	22:00	147.25	43198.06	0.00	-16474.65	146.50	-16475.65	0.00	0.00	0.00	0.00
39	RT	Load Pull	SDGE	San Diego-IV	10/17/2018	63	No	INC	6	16:00	22:00	-46.75	29447.65	0.00	756.32	0.00	0.00	0.00	0.00	0.00	0.00
40	RT	Load Pull	SDGE	San Diego-IV	10/22/2018	63	No	INC	4	16:45	20:00	2.71	17164.98	0.00	-145.28	0.02	-1.12	0.00	0.00	0.00	0.00
41	RT	Market Disruption	PGAE	Bay Area	10/4/2018	291	No	INC	1	14:20	14:40	-46.05	3556.46	0.00	1143.47	-46.05	0.00	1143.47	0.00	0.00	0.00
42	RT	Market Disruption	PGAE	Fresno	10/4/2018	10	No	INC	1	14:25	15:00	-0.01	0.00	0.00	-24.51	0.00	0.00	0.00	0.00	0.00	0.00
43	RT	Market Disruption	PGAE	Fresno	10/24/2018	83	No	INC	1	16:00	17:00	42.31	4934.68	0.00	-2200.15	0.00	0.00	0.00	0.00	0.00	0.00
44	RT	Market Disruption	PGAE	NA	10/24/2018	380	No	DEC	1	17:00	17:30	152.05	-6017.36	0.00	-5713.74	14.16	-465.17	0.00	-84.88	0.00	0.00
45	RT	Market Disruption	SCE	NA	10/4/2018	475	No	DEC	1	14:25	14:40	-23.14	0.04	0.00	783.04	-23.61	0.00	801.40	0.00	0.00	0.00
46	RT	Market Disruption	SDGE	San Diego-IV	10/4/2018	310	No	DEC	1	14:20	15:00	12.69	0.00	0.00	-249.99	-0.95	0.00	15.11	0.00	0.00	0.00
47	RT	Operating Procedure Number and Constraint (7430)	PGAE	Fresno	10/4/2018	75	No	INC	7	11:25	18:00	-1.74	0.00	0.00	332.14	0.00	0.00	0.00	0.00	0.00	0.00
48	RT	Operating Procedure Number and Constraint (7430)	PGAE	Fresno	10/10/2018	75 - 80	No	INC	5	11:15	15:45	45.62	0.00	0.00	-1549.17	0.00	0.00	0.00	0.00	0.00	0.00
49	RT	Operating Procedure Number and Constraint (7430)	PGAE	Fresno	10/11/2018	85	No	INC	1	11:15	12:00	25.76	0.00	0.00	-671.24	0.00	0.00	0.00	0.00	0.00	0.00
50	RT	Operating Procedure Number and Constraint (7430)	PGAE	Fresno	10/28/2018	80	No	INC	13	7:35	20:00	17.39	0.00	0.00	-569.99	0.00	0.00	0.00	0.00	0.00	0.00
51	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/1/2018	16 - 32	No	INC	18	6:05	0:00	46.93	4096.65	0.00	-2092.85	21.87	-953.91	1.17	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 (\$)
52	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/2/2018	15	No	DEC	3	6:10	8:15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
53	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/2/2018	15 - 30	No	INC	24	0:00	0:00	32.36	5803.59	0.00	-4730.25	9.19	-967.29	0.00	0.00	0.00	0.00
54	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/3/2018	15	No	DEC	22	2:00	0:00	22.20	-1098.98	0.00	-637.10	-0.18	0.00	2.50	0.00	0.00	0.00
55	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/3/2018	30 - 32	No	INC	24	0:00	0:00	26.26	5128.62	0.00	-718.75	3.15	-96.23	1.25	0.00	0.00	0.00
56	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/4/2018	15	No	DEC	14	0:00	13:15	-0.03	0.00	0.00	-12.60	-0.64	0.00	8.59	0.00	0.00	0.00
57	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/4/2018	15 - 32	No	INC	24	0:00	0:00	11.59	6780.53	0.00	-358.62	4.77	-173.38	0.00	0.00	0.00	0.00
58	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/5/2018	14	No	DEC	1	23:00	0:00	14.00	-722.50	0.00	-407.75	0.00	0.00	0.00	0.00	0.00	0.00
59	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/5/2018	14	No	INC	22	2:45	0:00	6.25	963.33	0.00	-207.83	0.00	0.00	0.00	0.00	0.00	0.00
60	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/6/2018	14	No	DEC	24	0:00	0:00	-3.22	-237.52	0.00	102.52	-0.34	0.00	4.41	0.00	0.00	0.00
61	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/6/2018	14 - 30	No	INC	24	0:00	0:00	17.00	-2494.00	0.00	-578.20	3.31	-117.77	4.41	0.00	0.00	0.00
62	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/7/2018	14	No	DEC	7	0:00	6:25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
63	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/7/2018	14 - 42	No	INC	24	0:00	0:00	49.69	-12649.01	0.00	-1252.96	0.33	-7.84	0.00	0.00	0.00	0.00
64	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/8/2018	14 - 32	No	INC	24	0:00	0:00	35.10	712.69	0.00	-1322.02	3.34	-112.53	0.00	0.00	0.00	0.00
65	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/9/2018	14 - 28	No	INC	24	0:00	0:00	30.49	-6746.40	0.00	-911.98	-0.57	0.00	7.64	0.00	0.00	0.00
66	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/10/2018	14 - 42	No	INC	24	0:00	0:00	42.42	-2042.76	0.00	-1417.58	0.93	-33.73	0.00	0.00	0.00	0.00
67	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/11/2018	14 - 42	No	INC	24	0:00	0:00	84.47	-9419.13	0.00	-2588.71	0.00	0.00	0.00	0.00	0.00	0.00
68	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/12/2018	14 - 42	No	INC	24	0:00	0:00	39.40	-366.85	1010.55	-1052.43	6.01	-202.95	0.00	0.00	0.00	0.00
69	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/13/2018	16	No	DEC	1	23:30	0:00	0.50	0.00	0.00	-12.61	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 (\$)
70	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/13/2018	16 - 42	No	INC	24	0:00	0:00	66.06	-17380.21	0.00	-2076.92	1.94	-73.20	0.30	0.00	0.00	0.00
71	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/14/2018	16	No	DEC	18	0:00	17:30	0.02	0.00	0.00	-6.14	0.00	0.00	0.00	0.00	0.00	0.00
72	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/14/2018	16 - 32	No	INC	24	0:00	0:00	67.97	-2949.28	0.00	-1958.39	19.38	-582.62	0.00	0.00	0.00	0.00
73	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/15/2018	14	No	DEC	7	17:00	0:00	7.37	-1474.64	0.00	-228.53	0.00	0.00	0.00	0.00	0.00	0.00
74	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/15/2018	14 - 42	No	INC	24	0:00	0:00	65.83	-2027.63	0.00	-2624.35	2.50	-88.40	0.00	0.00	0.00	0.00
75	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/16/2018	15 - 30	No	DEC	7	17:00	0:00	8.36	-757.24	0.00	-259.32	0.00	0.00	0.00	0.00	0.00	0.00
76	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/16/2018	0 - 42	No	INC	24	0:00	0:00	31.18	-6815.16	0.00	-1586.87	1.25	-183.80	0.00	0.00	0.00	0.00
77	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/17/2018	16 - 30	No	DEC	20	0:00	20:00	2.62	956.80	0.00	-81.57	0.00	0.00	0.00	0.00	0.00	0.00
78	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/17/2018	28 - 30	No	INC	17	0:00	17:00	30.90	-3253.12	0.00	-1219.82	0.00	0.00	0.00	0.00	0.00	0.00
79	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/18/2018	32	No	INC	2	22:00	0:00	3.39	-1549.36	0.00	-93.00	5.00	-173.81	0.00	0.00	0.00	0.00
80	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/19/2018	32	No	DEC	5	17:00	22:00	2.65	0.00	0.00	568.88	0.00	0.00	0.00	0.00	0.00	0.00
81	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/19/2018	16 - 32	No	INC	24	0:00	0:00	7.76	-7842.61	0.00	-308.31	3.95	-169.17	0.00	0.00	0.00	0.00
82	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/20/2018	32	No	DEC	3	15:00	18:00	0.79	0.00	0.00	-20.21	0.00	0.00	0.00	0.00	0.00	0.00
83	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/20/2018	15 - 32	No	INC	24	0:00	0:00	5.16	0.00	0.00	-216.00	5.96	-254.37	0.00	0.00	0.00	0.00
84	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/21/2018	15 - 42	No	INC	24	0:00	0:00	64.15	-3541.19	0.00	-2896.29	10.92	-508.72	0.00	0.00	0.00	0.00
85	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/22/2018	16 - 32	No	DEC	7	17:00	0:00	3.76	0.00	0.00	-75.78	0.00	0.00	0.00	0.00	0.00	0.00
86	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/22/2018	15 - 32	No	INC	24	0:00	0:00	47.28	1573.87	0.00	-2080.35	4.38	-172.45	0.00	0.00	0.00	0.00
87	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/23/2018	16 - 32	No	INC	17	0:00	17:00	27.00	-5223.27	0.00	-1097.55	23.25	-981.14	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 (\$)
88	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/25/2018	14 - 42	No	DEC	1	20:35	21:00	0.44	-662.40	0.00	-27.48	-0.94	0.00	14.69	0.00	0.00	0.00
89	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/25/2018	14 - 42	No	INC	18	6:20	0:00	44.23	-8901.68	0.00	-1722.23	2.40	-137.60	0.00	0.00	0.00	0.00
90	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/26/2018	15 - 32	No	DEC	3	17:00	20:00	2.03	-2054.30	0.00	-142.61	0.00	0.00	0.00	0.00	0.00	0.00
91	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/26/2018	14 - 42	No	INC	24	0:00	0:00	43.34	-13987.24	0.00	-1638.30	4.12	-156.37	0.00	0.00	0.00	0.00
92	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/27/2018	16	No	DEC	20	0:45	20:00	-1.99	0.00	0.00	88.30	0.08	-6.34	1.01	0.00	0.00	0.00
93	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/27/2018	16 - 32	No	INC	24	0:00	0:00	21.06	-11366.46	0.00	-1011.68	8.10	-372.39	0.66	0.00	0.00	0.00
94	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/28/2018	15	No	DEC	2	9:35	10:45	1.91	-404.86	0.00	-75.94	1.91	-75.94	0.00	0.00	0.00	0.00
95	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/28/2018	16 - 42	No	INC	24	0:00	0:00	16.80	-10256.45	0.00	-543.39	2.59	-103.95	0.00	0.00	0.00	0.00
96	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/29/2018	16	No	INC	2	0:00	2:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
97	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/30/2018	32	No	INC	2	22:00	0:00	9.95	0.00	0.00	-337.73	0.00	0.00	0.00	0.00	0.00	0.00
98	RT	Operating Procedure Number and Constraint (7110)	PGAE	Humboldt	10/31/2018	14 - 28	No	INC	24	0:00	0:00	-2.92	-976.99	0.00	121.05	0.00	0.00	0.00	0.00	0.00	0.00
99	RT	Operating Procedure Number and Constraint (7720)	SCE	NA	10/28/2018	325 - 345	No	DEC	3	16:45	19:15	69.13	-15289.16	0.00	-2731.18	-9.06	0.00	123.10	0.00	0.00	0.00
100	RT	Operating Procedure Number and Constraint (7720)	SCE	NA	10/31/2018	475	No	DEC	2	22:05	0:00	-2.02	-3354.52	0.00	46.44	0.00	0.00	0.00	0.00	0.00	0.00
101	RT	Other Reliability Requirement	PGAE	Fresno	10/4/2018	10	No	INC	1	15:15	15:45	-0.45	0.00	0.00	4.47	0.00	0.00	0.00	0.00	0.00	0.00
102	RT	Other Reliability Requirement	PGAE	Fresno	10/15/2018	12 - 15	No	DEC	2	11:10	13:00	-1.63	0.00	0.00	-11.51	0.00	0.00	0.00	0.00	0.00	0.00
103	RT	Other Reliability Requirement	PGAE	Stockton	10/16/2018	200	No	DEC	8	13:45	21:00	-193.95	-14966.76	0.00	8947.61	-70.17	0.00	1879.02	0.00	0.00	0.00
104	RT	Other Reliability Requirement	PGAE	Stockton	10/16/2018	240 - 250	No	INC	4	10:00	13:45	-88.49	4332.10	0.00	7021.76	-35.91	0.00	1575.10	0.00	0.00	0.00
105	RT	Other Reliability Requirement	PGAE	Stockton	10/19/2018	200	No	DEC	1	6:50	7:10	-0.33	273.13	0.00	4.51	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 (\$)
106	RT	Planned Transmission Outage	PGAE	Bay Area	10/2/2018	450	No	INC	5	15:10	20:00	-92.74	89479.26	0.00	-8849.02	-39.69	0.00	1914.90	0.00	-1861.97	0.00
107	RT	Planned Transmission Outage	PGAE	Bay Area	10/18/2018	200 - 400	No	DEC	7	8:30	15:30	-153.78	-5906.74	0.00	3577.29	-101.24	0.00	2383.21	0.00	-4967.28	0.00
108	RT	Planned Transmission Outage	PGAE	Bay Area	10/18/2018	0	No	INC	4	9:15	13:15	-97.14	-1458.58	0.00	2225.61	-77.14	0.00	1772.20	0.00	-2947.21	0.00
109	RT	Planned Transmission Outage	PGAE	Bay Area	10/19/2018	140 - 142	No	DEC	7	14:00	20:15	-162.72	-60278.30	0.00	7041.99	-130.07	0.00	4594.74	0.00	81157.23	0.00
110	RT	Planned Transmission Outage	PGAE	Bay Area	10/19/2018	0 - 300	No	INC	14	10:00	23:45	-311.87	-14620.33	0.00	10859.94	-168.69	-41.49	6486.11	0.00	12402.73	0.00
111	RT	Planned Transmission Outage	PGAE	Bay Area	10/20/2018	23	No	INC	8	9:35	17:30	5.83	11806.53	174.54	-646.03	0.00	0.00	0.00	0.00	0.00	0.00
112	RT	Planned Transmission Outage	PGAE	Bay Area	10/26/2018	0 - 54	No	INC	18	6:00	0:00	-67.80	22661.98	0.00	2368.02	-60.00	0.00	2051.75	0.00	-776.63	0.00
113	RT	Planned Transmission Outage	PGAE	Bay Area	10/27/2018	0	No	INC	1	0:00	0:05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
114	RT	Planned Transmission Outage	PGAE	Fresno	10/1/2018	39	No	INC	7	17:05	0:00	-44.57	24298.37	0.00	2613.82	0.00	0.00	0.00	0.00	0.00	0.00
115	RT	Planned Transmission Outage	PGAE	Fresno	10/2/2018	39	No	INC	24	0:00	0:00	-49.92	95070.53	0.00	15867.70	0.00	0.00	0.00	0.00	0.00	0.00
116	RT	Planned Transmission Outage	PGAE	Fresno	10/3/2018	39	No	INC	24	0:00	0:00	3.34	19379.62	0.00	-142.67	0.00	0.00	0.00	0.00	0.00	0.00
117	RT	Planned Transmission Outage	PGAE	Fresno	10/4/2018	39	No	INC	1	0:00	0:15	-6.50	775.19	0.00	247.01	0.00	0.00	0.00	0.00	0.00	0.00
118	RT	Planned Transmission Outage	PGAE	Fresno	10/5/2018	20	No	INC	8	10:55	18:00	-4.62	10426.74	306.60	199.46	0.00	0.00	0.00	0.00	0.00	0.00
119	RT	Planned Transmission Outage	PGAE	Fresno	10/15/2018	12	No	DEC	3	13:00	15:15	3.71	0.00	0.00	21.51	0.00	0.00	0.00	0.00	-157.46	0.00
120	RT	Planned Transmission Outage	PGAE	Fresno	10/22/2018	83	No	DEC	3	20:55	23:00	-55.22	0.00	0.00	2734.32	0.00	0.00	0.00	0.00	0.00	0.00
121	RT	Planned Transmission Outage	PGAE	Fresno	10/22/2018	83	No	INC	2	22:00	0:00	38.34	7073.04	0.00	-3022.42	0.00	0.00	0.00	0.00	0.00	0.00
122	RT	Planned Transmission Outage	PGAE	Fresno	10/23/2018	83	No	DEC	4	17:00	21:00	-349.13	0.00	0.00	1103.02	0.00	0.00	0.00	0.00	0.00	0.00
123	RT	Planned Transmission Outage	PGAE	Fresno	10/23/2018	48 - 190	No	INC	24	0:00	0:00	478.82	310254.92	317.70	-31404.47	41.83	-1671.41	0.00	0.00	-889.37	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 (\$)
124	RT	Planned Transmission Outage	PGAE	Fresno	10/24/2018	83	No	DEC	11	7:40	18:00	108.51	0.00	0.00	-6565.57	0.00	0.00	0.00	0.00	0.00	0.00
125	RT	Planned Transmission Outage	PGAE	Fresno	10/24/2018	83 - 190	No	INC	17	0:00	17:00	-297.87	160788.37	0.00	14548.48	0.00	0.00	0.00	0.00	-2335.87	0.00
126	RT	Planned Transmission Outage	PGAE	Humboldt	10/5/2018	14 - 28	No	INC	23	0:00	23:00	43.98	-1445.00	0.00	-1259.50	0.00	0.00	0.00	0.00	0.00	0.00
127	RT	Planned Transmission Outage	PGAE	Humboldt	10/6/2018	14	No	INC	17	6:05	22:45	7.58	0.00	0.00	-271.59	0.00	0.00	0.00	0.00	0.00	0.00
128	RT	Planned Transmission Outage	PGAE	Humboldt	10/17/2018	32	No	INC	2	22:00	0:00	6.02	-1722.24	0.00	-233.58	7.61	-319.34	0.00	0.00	0.00	0.00
129	RT	Planned Transmission Outage	PGAE	Humboldt	10/18/2018	28 - 32	No	DEC	4	16:00	20:00	1.36	0.00	0.00	613.83	0.00	0.00	0.00	0.00	0.00	0.00
130	RT	Planned Transmission Outage	PGAE	Humboldt	10/18/2018	16 - 32	No	INC	17	0:00	17:00	42.16	-9554.39	0.00	-1604.53	17.40	-657.35	0.00	0.00	0.00	0.00
131	RT	Planned Transmission Outage	PGAE	Humboldt	10/22/2018	32	No	DEC	3	17:00	20:00	-1.41	0.00	0.00	-21.86	0.00	0.00	0.00	0.00	0.00	0.00
132	RT	Planned Transmission Outage	PGAE	Humboldt	10/22/2018	32	No	INC	10	7:30	17:00	16.04	-5705.23	0.00	-850.48	14.03	-722.89	0.00	0.00	0.00	0.00
133	RT	Planned Transmission Outage	PGAE	Humboldt	10/23/2018	15 - 30	No	DEC	1	21:10	22:00	4.51	0.00	0.00	-111.19	0.00	0.00	0.00	0.00	0.00	0.00
134	RT	Planned Transmission Outage	PGAE	Humboldt	10/23/2018	15 - 30	No	INC	2	22:00	0:00	8.65	-200.90	0.00	-265.46	0.50	-12.90	0.00	0.00	0.00	0.00
135	RT	Planned Transmission Outage	PGAE	Humboldt	10/24/2018	15	No	DEC	4	2:30	6:00	1.95	-1262.94	0.00	-63.88	0.00	0.00	0.00	0.00	0.00	0.00
136	RT	Planned Transmission Outage	PGAE	Humboldt	10/24/2018	15 - 42	No	INC	24	0:10	0:00	69.07	-9682.54	0.00	-2558.18	6.41	-285.25	0.00	0.00	0.00	0.00
137	RT	Planned Transmission Outage	PGAE	Humboldt	10/25/2018	15	No	INC	17	0:00	17:00	42.88	0.00	0.00	-1659.48	0.51	-19.16	0.00	0.00	0.00	0.00
138	RT	Planned Transmission Outage	PGAE	Humboldt	10/28/2018	32	No	INC	2	22:30	0:00	2.82	-1214.58	0.00	-71.29	0.00	0.00	0.00	0.00	0.00	0.00
139	RT	Planned Transmission Outage	PGAE	Humboldt	10/29/2018	14 - 42	No	INC	24	0:00	0:00	98.55	-19028.42	0.00	-4024.30	0.00	0.00	0.00	0.00	0.00	0.00
140	RT	Planned Transmission Outage	PGAE	Humboldt	10/30/2018	32	No	DEC	3	16:00	19:00	1.13	0.00	0.00	-4.56	0.00	0.00	0.00	0.00	0.00	0.00
141	RT	Planned Transmission Outage	PGAE	Humboldt	10/30/2018	16 - 32	No	INC	19	0:00	19:00	63.64	-10082.60	0.00	-6546.66	8.08	-892.74	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 (\$)
142	RT	Planned Transmission Outage	PGAE	Humboldt	10/31/2018	14	No	DEC	1	16:00	16:30	1.31	0.00	0.00	-40.86	0.00	0.00	0.00	0.00	0.00	0.00
143	RT	Planned Transmission Outage	PGAE	Humboldt	10/31/2018	14 - 28	No	INC	18	6:15	0:00	18.52	-6969.17	0.00	-698.71	-0.09	0.00	3.70	0.00	-3.26	0.00
144	RT	Planned Transmission Outage	PGAE	NCNB	10/30/2018	50 - 65	No	DEC	5	19:45	0:00	-11.70	0.00	0.00	749.34	-22.90	0.00	1103.92	0.00	-6515.28	0.00
145	RT	Planned Transmission Outage	PGAE	Sierra	10/15/2018	10	No	INC	10	11:55	21:00	93.37	0.00	0.00	-2749.90	90.83	-2700.35	0.00	0.00	-848.29	0.00
146	RT	Planned Transmission Outage	PGAE	Stockton	10/10/2018	35	No	DEC	7	5:00	12:00	-0.69	0.00	0.00	0.73	-3.35	0.00	127.29	0.00	-686.08	0.00
147	RT	Planned Transmission Outage	PGAE	Stockton	10/19/2018	145 - 200	No	DEC	12	7:10	18:30	0.09	-31720.87	0.00	21.17	-9.83	0.00	460.28	0.00	-468.75	0.00
148	RT	Planned Transmission Outage	PGAE	Stockton	10/20/2018	192	No	DEC	10	9:45	19:00	-22.93	-27765.63	0.00	863.82	-1.72	0.00	99.94	0.00	-76.50	0.00
149	RT	Planned Transmission Outage	PGAE	Stockton	10/21/2018	145	No	DEC	24	0:15	0:00	-19.96	-94315.60	0.00	-218.81	-1.19	0.00	51.26	0.00	-15.33	0.00
150	RT	Planned Transmission Outage	PGAE	Stockton	10/22/2018	145	No	DEC	19	5:00	0:00	-14.36	-95025.97	0.00	407.48	0.00	0.00	0.00	0.00	0.00	0.00
151	RT	Planned Transmission Outage	PGAE	Stockton	10/22/2018	145	No	INC	5	0:00	5:00	-9.44	20474.35	0.00	235.34	0.00	0.00	0.00	0.00	0.00	0.00
152	RT	Planned Transmission Outage	PGAE	Stockton	10/23/2018	192	No	DEC	10	5:05	15:00	-9.70	-4899.76	0.00	423.55	-4.47	0.00	211.01	0.00	-2763.32	0.00
153	RT	Planned Transmission Outage	PGAE	NA	10/18/2018	0 - 50	No	INC	5	10:00	15:00	14.06	0.00	0.00	-586.87	-16.02	0.00	70.47	0.00	-45.92	0.00
154	RT	Planned Transmission Outage	SCE	Big Creek-Ventura	10/18/2018	54	No	INC	5	7:55	12:00	13.50	22153.69	0.00	-408.65	0.03	-0.76	0.00	0.00	-4.04	0.00
155	RT	Planned Transmission Outage	SCE	LA Basin	10/8/2018	263	No	INC	10	7:55	17:15	275.50	127032.82	0.00	-2511.92	128.62	-2264.93	0.00	0.00	-	12872.22
156	RT	Planned Transmission Outage	SCE	LA Basin	10/11/2018	100	No	INC	2	13:20	14:30	69.08	0.00	0.00	-5559.39	40.55	-968.85	0.00	0.00	-6379.10	0.00
157	RT	Planned Transmission Outage	SCE	LA Basin	10/25/2018	45.58	No	DEC	12	6:00	18:00	-2.32	0.00	0.00	127.03	0.00	0.00	0.00	0.00	0.00	0.00
158	RT	Planned Transmission Outage	SCE	LA Basin	10/25/2018	45.38 - 45.58	No	INC	8	8:00	16:00	-55.51	47133.34	0.00	1535.70	0.00	0.00	0.00	0.00	0.00	0.00
159	RT	Planned Transmission Outage	SCE	LA Basin	10/26/2018	46	No	DEC	14	6:40	20:00	-79.43	0.00	0.00	2882.73	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 (\$)
160	RT	Planned Transmission Outage	SCE	LA Basin	10/26/2018	46	No	INC	10	7:55	17:00	11.02	56934.85	0.00	-55.64	0.38	-10.82	0.00	0.00	-205.05	0.00
161	RT	Planned Transmission Outage	SCE	LA Basin	10/29/2018	0	No	INC	4	17:00	20:15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
162	RT	Planned Transmission Outage	SCE	NA	10/18/2018	615 - 700	No	DEC	2	16:50	18:00	-13.32	0.00	0.00	-2123.89	-40.58	0.00	1171.94	0.00	-335.19	0.00
163	RT	Planned Transmission Outage	SCE	NA	10/20/2018	700	No	DEC	5	16:15	21:00	-72.52	-34606.68	0.00	1508.05	-2.21	0.00	63.32	0.00	-2785.48	0.00
164	RT	Planned Transmission Outage	SCE	NA	10/31/2018	68	No	DEC	3	14:10	16:30	-41.25	0.00	0.00	-4056.89	-43.61	0.00	-4273.88	0.00	0.00	0.00
165	RT	Planned Transmission Outage	SDGE	San Diego-IV	10/11/2018	500	No	DEC	2	6:35	8:00	21.78	-7671.09	0.00	-846.11	-1.83	0.00	73.84	0.00	-125.29	0.00
166	RT	Planned Transmission Outage	SDGE	San Diego-IV	10/17/2018	0 - 281	No	DEC	7	14:05	21:00	-58.44	9534.71	0.00	-425.92	-27.00	0.00	-2777.34	0.00	0.00	0.00
167	RT	Planned Transmission Outage	SDGE	San Diego-IV	10/17/2018	63 - 290	No	INC	9	8:30	17:00	-30.66	5779.73	0.00	1612.87	62.66	-966.76	0.00	0.00	-20241.37	0.00
168	RT	Planned Transmission Outage	SDGE	San Diego-IV	10/26/2018	20 - 63	No	INC	19	5:00	0:00	24.08	125419.88	0.00	-1467.85	0.06	-2.95	0.00	0.00	-0.98	0.00
169	RT	Planned Transmission Outage	SDGE	San Diego-IV	10/27/2018	400 - 520	No	DEC	7	13:00	19:45	-9.07	-23539.24	0.00	-4043.43	0.00	0.00	0.00	0.00	-9629.93	0.00
170	RT	Planned Transmission Outage	SDGE	San Diego-IV	10/27/2018	520	No	INC	2	11:05	13:00	-140.46	0.00	0.00	-538.54	0.00	0.00	0.00	0.00	0.00	0.00
171	RT	Planned Transmission Outage	SDGE	San Diego-IV	10/30/2018	38	No	INC	5	11:55	16:00	-0.29	10354.27	373.06	9.61	0.56	-10.38	0.00	0.00	-165.85	0.00
172	RT	Software Limitation	PGAE	Bay Area	10/31/2018	0	No	INC	1	23:35	0:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
173	RT	Software Limitation	PGAE	Fresno	10/13/2018	83 - 407	No	INC	2	17:25	19:00	-222.26	12028.29	0.00	6250.16	13.96	-759.17	0.00	0.00	0.00	0.00
174	RT	Software Limitation	PGAE	Humboldt	10/30/2018	32	No	INC	2	0:45	2:45	-5.22	-1449.78	0.00	176.05	0.00	0.00	0.00	0.00	0.00	0.00
175	RT	Software Limitation	SCE	LA Basin	10/19/2018	0	No	DEC	2	20:45	22:00	-71.82	-9454.00	0.00	1918.57	-71.69	0.00	1911.17	0.00	0.00	0.00
176	RT	Software Limitation	SCE	LA Basin	10/19/2018	0	No	INC	2	22:00	0:00	-11.95	0.00	0.00	702.77	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 (\$)
177	RT	Software Limitation	SCE	NA	10/25/2018	0	No	DEC	1	8:00	9:00	-0.62	0.00	0.00	0.28	-0.62	0.00	0.28	0.00	0.00	0.00
178	RT	Software Limitation	SCE	NA	10/25/2018	0	No	INC	6	9:00	15:00	-0.21	0.00	0.00	10.33	0.00	0.00	0.00	0.00	0.00	0.00
179	RT	Software Limitation	SDGE	San Diego-IV	10/22/2018	20	No	INC	1	23:50	0:00	0.00	472.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180	RT	Unit Testing	PGAE	Fresno	10/25/2018	12	No	INC	1	18:40	19:15	-2.07	226.61	0.00	73.76	1.25	-97.22	0.00	0.00	0.00	0.00
181	RT	Unit Testing	PGAE	NA	10/25/2018	32	No	INC	1	18:45	19:15	5.88	0.00	0.00	-426.42	5.88	-428.41	0.00	0.00	0.00	0.00
182	RT	Unit Testing	SCE	LA Basin	10/26/2018	47.71	No	INC	1	18:55	19:25	9.61	2344.65	0.00	-608.63	6.29	-482.81	0.00	0.00	0.00	0.00
183	RT	Unit Testing	SDGE	San Diego-IV	10/26/2018	45	No	INC	1	21:00	21:35	-0.02	0.00	0.00	3.07	0.42	-33.57	0.00	0.00	0.00	0.00
184	RT	Unit Testing	SDGE	NA	10/27/2018	100	No	INC	2	9:00	10:30	36.55	0.00	0.00	-7.37	21.34	-41.06	0.00	0.00	0.00	0.00
185	RT	Unplanned Outage	PGAE	Bay Area	10/2/2018	175	No	INC	11	11:00	22:00	-68.14	182084.35	28249.97	-9402.72	-39.69	0.00	1914.90	0.00	-1861.97	0.00
186	RT	Unplanned Outage	PGAE	Fresno	10/2/2018	23 - 83	No	DEC	5	16:00	21:00	-204.51	-10585.68	0.00	4904.46	0.00	0.00	0.00	0.00	0.00	0.00
187	RT	Unplanned Outage	PGAE	Fresno	10/2/2018	23 - 83	No	INC	13	9:30	22:00	-350.52	58397.54	0.00	7230.34	0.62	-14.05	0.00	-59.49	0.00	0.00
188	RT	Unplanned Outage	PGAE	Humboldt	10/31/2018	28	No	INC	4	12:05	16:00	7.82	-3061.23	0.00	-224.73	0.00	0.00	0.00	0.00	0.00	0.00
189	RT	Unplanned Outage	PGAE	NA	10/2/2018	47	No	DEC	5	17:00	22:00	-13.14	-2597.91	0.00	-462.10	0.00	0.00	0.00	0.00	0.00	0.00
190	RT	Unplanned Outage	PGAE	NA	10/2/2018	47	No	INC	5	11:45	15:50	202.68	20460.84	0.00	-4847.45	42.48	-715.62	0.00	-397.54	0.00	0.00
191	RT	Unplanned Outage	SDGE	San Diego-IV	10/2/2018	68 - 290	No	INC	15	7:45	22:00	-481.25	238934.85	17922.86	-22091.01	19.00	-404.11	0.00	-269.55	0.00	0.00
192	RT	Voltage Support	PGAE	Fresno	10/6/2018	-322	No	DEC	7	2:00	9:00	-78.88	0.00	0.00	2691.09	0.00	0.00	0.00	0.00	0.00	0.00
193	RT	Voltage Support	PGAE	Fresno	10/7/2018	-322	No	DEC	8	0:30	8:00	-37.16	0.00	0.00	5995.23	0.00	0.00	0.00	0.00	0.00	0.00
194	RT	Voltage Support	PGAE	Fresno	10/7/2018	-322	No	INC	2	8:00	10:00	-12.93	0.00	0.00	330.40	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 (\$)
195	RT	Voltage Support	PGAE	Fresno	10/8/2018	-320	No	DEC	3	4:25	7:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
196	RT	Voltage Support	PGAE	Fresno	10/9/2018	-320	No	DEC	5	1:35	6:00	-71.00	0.00	0.00	2510.84	0.00	0.00	0.00	0.00	0.00	0.00
197	RT	Voltage Support	PGAE	Fresno	10/10/2018	-322	No	DEC	4	2:30	6:00	-79.75	0.00	0.00	2527.51	0.00	0.00	0.00	0.00	0.00	0.00
198	RT	Voltage Support	PGAE	Fresno	10/11/2018	-310	No	DEC	5	1:00	6:00	-443.92	0.00	0.00	28118.09	0.00	0.00	0.00	0.00	0.00	0.00
199	RT	Voltage Support	PGAE	Fresno	10/12/2018	-323	No	DEC	4	2:40	6:00	2.87	0.00	0.00	-376.07	0.00	0.00	0.00	0.00	0.00	0.00
200	RT	Voltage Support	PGAE	Fresno	10/13/2018	-322	No	DEC	8	1:20	9:00	-67.76	0.00	0.00	2865.84	0.00	0.00	0.00	0.00	0.00	0.00
201	RT	Voltage Support	PGAE	Fresno	10/13/2018	322	No	INC	1	1:00	1:45	-5.23	0.00	0.00	242.70	24.66	-997.35	0.00	0.00	0.00	0.00
202	RT	Voltage Support	PGAE	Fresno	10/14/2018	-8	No	DEC	22	2:50	0:00	-158.97	0.00	0.00	11125.76	0.00	0.00	0.00	0.00	0.00	0.00
203	RT	Voltage Support	PGAE	Fresno	10/15/2018	-10.5	No	DEC	7	0:00	6:30	-143.70	0.00	0.00	4978.88	0.00	0.00	0.00	0.00	0.00	0.00
204	RT	Voltage Support	PGAE	Fresno	10/16/2018	-308	No	DEC	6	0:00	6:00	-9.90	0.00	0.00	1125.80	0.00	0.00	0.00	0.00	0.00	0.00
205	RT	Voltage Support	PGAE	Fresno	10/17/2018	-5	No	DEC	14	2:10	16:00	-105.37	0.00	0.00	4307.37	0.00	0.00	0.00	0.00	0.00	0.00
206	RT	Voltage Support	PGAE	Fresno	10/19/2018	-315	No	DEC	5	0:55	5:00	-78.57	0.00	0.00	4163.95	0.00	0.00	0.00	0.00	0.00	0.00
207	RT	Voltage Support	PGAE	Fresno	10/21/2018	-315	No	DEC	15	1:50	16:00	-32.99	0.00	0.00	-4582.06	0.00	0.00	0.00	0.00	0.00	0.00
208	RT	Voltage Support	PGAE	Fresno	10/21/2018	-630	No	INC	12	1:45	13:00	9.60	0.00	0.00	-1392.01	0.00	0.00	0.00	0.00	0.00	0.00
209	RT	Voltage Support	PGAE	Fresno	10/22/2018	-319	No	DEC	5	0:15	5:00	-94.03	0.00	0.00	3344.99	0.00	0.00	0.00	0.00	0.00	0.00
210	RT	Voltage Support	PGAE	Fresno	10/22/2018	83	Yes	INC	1	5:15	6:00	-44.04	5304.78	0.00	1720.48	0.00	0.00	0.00	0.00	0.00	0.00
211	RT	Voltage Support	PGAE	Fresno	10/27/2018	-326	No	DEC	4	2:45	6:00	-80.82	0.00	0.00	11092.90	0.00	0.00	0.00	0.00	0.00	0.00
212	RT	Voltage Support	PGAE	Fresno	10/28/2018	-17	No	DEC	11	3:30	14:00	-181.69	0.00	0.00	21328.44	0.00	0.00	0.00	0.00	0.00	0.00

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213	RT	Voltage Support	PGAE	Fresno	10/28/2018	83	No	INC	4	20:00	0:00	-1.08	32897.88	0.00	44.93	0.00	0.00	0.00	0.00	0.00	0.00
214	RT	Voltage Support	PGAE	Fresno	10/29/2018	83	No	INC	7	0:00	7:00	-83.50	57571.29	0.00	3804.92	0.00	0.00	0.00	0.00	0.00	0.00
215	RT	Voltage Support	PGAE	Sierra	10/4/2018	2	No	INC	2	3:50	5:00	0.83	0.00	0.00	-25.40	0.83	-25.24	0.00	0.00	0.00	0.00
216	RT	Voltage Support	PGAE	NA	10/11/2018	175	No	INC	1	2:00	3:00	54.24	0.00	0.00	-1872.19	0.00	0.00	0.00	0.00	0.00	0.00
217	RT	Voltage Support	SCE	NA	10/16/2018	200	No	INC	8	8:00	16:00	6.00	184754.41	0.00	-140.26	0.00	0.00	0.00	0.00	0.00	0.00
218	RT	Voltage Support	SCE	NA	10/17/2018	200	No	INC	8	8:00	16:00	5.43	184488.80	0.00	-193.71	0.00	0.00	0.00	0.00	0.00	0.00
219	RT	Voltage Support	SCE	NA	10/18/2018	200	No	INC	8	8:10	16:00	126.52	185592.18	0.00	-3765.75	0.00	0.00	0.00	0.00	0.00	0.00
220	RT	Voltage Support	SCE	NA	10/19/2018	200	No	DEC	24	0:00	0:00	-119.88	-25410.35	0.00	6262.86	0.00	0.00	0.00	0.00	0.00	0.00
221	RT	Voltage Support	SCE	NA	10/20/2018	200	No	DEC	24	0:00	0:00	-155.94	-34591.59	0.00	2990.02	-2.21	0.00	63.32	0.00	-2785.48	0.00
222	RT	Voltage Support	SCE	NA	10/21/2018	200	No	DEC	24	0:00	0:00	14.03	-51474.93	0.00	-791.28	0.00	0.00	0.00	0.00	0.00	0.00
223	RT	Voltage Support	SCE	NA	10/21/2018	200	No	INC	6	8:00	14:00	0.43	3948.87	0.00	-1.46	0.00	0.00	0.00	0.00	0.00	0.00
224	RT	Voltage Support	SCE	NA	10/22/2018	200	No	DEC	24	0:00	0:00	-157.23	11501.29	0.00	2630.39	0.00	0.00	0.00	0.00	0.00	0.00
225	RT	Voltage Support	SCE	NA	10/23/2018	200	No	DEC	24	0:00	0:00	-301.71	27367.25	0.00	6790.29	0.00	0.00	0.00	0.00	0.00	0.00
226	RT	Voltage Support	SCE	NA	10/25/2018	200	No	DEC	24	0:00	0:00	-97.75	-2122.36	0.00	-765.29	0.00	0.00	0.00	0.00	0.00	0.00
227	RT	Voltage Support	SCE	NA	10/26/2018	200	No	DEC	24	0:00	0:00	676.67	-461746.24	0.00	-23552.77	0.00	0.00	0.00	0.00	0.00	0.00
228	RT	Voltage Support	SCE	NA	10/27/2018	200	No	DEC	24	0:00	0:00	-53.79	31181.94	0.00	114.16	0.00	0.00	0.00	0.00	0.00	0.00
229	RT	Voltage Support	SCE	NA	10/28/2018	125 - 200	No	DEC	24	0:00	0:00	-176.81	-11737.34	0.00	2535.81	-9.06	0.00	123.10	0.00	0.00	0.00
230	RT	Voltage Support	SCE	NA	10/29/2018	200	No	DEC	24	0:00	0:00	9.90	0.00	0.00	-569.32	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/October/2018 - 31/October/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 (\$)
231	RT	Voltage Support	SCE	NA	10/30/2018	200	No	DEC	24	0:00	0:00	-46.29	-49.04	0.00	-281.30	0.00	0.00	0.00	0.00	0.00	0.00
232	RT	Voltage Support	SCE	NA	10/31/2018	200	No	DEC	24	0:00	0:00	-25.67	2021.19	0.00	12.20	0.00	0.00	0.00	0.00	0.00	0.00
233	RT	Voltage Support	SCE	NA	10/31/2018	200	No	INC	5	9:00	14:00	1.44	3864.97	0.00	-40.85	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 costs<sup>7</sup>. 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

<sup>7</sup> 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 \* (\$100/MWh-\$10/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 October, this resource was issued exceptional dispatch instructions in 220 five-minute intervals. This resource was eligible to set the LMP in 75 intervals. Out of the 75 intervals, resource calculated LMP was larger than the market LMP in 19 intervals. In the 19 intervals, the average increase in five minute LMP was \$4.73/MWh. Out of the 75 intervals, resource calculated LMP was less than the market LMP in 56 intervals. In the 56 intervals, the average decrease in five minute LMP was \$20.09/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 \$13.81/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 October, this resource was issued exceptional dispatch instructions in 572 five-minute intervals. This resource was eligible to set the LMP in 437 intervals. Out of the 437 intervals, resource calculated LMP was larger than the market LMP in 391 intervals. In the 391 intervals, the average increase in five minute LMP was \$99.62/MWh. Out of the 437 intervals, resource calculated LMP was less than the market LMP in 46 intervals. In the 46 intervals, the average decrease in five minute LMP was \$367.76/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 \$50.42/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	10/2/2018	12	10	21.65	Yes	23.88	2.23
2	10/2/2018	12	11	21.37	Yes	23.88	2.51
3	10/2/2018	12	12	34.64	No	23.88	-10.76
4	10/2/2018	13	1	31.12	No	23.88	-7.24
5	10/2/2018	13	2	23.88	Yes	23.88	0.00
6	10/2/2018	13	3	22.06	Yes	23.88	1.82
7	10/2/2018	13	4	23.88	No	23.88	0.00
8	10/2/2018	13	5	28.90	No	23.88	-5.02
9	10/2/2018	13	6	23.88	No	31.17	7.29
10	10/2/2018	13	7	21.34	No	31.17	9.83
11	10/2/2018	13	8	20.83	No	31.17	10.34
12	10/2/2018	13	9	17.59	No	31.17	13.58
13	10/2/2018	13	10	31.30	No	23.88	-7.42
14	10/2/2018	13	11	23.55	No	23.88	0.33
15	10/2/2018	13	12	25.92	No	23.88	-2.04
16	10/2/2018	14	1	15.49	No	23.88	8.39
17	10/2/2018	14	2	15.06	No	23.88	8.82
18	10/2/2018	14	3	13.30	No	23.88	10.58
19	10/2/2018	14	4	16.58	No	23.88	7.30
20	10/2/2018	14	5	14.62	No	23.88	9.26
21	10/2/2018	14	6	15.43	No	23.88	8.45
22	10/2/2018	14	7	13.53	No	23.88	10.35
23	10/2/2018	14	8	13.35	No	23.88	10.53
24	10/2/2018	14	9	12.86	No	23.88	11.02
25	10/2/2018	14	10	16.34	No	23.88	7.54
26	10/2/2018	14	11	19.07	No	23.88	4.81
27	10/2/2018	14	12	14.40	No	23.88	9.48
28	10/2/2018	15	1	20.54	No	23.88	3.34
29	10/2/2018	15	2	17.40	No	23.88	6.48
30	10/2/2018	15	3	18.99	No	23.88	4.89
31	10/2/2018	15	4	21.94	No	23.88	1.94
32	10/2/2018	15	5	19.92	No	23.88	3.96
33	10/2/2018	15	6	21.62	No	23.88	2.26
34	10/2/2018	15	7	21.61	No	23.88	2.27

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Number	Trade Date	Trade Hour	Interval	Market LMP	Eligible Flag	Calculated LMP	Change in LMP
35	10/2/2018	15	8	20.80	No	23.88	3.08
36	10/2/2018	15	9	20.80	No	23.88	3.08
37	10/2/2018	15	10	19.57	No	23.88	4.31
38	10/2/2018	15	11	20.64	No	23.88	3.24
39	10/2/2018	15	12	19.44	No	23.88	4.44
40	10/2/2018	16	1	22.10	No	23.88	1.78
41	10/2/2018	16	2	21.25	No	23.88	2.63
42	10/2/2018	16	3	19.71	No	23.88	4.17
43	10/2/2018	16	4	41.63	No	23.88	-17.75
44	10/2/2018	16	5	22.67	No	23.88	1.21
45	10/2/2018	16	6	21.81	No	23.88	2.07
46	10/2/2018	16	7	22.65	No	23.88	1.23
47	10/2/2018	16	8	31.28	No	23.88	-7.40
48	10/2/2018	16	9	30.45	No	23.88	-6.57
49	10/2/2018	16	10	24.65	No	23.88	-0.77
50	10/2/2018	16	11	23.88	No	23.88	0.00
51	10/2/2018	16	12	23.88	No	23.88	0.00
52	10/2/2018	17	1	23.88	No	23.88	0.00
53	10/2/2018	17	2	18.89	Yes	23.88	4.99
54	10/2/2018	17	3	12.30	Yes	23.88	11.58
55	10/2/2018	17	4	14.32	Yes	23.88	9.56
56	10/2/2018	17	5	15.30	Yes	23.88	8.58
57	10/2/2018	17	6	15.30	Yes	23.88	8.58
58	10/2/2018	17	7	17.55	Yes	23.88	6.33
59	10/2/2018	17	8	25.26	Yes	23.88	-1.38
60	10/2/2018	17	9	30.29	Yes	23.88	-6.41
61	10/2/2018	17	10	30.48	Yes	23.88	-6.60
62	10/2/2018	17	11	29.20	Yes	23.88	-5.32
63	10/2/2018	17	12	37.35	Yes	23.88	-13.47
64	10/2/2018	18	1	31.30	No	23.88	-7.42
65	10/2/2018	18	2	41.95	Yes	23.88	-18.07
66	10/2/2018	18	3	39.14	Yes	23.88	-15.26
67	10/2/2018	18	4	23.88	No	23.88	0.00
68	10/2/2018	18	5	24.43	No	23.88	-0.55
69	10/2/2018	18	6	25.88	No	23.88	-2.00
70	10/2/2018	18	7	26.34	No	23.88	-2.46
71	10/2/2018	18	8	32.70	No	23.88	-8.82
72	10/2/2018	18	9	58.24	No	23.88	-34.36

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Number	Trade Date	Trade Hour	Interval	Market LMP	Eligible Flag	Calculated LMP	Change in LMP
73	10/2/2018	18	10	31.17	No	23.88	-7.29
74	10/2/2018	18	11	66.86	No	23.88	-42.98
75	10/2/2018	18	12	1002.30	No	23.88	-978.42
76	10/2/2018	19	1	1016.30	No	23.88	-992.42
77	10/2/2018	19	2	1016.30	No	23.88	-992.42
78	10/2/2018	19	3	1016.30	No	23.88	-992.42
79	10/2/2018	19	4	1017.30	No	23.88	-993.42
80	10/2/2018	19	5	1017.30	No	23.88	-993.42
81	10/2/2018	19	6	1017.30	No	23.88	-993.42
82	10/2/2018	19	7	1016.00	No	23.88	-992.12
83	10/2/2018	19	8	1016.00	No	23.88	-992.12
84	10/2/2018	19	9	947.67	No	23.88	-923.79
85	10/2/2018	19	10	135.24	No	23.88	-111.36
86	10/2/2018	19	11	68.74	No	23.88	-44.86
87	10/2/2018	19	12	47.08	No	23.88	-23.20
88	10/2/2018	20	1	65.38	No	23.88	-41.50
89	10/2/2018	20	2	96.01	No	23.88	-72.13
90	10/2/2018	20	3	90.72	No	23.88	-66.84
91	10/2/2018	20	4	98.01	No	23.88	-74.13
92	10/2/2018	20	5	95.40	No	23.88	-71.52
93	10/2/2018	20	6	90.45	No	23.88	-66.57
94	10/2/2018	20	7	80.78	No	23.88	-56.90
95	10/2/2018	20	8	67.63	No	23.88	-43.75
96	10/2/2018	20	9	45.52	No	23.88	-21.64
97	10/2/2018	20	10	40.50	No	23.88	-16.62
98	10/2/2018	20	11	35.14	No	23.88	-11.26
99	10/2/2018	20	12	32.67	No	23.88	-8.79
100	10/2/2018	21	1	42.26	No	23.88	-18.38
101	10/2/2018	21	2	41.19	No	23.88	-17.31
102	10/2/2018	21	3	40.88	No	23.88	-17.00
103	10/2/2018	21	4	41.18	No	23.88	-17.30
104	10/2/2018	21	5	41.20	No	23.88	-17.32
105	10/2/2018	21	6	35.90	No	23.88	-12.02
106	10/2/2018	21	7	35.18	No	23.88	-11.30
107	10/2/2018	21	8	31.98	No	23.88	-8.10
108	10/2/2018	21	9	33.00	No	23.88	-9.12
109	10/2/2018	21	10	32.44	No	23.88	-8.56
110	10/2/2018	21	11	32.44	No	23.88	-8.56

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Number	Trade Date	Trade Hour	Interval	Market LMP	Eligible Flag	Calculated LMP	Change in LMP
111	10/2/2018	21	12	33.77	No	23.88	-9.89
112	10/2/2018	22	1	40.99	No	23.88	-17.11
113	10/2/2018	22	2	35.88	No	23.88	-12.00
114	10/2/2018	22	3	36.37	No	23.88	-12.49
115	10/2/2018	22	4	46.98	No	23.88	-23.10
116	10/2/2018	22	5	51.29	No	23.88	-27.41
117	10/2/2018	22	6	46.98	No	23.88	-23.10
118	10/2/2018	22	7	39.42	No	23.88	-15.54
119	10/2/2018	22	8	32.16	No	23.88	-8.28
120	10/2/2018	22	9	32.16	No	23.88	-8.28
121	10/2/2018	22	10	33.81	No	23.88	-9.93
122	10/2/2018	22	11	35.11	No	23.88	-11.23
123	10/2/2018	22	12	37.10	No	23.88	-13.22
124	10/3/2018	15	6	33.67	Yes	24.57	-9.10
125	10/3/2018	15	7	36.30	Yes	24.57	-11.73
126	10/3/2018	15	8	35.98	Yes	24.57	-11.41
127	10/3/2018	15	9	36.08	Yes	24.57	-11.51
128	10/3/2018	15	10	43.87	Yes	24.57	-19.30
129	10/3/2018	15	11	40.16	Yes	24.57	-15.59
130	10/3/2018	15	12	34.40	Yes	24.57	-9.83
131	10/3/2018	16	1	31.01	Yes	24.57	-6.44
132	10/3/2018	16	2	31.51	Yes	24.57	-6.94
133	10/3/2018	16	3	29.58	Yes	24.57	-5.01
134	10/3/2018	16	4	29.57	Yes	24.57	-5.00
135	10/3/2018	16	5	32.08	Yes	24.57	-7.51
136	10/3/2018	16	6	33.14	Yes	24.57	-8.57
137	10/3/2018	16	7	38.16	Yes	24.57	-13.59
138	10/3/2018	16	8	37.79	Yes	24.57	-13.22
139	10/3/2018	16	9	50.34	Yes	24.57	-25.77
140	10/3/2018	16	10	48.32	Yes	24.57	-23.75
141	10/3/2018	16	11	40.25	Yes	24.57	-15.68
142	10/3/2018	16	12	39.56	Yes	24.57	-14.99
143	10/3/2018	17	1	57.31	Yes	24.57	-32.74
144	10/3/2018	17	2	55.92	Yes	24.57	-31.35
145	10/3/2018	17	3	53.27	Yes	24.57	-28.70
146	10/3/2018	17	4	43.43	Yes	24.57	-18.86
147	10/3/2018	17	5	43.31	Yes	24.57	-18.74
148	10/3/2018	17	6	47.77	Yes	24.57	-23.20

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Number	Trade Date	Trade Hour	Interval	Market LMP	Eligible Flag	Calculated LMP	Change in LMP
149	10/3/2018	17	7	113.79	Yes	24.57	-89.22
150	10/3/2018	17	8	129.13	Yes	24.57	-104.56
151	10/3/2018	17	9	277.66	Yes	24.57	-253.09
152	10/3/2018	17	10	100.56	Yes	24.57	-75.99
153	10/3/2018	17	11	71.20	Yes	24.57	-46.63
154	10/3/2018	17	12	57.63	Yes	24.57	-33.06
155	10/3/2018	18	1	34.26	Yes	24.57	-9.69
156	10/3/2018	18	2	30.80	Yes	24.57	-6.23
157	10/3/2018	18	3	25.56	Yes	24.57	-0.99
158	10/3/2018	18	4	26.30	Yes	24.57	-1.73
159	10/3/2018	18	5	29.86	Yes	24.57	-5.29
160	10/3/2018	18	6	29.86	Yes	24.57	-5.29
161	10/3/2018	18	7	29.80	Yes	24.57	-5.23
162	10/3/2018	18	8	30.00	Yes	24.57	-5.43
163	10/3/2018	18	9	35.45	Yes	24.57	-10.88
164	10/3/2018	18	10	44.80	No	24.57	-20.23
165	10/3/2018	18	11	44.80	No	24.57	-20.23
166	10/3/2018	18	12	41.43	No	24.57	-16.86
167	10/3/2018	19	1	26.63	No	24.57	-2.06
168	10/3/2018	19	2	27.51	No	24.57	-2.94
169	10/3/2018	19	3	26.63	No	24.57	-2.06
170	10/3/2018	19	4	28.68	No	24.57	-4.11
171	10/3/2018	19	5	30.44	No	24.57	-5.87
172	10/3/2018	19	6	31.52	No	24.57	-6.95
173	10/3/2018	19	7	31.68	No	24.57	-7.11
174	10/3/2018	19	8	35.44	No	24.57	-10.87
175	10/3/2018	19	9	38.94	No	24.57	-14.37
176	10/3/2018	19	10	37.62	No	24.57	-13.05
177	10/3/2018	19	11	39.32	No	24.57	-14.75
178	10/3/2018	19	12	36.62	No	24.57	-12.05
179	10/3/2018	20	1	39.47	No	24.57	-14.90
180	10/3/2018	20	2	42.05	No	24.57	-17.48
181	10/3/2018	20	3	39.90	No	24.57	-15.33
182	10/3/2018	20	4	39.41	No	24.57	-14.84
183	10/3/2018	20	5	42.49	No	24.57	-17.92
184	10/3/2018	20	6	40.76	No	24.57	-16.19
185	10/3/2018	20	7	40.32	No	24.57	-15.75
186	10/3/2018	20	8	32.08	No	24.57	-7.51

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Number	Trade Date	Trade Hour	Interval	Market LMP	Eligible Flag	Calculated LMP	Change in LMP
187	10/3/2018	20	9	32.08	No	24.57	-7.51
188	10/3/2018	20	10	30.41	No	24.57	-5.84
189	10/3/2018	20	11	30.41	No	24.57	-5.84
190	10/3/2018	20	12	30.41	No	24.57	-5.84
191	10/3/2018	21	1	30.99	No	24.57	-6.42
192	10/3/2018	21	2	31.40	No	24.57	-6.83
193	10/3/2018	21	3	31.39	No	24.57	-6.82
194	10/3/2018	21	4	31.60	No	24.57	-7.03
195	10/3/2018	21	5	30.75	No	24.57	-6.18
196	10/3/2018	21	6	31.20	No	24.57	-6.63
197	10/3/2018	21	7	32.08	No	24.57	-7.51
198	10/3/2018	21	8	30.93	No	24.57	-6.36
199	10/3/2018	21	9	30.13	No	24.57	-5.56
200	10/3/2018	21	10	30.05	No	24.57	-5.48
201	10/3/2018	21	11	27.99	No	24.57	-3.42
202	10/3/2018	21	12	29.15	No	24.57	-4.58
203	10/4/2018	19	1	20.52	Yes	24.58	4.06
204	10/4/2018	19	2	21.97	Yes	24.58	2.61
205	10/4/2018	19	3	23.11	Yes	24.58	1.47
206	10/4/2018	19	4	24.14	Yes	24.58	0.44
207	10/4/2018	19	5	23.62	Yes	24.58	0.96
208	10/4/2018	19	6	24.77	Yes	24.58	-0.19
209	10/4/2018	19	7	25.00	Yes	24.58	-0.42
210	10/4/2018	19	8	24.77	Yes	24.58	-0.19
211	10/4/2018	19	9	25.26	Yes	24.58	-0.68
212	10/4/2018	19	10	26.42	Yes	24.58	-1.84
213	10/4/2018	19	11	26.74	Yes	24.58	-2.16
214	10/4/2018	19	12	26.42	Yes	24.58	-1.84
215	10/24/2018	18	1	32.88	Yes	38.85	5.97
216	10/24/2018	18	2	32.73	Yes	38.85	6.12
217	10/24/2018	18	3	32.73	Yes	38.85	6.12
218	10/24/2018	18	4	33.00	Yes	38.85	5.85
219	10/24/2018	18	5	39.14	Yes	38.85	-0.29
220	10/24/2018	18	6	48.16	Yes	38.85	-9.31

**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	10/1/2018	16	1	55.81	Yes	55.06	-0.75
2	10/1/2018	16	2	56.19	Yes	55.06	-1.13
3	10/1/2018	16	3	56.62	Yes	55.06	-1.56
4	10/1/2018	16	4	61.39	Yes	56.34	-5.05
5	10/1/2018	16	5	61.19	Yes	55.06	-6.13
6	10/1/2018	16	6	60.89	Yes	55.06	-5.83
7	10/1/2018	16	7	62.11	Yes	55.90	-6.21
8	10/1/2018	16	8	69.89	Yes	55.90	-13.99
9	10/1/2018	16	9	73.54	Yes	55.90	-17.64
10	10/1/2018	16	10	70.52	Yes	59.53	-10.99
11	10/1/2018	16	11	65.96	Yes	56.88	-9.08
12	10/1/2018	16	12	54.15	Yes	55.06	0.91
13	10/1/2018	17	1	55.34	Yes	55.06	-0.28
14	10/1/2018	17	2	46.08	Yes	55.06	8.98
15	10/1/2018	17	3	42.00	Yes	55.06	13.06
16	10/1/2018	17	4	54.31	Yes	137.12	82.81
17	10/1/2018	17	5	56.31	Yes	56.31	0.00
18	10/1/2018	17	6	56.30	Yes	56.31	0.01
19	10/1/2018	17	7	50.90	Yes	137.12	86.22
20	10/1/2018	17	8	53.62	Yes	137.12	83.50
21	10/1/2018	17	9	79.85	Yes	137.12	57.27
22	10/1/2018	17	10	71.68	Yes	137.12	65.44
23	10/1/2018	17	11	149.14	Yes	137.12	-12.02
24	10/1/2018	17	12	85.05	Yes	137.12	52.07
25	10/1/2018	18	1	48.86	Yes	137.12	88.26
26	10/1/2018	18	2	50.99	Yes	137.12	86.13
27	10/1/2018	18	3	49.98	Yes	55.06	5.08
28	10/1/2018	18	4	50.89	Yes	55.06	4.17
29	10/1/2018	18	5	53.17	Yes	55.06	1.89
30	10/1/2018	18	6	58.88	Yes	55.06	-3.82
31	10/1/2018	18	7	187.84	Yes	137.12	-50.72
32	10/1/2018	18	8	127.33	Yes	137.12	9.79
33	10/1/2018	18	9	137.12	Yes	137.12	0.00
34	10/1/2018	18	10	88.74	Yes	137.12	48.38

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Number	Trade Date	Trade Hour	Interval	Market LMP	Eligible Flag	Calculated LMP	Change in LMP
35	10/1/2018	18	11	89.87	Yes	137.12	47.25
36	10/1/2018	18	12	88.12	Yes	137.12	49.00
37	10/1/2018	19	1	50.91	Yes	137.12	86.21
38	10/1/2018	19	2	48.60	Yes	55.06	6.46
39	10/1/2018	19	3	47.49	Yes	55.06	7.57
40	10/1/2018	19	4	51.57	Yes	137.12	85.55
41	10/1/2018	19	5	50.95	Yes	137.12	86.17
42	10/1/2018	19	6	54.85	Yes	137.12	82.27
43	10/1/2018	19	7	52.93	Yes	137.12	84.19
44	10/1/2018	19	8	53.83	Yes	137.12	83.29
45	10/1/2018	19	9	53.44	Yes	137.12	83.68
46	10/1/2018	19	10	63.86	Yes	58.72	-5.14
47	10/1/2018	19	11	56.12	Yes	56.12	0.00
48	10/1/2018	19	12	82.02	Yes	55.06	-26.96
49	10/1/2018	20	1	56.93	Yes	137.12	80.19
50	10/1/2018	20	2	270.28	Yes	137.12	-133.16
51	10/1/2018	20	3	84.52	Yes	137.12	52.60
52	10/1/2018	20	4	67.44	Yes	67.44	0.00
53	10/1/2018	20	5	60.73	Yes	59.24	-1.49
54	10/1/2018	20	6	70.38	Yes	55.51	-14.87
55	10/1/2018	20	7	61.13	Yes	137.12	75.99
56	10/1/2018	20	8	55.06	Yes	55.06	0.00
57	10/1/2018	20	9	48.10	Yes	55.06	6.96
58	10/1/2018	20	10	68.83	Yes	55.06	-13.77
59	10/1/2018	20	11	52.38	Yes	55.06	2.68
60	10/1/2018	20	12	47.87	Yes	55.06	7.19
61	10/2/2018	8	11	57.00	Yes	134.90	77.90
62	10/2/2018	8	12	1015.30	Yes	134.90	-880.40
63	10/2/2018	9	1	1000.00	Yes	134.90	-865.10
64	10/2/2018	9	2	1000.00	Yes	134.90	-865.10
65	10/2/2018	9	3	1000.00	Yes	134.90	-865.10
66	10/2/2018	9	4	1000.00	Yes	134.90	-865.10
67	10/2/2018	9	5	1000.00	Yes	134.90	-865.10
68	10/2/2018	9	6	1000.00	Yes	134.90	-865.10
69	10/2/2018	9	7	1003.40	Yes	134.90	-868.50
70	10/2/2018	9	8	994.35	Yes	134.90	-859.45
71	10/2/2018	9	9	54.60	Yes	134.90	80.30
72	10/2/2018	9	10	49.32	Yes	134.90	85.58



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Number	Trade Date	Trade Hour	Interval	Market LMP	Eligible Flag	Calculated LMP	Change in LMP
73	10/2/2018	9	11	42.31	Yes	134.90	92.59
74	10/2/2018	9	12	42.42	Yes	134.90	92.48
75	10/2/2018	10	1	46.22	Yes	134.90	88.68
76	10/2/2018	10	2	48.93	Yes	134.90	85.97
77	10/2/2018	10	3	44.51	Yes	134.90	90.39
78	10/2/2018	10	4	31.70	Yes	134.90	103.20
79	10/2/2018	10	5	31.70	Yes	134.90	103.20
80	10/2/2018	10	6	36.59	Yes	134.90	98.31
81	10/2/2018	10	7	31.96	Yes	134.90	102.94
82	10/2/2018	10	8	31.36	Yes	134.90	103.54
83	10/2/2018	10	9	31.64	Yes	134.90	103.26
84	10/2/2018	10	10	31.36	Yes	134.90	103.54
85	10/2/2018	10	11	28.44	Yes	134.90	106.46
86	10/2/2018	10	12	24.17	Yes	134.90	110.73
87	10/2/2018	11	1	23.74	Yes	134.90	111.16
88	10/2/2018	11	2	23.57	Yes	134.90	111.33
89	10/2/2018	11	3	20.93	Yes	134.90	113.97
90	10/2/2018	11	4	16.01	Yes	134.90	118.89
91	10/2/2018	11	5	15.84	Yes	134.90	119.06
92	10/2/2018	11	6	-4.86	Yes	134.90	139.76
93	10/2/2018	11	7	14.14	Yes	134.90	120.76
94	10/2/2018	11	8	13.74	Yes	134.90	121.16
95	10/2/2018	11	9	8.11	Yes	134.90	126.79
96	10/2/2018	11	10	13.79	Yes	134.90	121.11
97	10/2/2018	11	11	6.52	Yes	134.90	128.38
98	10/2/2018	11	12	18.09	Yes	134.90	116.81
99	10/2/2018	12	1	24.61	Yes	134.90	110.29
100	10/2/2018	12	2	20.03	Yes	134.90	114.87
101	10/2/2018	12	3	20.41	Yes	134.90	114.49
102	10/2/2018	12	4	19.82	Yes	134.90	115.08
103	10/2/2018	12	5	21.57	Yes	134.90	113.33
104	10/2/2018	12	6	21.96	Yes	134.90	112.94
105	10/2/2018	12	7	21.28	Yes	134.90	113.62
106	10/2/2018	12	8	21.09	Yes	134.90	113.81
107	10/2/2018	12	9	22.21	Yes	134.90	112.69
108	10/2/2018	12	10	22.24	Yes	134.90	112.66
109	10/2/2018	12	11	22.03	Yes	134.90	112.87
110	10/2/2018	12	12	31.48	Yes	134.90	103.42

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Number	Trade Date	Trade Hour	Interval	Market LMP	Eligible Flag	Calculated LMP	Change in LMP
111	10/2/2018	13	1	31.54	Yes	134.90	103.36
112	10/2/2018	13	2	30.99	Yes	134.90	103.91
113	10/2/2018	13	3	23.68	Yes	134.90	111.22
114	10/2/2018	13	4	24.77	Yes	134.90	110.13
115	10/2/2018	13	5	29.44	Yes	134.90	105.46
116	10/2/2018	13	6	25.42	Yes	134.90	109.48
117	10/2/2018	13	7	19.92	Yes	134.90	114.98
118	10/2/2018	13	8	22.80	Yes	134.90	112.10
119	10/2/2018	13	9	20.28	Yes	134.90	114.62
120	10/2/2018	13	10	30.72	Yes	134.90	104.18
121	10/2/2018	13	11	25.70	Yes	134.90	109.20
122	10/2/2018	13	12	27.97	Yes	134.90	106.93
123	10/2/2018	14	1	18.85	Yes	134.90	116.05
124	10/2/2018	14	2	17.18	Yes	134.90	117.72
125	10/2/2018	14	3	16.01	Yes	134.90	118.89
126	10/2/2018	14	4	18.55	Yes	134.90	116.35
127	10/2/2018	14	5	17.31	Yes	134.90	117.59
128	10/2/2018	14	6	18.13	Yes	134.90	116.77
129	10/2/2018	14	7	16.23	Yes	134.90	118.67
130	10/2/2018	14	8	15.56	Yes	134.90	119.34
131	10/2/2018	14	9	14.56	Yes	134.90	120.34
132	10/2/2018	14	10	17.72	Yes	134.90	117.18
133	10/2/2018	14	11	20.34	Yes	134.90	114.56
134	10/2/2018	14	12	16.29	Yes	134.90	118.61
135	10/2/2018	15	1	21.62	Yes	134.90	113.28
136	10/2/2018	15	2	18.85	Yes	134.90	116.05
137	10/2/2018	15	3	20.06	Yes	134.90	114.84
138	10/2/2018	15	4	22.97	Yes	134.90	111.93
139	10/2/2018	15	5	21.14	Yes	134.90	113.76
140	10/2/2018	15	6	22.69	Yes	134.90	112.21
141	10/2/2018	15	7	22.76	Yes	134.90	112.14
142	10/2/2018	15	8	22.04	Yes	134.90	112.86
143	10/2/2018	15	9	22.04	Yes	134.90	112.86
144	10/2/2018	15	10	20.93	Yes	134.90	113.97
145	10/2/2018	15	11	18.94	Yes	134.90	115.96
146	10/2/2018	15	12	20.81	Yes	134.90	114.09
147	10/2/2018	16	1	23.47	Yes	134.90	111.43
148	10/2/2018	16	2	22.54	Yes	134.90	112.36

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Number	Trade Date	Trade Hour	Interval	Market LMP	Eligible Flag	Calculated LMP	Change in LMP
149	10/2/2018	16	3	21.80	Yes	134.90	113.10
150	10/2/2018	16	4	29.73	Yes	134.90	105.17
151	10/2/2018	16	5	23.92	Yes	134.90	110.98
152	10/2/2018	16	6	23.09	Yes	134.90	111.81
153	10/2/2018	16	7	23.54	Yes	134.90	111.36
154	10/2/2018	16	8	34.49	Yes	134.90	100.41
155	10/2/2018	16	9	32.39	Yes	134.90	102.51
156	10/2/2018	16	10	26.89	Yes	134.90	108.01
157	10/2/2018	16	11	26.14	Yes	134.90	108.76
158	10/2/2018	16	12	56.48	Yes	134.90	78.42
159	10/2/2018	17	1	21.61	Yes	134.90	113.29
160	10/2/2018	17	2	19.85	Yes	134.90	115.05
161	10/2/2018	17	3	13.74	Yes	134.90	121.16
162	10/2/2018	17	4	16.39	Yes	134.90	118.51
163	10/2/2018	17	5	16.88	Yes	134.90	118.02
164	10/2/2018	17	6	16.88	Yes	134.90	118.02
165	10/2/2018	17	7	18.78	Yes	134.90	116.12
166	10/2/2018	17	8	26.13	Yes	134.90	108.77
167	10/2/2018	17	9	31.91	Yes	134.90	102.99
168	10/2/2018	17	10	31.86	Yes	134.90	103.04
169	10/2/2018	17	11	30.42	Yes	134.90	104.48
170	10/2/2018	17	12	38.42	Yes	134.90	96.48
171	10/2/2018	18	1	33.08	Yes	134.90	101.82
172	10/2/2018	18	2	31.07	Yes	134.90	103.83
173	10/2/2018	18	3	29.28	Yes	134.90	105.62
174	10/2/2018	18	4	25.23	Yes	134.90	109.67
175	10/2/2018	18	5	25.09	Yes	134.90	109.81
176	10/2/2018	18	6	26.45	Yes	134.90	108.45
177	10/2/2018	18	7	26.79	Yes	134.90	108.11
178	10/2/2018	18	8	32.79	Yes	134.90	102.11
179	10/2/2018	18	9	58.55	Yes	134.90	76.35
180	10/2/2018	18	10	69.43	Yes	134.90	65.47
181	10/2/2018	18	11	66.70	Yes	134.90	68.20
182	10/2/2018	18	12	999.80	Yes	134.90	-864.90
183	10/2/2018	19	1	1005.40	Yes	134.90	-870.50
184	10/2/2018	19	2	1005.40	Yes	134.90	-870.50
185	10/2/2018	19	3	1005.40	Yes	134.90	-870.50
186	10/2/2018	19	4	1009.80	Yes	134.90	-874.90

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187	10/2/2018	19	5	1009.80	Yes	134.90	-874.90
188	10/2/2018	19	6	1009.80	Yes	134.90	-874.90
189	10/2/2018	19	7	1002.60	Yes	134.90	-867.70
190	10/2/2018	19	8	1002.60	Yes	134.90	-867.70
191	10/2/2018	19	9	935.17	Yes	134.90	-800.27
192	10/2/2018	19	10	133.19	Yes	134.90	1.71
193	10/2/2018	19	11	67.70	Yes	134.90	67.20
194	10/2/2018	19	12	46.36	Yes	66.51	20.15
195	10/2/2018	20	1	64.42	Yes	134.90	70.48
196	10/2/2018	20	2	94.61	Yes	134.90	40.29
197	10/2/2018	20	3	89.40	Yes	134.90	45.50
198	10/2/2018	20	4	96.26	Yes	134.90	38.64
199	10/2/2018	20	5	93.69	Yes	134.90	41.21
200	10/2/2018	20	6	88.83	Yes	134.90	46.07
201	10/2/2018	20	7	79.45	Yes	134.90	55.45
202	10/2/2018	20	8	66.51	Yes	134.90	68.39
203	10/2/2018	20	9	44.76	Yes	134.90	90.14
204	10/2/2018	20	10	39.82	Yes	134.90	95.08
205	10/2/2018	20	11	33.39	Yes	134.90	101.51
206	10/2/2018	20	12	30.43	Yes	134.90	104.47
207	10/2/2018	21	1	41.87	Yes	56.65	14.78
208	10/2/2018	21	2	40.72	Yes	56.65	15.93
209	10/2/2018	21	3	40.41	Yes	56.65	16.24
210	10/2/2018	21	4	40.60	Yes	134.90	94.30
211	10/2/2018	21	5	40.63	Yes	134.90	94.27
212	10/2/2018	21	6	35.40	Yes	134.90	99.50
213	10/2/2018	21	7	33.62	Yes	134.90	101.28
214	10/2/2018	21	8	29.75	Yes	134.90	105.15
215	10/2/2018	21	9	30.99	Yes	134.90	103.91
216	10/2/2018	21	10	32.42	Yes	134.90	102.48
217	10/2/2018	21	11	32.42	Yes	134.90	102.48
218	10/2/2018	21	12	33.76	Yes	134.90	101.14
219	10/2/2018	22	1	41.00	Yes	134.90	93.90
220	10/2/2018	22	2	35.89	Yes	134.90	99.01
221	10/2/2018	22	3	36.38	Yes	134.90	98.52
222	10/2/2018	22	4	46.78	Yes	134.90	88.12
223	10/2/2018	22	5	51.07	Yes	134.90	83.83
224	10/2/2018	22	6	46.78	Yes	134.90	88.12

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225	10/2/2018	22	7	39.24	Yes	134.90	95.66
226	10/2/2018	22	8	32.01	Yes	134.90	102.89
227	10/2/2018	22	9	32.01	Yes	134.90	102.89
228	10/2/2018	22	10	33.56	Yes	134.90	101.34
229	10/2/2018	22	11	34.85	Yes	134.90	100.05
230	10/2/2018	22	12	36.83	Yes	134.90	98.07
231	10/3/2018	15	1	39.66	Yes	55.31	15.65
232	10/3/2018	15	2	41.32	Yes	55.31	13.99
233	10/3/2018	15	3	42.62	Yes	55.31	12.69
234	10/3/2018	15	4	36.92	Yes	55.31	18.39
235	10/3/2018	15	5	38.08	Yes	55.31	17.23
236	10/3/2018	15	6	37.77	Yes	55.31	17.54
237	10/3/2018	15	7	42.01	Yes	55.31	13.30
238	10/3/2018	15	8	40.84	Yes	55.31	14.47
239	10/3/2018	15	9	40.73	Yes	55.31	14.58
240	10/3/2018	15	10	50.16	Yes	55.31	5.15
241	10/3/2018	15	11	45.68	Yes	55.31	9.63
242	10/3/2018	15	12	38.76	Yes	55.31	16.55
243	10/3/2018	16	1	33.55	Yes	55.31	21.76
244	10/3/2018	16	2	31.48	Yes	55.31	23.83
245	10/3/2018	16	3	29.56	Yes	55.31	25.75
246	10/3/2018	16	4	29.52	Yes	55.31	25.79
247	10/3/2018	16	5	33.77	Yes	55.31	21.54
248	10/3/2018	16	6	35.87	Yes	55.31	19.44
249	10/3/2018	16	7	43.62	Yes	55.31	11.69
250	10/3/2018	16	8	43.59	Yes	55.31	11.72
251	10/3/2018	16	9	58.42	Yes	55.31	-3.11
252	10/3/2018	16	10	56.06	Yes	55.31	-0.75
253	10/3/2018	16	11	46.17	Yes	55.31	9.14
254	10/3/2018	16	12	45.32	Yes	55.31	9.99
255	10/3/2018	17	1	46.41	Yes	55.31	8.90
256	10/3/2018	17	2	45.04	Yes	55.31	10.27
257	10/3/2018	17	3	42.93	Yes	55.31	12.38
258	10/3/2018	17	4	49.90	Yes	55.31	5.41
259	10/3/2018	17	5	49.69	Yes	55.31	5.62
260	10/3/2018	17	6	55.31	Yes	55.31	0.00
261	10/3/2018	17	7	52.76	Yes	55.31	2.55
262	10/3/2018	17	8	55.88	Yes	55.31	-0.57

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263	10/3/2018	17	9	162.51	Yes	55.31	-107.20
264	10/3/2018	17	10	78.43	Yes	55.31	-23.12
265	10/3/2018	17	11	54.78	Yes	55.31	0.53
266	10/3/2018	17	12	61.42	Yes	55.31	-6.11
267	10/3/2018	18	1	34.01	Yes	136.01	102.00
268	10/3/2018	18	2	30.59	Yes	136.01	105.42
269	10/3/2018	18	3	25.38	Yes	136.01	110.63
270	10/3/2018	18	4	26.16	Yes	136.01	109.85
271	10/3/2018	18	5	29.70	Yes	136.01	106.31
272	10/3/2018	18	6	29.70	Yes	136.01	106.31
273	10/3/2018	18	7	29.86	Yes	136.01	106.15
274	10/3/2018	18	8	30.06	Yes	136.01	105.95
275	10/3/2018	18	9	35.52	Yes	136.01	100.49
276	10/3/2018	18	10	45.46	Yes	136.01	90.55
277	10/3/2018	18	11	45.46	Yes	136.01	90.55
278	10/3/2018	18	12	42.04	Yes	136.01	93.97
279	10/3/2018	19	1	26.80	Yes	136.01	109.21
280	10/3/2018	19	2	27.69	Yes	136.01	108.32
281	10/3/2018	19	3	26.80	Yes	136.01	109.21
282	10/3/2018	19	4	29.12	Yes	136.01	106.89
283	10/3/2018	19	5	30.90	Yes	136.01	105.11
284	10/3/2018	19	6	32.01	Yes	136.01	104.00
285	10/3/2018	19	7	32.57	Yes	136.01	103.44
286	10/3/2018	19	8	36.43	Yes	136.01	99.58
287	10/3/2018	19	9	40.03	Yes	136.01	95.98
288	10/3/2018	19	10	38.44	Yes	136.01	97.57
289	10/3/2018	19	11	40.18	Yes	136.01	95.83
290	10/3/2018	19	12	37.42	Yes	136.01	98.59
291	10/3/2018	20	1	40.39	Yes	136.01	95.62
292	10/3/2018	20	2	43.03	Yes	136.01	92.98
293	10/3/2018	20	3	40.84	Yes	136.01	95.17
294	10/3/2018	20	4	40.18	Yes	136.01	95.83
295	10/3/2018	20	5	43.32	Yes	136.01	92.69
296	10/3/2018	20	6	41.55	Yes	136.01	94.46
297	10/3/2018	20	7	41.14	Yes	136.01	94.87
298	10/3/2018	20	8	32.74	Yes	136.01	103.27
299	10/3/2018	20	9	32.74	Yes	136.01	103.27
300	10/3/2018	20	10	30.96	Yes	136.01	105.05

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301	10/3/2018	20	11	30.96	Yes	136.01	105.05
302	10/3/2018	20	12	30.96	Yes	136.01	105.05
303	10/3/2018	21	1	31.52	Yes	136.01	104.49
304	10/3/2018	21	2	31.93	Yes	136.01	104.08
305	10/3/2018	21	3	31.92	Yes	136.01	104.09
306	10/3/2018	21	4	32.15	Yes	136.01	103.86
307	10/3/2018	21	5	31.29	Yes	136.01	104.72
308	10/3/2018	21	6	31.75	Yes	136.01	104.26
309	10/3/2018	21	7	34.14	Yes	136.01	101.87
310	10/3/2018	21	8	31.39	Yes	136.01	104.62
311	10/3/2018	21	9	30.57	Yes	136.01	105.44
312	10/3/2018	21	10	30.55	Yes	136.01	105.46
313	10/3/2018	21	11	28.46	Yes	136.01	107.55
314	10/3/2018	21	12	29.64	Yes	136.01	106.37
315	10/16/2018	17	1	10.17	No	149.73	139.56
316	10/16/2018	17	2	24.40	No	149.73	125.33
317	10/16/2018	17	3	29.72	No	149.73	120.01
318	10/16/2018	17	4	33.06	No	149.73	116.67
319	10/16/2018	17	5	33.06	No	149.73	116.67
320	10/16/2018	17	6	31.49	No	149.73	118.24
321	10/16/2018	17	7	28.30	No	149.73	121.43
322	10/16/2018	17	8	28.30	No	149.73	121.43
323	10/16/2018	17	9	31.21	No	149.73	118.52
324	10/16/2018	17	10	60.16	No	149.73	89.57
325	10/16/2018	17	11	41.30	No	149.73	108.43
326	10/16/2018	17	12	44.66	No	149.73	105.07
327	10/16/2018	18	1	23.86	No	149.73	125.87
328	10/16/2018	18	2	30.14	No	149.73	119.59
329	10/16/2018	18	3	33.24	No	149.73	116.49
330	10/16/2018	18	4	44.26	No	149.73	105.47
331	10/16/2018	18	5	44.28	No	59.30	15.02
332	10/16/2018	18	6	45.93	No	59.30	13.37
333	10/16/2018	18	7	40.85	No	149.73	108.88
334	10/16/2018	18	8	46.56	No	149.73	103.17
335	10/16/2018	18	9	53.45	No	149.73	96.28
336	10/16/2018	18	10	51.39	No	149.73	98.34
337	10/16/2018	18	11	56.48	No	149.73	93.25
338	10/16/2018	18	12	53.03	No	149.73	96.70

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339	10/16/2018	19	1	39.04	Yes	150.95	111.91
340	10/16/2018	19	2	35.49	Yes	150.95	115.46
341	10/16/2018	19	3	35.49	Yes	150.95	115.46
342	10/16/2018	19	4	35.49	Yes	150.95	115.46
343	10/16/2018	19	5	38.56	Yes	150.95	112.39
344	10/16/2018	19	6	40.28	Yes	150.95	110.67
345	10/16/2018	19	7	39.49	Yes	150.95	111.46
346	10/16/2018	19	8	38.56	Yes	150.95	112.39
347	10/16/2018	19	9	39.33	Yes	150.95	111.62
348	10/16/2018	19	10	39.04	Yes	150.95	111.91
349	10/16/2018	19	11	40.28	Yes	150.95	110.67
350	10/16/2018	19	12	45.00	Yes	150.95	105.95
351	10/16/2018	20	1	43.24	Yes	150.95	107.71
352	10/16/2018	20	2	47.32	Yes	150.95	103.63
353	10/16/2018	20	3	47.32	Yes	150.95	103.63
354	10/16/2018	20	4	46.56	Yes	150.95	104.39
355	10/16/2018	20	5	45.00	Yes	150.95	105.95
356	10/16/2018	20	6	43.53	Yes	150.95	107.42
357	10/16/2018	20	7	42.93	Yes	150.95	108.02
358	10/16/2018	20	8	38.56	Yes	150.95	112.39
359	10/16/2018	20	9	39.13	Yes	150.95	111.82
360	10/16/2018	20	10	38.80	Yes	150.95	112.15
361	10/16/2018	20	11	38.80	Yes	150.95	112.15
362	10/16/2018	20	12	39.27	Yes	150.95	111.68
363	10/16/2018	21	1	42.39	Yes	150.95	108.56
364	10/16/2018	21	2	43.45	Yes	150.95	107.50
365	10/16/2018	21	3	40.28	Yes	150.95	110.67
366	10/16/2018	23	1	44.37	No	149.73	105.36
367	10/16/2018	23	2	58.77	No	149.73	90.96
368	10/16/2018	23	3	51.64	No	149.73	98.09
369	10/16/2018	23	4	60.21	No	149.73	89.52
370	10/16/2018	23	5	51.18	No	149.73	98.55
371	10/16/2018	23	6	41.55	No	149.73	108.18
372	10/16/2018	23	7	38.00	No	149.73	111.73
373	10/16/2018	23	8	36.50	No	149.73	113.23
374	10/16/2018	23	9	36.50	No	149.73	113.23
375	10/16/2018	23	10	34.12	No	149.73	115.61
376	10/16/2018	23	11	34.75	No	149.73	114.98



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377	10/16/2018	23	12	36.11	No	149.73	113.62
378	10/16/2018	24	1	39.38	No	149.73	110.35
379	10/16/2018	24	2	39.38	No	149.73	110.35
380	10/16/2018	24	3	37.47	No	149.73	112.26
381	10/16/2018	24	4	39.49	No	149.73	110.24
382	10/16/2018	24	5	39.54	No	149.73	110.19
383	10/16/2018	24	6	39.49	No	149.73	110.24
384	10/16/2018	24	7	33.38	No	149.73	116.35
385	10/16/2018	24	8	34.28	No	149.73	115.45
386	10/16/2018	24	9	33.38	No	149.73	116.35
387	10/16/2018	24	10	33.32	No	149.73	116.41
388	10/16/2018	24	11	32.07	No	149.73	117.66
389	10/16/2018	24	12	33.28	No	149.73	116.45
390	10/17/2018	1	1	37.94	No	170.81	132.87
391	10/17/2018	1	2	43.76	No	170.81	127.05
392	10/17/2018	1	3	44.31	No	170.81	126.50
393	10/17/2018	1	4	43.21	No	170.81	127.60
394	10/17/2018	1	5	42.75	No	170.81	128.06
395	10/17/2018	1	6	40.34	No	170.81	130.47
396	10/17/2018	1	7	38.82	No	170.81	131.99
397	10/17/2018	1	8	37.49	No	170.81	133.32
398	10/17/2018	1	9	37.01	No	170.81	133.80
399	10/17/2018	1	10	35.10	No	170.81	135.71
400	10/17/2018	1	11	35.11	No	170.81	135.70
401	10/17/2018	1	12	35.02	No	170.81	135.79
402	10/17/2018	2	1	37.13	No	170.81	133.68
403	10/17/2018	2	2	37.13	No	170.81	133.68
404	10/17/2018	2	3	37.13	No	170.81	133.68
405	10/17/2018	2	4	36.06	No	170.81	134.75
406	10/17/2018	2	5	30.64	No	170.81	140.17
407	10/17/2018	2	6	30.16	No	170.81	140.65
408	10/17/2018	2	7	30.05	No	170.81	140.76
409	10/17/2018	2	8	30.63	No	170.81	140.18
410	10/17/2018	2	9	30.63	No	170.81	140.18
411	10/17/2018	2	10	31.74	No	170.81	139.07
412	10/17/2018	2	11	30.56	No	170.81	140.25
413	10/17/2018	2	12	29.88	No	170.81	140.93
414	10/17/2018	3	1	31.62	No	170.81	139.19

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415	10/17/2018	3	2	37.15	No	170.81	133.66
416	10/17/2018	3	3	39.72	No	170.81	131.09
417	10/17/2018	3	4	39.83	No	170.81	130.98
418	10/17/2018	3	5	39.83	No	170.81	130.98
419	10/17/2018	3	6	38.16	No	170.81	132.65
420	10/17/2018	3	7	34.56	No	170.81	136.25
421	10/17/2018	3	8	34.95	No	170.81	135.86
422	10/17/2018	3	9	38.03	No	170.81	132.78
423	10/17/2018	3	10	37.18	No	170.81	133.63
424	10/17/2018	3	11	37.24	No	170.81	133.57
425	10/17/2018	3	12	37.24	No	170.81	133.57
426	10/17/2018	4	1	38.51	No	170.81	132.30
427	10/17/2018	4	2	38.05	No	170.81	132.76
428	10/17/2018	4	3	38.05	No	170.81	132.76
429	10/17/2018	4	4	37.06	No	170.81	133.75
430	10/17/2018	4	5	37.04	No	170.81	133.77
431	10/17/2018	4	6	37.04	No	170.81	133.77
432	10/17/2018	4	7	36.82	No	170.81	133.99
433	10/17/2018	4	8	36.19	No	170.81	134.62
434	10/17/2018	4	9	37.77	No	170.81	133.04
435	10/17/2018	4	10	37.79	No	170.81	133.02
436	10/17/2018	4	11	38.04	No	170.81	132.77
437	10/17/2018	4	12	36.99	No	170.81	133.82
438	10/17/2018	5	1	34.83	No	170.81	135.98
439	10/17/2018	5	2	34.40	No	170.81	136.41
440	10/17/2018	5	3	34.85	No	170.81	135.96
441	10/17/2018	5	4	34.95	No	170.81	135.86
442	10/17/2018	5	5	36.00	No	170.81	134.81
443	10/17/2018	5	6	36.00	No	170.81	134.81
444	10/17/2018	5	7	36.86	No	170.81	133.95
445	10/17/2018	5	8	35.99	No	170.81	134.82
446	10/17/2018	5	9	39.93	No	170.81	130.88
447	10/17/2018	5	10	42.23	No	170.81	128.58
448	10/17/2018	5	11	40.96	No	170.81	129.85
449	10/17/2018	5	12	39.96	No	170.81	130.85
450	10/17/2018	6	1	28.30	No	170.81	142.51
451	10/17/2018	6	2	28.70	No	170.81	142.11
452	10/17/2018	6	3	29.01	No	170.81	141.80

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Number	Trade Date	Trade Hour	Interval	Market LMP	Eligible Flag	Calculated LMP	Change in LMP
453	10/17/2018	6	4	30.59	No	170.81	140.22
454	10/17/2018	6	5	34.62	No	170.81	136.19
455	10/17/2018	6	6	34.85	No	170.81	135.96
456	10/17/2018	6	7	39.47	No	170.81	131.34
457	10/17/2018	6	8	39.47	No	170.81	131.34
458	10/17/2018	6	9	39.47	No	170.81	131.34
459	10/17/2018	6	10	39.18	No	170.81	131.63
460	10/17/2018	6	11	39.18	No	170.81	131.63
461	10/17/2018	6	12	40.75	No	170.81	130.06
462	10/17/2018	7	1	33.73	No	170.81	137.08
463	10/17/2018	7	2	33.73	No	170.81	137.08
464	10/17/2018	7	3	34.69	No	170.81	136.12
465	10/17/2018	7	4	35.01	No	170.81	135.80
466	10/17/2018	7	5	40.01	No	170.81	130.80
467	10/17/2018	7	6	40.57	No	170.81	130.24
468	10/17/2018	7	7	38.99	No	170.81	131.82
469	10/17/2018	7	8	41.12	No	170.81	129.69
470	10/17/2018	7	9	41.12	No	170.81	129.69
471	10/17/2018	7	10	40.94	No	170.81	129.87
472	10/17/2018	7	11	41.61	No	170.81	129.20
473	10/17/2018	7	12	38.50	No	170.81	132.31
474	10/17/2018	8	1	35.05	No	170.81	135.76
475	10/17/2018	8	2	39.41	No	170.81	131.40
476	10/17/2018	8	3	39.41	No	170.81	131.40
477	10/17/2018	15	1	2.15	Yes	172.05	169.90
478	10/17/2018	15	2	2.39	Yes	172.05	169.66
479	10/17/2018	15	3	2.39	Yes	172.05	169.66
480	10/17/2018	15	4	2.34	Yes	172.05	169.71
481	10/17/2018	15	5	2.17	Yes	172.05	169.88
482	10/17/2018	15	6	-0.43	Yes	172.05	172.48
483	10/17/2018	15	7	2.07	Yes	172.05	169.98
484	10/17/2018	15	8	-0.65	Yes	172.05	172.70
485	10/17/2018	15	9	0.11	Yes	172.05	171.94
486	10/17/2018	15	10	0.69	Yes	172.05	171.36
487	10/17/2018	15	11	0.65	Yes	172.05	171.40
488	10/17/2018	15	12	0.63	Yes	172.05	171.42
489	10/17/2018	16	1	-2.25	Yes	172.05	174.30
490	10/17/2018	16	2	1.52	Yes	172.05	170.53

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Number	Trade Date	Trade Hour	Interval	Market LMP	Eligible Flag	Calculated LMP	Change in LMP
491	10/17/2018	16	3	1.50	Yes	172.05	170.55
492	10/17/2018	16	4	-0.48	Yes	172.05	172.53
493	10/17/2018	16	5	-1.43	Yes	172.05	173.48
494	10/17/2018	16	6	-1.05	Yes	172.05	173.10
495	10/17/2018	16	7	-1.05	Yes	172.05	173.10
496	10/17/2018	16	8	-1.05	Yes	172.05	173.10
497	10/17/2018	16	9	-1.05	Yes	172.05	173.10
498	10/17/2018	16	10	2.16	Yes	172.05	169.89
499	10/17/2018	16	11	2.00	Yes	172.05	170.05
500	10/17/2018	16	12	1.98	Yes	172.05	170.07
501	10/17/2018	17	1	-2.32	Yes	172.05	174.37
502	10/17/2018	17	2	0.06	Yes	172.05	171.99
503	10/17/2018	17	3	0.53	Yes	172.05	171.52
504	10/17/2018	17	4	-0.68	Yes	172.05	172.73
505	10/17/2018	17	5	1.23	Yes	172.05	170.82
506	10/17/2018	17	6	6.35	Yes	172.05	165.70
507	10/17/2018	17	7	19.04	Yes	172.05	153.01
508	10/17/2018	17	8	21.49	Yes	172.05	150.56
509	10/17/2018	17	9	21.34	Yes	172.05	150.71
510	10/17/2018	17	10	24.97	Yes	172.05	147.08
511	10/17/2018	17	11	27.60	Yes	172.05	144.45
512	10/17/2018	17	12	32.20	Yes	172.05	139.85
513	10/17/2018	18	1	19.55	Yes	172.05	152.50
514	10/17/2018	18	2	23.81	Yes	172.05	148.24
515	10/17/2018	18	3	29.85	Yes	172.05	142.20
516	10/17/2018	18	4	30.28	Yes	172.05	141.77
517	10/17/2018	18	5	36.29	Yes	172.05	135.76
518	10/17/2018	18	6	38.92	Yes	172.05	133.13
519	10/17/2018	18	7	41.09	Yes	172.05	130.96
520	10/17/2018	18	8	54.91	Yes	172.05	117.14
521	10/17/2018	18	9	52.53	Yes	172.05	119.52
522	10/17/2018	18	10	53.18	Yes	172.05	118.87
523	10/17/2018	18	11	54.84	Yes	172.05	117.21
524	10/17/2018	18	12	48.70	Yes	172.05	123.35
525	10/17/2018	19	1	38.28	Yes	172.05	133.77
526	10/17/2018	19	2	38.28	Yes	172.05	133.77
527	10/17/2018	19	3	39.11	Yes	172.05	132.94
528	10/17/2018	19	4	39.33	Yes	172.05	132.72

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Number	Trade Date	Trade Hour	Interval	Market LMP	Eligible Flag	Calculated LMP	Change in LMP
529	10/17/2018	19	5	39.69	Yes	172.05	132.36
530	10/17/2018	19	6	39.67	Yes	172.05	132.38
531	10/17/2018	19	7	39.49	Yes	172.05	132.56
532	10/17/2018	19	8	39.49	Yes	172.05	132.56
533	10/17/2018	19	9	40.19	Yes	172.05	131.86
534	10/17/2018	19	10	41.47	Yes	172.05	130.58
535	10/17/2018	19	11	41.55	Yes	172.05	130.50
536	10/17/2018	19	12	42.13	Yes	172.05	129.92
537	10/17/2018	20	1	41.48	Yes	172.05	130.57
538	10/17/2018	20	2	41.48	Yes	172.05	130.57
539	10/17/2018	20	3	41.43	Yes	172.05	130.62
540	10/17/2018	20	4	41.41	Yes	172.05	130.64
541	10/17/2018	20	5	40.80	Yes	172.05	131.25
542	10/17/2018	20	6	40.80	Yes	172.05	131.25
543	10/17/2018	20	7	40.69	Yes	172.05	131.36
544	10/17/2018	20	8	40.69	Yes	172.05	131.36
545	10/17/2018	20	9	40.69	Yes	172.05	131.36
546	10/17/2018	20	10	40.62	Yes	172.05	131.43
547	10/17/2018	20	11	40.62	Yes	172.05	131.43
548	10/17/2018	20	12	40.62	Yes	172.05	131.43
549	10/17/2018	21	1	41.56	Yes	172.05	130.49
550	10/17/2018	21	2	46.57	Yes	172.05	125.48
551	10/17/2018	21	3	46.57	Yes	172.05	125.48
552	10/17/2018	21	4	45.67	Yes	172.05	126.38
553	10/17/2018	21	5	41.60	Yes	172.05	130.45
554	10/17/2018	21	6	41.57	Yes	172.05	130.48
555	10/17/2018	21	7	41.51	Yes	172.05	130.54
556	10/17/2018	21	8	41.51	Yes	172.05	130.54
557	10/17/2018	21	9	39.81	Yes	172.05	132.24
558	10/17/2018	21	10	39.73	Yes	172.05	132.32
559	10/17/2018	21	11	38.56	Yes	172.05	133.49
560	10/17/2018	21	12	38.93	Yes	172.05	133.12
561	10/17/2018	22	1	45.90	Yes	172.05	126.15
562	10/17/2018	22	2	54.48	Yes	172.05	117.57
563	10/17/2018	22	3	48.68	Yes	172.05	123.37
564	10/17/2018	22	4	44.99	Yes	172.05	127.06
565	10/17/2018	22	5	40.73	Yes	172.05	131.32
566	10/17/2018	22	6	39.86	Yes	172.05	132.19

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Number	Trade Date	Trade Hour	Interval	Market LMP	Eligible Flag	Calculated LMP	Change in LMP
567	10/17/2018	22	7	39.19	Yes	172.05	132.86
568	10/17/2018	22	8	39.19	Yes	172.05	132.86
569	10/17/2018	22	9	39.20	Yes	172.05	132.85
570	10/17/2018	22	10	38.75	Yes	172.05	133.30
571	10/17/2018	22	11	36.86	Yes	172.05	135.19
572	10/17/2018	22	12	34.67	Yes	172.05	137.38

## Appendix C: Exceptional Dispatch Bid Mitigation Analysis

In October 2018, the ISO applied the exceptional dispatch bid mitigation to the exceptional dispatches. Table 10 shows the costs by instruction type in October. With exceptional dispatch bid mitigation, the costs for these types of exceptional dispatches were \$ 2807. Without the exceptional dispatch bid mitigation, the costs for these types of exceptional dispatches would be \$ 0. The cost saving from the exceptional dispatch bid mitigation was \$ (2807).

**Table 10: Bid Mitigation Analysis for October 2018**

Type	Number of Resources	Costs without Bid Mitigation	Costs with Bid Mitigation	Cost Saving
NONTMOD	4	\$ 0	\$ 2807	\$ (2807)
Total	4	\$ 0	\$ 2807	\$ (2807)