

November 30, 2017

The Honorable Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Re: California Independent System Operator Corporation
Docket Nos. ER08-1178-000 and EL08-88-000
August 2017 Exceptional Dispatch Report (Chart 2 Data)**

Dear Secretary Bose:

Pursuant to the orders issued in the above-referenced dockets on September 2, 2009 and May 4, 2010, the California Independent System Operator Corporation (CAISO) submits the attached report. The report provides Exceptional Dispatch information that the Commission directed be included in "Chart 2," which is set forth in Appendix A to the September 2, 2009 order, as modified by the May 4, 2010 order.

The attached report provides Chart 2 data for the month of August 2017. The report also includes the price impact analysis for August 2017 required by paragraph 44 of the September 2, 2009 order, as well as the degree of mitigation analysis required by CAISO tariff section 34.11.4 for August 2017.

Respectfully submitted,

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Exceptional Dispatch Report

Table 2: August 2017

Market Quality and Renewable Integration

November 30, 2017

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Introduction

This report is filed pursuant to FERC's September 2, 2009, and May 4, 2010, orders in ER08-1178. These orders require two monthly Exceptional Dispatch reports—one issued on the 15th of each month and one issued on the 30th of each month. This report provides data on the frequency, reasons and costs for Exceptional Dispatches issued in August 2017.

This report contains a price impact analysis as prescribed by FERC in its September 2 order. The price impact analysis for the month of August is presented in Appendix B. This report also includes mitigation analysis for August 2017 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 August 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 inertia emergency assistance. Whenever the CAISO issues an exceptional dispatch instruction, the operators log these instructions and the associated reason for each instruction.

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

The following additional reason for exceptional dispatch instructions in 2017 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 August, which are self explanatory.

The data in Table 1 is based on a template specified in the September 2009 order.² This table contains all the information published in Table 1 of the first report for August 2017. 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).

¹ A list of all of the CAISO’s Operating Procedures and all the publicly available Operating Procedures are available at the following link: <http://www.caiso.com/thegrid/operations/opsdoc/index.html>

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

The Begin Time and End Time columns show the start and end time of exceptional dispatch for the classification respectively.

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

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

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

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

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

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.

Table 1: Exceptional Dispatches in August 2017

California Independent System Operator Corporation Exceptional Dispatch Report November 30, 2017																					
Chart 2: Table of Exceptional Dispatches for Period 01/August/2017 - 31/August/2017																					
Number	Market Type	Reason	Location	Local Reliability Area	Trade Date	MW	Commitment	INC_DEC	Hours	Begin Time	End Time	Total MWH	Min Load Cost	Start Up Cost	CC6470	ED MWH (INC/DEC)	CC6470 INC	CC6470 DEC	CC6482	CC6488	CC6620
1	RT	Bridging Schedules	PG&E	N/A	8/30/2017	50	No	DEC	6	4:55	9:59	-101.39	-2071.14	1131.20	2325.45	0.00	0.00	0.00	0.00	0.00	0.00
2	RT	Bridging Schedules	PG&E	N/A	8/30/2017	50	No	INC	6	4:55	9:59	-15.12	10309.42	612.74	438.35	0.00	0.00	0.00	0.00	0.00	0.00
3	RT	Bridging Schedules	SCE	Big Creek-Ventura	8/27/2017	100	No	INC	1	23:00	23:59	6.47	12966.46	0.00	-210.48	0.00	0.00	0.00	0.00	0.00	0.00
4	RT	Bridging Schedules	SCE	Big Creek-Ventura	8/31/2017	100	No	INC	2	22:00	23:59	78.50	36052.62	0.00	-2913.17	0.00	0.00	0.00	0.00	0.00	0.00
5	RT	Bridging Schedules	SCE	LA Basin	8/2/2017	10	Yes	INC	1	23:00	23:59	-5.45	1349.24	0.00	190.52	0.00	0.00	0.00	0.00	0.00	0.00
6	RT	Bridging Schedules	SCE	LA Basin	8/30/2017	70	No	INC	1	23:00	23:59	-6.39	9957.76	0.00	239.72	0.00	0.00	0.00	0.00	0.00	0.00
7	RT	Bridging Schedules	SCE	LA Basin	8/31/2017	70	No	INC	16	0:00	15:59	-94.16	154722.56	0.00	11737.07	0.00	0.00	0.00	0.00	0.00	0.00
8	RT	Bridging Schedules	SDG&E	San Diego-IV	8/10/2017	20	Yes	INC	2	22:00	23:59	0.35	4285.12	0.00	-9.92	0.00	0.00	0.00	0.00	0.00	0.00
9	RT	Conditions beyond the control of the CAISO	PG&E	N/A	8/29/2017	182-410	No	INC	2	10:45	12:14	-12.80	0.00	0.00	360.80	-0.75	0.00	19.44	0.00	0.00	0.00
10	RT	Conditions beyond the control of the CAISO	PG&E	N/A	8/29/2017	897-1130	No	DEC	4	10:45	14:44	-327.48	0.00	0.00	5625.85	-420.18	0.00	10031.22	0.00	0.00	0.00
11	RT	Conditions beyond the control of the CAISO	SCE	Big Creek-Ventura	8/29/2017	452-559	No	DEC	5	10:45	14:59	-166.69	-7817.84	0.00	1474.80	-262.06	0.00	5839.02	0.00	0.00	0.00
12	RT	Conditions beyond the control of the CAISO	SCE	N/A	8/29/2017	495-581	No	DEC	4	10:45	14:44	-160.74	2138.30	0.00	2581.31	-181.01	0.00	4371.48	0.00	0.00	0.00
13	RT	Fast Start Unit Management	PG&E	Bay Area	8/13/2017	0	No	INC	2	0:00	1:09	-160.00	6330.30	0.00	0.00	-160.00	0.00	0.00	0.00	0.00	0.00
14	RT	Fast Start Unit Management	SCE	Big Creek-Ventura	8/1/2017	0	No	INC	1	0:50	1:44	-31.40	832.19	0.00	0.00	-31.40	0.00	0.00	0.00	0.00	0.00
15	RT	Incomplete or Inaccurate Transmission	PG&E	Bay Area	8/16/2017	500	No	DEC	2	22:40	23:59	-13.35	-2626.23	0.00	670.51	-13.27	0.00	703.84	0.00	-530.68	0.00
16	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/1/2017	40	No	INC	2	22:10	23:59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/2/2017	13-40	No	INC	24	0:00	23:59	-18.08	0.00	0.00	868.21	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/August/2017 - 31/August/2017

Number	Market Type	Reason	Location	Local Reliability Area	Trade Date	MW	Commitment	INC_DEC	Hours	Begin Time	End Time	Total MWH	Min Load Cost	Start Up Cost	CC6470	ED MWH (INC/DEC)	CC6470 INC	CC6470 DEC	CC6482	CC6488	CC6620
18	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/2/2017	28-40	No	DEC	18	6:55	23:59	-10.22	0.00	0.00	939.28	0.00	0.00	0.00	0.00	-146.33	0.00
19	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/3/2017	13-40	No	INC	24	0:00	23:59	-16.96	0.00	0.00	1375.93	0.00	0.00	0.00	0.00	0.00	0.00
20	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/3/2017	28-40	No	DEC	24	0:00	23:59	-0.69	0.00	0.00	-369.42	0.00	0.00	0.00	0.00	-8.96	0.00
21	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/4/2017	10-40	No	DEC	24	0:00	23:59	0.69	0.00	0.00	-64.08	0.00	0.00	0.00	0.00	-114.52	0.00
22	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/4/2017	13-40	No	INC	24	0:00	23:59	7.45	0.00	0.00	-258.71	0.00	0.00	0.00	0.00	0.00	0.00
23	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/5/2017	4-40	No	INC	24	0:00	23:59	3.29	0.00	0.00	-147.98	0.00	0.00	0.00	0.00	0.00	0.00
24	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/5/2017	10-40	No	DEC	24	0:00	23:59	-0.56	0.00	0.00	-31.71	0.00	0.00	0.00	0.00	-156.87	0.00
25	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/6/2017	4-40	No	INC	24	0:00	23:59	7.66	0.00	0.00	-149.73	0.00	0.00	0.00	0.00	0.00	0.00
26	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/6/2017	10-40	No	DEC	24	0:00	23:59	-3.72	0.00	0.00	82.50	0.00	0.00	0.00	0.00	-58.34	0.00
27	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/7/2017	4-40	No	INC	24	0:00	23:59	7.69	0.00	0.00	-705.08	0.00	0.00	0.00	0.00	0.00	0.00
28	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/7/2017	10-40	No	DEC	24	0:00	23:59	-3.18	0.00	0.00	93.06	0.00	0.00	0.00	0.00	0.00	0.00
29	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/8/2017	4-40	No	INC	24	0:00	23:59	4.42	0.00	0.00	-149.79	0.00	0.00	0.00	0.00	0.00	0.00
30	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/8/2017	10-40	No	DEC	24	0:00	23:59	-7.09	0.00	0.00	216.28	0.00	0.00	0.00	0.00	-1.04	0.00
31	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/9/2017	4-40	No	INC	24	0:00	23:59	3.12	0.00	0.00	70.44	0.00	0.00	0.00	0.00	0.00	0.00
32	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/9/2017	18-40	No	DEC	24	0:00	23:59	-4.95	0.00	0.00	121.50	0.00	0.00	0.00	0.00	-6.44	0.00
33	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/10/2017	4-40	No	INC	24	0:00	23:59	1.42	0.00	0.00	-62.48	0.00	0.00	0.00	0.00	0.00	0.00
34	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/10/2017	18-40	No	DEC	24	0:00	23:59	-3.32	0.00	0.00	105.35	0.00	0.00	0.00	0.00	-12.16	0.00
35	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/11/2017	10-40	No	INC	24	0:00	23:59	2.49	0.00	0.00	-658.31	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/August/2017 - 31/August/2017

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	
36	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/11/2017	18-40	No	DEC	24	0:00	23:59	-1.76	0.00	0.00	-2.51	0.00	0.00	0.00	0.00	0.00	-15.34	0.00
37	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/12/2017	10-40	No	INC	24	0:00	23:59	2.23	0.00	0.00	-49.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/12/2017	18-40	No	DEC	24	0:00	23:59	-3.06	0.00	0.00	76.32	0.00	0.00	0.00	0.00	0.00	-13.22	0.00
39	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/13/2017	5-40	No	DEC	24	0:00	23:59	-3.59	0.00	0.00	64.43	0.00	0.00	0.00	0.00	0.00	-4.37	0.00
40	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/13/2017	10-40	No	INC	24	0:00	23:59	4.47	0.00	0.00	-54.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00
41	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/14/2017	5-40	No	INC	24	0:00	23:59	16.53	0.00	0.00	-907.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00
42	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/14/2017	10-40	No	DEC	24	0:00	23:59	-3.16	0.00	0.00	117.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
43	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/15/2017	10-40	No	INC	24	0:00	23:59	5.28	0.00	0.00	-743.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00
44	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/15/2017	22-40	No	DEC	24	0:00	23:59	-3.74	0.00	0.00	78.72	0.00	0.00	0.00	0.00	0.00	-2.68	0.00
45	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/16/2017	5-40	No	INC	24	0:00	23:59	6.23	0.00	0.00	207.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00
46	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/16/2017	30-40	No	DEC	24	0:00	23:59	-5.63	0.00	0.00	134.30	0.00	0.00	0.00	0.00	0.00	-6.18	0.00
47	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/17/2017	5-40	No	INC	24	0:00	23:59	3.58	0.00	0.00	245.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00
48	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/17/2017	30-40	No	DEC	24	0:00	23:59	2.89	0.00	0.00	-91.06	0.00	0.00	0.00	0.00	0.00	-1.93	0.00
49	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/18/2017	5-40	No	DEC	24	0:00	23:59	1.88	0.00	0.00	1.82	0.00	0.00	0.00	0.00	0.00	-0.70	0.00
50	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/18/2017	10-40	No	INC	24	0:00	23:59	6.66	0.00	0.00	-415.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00
51	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/19/2017	10-40	No	DEC	24	0:00	23:59	2.42	0.00	0.00	-73.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00
52	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/19/2017	10-40	No	INC	24	0:00	23:59	2.87	0.00	0.00	-15.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00
53	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/20/2017	5-40	No	INC	24	0:00	23:59	2.39	0.00	0.00	-845.19	0.00	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/August/2017 - 31/August/2017

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
54	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/20/2017	10-40	No	DEC	24	0:00	23:59	1.30	0.00	0.00	-290.98	0.00	0.00	0.00	0.00	0.00	0.00
55	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/21/2017	5-40	No	DEC	24	0:00	23:59	-0.92	0.00	0.00	10.78	0.00	0.00	0.00	0.00	0.00	0.00
56	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/21/2017	10-40	No	INC	24	0:00	23:59	2.92	0.00	0.00	-472.21	0.00	0.00	0.00	0.00	0.00	0.00
57	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/22/2017	5-40	No	DEC	24	0:00	23:59	-0.57	0.00	0.00	7.88	0.00	0.00	0.00	0.00	0.00	0.00
58	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/22/2017	10-40	No	INC	24	0:00	23:59	2.12	0.00	0.00	-70.87	0.00	0.00	0.00	0.00	0.00	0.00
59	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/23/2017	5-40	No	INC	24	0:00	23:59	-0.34	0.00	0.00	4.25	0.00	0.00	0.00	0.00	0.00	0.00
60	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/23/2017	10-40	No	DEC	24	0:00	23:59	-1.39	0.00	0.00	44.89	0.00	0.00	0.00	0.00	-4.99	0.00
61	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/24/2017	5-40	No	INC	24	0:00	23:59	0.92	0.00	0.00	374.05	0.00	0.00	0.00	0.00	0.00	0.00
62	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/24/2017	10-40	No	DEC	24	0:00	23:59	-2.15	0.00	0.00	44.57	0.00	0.00	0.00	0.00	-3.08	0.00
63	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/25/2017	5-40	No	INC	24	0:00	23:59	1.31	0.00	0.00	-649.30	0.00	0.00	0.00	0.00	0.00	0.00
64	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/25/2017	10-40	No	DEC	24	0:00	23:59	-0.05	0.00	0.00	-245.71	0.00	0.00	0.00	0.00	-2.52	0.00
65	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/26/2017	5-40	No	INC	24	0:00	23:59	3.11	0.00	0.00	-133.19	0.00	0.00	0.00	0.00	0.00	0.00
66	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/26/2017	10-40	No	DEC	24	0:00	23:59	-1.64	0.00	0.00	-51.23	0.00	0.00	0.00	0.00	0.00	0.00
67	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/27/2017	10-40	No	DEC	24	0:00	23:59	0.51	0.00	0.00	-32.48	0.00	0.00	0.00	0.00	0.00	0.00
68	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/27/2017	30-40	No	INC	24	0:00	23:59	6.26	0.00	0.00	-500.82	0.00	0.00	0.00	0.00	0.00	0.00
69	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/28/2017	10-40	No	DEC	24	0:00	23:59	0.12	0.00	0.00	-23.69	0.00	0.00	0.00	0.00	0.00	0.00
70	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/28/2017	30-40	No	INC	24	0:00	23:59	6.97	0.00	0.00	-1927.82	0.00	0.00	0.00	0.00	0.00	0.00
71	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/29/2017	10-40	No	DEC	24	0:00	23:59	1.53	0.00	0.00	-57.04	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
72	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/29/2017	30-40	No	INC	24	0:00	23:59	1.57	0.00	0.00	-1576.40	0.00	0.00	0.00	0.00	0.00	0.00
73	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/30/2017	10-40	No	DEC	24	0:00	23:59	3.09	0.00	0.00	-84.69	0.00	0.00	0.00	0.00	0.00	0.00
74	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/30/2017	30-40	No	INC	24	0:00	23:59	-8.87	0.00	0.00	186.22	0.00	0.00	0.00	0.00	0.00	0.00
75	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/31/2017	10-40	No	DEC	24	0:00	23:59	-0.23	0.00	0.00	39.66	0.00	0.00	0.00	0.00	-15.22	0.00
76	RT	Incomplete or Inaccurate Transmission	PG&E	Fresno	8/31/2017	30-40	No	INC	24	0:00	23:59	5.98	0.00	0.00	-434.33	0.00	0.00	0.00	0.00	0.00	0.00
77	RT	Incomplete or Inaccurate Transmission	SCE	N/A	8/11/2017	411-460	No	INC	5	14:55	18:59	84.04	-5936.17	0.00	-23176.97	0.00	0.00	0.00	0.00	0.00	0.00
78	RT	Incomplete or Inaccurate Transmission	SDG&E	San Diego-IV	8/7/2017	94-188	No	INC	3	11:15	13:44	25.49	7240.83	158.25	-496.39	18.72	-440.76	0.00	0.00	-3245.52	0.00
79	RT	Incomplete or Inaccurate Transmission	SDG&E	San Diego-IV	8/29/2017	25	No	DEC	6	14:30	19:59	-2.53	-545.91	0.00	-4210.53	0.00	0.00	0.00	0.00	0.00	0.00
80	RT	Load Forecast Uncertainty	PG&E	Bay Area	8/1/2017	480	No	DEC	7	14:30	20:59	42.98	0.00	0.00	-2043.51	0.00	0.00	0.00	0.00	0.00	0.00
81	RT	Load Forecast Uncertainty	PG&E	Bay Area	8/4/2017	117	No	INC	7	6:00	12:14	-31.45	49046.25	0.00	913.60	0.00	0.00	0.00	0.00	0.00	0.00
82	RT	Load Forecast Uncertainty	PG&E	Bay Area	8/21/2017	54	No	INC	3	9:00	11:59	-0.01	7762.14	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00
83	RT	Load Forecast Uncertainty	PG&E	Fresno	8/26/2017	200	No	INC	1	13:15	13:19	7.14	0.00	0.00	-282.49	2.99	-118.33	0.00	0.00	0.00	0.00
84	RT	Load Forecast Uncertainty	PG&E	Fresno	8/28/2017	900	No	INC	1	17:48	17:59	58.35	0.00	0.00	-61494.96	0.00	0.00	0.00	0.00	0.00	0.00
85	RT	Load Forecast Uncertainty	PG&E	N/A	8/28/2017	182	No	DEC	5	17:15	21:59	441.22	-45227.98	0.00	-164294.80	0.00	0.00	0.00	0.00	0.00	0.00
86	RT	Load Forecast Uncertainty	PG&E	N/A	8/31/2017	47	No	DEC	13	8:35	20:59	-56.68	-74922.94	0.00	1428.39	0.00	0.00	0.00	0.00	0.00	0.00
87	RT	Load Forecast Uncertainty	PG&E	Sierra	8/21/2017	166	Yes	INC	3	9:00	11:59	0.00	22544.40	23173.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00
88	RT	Load Forecast Uncertainty	SCE	Big Creek-Ventura	8/3/2017	50	No	INC	2	22:00	23:59	-6.59	21111.35	0.00	400.83	0.00	0.00	0.00	0.00	0.00	0.00
89	RT	Load Forecast Uncertainty	SCE	Big Creek-Ventura	8/4/2017	50	No	INC	24	0:00	23:59	-69.73	137483.52	0.00	2195.41	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
90	RT	Load Forecast Uncertainty	SCE	Big Creek-Ventura	8/27/2017	50	No	INC	7	17:00	23:59	-30.00	4444.13	0.00	1318.78	0.00	0.00	0.00	0.00	0.00	0.00
91	RT	Load Forecast Uncertainty	SCE	Big Creek-Ventura	8/30/2017	100	No	INC	22	2:00	23:59	0.05	220768.44	0.00	-2.60	0.00	0.00	0.00	0.00	0.00	0.00
92	RT	Load Forecast Uncertainty	SCE	LA Basin	8/1/2017	130	No	INC	5	9:45	13:59	49.97	28444.84	0.00	-2195.34	0.00	0.00	0.00	0.00	0.00	0.00
93	RT	Load Forecast Uncertainty	SCE	LA Basin	8/2/2017	20	No	INC	12	12:00	23:59	-54.53	25690.08	0.00	1566.60	0.11	-5.02	0.00	0.00	0.00	0.00
94	RT	Load Forecast Uncertainty	SCE	LA Basin	8/2/2017	130	No	DEC	8	16:00	23:58	111.82	0.00	0.00	-4694.90	0.00	0.00	0.00	0.00	0.00	0.00
95	RT	Load Forecast Uncertainty	SCE	LA Basin	8/3/2017	10	Yes	INC	24	0:00	23:59	1099.31	32802.00	0.00	63555.05	0.00	0.00	0.00	0.00	0.00	0.00
96	RT	Load Forecast Uncertainty	SCE	LA Basin	8/7/2017	20-570	No	INC	10	14:00	23:59	-311.71	24725.09	0.00	30301.84	0.00	0.00	0.00	-112.19	0.00	0.00
97	RT	Load Forecast Uncertainty	SCE	LA Basin	8/14/2017	190-194	No	DEC	6	15:35	20:59	-23.78	0.00	0.00	-12857.47	0.00	0.00	0.00	0.00	0.00	0.00
98	RT	Load Forecast Uncertainty	SCE	LA Basin	8/14/2017	194	No	INC	6	15:40	20:59	-41.53	0.00	0.00	1188.55	1.48	-57.09	0.00	-1.58	0.00	0.00
99	RT	Load Forecast Uncertainty	SCE	LA Basin	8/16/2017	194	No	DEC	7	14:05	20:59	-208.53	0.00	0.00	3740.75	0.00	0.00	0.00	0.00	0.00	0.00
100	RT	Load Forecast Uncertainty	SCE	LA Basin	8/16/2017	194	No	INC	7	14:05	20:59	-35.49	0.00	0.00	1296.63	0.89	-24.35	0.00	-8.13	0.00	0.00
101	RT	Load Forecast Uncertainty	SCE	LA Basin	8/21/2017	20-388	No	INC	16	8:00	23:59	-9.86	72497.57	0.00	2472.55	6.19	-168.51	0.00	4556.69	0.00	0.00
102	RT	Load Forecast Uncertainty	SCE	LA Basin	8/24/2017	195	No	INC	6	15:00	20:59	-72.89	0.00	0.00	2448.05	0.00	0.00	0.00	0.00	0.00	0.00
103	RT	Load Forecast Uncertainty	SCE	LA Basin	8/24/2017	195-390	No	DEC	6	15:00	20:59	-471.47	0.00	0.00	18148.70	48.22	-1217.22	0.00	-601.76	0.00	0.00
104	RT	Load Forecast Uncertainty	SCE	LA Basin	8/25/2017	10	No	INC	11	13:00	23:59	-338.61	19466.62	0.00	11976.73	0.00	0.00	0.00	0.00	0.00	0.00
105	RT	Load Forecast Uncertainty	SCE	LA Basin	8/27/2017	390	No	DEC	7	14:15	20:59	-199.36	0.00	0.00	9662.41	2.49	-107.73	0.00	-1.03	0.00	0.00
106	RT	Load Forecast Uncertainty	SCE	LA Basin	8/28/2017	70	No	INC	12	12:10	23:59	860.89	99501.29	0.00	-226796.89	98.53	-4899.23	0.00	0.00	0.00	0.00

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107	RT	Load Forecast Uncertainty	SCE	LA Basin	8/30/2017	70	No	INC	1	23:00	23:59	-3.39	10567.12	0.00	113.07	0.00	0.00	0.00	0.00	0.00	0.00
108	RT	Load Forecast Uncertainty	SCE	LA Basin	8/31/2017	70	No	INC	24	0:00	23:59	-84.58	191818.34	0.00	-4021.17	24.63	-1259.35	0.00	0.00	0.00	0.00
109	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	8/3/2017	20	No	INC	3	21:25	23:59	1.64	0.00	0.00	-64.10	0.00	0.00	0.00	0.00	0.00	0.00
110	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	8/4/2017	20-40	Yes	INC	24	0:00	23:59	-164.85	36190.56	20528.39	9870.07	0.00	0.00	0.00	0.00	0.00	0.00
111	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	8/7/2017	20	No	INC	10	14:00	23:59	-110.67	63652.99	26788.51	-8636.34	0.00	0.00	0.00	0.00	0.00	0.00
112	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	8/8/2017	20-146	No	INC	24	0:00	23:59	-519.43	120497.14	0.00	19951.62	0.08	-3.21	0.00	-0.29	0.00	0.00
113	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	8/9/2017	20-40	Yes	INC	11	13:00	23:59	-158.83	58175.61	24301.90	5808.61	0.01	-0.56	0.00	0.00	0.00	0.00
114	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	8/10/2017	20	No	INC	22	2:00	23:59	-214.10	88215.68	0.00	6528.01	0.02	-0.73	0.00	0.00	0.00	0.00
115	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	8/15/2017	63-131	No	INC	5	16:45	20:59	80.75	34910.03	0.00	-87392.00	0.00	0.00	0.00	0.00	0.00	0.00
116	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	8/16/2017	68	No	INC	4	17:00	20:59	-43.70	20169.12	0.00	-8194.45	0.00	0.00	0.00	0.00	0.00	0.00
117	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	8/21/2017	20-321	Yes	INC	14	8:00	21:59	-92.01	130974.52	12770.15	-13370.55	0.00	0.00	0.00	0.00	0.00	0.00
118	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	8/25/2017	63	No	INC	4	16:45	19:59	-37.56	15164.79	0.00	1339.76	0.00	0.00	0.00	0.00	0.00	0.00
119	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	8/27/2017	63	No	DEC	6	15:15	20:59	-14.25	0.00	0.00	597.93	0.00	0.00	0.00	0.00	0.00	0.00
120	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	8/27/2017	63	No	INC	6	15:15	20:59	-32.81	718.65	0.00	1641.06	0.00	0.00	0.00	0.00	0.00	0.00
121	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	8/28/2017	11	No	DEC	2	15:45	16:59	8.64	0.00	0.00	-2740.05	0.00	0.00	0.00	0.00	0.00	0.00
122	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	8/29/2017	20	Yes	INC	3	21:00	23:59	-1.06	7217.10	0.00	37.97	0.00	0.00	0.00	0.00	0.00	0.00
123	RT	Load Forecast Uncertainty	SDG&E	San Diego-IV	8/30/2017	20-40	Yes	INC	24	0:00	23:59	-28.41	101156.74	0.00	-6546.13	0.00	0.00	0.00	0.00	0.00	0.00
124	RT	Load Pull	PG&E	Bay Area	8/1/2017	141	No	INC	1	12:37	13:14	16.03	0.00	0.00	-720.11	13.20	-600.61	0.00	0.00	0.00	0.00

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125	RT	Load Pull	PG&E	Bay Area	8/2/2017	120-360	No	DEC	7	14:45	20:59	-5.25	0.00	0.00	-862.57	0.00	0.00	0.00	0.00	0.00	0.00
126	RT	Load Pull	PG&E	Bay Area	8/31/2017	74-96	No	DEC	7	14:00	20:29	-27.72	-7880.76	0.00	5629.95	5.41	-238.84	0.00	0.00	0.00	0.00
127	RT	Load Pull	SCE	LA Basin	8/1/2017	71	No	INC	10	11:55	20:59	21.01	0.00	0.00	-962.19	19.24	-858.28	0.00	0.00	0.00	0.00
128	RT	Load Pull	SCE	LA Basin	8/1/2017	194-526	No	DEC	10	11:55	20:59	-1666.69	-1205.08	0.00	70551.51	1.79	-78.97	0.00	0.00	0.00	0.00
129	RT	Load Pull	SCE	LA Basin	8/2/2017	190	No	INC	4	17:25	20:59	-83.24	7671.34	0.00	3688.92	0.11	-5.02	0.00	0.00	0.00	0.00
130	RT	Load Pull	SCE	LA Basin	8/2/2017	194	No	DEC	4	17:25	20:59	-148.67	0.00	0.00	7233.99	0.32	-13.99	0.00	0.00	0.00	0.00
131	RT	Load Pull	SCE	LA Basin	8/10/2017	194	No	DEC	8	13:50	20:59	-334.94	0.00	0.00	15066.06	0.00	0.00	0.00	0.00	0.00	0.00
132	RT	Load Pull	SCE	LA Basin	8/11/2017	384	No	DEC	6	14:45	19:59	-316.09	0.00	0.00	14031.97	13.39	-559.33	0.00	0.00	0.00	0.00
133	RT	Load Pull	SCE	LA Basin	8/12/2017	384	No	DEC	5	15:50	19:59	-322.56	0.00	0.00	10770.59	0.00	0.00	0.00	0.00	0.00	0.00
134	RT	Load Pull	SCE	LA Basin	8/22/2017	240	No	INC	1	16:25	16:59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135	RT	Load Pull	SCE	LA Basin	8/22/2017	384	No	DEC	5	16:20	20:59	-375.13	0.00	0.00	16646.19	0.00	0.00	0.00	0.00	0.00	0.00
136	RT	Load Pull	SCE	LA Basin	8/28/2017	240	No	INC	9	13:15	21:59	721.12	82012.36	0.00	-221229.06	98.53	-4899.23	0.00	0.00	0.00	0.00
137	RT	Load Pull	SCE	LA Basin	8/28/2017	384	No	DEC	9	13:20	21:59	-669.01	0.00	0.00	210599.74	0.00	0.00	0.00	0.00	0.00	0.00
138	RT	Load Pull	SCE	LA Basin	8/29/2017	384	No	DEC	7	14:45	20:59	-682.78	0.00	0.00	75967.24	0.00	0.00	0.00	0.00	0.00	0.00
139	RT	Load Pull	SCE	LA Basin	8/30/2017	384	No	DEC	7	14:05	20:59	-378.03	0.00	0.00	38404.71	0.00	0.00	0.00	0.00	0.00	0.00
140	RT	Load Pull	SCE	LA Basin	8/31/2017	220-500	No	INC	6	15:20	20:59	-183.10	74888.64	0.00	1902.85	55.17	-2824.35	0.00	0.00	0.00	0.00
141	RT	Load Pull	SCE	LA Basin	8/31/2017	250	No	DEC	5	16:30	20:59	-109.27	0.00	0.00	5995.71	0.00	0.00	0.00	0.00	0.00	0.00
142	RT	Load Pull	SDG&E	San Diego-IV	8/9/2017	63	No	INC	6	16:12	21:59	-109.42	25084.29	3780.30	3474.49	0.01	-0.56	0.00	0.00	0.00	0.00

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143	RT	Load Pull	SDG&E	San Diego-IV	8/13/2017	63	No	INC	4	16:15	19:59	-49.15	0.00	0.00	1342.31	0.00	0.00	0.00	0.00	0.00	0.00
144	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/1/2017	13-38	No	INC	17	7:55	23:59	12.67	0.00	0.00	-344.80	0.12	-3.64	0.00	0.00	0.00	0.00
145	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/1/2017	38	No	DEC	2	22:50	23:59	1.36	0.00	0.00	-42.42	0.00	0.00	0.00	0.00	0.00	0.00
146	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/2/2017	13-38	No	INC	11	0:00	10:04	8.07	-329.42	0.00	-341.60	0.13	-4.22	0.00	0.00	0.00	0.00
147	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/3/2017	16	No	DEC	18	6:50	23:59	12.98	-555.95	0.00	-466.84	0.00	0.00	0.00	0.00	0.00	0.00
148	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/3/2017	16	No	INC	18	6:50	23:59	2.89	0.00	0.00	-165.95	0.00	0.00	0.00	0.00	0.00	0.00
149	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/4/2017	13	No	DEC	13	7:40	19:59	6.25	-5470.51	0.00	-212.34	0.00	0.00	0.00	0.00	0.00	0.00
150	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/4/2017	13-16	No	INC	20	0:00	19:59	15.42	0.00	0.00	-472.78	0.00	0.00	0.00	0.00	0.00	0.00
151	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/5/2017	13	No	INC	8	16:50	23:59	14.57	0.00	0.00	-393.82	0.00	0.00	0.00	0.00	0.00	0.00
152	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/6/2017	16-32	No	DEC	9	15:55	23:59	1.35	-324.38	0.00	-15.43	0.00	0.00	0.00	0.00	0.00	0.00
153	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/6/2017	16-61	No	INC	9	15:55	23:59	41.20	-1946.28	0.00	-1162.46	4.00	-132.10	0.00	0.00	0.00	0.00
154	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/7/2017	16-92	No	INC	24	0:00	23:59	53.56	-6163.22	0.00	-1574.20	17.99	-605.32	0.00	0.00	0.00	0.00
155	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/7/2017	25	No	DEC	13	7:35	19:59	12.91	-790.30	0.00	2180.74	0.00	0.00	0.00	0.00	0.00	0.00
156	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/8/2017	25	No	DEC	15	3:45	18:14	3.30	-1116.74	0.00	-93.13	0.00	0.00	0.00	0.00	0.00	0.00
157	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/8/2017	25-62	No	INC	19	0:00	18:14	76.70	-12132.21	0.00	-2219.18	0.00	0.00	0.00	0.00	0.00	0.00
158	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/9/2017	13	No	DEC	12	6:39	17:59	-7.22	0.00	0.00	142.82	0.00	0.00	0.00	0.00	0.00	0.00
159	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/9/2017	13-43	No	INC	17	6:39	22:59	22.77	0.00	0.00	-585.70	3.27	-101.95	0.00	0.00	0.00	0.00
160	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/10/2017	25	No	DEC	9	8:50	17:14	1.33	0.00	0.00	-45.12	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
161	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/10/2017	25-32	No	INC	16	8:50	23:59	35.30	-1094.63	0.00	-1121.97	9.62	-320.43	0.00	0.00	0.00	0.00
162	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/11/2017	13-26	No	DEC	23	1:50	23:59	-14.95	-439.28	0.00	346.53	0.00	0.00	0.00	0.00	0.00	0.00
163	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/11/2017	13-32	No	INC	24	0:00	23:59	21.40	-6424.47	0.00	-664.75	4.91	-186.59	0.00	0.00	0.00	0.00
164	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/12/2017	13	No	DEC	14	0:00	13:59	-4.44	0.00	0.00	91.87	0.00	0.00	0.00	0.00	0.00	0.00
165	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/12/2017	13-32	No	INC	24	0:00	23:59	53.83	-5625.81	0.00	-1354.90	19.65	-652.85	0.00	0.00	0.00	0.00
166	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/13/2017	13-26	No	INC	24	0:00	23:44	3.21	-937.65	0.00	-85.70	0.25	-8.45	0.00	0.00	0.00	0.00
167	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/14/2017	13-75	No	INC	15	8:00	22:59	37.62	-5791.36	0.00	-2131.84	0.73	-21.44	0.00	0.00	0.00	0.00
168	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/15/2017	26	No	INC	15	6:55	21:54	9.44	-9677.80	0.00	-501.80	5.39	-265.96	0.00	0.00	0.00	0.00
169	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/16/2017	13-39	No	INC	18	6:20	23:44	31.01	-2791.70	65.05	-1268.11	2.33	-83.25	0.00	0.00	0.00	0.00
170	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/17/2017	15-76	No	INC	16	7:34	23:29	13.53	-1754.01	0.00	-467.54	3.96	-132.83	0.00	0.00	0.00	0.00
171	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/17/2017	16-32	No	DEC	11	12:40	23:29	0.67	-526.20	0.00	-16.27	0.50	-12.60	0.00	0.00	0.00	0.00
172	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/18/2017	30	No	DEC	17	7:25	23:59	1.31	0.00	0.00	-58.71	0.00	0.00	0.00	0.00	0.00	0.00
173	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/18/2017	30-45	No	INC	17	7:25	23:59	15.87	-9826.05	0.00	-654.75	15.93	-659.60	0.00	0.00	0.00	0.00
174	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/19/2017	30	No	INC	2	0:00	1:59	2.68	-1408.17	0.00	-89.29	2.65	-88.10	0.00	0.00	0.00	0.00
175	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/20/2017	16-31	No	INC	7	17:00	23:59	32.57	0.00	0.00	-8277.93	30.13	-9653.96	0.00	0.00	0.00	0.00
176	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/20/2017	27-30	No	DEC	6	17:00	22:59	36.47	-2411.11	0.00	-1243.56	27.50	-928.80	0.00	0.00	0.00	0.00
177	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/21/2017	15-56	No	INC	24	0:00	23:59	-1.33	2112.41	0.00	-151.94	2.57	-108.78	0.00	0.00	0.00	0.00
178	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/21/2017	28	No	DEC	13	9:40	21:59	-2.16	0.00	0.00	112.99	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
179	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/22/2017	15-43	No	INC	8	0:00	7:14	-0.77	-885.64	0.00	31.08	0.72	-29.00	0.00	0.00	0.00	0.00
180	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/23/2017	15	No	DEC	4	20:00	23:59	-1.21	-180.17	0.00	58.29	0.00	0.00	0.00	0.00	0.00	0.00
181	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/23/2017	15-28	No	INC	4	20:00	23:59	43.47	0.00	0.00	-2001.38	2.24	-105.91	0.00	0.00	0.00	0.00
182	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/24/2017	15	No	DEC	8	0:00	7:59	-2.01	0.00	0.00	49.41	0.00	0.00	0.00	0.00	0.00	0.00
183	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/24/2017	15-28	No	INC	24	0:00	23:59	44.52	-6612.20	0.00	-1905.70	13.14	-443.37	0.00	0.00	0.00	0.00
184	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/25/2017	14-42	No	DEC	10	13:30	23:29	26.09	-2654.16	0.00	-947.10	0.00	0.00	0.00	0.00	0.00	0.00
185	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/25/2017	28-42	No	INC	24	0:00	23:59	16.29	-11261.82	0.00	-551.51	0.75	-26.73	0.00	0.00	0.00	0.00
186	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/26/2017	48-96	No	INC	1	22:15	23:14	22.07	-956.00	0.00	-6013.07	7.45	-1230.12	0.00	0.00	0.00	0.00
187	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/27/2017	42-96	No	INC	2	21:30	22:39	16.49	-1615.06	0.00	-740.65	0.00	0.00	0.00	0.00	0.00	0.00
188	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/28/2017	14-28	No	INC	17	7:25	23:59	9.82	736.75	0.00	-526.82	0.20	-7.46	0.00	0.00	0.00	0.00
189	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/28/2017	28-57	No	DEC	13	7:25	19:59	-0.24	0.00	0.00	25.39	0.00	0.00	0.00	0.00	0.00	0.00
190	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/30/2017	16	No	INC	2	7:00	8:59	5.80	0.00	0.00	-228.62	1.13	-43.41	0.00	0.00	0.00	0.00
191	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/31/2017	30-60	No	DEC	20	0:00	19:59	25.56	0.00	0.00	-1005.88	0.00	0.00	0.00	0.00	0.00	0.00
192	RT	Operating Procedure Number and Constraint (7110)	PG&E	Humboldt	8/31/2017	30-120	No	INC	20	0:00	19:59	51.13	-9146.52	0.00	-1462.88	6.49	-204.89	0.00	0.00	0.00	0.00
193	RT	Operating Procedure Number and Constraint (7230)	PG&E	Sierra	8/12/2017	20-30	No	INC	7	16:10	22:59	44.58	11195.14	56.31	-1340.92	15.00	-729.45	0.00	0.00	0.00	0.00
194	RT	Operating Procedure Number and Constraint (7230)	PG&E	Sierra	8/13/2017	20	No	INC	4	16:30	19:59	-0.45	5343.21	473.02	121.91	0.00	0.00	0.00	0.00	0.00	0.00
195	RT	Operating Procedure Number and Constraint (7230)	PG&E	Sierra	8/27/2017	16	No	INC	1	16:18	16:29	2.64	0.00	0.00	-388.51	2.64	-388.51	0.00	0.00	0.00	0.00
196	RT	Operating Procedure Number and Constraint (7230)	PG&E	Sierra	8/28/2017	35	No	INC	3	17:15	19:59	17.14	0.00	0.00	-5300.68	14.58	-2232.12	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
197	RT	Operating Procedure Number and Constraint (7430)	PG&E	Fresno	8/3/2017	16	No	INC	4	2:45	5:59	35.30	834.93	0.00	-4576.52	1.73	-180.33	0.00	0.00	0.00	0.00
198	RT	Operating Procedure Number and Constraint (7430)	PG&E	Fresno	8/14/2017	83-150	No	INC	3	19:40	21:59	68.16	16798.48	4000.72	-4012.74	76.77	-3930.67	0.00	0.00	0.00	0.00
199	RT	Operating Procedure Number and Constraint (7430)	PG&E	Fresno	8/23/2017	80	No	INC	2	15:35	16:59	0.83	0.00	0.00	-45.22	0.00	0.00	0.00	0.00	0.00	0.00
200	RT	Operating Procedure Number and Constraint (7720)	SCE	N/A	8/4/2017	410	No	DEC	8	14:45	21:59	876.94	-75804.08	0.00	-3468.65	0.00	0.00	0.00	0.00	0.00	0.00
201	RT	Operating Procedure Number and Constraint (7720)	SCE	N/A	8/6/2017	410	No	DEC	7	16:40	22:59	841.83	-54880.03	0.00	-27870.16	0.00	0.00	0.00	0.00	0.00	0.00
202	RT	Operating Procedure Number and Constraint (7720)	SCE	N/A	8/8/2017	430	No	DEC	2	17:05	18:44	8.62	193.75	0.00	-457.88	-3.38	0.00	-250.89	0.00	0.00	0.00
203	RT	Operating Procedure Number and Constraint (7720)	SCE	N/A	8/10/2017	450	No	DEC	5	17:30	21:59	3.66	0.00	0.00	-124.63	0.00	0.00	0.00	0.00	0.00	0.00
204	RT	Operating Procedure Number and Constraint (7720)	SCE	N/A	8/10/2017	450	No	INC	5	17:30	21:59	-10.81	-42.45	0.00	312.32	-10.72	0.00	372.39	0.00	0.00	0.00
205	RT	Operating Procedure Number and Constraint (7720)	SCE	N/A	8/29/2017	450	No	DEC	5	17:40	21:59	-192.77	-37538.92	0.00	96023.96	-14.59	0.00	0.00	0.00	0.00	0.00
206	RT	Operating Procedure Number and Constraint (7720)	SCE	N/A	8/30/2017	470	No	INC	7	15:15	21:59	34.00	-2240.23	0.00	-2033.67	0.00	0.00	0.00	0.00	0.00	0.00
207	RT	Other Reliability Requirement	PG&E	Bay Area	8/12/2017	240	No	INC	1	21:10	21:59	182.58	3452.81	0.00	-3296.43	0.00	0.00	0.00	0.00	0.00	0.00
208	RT	Other Reliability Requirement	PG&E	Fresno	8/28/2017	35-70	No	DEC	5	15:25	19:59	-7.45	0.00	0.00	451.23	-7.58	0.00	468.50	0.00	0.00	0.00
209	RT	Other Reliability Requirement	PG&E	N/A	8/30/2017	310	No	DEC	7	14:00	20:59	120.05	0.00	0.00	-2589.85	160.28	-3742.64	0.00	0.00	0.00	0.00
210	RT	Other Reliability Requirement	PG&E	N/A	8/31/2017	47	No	DEC	12	9:00	20:59	-1.00	-74922.94	0.00	-16.85	0.00	0.00	0.00	0.00	0.00	0.00
211	RT	Other Reliability Requirement	SCE	LA Basin	8/4/2017	384	No	DEC	3	18:50	20:59	-117.33	0.00	0.00	5435.17	9.43	-403.90	0.00	0.00	0.00	0.00
212	RT	Other Reliability Requirement	SCE	LA Basin	8/12/2017	275-279	No	INC	1	21:10	21:59	209.41	4946.75	0.00	-4988.45	0.00	0.00	0.00	0.00	0.00	0.00
213	RT	Other Reliability Requirement	SCE	LA Basin	8/29/2017	20	Yes	INC	2	22:00	23:59	-1.29	7618.76	0.00	42.48	0.00	0.00	0.00	0.00	0.00	0.00
214	RT	Other Reliability Requirement	SCE	LA Basin	8/29/2017	300	No	DEC	10	11:00	20:59	229.85	-27264.31	0.00	-9058.80	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
215	RT	Other Reliability Requirement	SCE	LA Basin	8/30/2017	20	Yes	INC	3	0:00	2:59	0.00	10861.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
216	RT	Other Reliability Requirement	SCE	N/A	8/1/2017	470	No	DEC	8	13:10	20:59	9.74	-17691.83	0.00	236.35	-0.40	0.00	14.76	0.00	0.00	0.00
217	RT	Other Reliability Requirement	SDG&E	San Diego-IV	8/12/2017	30	No	INC	1	21:10	21:59	24.51	569.71	0.00	-582.76	0.00	0.00	0.00	0.00	0.00	0.00
218	RT	Over Generation	PG&E	Fresno	8/3/2017	83	No	DEC	1	13:13	13:24	-4.14	0.00	0.00	168.88	-0.64	0.00	27.16	0.00	0.00	0.00
219	RT	Over Generation	PG&E	Fresno	8/3/2017	166	No	INC	1	13:13	13:24	-32.74	4112.23	0.00	1324.88	0.00	0.00	0.00	0.00	0.00	0.00
220	RT	Over Generation	SCE	LA Basin	8/3/2017	420	No	DEC	1	13:15	13:24	-4.17	0.00	0.00	122.29	-4.17	0.00	122.29	0.00	0.00	0.00
221	RT	Over Generation	SDG&E	San Diego-IV	8/3/2017	465	No	DEC	1	13:17	13:29	-59.10	0.00	0.00	2251.65	-24.34	0.00	869.70	0.00	0.00	0.00
222	RT	Planned Transmission Outage and Constraint	PG&E	Bay Area	8/14/2017	450	No	DEC	2	20:25	22:14	-87.22	3979.62	0.00	2243.69	-59.63	0.00	1742.81	0.00	-547.93	0.00
223	RT	Planned Transmission Outage and Constraint	PG&E	Bay Area	8/14/2017	450	No	INC	2	20:25	22:14	-0.29	2735.86	0.00	2.99	0.00	0.00	0.00	0.00	0.00	0.00
224	RT	Planned Transmission Outage and Constraint	PG&E	Humboldt	8/8/2017	15-95	No	DEC	4	20:55	23:59	-11.67	-1245.72	0.00	327.41	0.00	0.00	0.00	0.00	0.00	0.00
225	RT	Planned Transmission Outage and Constraint	PG&E	Humboldt	8/8/2017	30-80	No	INC	3	20:55	23:44	30.91	-2437.28	0.00	-1014.94	10.60	-358.20	0.00	0.00	-30.89	0.00
226	RT	Planned Transmission Outage and Constraint	PG&E	Humboldt	8/9/2017	15	No	DEC	2	0:00	1:59	0.49	0.00	0.00	-21.44	0.00	0.00	0.00	0.00	0.00	0.00
227	RT	Planned Transmission Outage and Constraint	PG&E	Humboldt	8/9/2017	15	No	INC	1	0:00	0:44	7.12	0.00	0.00	-250.69	0.00	0.00	0.00	0.00	-7.16	0.00
228	RT	Planned Transmission Outage and Constraint	PG&E	Humboldt	8/10/2017	13-25	No	INC	2	7:50	9:14	2.68	0.00	0.00	-72.62	0.06	-2.14	0.00	0.00	0.00	0.00
229	RT	Planned Transmission Outage and Constraint	PG&E	Humboldt	8/11/2017	13	No	INC	15	7:05	21:59	6.56	0.00	0.00	-227.04	1.12	-47.35	0.00	0.00	-0.44	0.00
230	RT	Planned Transmission Outage and Constraint	PG&E	Humboldt	8/11/2017	13-26	No	DEC	15	7:05	21:59	-41.80	0.00	0.00	1029.67	0.00	0.00	0.00	0.00	0.00	0.00
231	RT	Planned Transmission Outage and Constraint	PG&E	Humboldt	8/22/2017	16-28	No	DEC	15	9:30	23:59	3.85	0.00	0.00	-164.33	0.00	0.00	0.00	0.00	0.00	0.00
232	RT	Planned Transmission Outage and Constraint	PG&E	Humboldt	8/22/2017	28-184	No	INC	18	6:30	23:59	29.20	-11927.68	0.00	-1157.33	18.83	-708.53	0.00	0.00	-49.43	0.00

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Chart 2: Table of Exceptional Dispatches for Period 01/August/2017 - 31/August/2017

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
233	RT	Planned Transmission Outage and Constraint	PG&E	Humboldt	8/23/2017	28-42	No	INC	20	0:00	19:59	44.31	-14383.00	0.00	-1721.06	0.00	0.00	0.00	0.00	0.00	0.00
234	RT	Planned Transmission Outage and Constraint	PG&E	N/A	8/8/2017	40-54	No	INC	7	5:50	11:59	-6.63	0.00	0.00	51.24	-7.56	0.00	57.25	0.00	-75.27	0.00
235	RT	Planned Transmission Outage and Constraint	PG&E	N/A	8/9/2017	52-62	No	INC	4	20:50	23:59	-8.25	0.00	0.00	104.84	0.00	0.00	0.00	0.00	0.00	0.00
236	RT	Planned Transmission Outage and Constraint	PG&E	N/A	8/10/2017	40-116	No	INC	15	0:00	14:59	1.39	0.00	0.00	-57.71	-8.83	0.00	221.18	0.00	-180.66	0.00
237	RT	Planned Transmission Outage and Constraint	SCE	LA Basin	8/15/2017	20	No	INC	17	7:15	23:59	84.67	48591.06	0.00	-35922.33	0.00	0.00	0.00	0.00	0.00	0.00
238	RT	Planned Transmission Outage and Constraint	SCE	LA Basin	8/16/2017	10-30	Yes	INC	17	7:00	23:59	-147.24	23730.04	0.00	-5370.29	0.00	0.00	0.00	0.00	0.00	0.00
239	RT	Planned Transmission Outage and Constraint	SCE	LA Basin	8/17/2017	20	No	INC	24	0:15	23:59	-263.38	44382.91	0.00	9718.44	0.00	0.00	0.00	0.00	0.00	0.00
240	RT	Planned Transmission Outage and Constraint	SCE	LA Basin	8/22/2017	10	No	INC	12	12:10	23:59	-311.69	15118.38	0.00	12816.36	0.00	0.00	0.00	0.00	0.00	0.00
241	RT	Planned Transmission Outage and Constraint	SCE	LA Basin	8/23/2017	10	Yes	INC	12	12:00	23:59	-160.27	15960.60	0.00	5960.29	0.00	0.00	0.00	0.00	0.00	0.00
242	RT	Planned Transmission Outage and Constraint	SDG&E	San Diego-IV	8/7/2017	68	No	INC	7	15:00	21:59	-110.68	51343.55	11480.79	-8635.57	0.00	0.00	0.00	0.00	0.00	0.00
243	RT	Planned Transmission Outage and Constraint	SDG&E	San Diego-IV	8/8/2017	68	No	INC	6	16:00	21:59	-375.20	31410.30	0.00	14649.51	0.00	0.00	0.00	0.00	0.00	0.00
244	RT	Planned Transmission Outage and Constraint	SDG&E	San Diego-IV	8/9/2017	243-350	No	INC	11	6:45	17:29	-317.14	56173.87	0.00	5781.71	-32.00	0.00	800.83	0.00	-310.12	0.00
245	RT	Planned Transmission Outage and Constraint	SDG&E	San Diego-IV	8/9/2017	291	No	DEC	2	15:35	17:29	-1.49	0.00	0.00	-157.01	0.00	0.00	0.00	0.00	-460.32	0.00
246	RT	Planned Transmission Outage and Constraint	SDG&E	San Diego-IV	8/11/2017	40-156	Yes	INC	24	0:00	23:59	-306.84	149696.53	0.00	11799.71	0.07	-1.52	0.00	0.00	-1.42	0.00
247	RT	Planned Transmission Outage and Constraint	SDG&E	San Diego-IV	8/13/2017	20	No	INC	6	9:00	14:59	0.00	15865.44	16309.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
248	RT	Planned Transmission Outage and Constraint	SDG&E	San Diego-IV	8/14/2017	40-103	No	INC	16	6:30	21:59	284.55	79461.96	25981.63	-55225.09	0.00	0.00	0.00	0.00	0.00	0.00
249	RT	Planned Transmission Outage and Constraint	SDG&E	San Diego-IV	8/15/2017	20	No	INC	16	7:00	22:59	18.48	52883.18	25947.01	-44291.59	0.00	0.00	0.00	0.00	0.00	0.00
250	RT	Planned Transmission Outage and Constraint	SDG&E	San Diego-IV	8/16/2017	20	No	INC	15	7:00	21:59	-55.48	49864.62	24296.70	-7421.48	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	
251	RT	Planned Transmission Outage and Constraint	SDG&E	San Diego-IV	8/17/2017	20	No	INC	16	6:00	21:59	-327.89	50476.56	21742.35	13464.01	0.00	0.00	0.00	0.00	0.00	0.00	
252	RT	Planned Transmission Outage and Constraint	SDG&E	San Diego-IV	8/18/2017	155	No	DEC	4	14:45	18:29	36.11	-16714.32	0.00	-1378.37	0.00	0.00	0.00	0.00	0.00	-5597.19	0.00
253	RT	Planned Transmission Outage and Constraint	SDG&E	San Diego-IV	8/18/2017	155	Yes	INC	13	6:00	18:29	-29.98	2042.51	0.00	840.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00
254	RT	Planned Transmission Outage and Constraint	SDG&E	San Diego-IV	8/19/2017	155-200	No	INC	2	16:00	17:29	-0.98	3415.83	0.00	11.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00
255	RT	Planned Transmission Outage and Constraint	SDG&E	San Diego-IV	8/19/2017	155-300	No	DEC	3	16:00	18:59	81.18	-10555.74	0.00	337.04	0.00	0.00	0.00	0.00	0.00	-76.87	0.00
256	RT	Planned Transmission Outage and Constraint	SDG&E	San Diego-IV	8/22/2017	20-126	No	INC	18	6:30	23:59	-595.09	66653.80	0.00	26758.13	0.00	0.00	0.00	0.00	0.00	-0.08	0.00
257	RT	Planned Transmission Outage and Constraint	SDG&E	San Diego-IV	8/23/2017	15-35	Yes	INC	12	12:15	23:59	-21.59	35586.45	0.00	683.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00
258	RT	Planned Transmission Outage and Constraint	SDG&E	San Diego-IV	8/24/2017	20-900	No	INC	12	12:00	23:59	95.88	82399.25	37734.09	-5818.88	46.27	-1160.72	0.00	0.00	-	31585.05	0.00
259	RT	Planned Transmission Outage and Constraint	SDG&E	San Diego-IV	8/31/2017	25	No	DEC	3	17:45	19:59	-8.73	0.00	0.00	497.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00
260	RT	Software Limitation	PG&E	Bay Area	8/30/2017	0	No	INC	14	0:55	14:54	-664.00	19684.97	564.91	9875.85	-276.67	0.00	0.00	0.00	0.00	0.00	0.00
261	RT	Software Limitation	PG&E	Fresno	8/4/2017	83	No	INC	1	21:05	21:59	53.43	0.00	0.00	-1784.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00
262	RT	Software Limitation	PG&E	Fresno	8/8/2017	20	No	DEC	1	18:20	18:44	16.46	-310.73	0.00	-653.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00
263	RT	Software Limitation	PG&E	Fresno	8/14/2017	45	No	INC	1	10:15	10:44	22.24	0.00	0.00	-970.44	8.07	-302.49	0.00	0.00	0.00	0.00	0.00
264	RT	Software Limitation	PG&E	Humboldt	8/9/2017	16	No	DEC	1	22:15	22:59	-3.18	-884.15	0.00	33.99	-1.79	0.00	0.50	0.00	0.00	0.00	0.00
265	RT	Software Limitation	PG&E	Humboldt	8/10/2017	0	No	DEC	3	21:50	23:59	-1.91	-250.81	0.00	0.00	-1.91	0.00	0.00	0.00	0.00	0.00	0.00
266	RT	Software Limitation	PG&E	Humboldt	8/10/2017	0	No	INC	3	21:50	23:59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
267	RT	Software Limitation	PG&E	Humboldt	8/11/2017	0	No	INC	8	0:00	7:44	10.34	0.00	0.00	-316.03	1.12	-47.35	0.00	0.00	0.00	0.00	0.00
268	RT	Software Limitation	PG&E	Humboldt	8/27/2017	48	No	INC	1	22:05	22:29	0.10	-299.09	0.00	12.10	0.00	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
269	RT	Software Limitation	SCE	LA Basin	8/1/2017	5	No	DEC	3	17:25	19:59	2.50	-169.05	0.00	-111.72	0.00	0.00	0.00	0.00	0.00	0.00
270	RT	Software Limitation	SCE	LA Basin	8/1/2017	38-42	No	INC	1	17:20	17:59	41.07	0.00	0.00	-2193.79	0.00	0.00	0.00	0.00	0.00	0.00
271	RT	Software Limitation	SCE	LA Basin	8/4/2017	70	No	INC	2	1:00	2:59	5.45	12265.11	0.00	-153.85	0.00	0.00	0.00	0.00	0.00	0.00
272	RT	Software Limitation	SCE	LA Basin	8/7/2017	20	Yes	INC	6	10:00	15:59	-19.50	5547.30	0.00	584.73	0.00	0.00	0.00	0.00	0.00	0.00
273	RT	Software Limitation	SCE	LA Basin	8/10/2017	190	No	DEC	7	13:50	19:59	-242.38	0.00	0.00	10350.02	0.00	0.00	0.00	0.00	0.00	0.00
274	RT	Software Limitation	SCE	LA Basin	8/30/2017	0	No	INC	1	23:45	23:59	-2.50	0.00	0.00	0.00	-2.50	0.00	0.00	0.00	0.00	0.00
275	RT	Software Limitation	SCE	LA Basin	8/31/2017	0	No	INC	2	0:00	1:59	-0.42	0.00	0.00	13.20	0.00	0.00	0.00	0.00	0.00	0.00
276	RT	Software Limitation	SDG&E	San Diego-IV	8/10/2017	68	No	INC	11	9:00	19:59	-162.63	52882.43	0.00	4493.67	0.02	-0.73	0.00	0.00	0.00	0.00
277	RT	Software Limitation	SDG&E	San Diego-IV	8/12/2017	63	No	INC	12	8:00	19:59	-81.02	23403.47	0.00	2811.89	0.03	-1.17	0.00	0.00	0.00	0.00
278	RT	Start-Up Instructions	PG&E	Stockton	8/14/2017	0	No	DEC	1	22:20	23:04	31.30	0.00	0.00	-746.08	0.00	0.00	0.00	0.00	0.00	0.00
279	RT	Unit Testing	Intertie	N/A	8/1/2017	63	No	INC	24	0:00	23:59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
280	RT	Unit Testing	Intertie	N/A	8/2/2017	63	No	INC	24	0:00	23:59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
281	RT	Unit Testing	Intertie	N/A	8/3/2017	63	No	INC	24	0:00	23:59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
282	RT	Unit Testing	Intertie	N/A	8/4/2017	63	No	INC	23	1:50	23:59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
283	RT	Unit Testing	Intertie	N/A	8/5/2017	63	No	INC	24	0:00	23:59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
284	RT	Unit Testing	Intertie	N/A	8/7/2017	63-126	No	INC	17	7:00	23:59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
285	RT	Unit Testing	Intertie	N/A	8/8/2017	63	No	INC	10	14:40	23:59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
286	RT	Unit Testing	Intertie	N/A	8/9/2017	63	No	INC	24	0:00	23:59	0.00	0.00	0.00	0.00	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	
287	RT	Unit Testing	Intertie	N/A	8/10/2017	63	No	INC	24	0:00	23:59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
288	RT	Unit Testing	Intertie	N/A	8/11/2017	63	No	INC	24	0:00	23:59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
289	RT	Unit Testing	Intertie	N/A	8/13/2017	63	No	INC	24	0:00	23:59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
290	RT	Unit Testing	Intertie	N/A	8/14/2017	63	No	INC	24	0:00	23:59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
291	RT	Unit Testing	Intertie	N/A	8/15/2017	63	No	INC	24	0:00	23:59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
292	RT	Unit Testing	Intertie	N/A	8/16/2017	63	No	INC	24	0:00	23:59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
293	RT	Unit Testing	Intertie	N/A	8/17/2017	63	No	INC	24	0:15	23:59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
294	RT	Unit Testing	Intertie	N/A	8/18/2017	63	No	INC	23	1:20	23:59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
295	RT	Unit Testing	Intertie	N/A	8/19/2017	100	No	INC	24	0:00	23:59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
296	RT	Unit Testing	Intertie	N/A	8/20/2017	100	No	INC	24	0:00	23:59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
297	RT	Unit Testing	Intertie	N/A	8/21/2017	100	No	INC	24	0:00	23:59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
298	RT	Unit Testing	Intertie	N/A	8/22/2017	100	No	INC	24	0:00	23:59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
299	RT	Unit Testing	Intertie	N/A	8/23/2017	100	No	INC	24	0:00	23:59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
300	RT	Unit Testing	Intertie	N/A	8/24/2017	100	No	INC	24	0:00	23:59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
301	RT	Unit Testing	Intertie	N/A	8/25/2017	100	No	INC	24	0:00	23:59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
302	RT	Unit Testing	Intertie	N/A	8/26/2017	100	No	INC	24	0:00	23:59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
303	RT	Unit Testing	Intertie	N/A	8/27/2017	100	No	INC	24	0:00	23:59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
304	RT	Unit Testing	Intertie	N/A	8/28/2017	100	No	INC	24	0:00	23:59	0.00	0.00	0.00	0.00	0.00	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/August/2017 - 31/August/2017

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
305	RT	Unit Testing	Intertie	N/A	8/29/2017	100	No	INC	20	4:00	23:59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
306	RT	Unit Testing	Intertie	N/A	8/30/2017	100	No	INC	24	0:00	23:59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
307	RT	Unit Testing	Intertie	N/A	8/31/2017	100	No	INC	24	0:00	23:59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
308	RT	Unit Testing	PG&E	Bay Area	8/3/2017	92	No	INC	1	15:21	15:44	20.38	0.00	0.00	-7745.37	0.00	0.00	0.00	0.00	0.00	0.00
309	RT	Unit Testing	PG&E	Bay Area	8/8/2017	148	No	INC	1	19:30	19:59	50.65	13484.16	0.00	-2021.29	0.00	0.00	0.00	0.00	0.00	0.00
310	RT	Unit Testing	PG&E	Bay Area	8/25/2017	49	No	INC	1	19:45	19:49	20.23	0.00	0.00	-801.89	20.23	-801.89	0.00	0.00	0.00	0.00
311	RT	Unit Testing	PG&E	Bay Area	8/29/2017	144	No	INC	1	21:30	21:54	31.91	0.00	0.00	-1538.73	31.28	-1521.52	0.00	0.00	0.00	0.00
312	RT	Unit Testing	PG&E	Bay Area	8/30/2017	59-92	Yes	INC	2	18:25	19:59	14.03	0.00	586.47	-1048.71	1.54	-85.36	0.00	0.00	0.00	0.00
313	RT	Unit Testing	PG&E	Bay Area	8/31/2017	535	No	INC	1	19:35	19:59	2.90	0.00	0.00	-154.96	0.00	0.00	0.00	0.00	0.00	0.00
314	RT	Unit Testing	PG&E	Fresno	8/23/2017	45	No	INC	1	18:35	18:59	8.67	0.00	0.00	-529.32	0.00	0.00	0.00	0.00	0.00	0.00
315	RT	Unit Testing	PG&E	Fresno	8/25/2017	27	No	INC	1	11:45	12:14	6.95	0.00	0.00	-186.60	6.95	-189.88	0.00	0.00	0.00	0.00
316	RT	Unit Testing	PG&E	N/A	8/9/2017	590	No	DEC	2	10:10	11:59	19.42	0.00	0.00	-587.94	21.30	-630.12	0.00	0.00	0.00	0.00
317	RT	Unit Testing	PG&E	N/A	8/16/2017	245	No	INC	1	19:07	19:34	7.62	0.00	0.00	-268.48	4.45	-156.44	0.00	0.00	0.00	0.00
318	RT	Unit Testing	PG&E	N/A	8/17/2017	15-30	No	INC	3	11:45	14:44	10.78	0.00	0.00	-723.97	7.50	-490.28	0.00	0.00	0.00	0.00
319	RT	Unit Testing	PG&E	Stockton	8/22/2017	275-304	No	INC	11	7:00	17:59	361.45	88793.63	743.99	-11474.27	84.91	-3418.36	0.00	0.00	0.00	0.00
320	RT	Unit Testing	PG&E	Stockton	8/23/2017	220	No	INC	11	6:45	17:14	25.53	76542.90	0.00	-833.11	16.09	-497.46	0.00	0.00	0.00	0.00
321	RT	Unit Testing	SCE	Big Creek-Ventura	8/11/2017	76	No	INC	1	15:45	15:59	2.36	0.00	0.00	-1053.17	0.00	0.00	0.00	0.00	0.00	0.00
322	RT	Unit Testing	SCE	Big Creek-Ventura	8/31/2017	70	No	INC	1	20:40	20:59	0.67	0.00	0.00	-42.94	0.67	-42.94	0.00	0.00	0.00	0.00

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Chart 2: Table of Exceptional Dispatches for Period 01/August/2017 - 31/August/2017

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
323	RT	Unit Testing	SCE	LA Basin	8/1/2017	40-244	No	INC	2	4:01	5:49	40.78	0.00	0.00	-2082.07	40.78	-2082.07	0.00	0.00	0.00	0.00
324	RT	Unit Testing	SCE	LA Basin	8/3/2017	96-204	No	INC	11	2:10	12:59	31.32	0.00	0.00	-2451.35	19.98	-994.27	0.00	0.00	0.00	0.00
325	RT	Unit Testing	SCE	LA Basin	8/4/2017	36	No	INC	1	2:58	3:29	7.33	0.00	0.00	-432.54	7.33	-432.40	0.00	0.00	0.00	0.00
326	RT	Unit Testing	SCE	LA Basin	8/6/2017	47	No	INC	1	7:17	7:34	0.23	0.00	0.00	-28.24	0.57	-35.03	0.00	0.00	0.00	0.00
327	RT	Unit Testing	SCE	LA Basin	8/8/2017	96	No	INC	2	22:40	23:59	34.40	4741.50	0.00	-1297.64	23.98	-968.64	0.00	0.00	0.00	0.00
328	RT	Unit Testing	SCE	LA Basin	8/9/2017	36	No	INC	1	1:11	1:59	11.58	0.00	0.00	-542.30	11.58	-542.30	0.00	0.00	0.00	0.00
329	RT	Voltage Support	PG&E	Humboldt	8/31/2017	70	No	DEC	1	23:45	23:59	3.15	0.00	0.00	-82.57	0.00	0.00	0.00	0.00	0.00	0.00
330	RT	Voltage Support	PG&E	Humboldt	9/1/2017	28-70	No	INC	2	0:00	1:59	15.16	0.00	0.00	-440.45	0.00	0.00	0.00	0.00	0.00	0.00
331	RT	Voltage Support	PG&E	Sierra	8/18/2017	20	No	INC	1	23:20	23:59	5.05	753.21	0.00	-127.46	0.00	0.00	0.00	0.00	0.00	0.00
332	RT	Voltage Support	PG&E	Sierra	8/19/2017	20	Yes	INC	24	0:00	23:59	18.10	32109.18	0.00	-3037.33	0.00	0.00	0.00	0.00	0.00	0.00
333	RT	Voltage Support	PG&E	Sierra	8/20/2017	20-40	Yes	INC	24	0:00	23:59	17.33	35133.54	0.00	-12021.27	0.00	0.00	0.00	0.00	0.00	0.00
334	RT	Voltage Support	PG&E	Sierra	8/21/2017	20	No	INC	4	0:00	3:29	10.00	10074.13	0.00	-374.05	0.00	0.00	0.00	0.00	0.00	0.00
335	RT	Voltage Support	PG&E	Sierra	8/26/2017	20-25	No	INC	16	8:15	23:59	-19.97	27291.34	969.17	-3651.70	0.00	0.00	0.00	0.00	0.00	0.00
336	RT	Voltage Support	PG&E	Sierra	8/27/2017	20-46	No	INC	24	0:00	23:59	13.71	0.00	0.00	-641.85	21.43	-953.39	0.00	0.00	-799.71	0.00

Appendix A: Explanation by Example

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

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

Example 1: Exceptional Dispatch Instructions Prior to DAM

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

Table 2: Instructions Prior to Day-Ahead Market

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

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

Table 3: FERC Summary of Instructions Prior to DAM

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

Example 2: Incremental Exceptional Dispatch Instructions in RTM

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

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

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

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

Resource B is dispatched 20 MW above its day-ahead schedule, so its total volume (MWh) is calculated as 20 MW times 3 hours which is equal to 60 MWh. Since the resource was committed in the Day-Ahead Market there are no minimum load quantity and start up costs associated with this resource. The resource had a bid price of \$100/MWh and the LMP at that resource was \$10/MWh. All of 60 MWh is considered as exceptional dispatch incremental quantity shown in ED Volume (MWH INC/DEC) column. The charge code CC6470 INC is calculated as 60 MWh * resource LMP (\$10/MWh) which is equal to \$600. Since the only imbalance energy in this timeframe was the exceptional dispatch volume, the charge code CC6470 is equal to CC6470 INC. The charge code CC6488 is calculated as MWH quantity *(bid price – LMP), which is equal to \$5400 (60 MWh * (\$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 (PGAE) 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 PGAE 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 PGAE 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 August, this resource was issued exceptional dispatch instructions in 67 five-minute intervals. This resource was eligible to set the LMP in 32 intervals. Out of the 32 intervals, resource calculated LMP was larger than the market LMP in 0 intervals. Out of the 32 intervals, resource calculated LMP was less than the market LMP in 32 intervals. In the 32 intervals, the average decrease in five minute LMP was \$154.54/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 \$154.54/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 August, this resource was issued exceptional dispatch instructions in 72 five-minute intervals. This resource was eligible to set the LMP in 31 intervals. Out of the 31 intervals, resource calculated LMP was larger than the market LMP in 21 intervals. In the 21 intervals, the average increase in five minute LMP was \$35.90/MWh. Out of the 31 intervals, resource calculated LMP was less than the market LMP in 10 intervals. In the 10 intervals, the average decrease in five minute LMP was \$154.68/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 \$25.58/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	8/28/2017	18	1	140.17	No	22.46	-117.71
2	8/28/2017	18	5	69.92	Yes	0.4	-69.52
3	8/28/2017	18	6	68.59	Yes	0.4	-68.19
4	8/28/2017	18	7	68.16	Yes	0.4	-67.76
5	8/28/2017	18	8	121.09	Yes	0.4	-120.69
6	8/28/2017	18	9	1079.41	Yes	0.4	-1079.01
7	8/28/2017	18	10	998.70	Yes	0.4	-998.30
8	8/28/2017	18	11	998.70	Yes	0.4	-998.30
9	8/28/2017	18	12	998.70	Yes	0.4	-998.30
10	8/30/2017	5	3	28.65	No	22.88	-5.77
11	8/30/2017	5	4	28.39	No	22.88	-5.51
12	8/30/2017	5	5	28.48	No	22.88	-5.60
13	8/30/2017	5	6	25.11	No	22.88	-2.23
14	8/30/2017	5	7	26.34	No	22.88	-3.46
15	8/30/2017	5	8	27.52	No	22.88	-4.64
16	8/30/2017	5	9	28.63	No	22.88	-5.75
17	8/30/2017	5	10	28.56	No	22.88	-5.68
18	8/30/2017	5	11	28.46	No	22.88	-5.58
19	8/30/2017	5	12	27.84	No	22.88	-4.96
20	8/30/2017	6	1	26.53	No	22.88	-3.65
21	8/30/2017	6	2	27.20	No	22.88	-4.32
22	8/30/2017	6	3	28.44	No	22.88	-5.56
23	8/30/2017	6	4	29.85	No	22.88	-6.97
24	8/30/2017	6	5	29.85	No	22.88	-6.97
25	8/30/2017	6	6	29.85	No	22.88	-6.97
26	8/30/2017	6	7	48.16	No	22.88	-25.28
27	8/30/2017	6	8	44.65	No	22.88	-21.77
28	8/30/2017	6	9	50.78	No	22.88	-27.90
29	8/30/2017	6	10	50.79	No	22.88	-27.91
30	8/30/2017	6	11	51.24	No	22.88	-28.36
31	8/30/2017	6	12	51.19	No	22.88	-28.31
32	8/30/2017	15	1	20.43	Yes	0.4	-20.03
33	8/30/2017	15	2	21.08	Yes	0.4	-20.68
34	8/30/2017	15	3	22.54	Yes	0.4	-22.14
35	8/30/2017	15	4	19.05	Yes	0.4	-18.65
36	8/30/2017	15	5	2.23	Yes	0.4	-1.83
37	8/30/2017	15	6	2.15	Yes	0.4	-1.75
38	8/30/2017	15	7	3.96	Yes	0.4	-3.56
39	8/30/2017	15	8	1.55	Yes	0.4	-1.15
40	8/30/2017	15	9	2.28	Yes	0.4	-1.88
41	8/30/2017	15	10	6.90	Yes	0.4	-6.50
42	8/30/2017	15	11	13.93	Yes	0.4	-13.53

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Number	Trade Date	Trade Hour	Interval	Market LMP	Eligible Flag	Calculated LMP	Change in LMP
43	8/30/2017	15	12	17.21	Yes	0.4	-16.81
44	8/31/2017	9	1	34.79	No	22.68	-12.11
45	8/31/2017	9	2	33.03	No	22.68	-10.35
46	8/31/2017	9	3	30.97	No	22.68	-8.29
47	8/31/2017	9	4	30.39	No	22.68	-7.71
48	8/31/2017	9	5	29.71	No	22.68	-7.03
49	8/31/2017	9	6	29.58	No	22.68	-6.90
50	8/31/2017	9	7	28.94	No	22.68	-6.26
51	8/31/2017	9	8	27.73	No	22.68	-5.05
52	8/31/2017	9	9	26.25	No	22.68	-3.57
53	8/31/2017	9	10	23.31	No	22.68	-0.63
54	8/31/2017	9	11	23.86	No	22.68	-1.18
55	8/31/2017	9	12	27.65	No	22.68	-4.97
56	8/31/2017	10	1	48.17	Yes	0.15	-48.02
57	8/31/2017	10	2	48.47	Yes	0.15	-48.32
58	8/31/2017	10	3	48.63	Yes	0.15	-48.48
59	8/31/2017	10	4	29.71	Yes	0.15	-29.56
60	8/31/2017	10	5	29.81	Yes	0.15	-29.66
61	8/31/2017	10	6	29.97	Yes	0.15	-29.82
62	8/31/2017	10	7	31.51	Yes	0.15	-31.36
63	8/31/2017	10	8	30.62	Yes	0.15	-30.47
64	8/31/2017	10	9	29.87	Yes	0.15	-29.72
65	8/31/2017	10	10	30.73	Yes	0.15	-30.58
66	8/31/2017	10	11	30.70	Yes	0.15	-30.55
67	8/31/2017	10	12	30.33	Yes	0.15	-30.18

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	8/3/2017	3	3	34.51	No	44.60	10.09
2	8/3/2017	3	4	35.96	No	44.60	8.64
3	8/3/2017	3	5	35.26	No	44.60	9.34
4	8/3/2017	3	6	35.05	No	44.60	9.55
5	8/3/2017	3	7	34.20	No	44.60	10.40
6	8/3/2017	3	8	33.58	No	44.60	11.02
7	8/22/2017	17	6	38.75	No	38.87	0.12
8	8/22/2017	17	7	39.47	No	38.87	-0.60
9	8/22/2017	17	8	41.06	No	38.87	-2.19
10	8/22/2017	17	10	42.49	No	38.87	-3.62
11	8/22/2017	17	11	42.08	No	38.87	-3.21
12	8/22/2017	17	12	42.05	No	38.87	-3.18
13	8/28/2017	13	2	33.48	Yes	83.94	50.46
14	8/28/2017	13	3	37.20	Yes	83.94	46.74
15	8/28/2017	13	4	35.00	Yes	83.94	48.94
16	8/28/2017	13	5	35.89	Yes	83.94	48.05
17	8/28/2017	13	6	36.76	Yes	83.94	47.18
18	8/28/2017	13	7	38.85	Yes	83.94	45.09
19	8/28/2017	13	8	39.00	Yes	83.94	44.94
20	8/28/2017	13	9	42.61	Yes	83.94	41.33
21	8/28/2017	13	10	42.84	Yes	83.94	41.10
22	8/28/2017	13	11	42.97	Yes	83.94	40.97
23	8/28/2017	13	12	44.49	Yes	83.94	39.45
24	8/28/2017	14	1	39.82	Yes	83.94	44.12
25	8/28/2017	14	2	40.68	Yes	83.94	43.26
26	8/28/2017	14	3	44.18	Yes	83.94	39.76
27	8/28/2017	14	4	47.48	Yes	83.94	36.46
28	8/28/2017	14	5	47.56	Yes	83.94	36.38
29	8/28/2017	14	6	54.16	Yes	83.94	29.78
30	8/28/2017	14	7	99.55	Yes	83.94	-15.61
31	8/28/2017	14	8	143.82	Yes	83.94	-59.88
32	8/28/2017	14	9	257.34	Yes	83.94	-173.40
33	8/28/2017	14	10	58.53	Yes	83.94	25.41
34	8/28/2017	14	11	71.09	No	49.71	-21.38

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Number	Trade Date	Trade Hour	Interval	Market LMP	Eligible Flag	Calculated LMP	Change in LMP
35	8/28/2017	14	12	67.84	No	49.71	-18.13
36	8/28/2017	16	1	45.35	No	49.71	4.36
37	8/28/2017	16	2	46.26	No	49.71	3.45
38	8/28/2017	16	3	51.46	No	49.71	-1.75
39	8/28/2017	16	4	51.43	No	49.71	-1.72
40	8/28/2017	16	5	58.23	No	49.71	-8.52
41	8/28/2017	16	6	116.54	No	49.71	-66.83
42	8/28/2017	16	7	118.88	No	49.71	-69.17
43	8/28/2017	16	8	1000.00	No	49.71	-950.29
44	8/28/2017	16	9	1000.00	No	49.71	-950.29
45	8/28/2017	16	10	1000.00	No	49.71	-950.29
46	8/28/2017	16	11	1000.00	No	49.71	-950.29
47	8/28/2017	16	12	66.52	No	49.71	-16.81
48	8/30/2017	24	1	36.65	No	0.09	-36.56
49	8/30/2017	24	2	37.92	No	0.09	-37.83
50	8/30/2017	24	3	40.44	No	0.09	-40.35
51	8/30/2017	24	4	45.84	No	0.09	-45.75
52	8/30/2017	24	5	47.38	No	0.09	-47.29
53	8/30/2017	24	6	46.73	No	0.09	-46.64
54	8/30/2017	24	7	34.69	No	0.09	-34.60
55	8/30/2017	24	8	42.93	No	0.09	-42.84
56	8/30/2017	24	9	38.58	No	0.09	-38.49
57	8/30/2017	24	10	36.65	No	0.09	-36.56
58	8/30/2017	24	11	36.69	No	0.09	-36.60
59	8/30/2017	24	12	34.66	No	0.09	-34.57
60	8/31/2017	16	12	1084.04	Yes	52.53	-1031.51
61	8/31/2017	17	1	72.47	No	52.53	-19.94
62	8/31/2017	17	2	62.69	No	52.53	-10.16
63	8/31/2017	17	3	55.71	No	52.53	-3.18
64	8/31/2017	17	4	53.97	Yes	54.06	0.09
65	8/31/2017	17	5	51.86	Yes	54.06	2.20
66	8/31/2017	17	6	51.82	Yes	54.06	2.24
67	8/31/2017	17	7	49.04	Yes	6.11	-42.93
68	8/31/2017	17	8	50.50	Yes	6.11	-44.39
69	8/31/2017	17	9	51.12	Yes	6.11	-45.01
70	8/31/2017	17	10	49.96	Yes	6.11	-43.85
71	8/31/2017	17	11	51.22	Yes	6.11	-45.11
72	8/31/2017	17	12	51.26	Yes	6.11	-45.15

Appendix C: Exceptional Dispatch Bid Mitigation Analysis

In August 2017, the ISO applied the exceptional dispatch bid mitigation to the exceptional dispatches. Table 10 shows the costs by instruction type in August. With exceptional dispatch bid mitigation, the costs for these types of exceptional dispatches were \$ 10,680. Without the exceptional dispatch bid mitigation, the costs for these types of exceptional dispatches would be \$ 9,801. The cost saving from the exceptional dispatch bid mitigation was \$ (879).

Table 10: Bid Mitigation Analysis for August 2017

Type	Number of Resources	Costs without Bid Mitigation	Costs with Bid Mitigation	Cost Saving
NONTMOD	6	\$9,801	\$10,680	\$ (879)
Total	6	\$9,801	\$10,680	\$ (879)

CERTIFICATE OF SERVICE

I hereby certify that I have served the foregoing document upon the parties listed on the official service lists in the above-referenced proceedings, in accordance with the requirements of Rule 2010 of the Commission's Rules of Practice and Procedure (18 C.F.R. § 385.2010).

Dated at Folsom, California this 30th day of November 2017.

/s/ Grace Clark
Grace Clark