



September 26, 2014

FILED

2014 SEP 26 P 3:53

The Honorable Chair and Members  
of the Hawai'i Public Utilities Commission  
Kekuanaoa Building, 1st Floor  
465 South King Street  
Honolulu, Hawai'i 96813

PUBLIC UTILITIES  
COMMISSION

Dear Commissioners:

Subject: Docket No. 2011-0206  
Reliability Standards Working Group  
Monthly Report

Pursuant to Ordering Paragraph 3 of the Commission's Order No. 30371, filed on May 4, 2012, in the above subject proceeding, enclosed as Exhibit A is the Hawaiian Electric Companies'<sup>1</sup> monthly report for August 2014 on (1) system frequency control performance during month; (2) significant system events during month; and (3) curtailment of non-dispatchable renewable resources.

In addition, an electronic copy of each report is also included with this filing. These files are voluminous, and therefore, the Company is providing a compact disc ("CD") containing the electronic files to both the Commission and the Consumer Advocate. Copies of the CD will be available to any Party to this proceeding. Interested Parties should email Marisa Chun at [marisa.chun@heco.com](mailto:marisa.chun@heco.com) to request a copy.

If you have any questions on this matter, please contact Marisa Chun at (808) 543-4723.

Sincerely,

Daniel G. Brown  
Manager  
Regulatory Non-Rate Proceedings

Enclosure

cc: Service List

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<sup>1</sup> Hawaiian Electric Company, Inc., Hawai'i Electric Light Company, Inc., and Maui Electric Company, Limited are collectively referred to as the "Hawaiian Electric Companies" or "Companies".

SERVICE LIST  
(Docket No. 2011-0206)

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**The Commission's Order No. 30371 (Docket No 2011-0206 – Relating To Various Matters in RSWG Process), filed May 4, 2012, ordered the following information for each island grid:**

- (1) System frequency control performance during month:
  - a) Frequency duration plot based on the highest resolution SCADA data available for the month detailing how many seconds each power system operated at frequencies above 60 hertz and at frequencies below 60 Hz.
  - b) Tabulation of the number, magnitude and duration of frequency excursions (high and low) outside normal frequency control range (59.95 to 60.05 Hz).

The following provides information with respect to items 1a) through 1b) – (all statements are current as of the month ending August 31, 2014):

**1a) Frequency duration plot based on the highest resolution SCADA data available for the month detailing how many seconds each power system operated at frequencies above 60 hertz and at frequencies below 60 Hz:**

The frequency duration plots for Hawaiian Electric, Maui Electric (Maui Division) and Hawai'i Electric Light based on two-second data are provided in Attachment 1, and the enclosed Excel files. Refer to the electronic files for the individual data points because the information is voluminous and does not translate well to a hard copy.

**1b) Tabulation of the number, magnitude and duration of frequency excursions (high and low) outside normal frequency control range (59.95 to 60.05 Hz):**

Tabulation of the number, magnitude and duration of frequency excursions outside of the frequency range of 59.95 Hz to 60.05 Hz for Hawaiian Electric, Maui Electric (Maui Division) and Hawai'i Electric Light are provided in Attachment 2, and the enclosed Excel files. Refer to the electronic files for the individual data points because the information is voluminous and does not translate well to a hard copy.

- (2) Significant system events during month:
  - a) Tabulation of contingency reserve activations including date and time, MW magnitude, duration, and triggering event.
  - b) Tabulation of under frequency load shed activations including date and time, triggering frequency, MW magnitude, duration, and triggering event.
  - c) Tabulation of demand response activations for system events, including date and time, MW magnitude, duration, and triggering event, (excluding demand response utilization for unit commitment deferral or system operations economics.)

The following provides information with respect to items 2a) through 2c) – (all statements are current as of the month ending August 31, 2014):

**2a) Tabulation of contingency reserve activations including date and time, MW magnitude, duration, and triggering event:**

Hawaiian Electric did not have any contingency reserve activations in the month of August. Maui Electric and Hawai'i Electric Light do not operate with contingency reserve requirements. Therefore, Attachment 3 is not being provided for this reporting period.

**2b) Tabulation of under frequency load shed activations including date and time, triggering frequency, MW magnitude, duration, and triggering event:**

Maui Electric, and Hawai'i Electric Light's under frequency load shed events are provided in Attachment 4. Hawaiian Electric did not have any under frequency load shed events for the month of August.

**2c) Tabulation of demand response activations for system events, including date and time, MW magnitude, duration, and triggering event, (excluding demand response utilization for unit commitment deferral or system operations economics.)**

Hawaiian Electric did not have any demand response activations for system events for the month of August. Hawai'i Electric Light currently does not have demand response program. Maui Electric has implemented the Fast Demand Response pilot program on a limited basis. Hawai'i Electric Light plans to use the findings of Maui Electric's pilot program to help in the evaluation and development of future demand response programs. Maui Electric executes a weekly testing protocol which measures customer participation. This program is not currently used in response to actual system events. Therefore, Attachment 5 is not being provided for this reporting period.

- (3) Curtailment of non-dispatchable renewable resources:
- (a) Tabulation of each curtailment event for each resource including the starting date and time, duration, megawatt hours curtailed, peak MW curtailed, and reason for curtailment.
  - (b) Total MWh of non-dispatchable renewable resources curtailed for the month.

The following provides information with respect to items 3a) through 3b) – (all statements are current as of the month ending August 31, 2014):

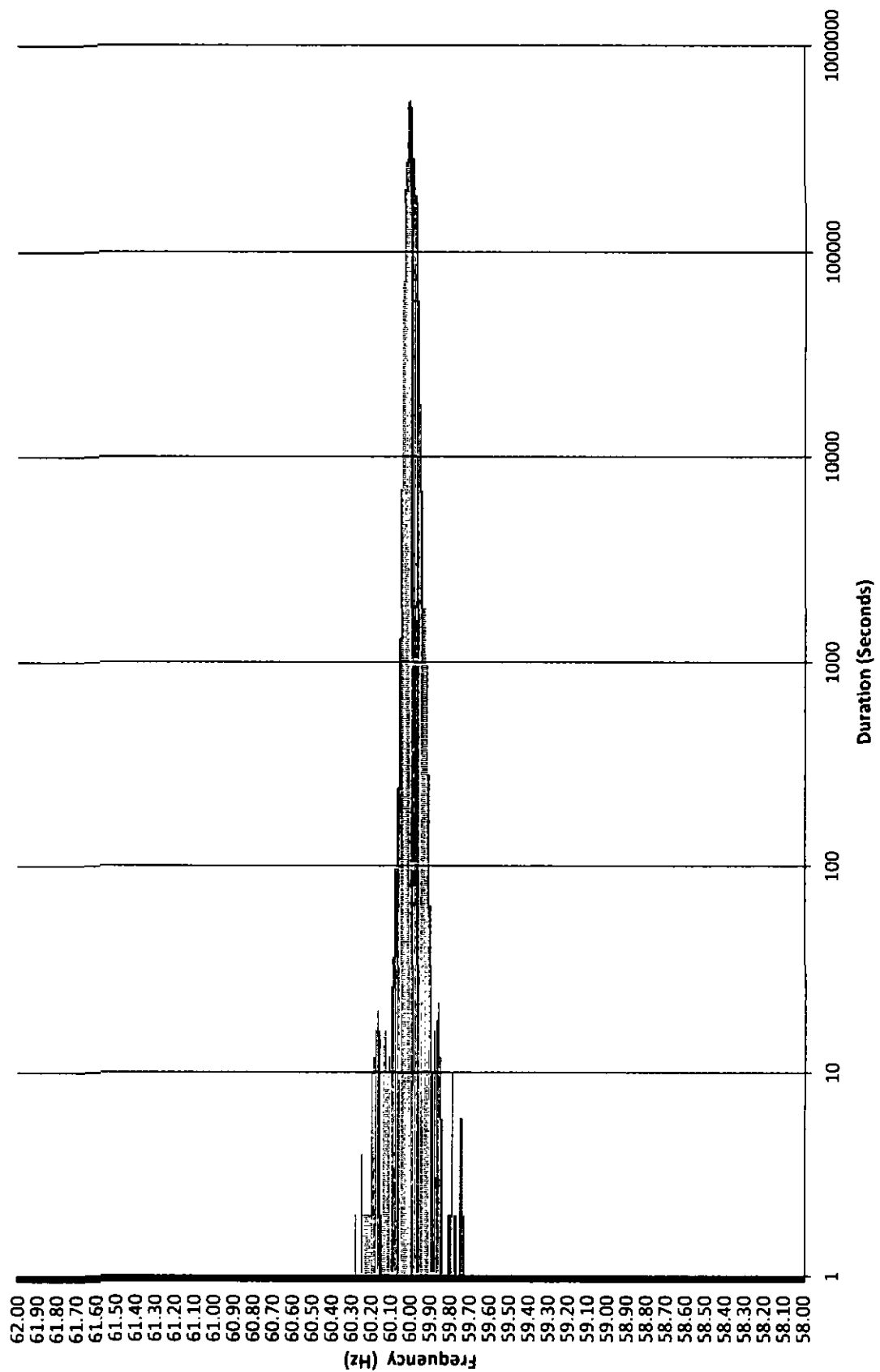
**3a) Tabulation of each curtailment event for each resource including the starting date and time, duration, megawatt hours curtailed, peak MW curtailed, and reason for curtailment:**

The tabulation of each curtailment event for each resource is provided in Attachment 6.

**3b) Total MWh of non-dispatchable renewable resources curtailed for the month:**

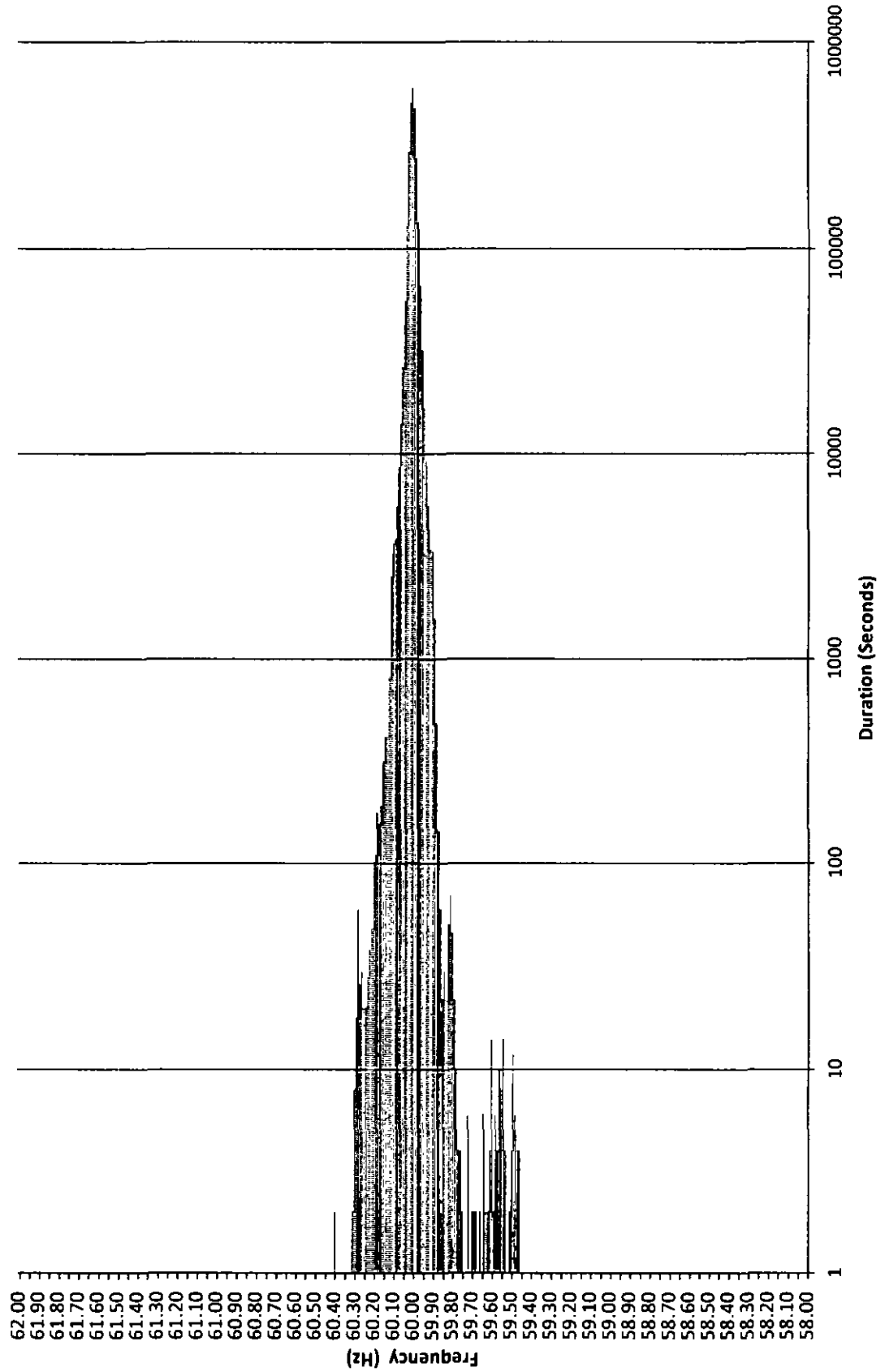
Curtailed MWh from non-dispatchable resources are difficult to determine due to the variability of the resource during curtailment periods. In some cases, the curtailed MWh estimates were provided by the IPPs under curtailment. Hawai'i Electric Light is not providing an estimate of curtailed MWh, as this information is not provided to Hawai'i Electric Light from the IPP. The Hawaiian Electric Companies do not make any representations as to the accuracy of the curtailed MWh. The estimated MWh of non-dispatchable resources curtailed for the month are provided in Attachment 6, corresponding to each curtailment event.

# Frequency Distribution Plot - Hawaiian Electric August 2014

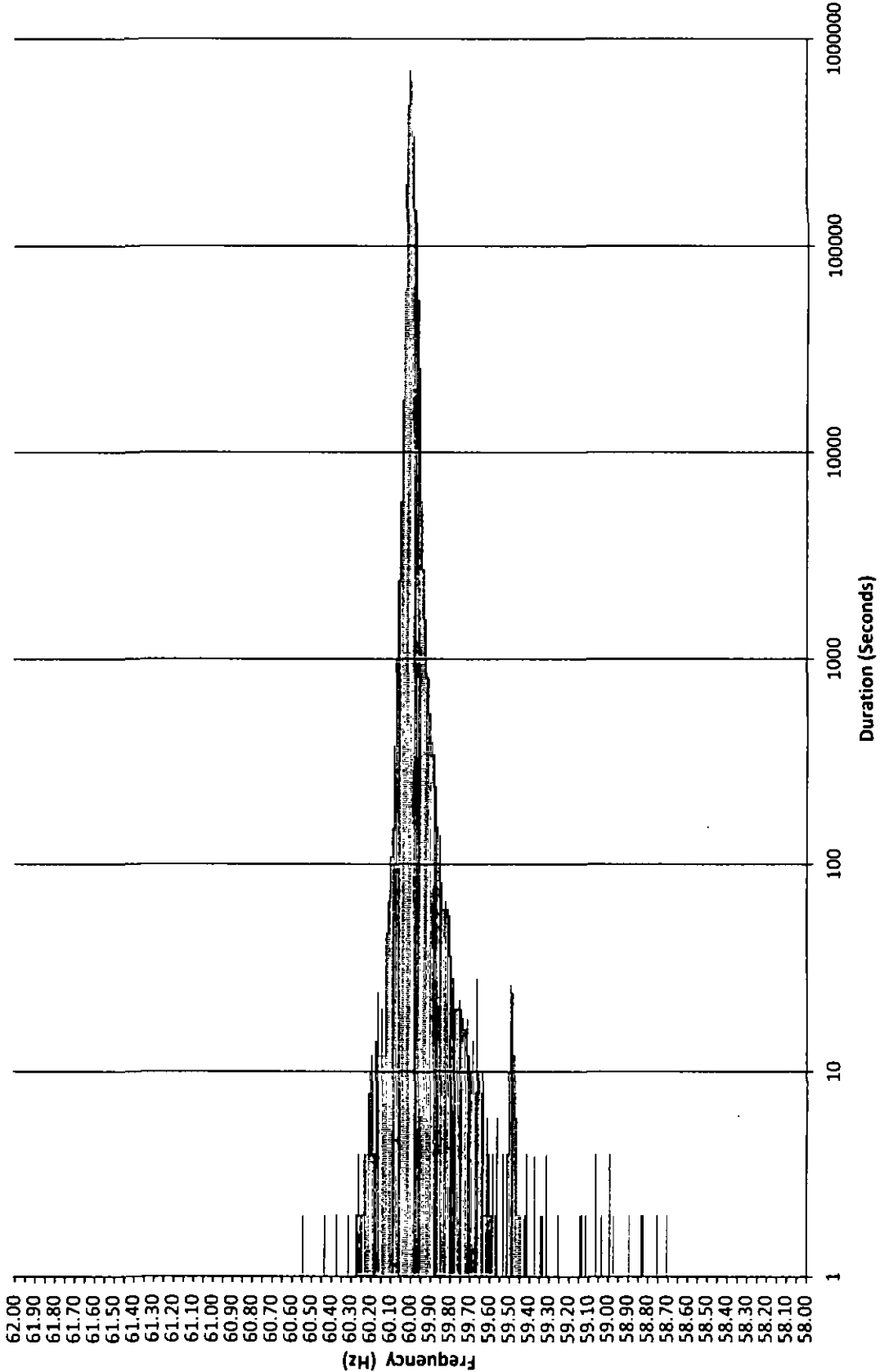




# Maui Electric Frequency Distribution Plot - Maui August 2014



**Frequency Distribution Plot - Hawai'i Electric Light  
August 2014**



Hawaiian Electric Frequency Excursion Statistics August 2014		
Data Rounded to the nearest	<59.95 Hz	>60.05 Hz
Number of Excursions	1441	387
Maximum Duration (sec)	528	214
Maximum Deviation (Hz)	59.73	60.284
Total Duration of Excursions (sec)	15918	3338

Maui Electric Frequency Excursion Statistics August 2014		
	<59.95 Hz	>60.05 Hz
Number of Excursions	6942	4894
Maximum Duration (sec)	950	618
Maximum Deviation (Hz)	59.4608	60.4007
Total Duration of Excursions (sec)	54340	52006

Hawai'i Electric Light Frequency Excursion Statistics August 2014		
	<59.95 Hz	>60.05 Hz
Number of Excursions	4385	1280
Maximum Duration (sec)	452	102
Maximum Deviation (Hz)	58.705	60.541
Total Duration of Excursions (sec)	26962	6444

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Hawaiian Electric Curtailment Report August 2014

Start Date/Time	Curtailment Set Point	MW output prior to start of curtailment	End Date/Time	MW output after curtailment released	Estimated MWh of curtailed energy during event (1)	IPP	Reason for Curtailment
07/17/14 14:29	48.0	41.10	Ongoing	---	---	Mauka	Flicker
08/03/14 06:00	0.0	0.00	08/03/14 06:28	0	*	KREP	Replacement work
08/03/14 19:55	0.0	0.00	08/03/14 20:14	0	*	KREP	Replacement work
08/05/14 05:23	0.0	0.00	08/05/14 05:30	0	*	KREP	Maintenance work
08/05/14 16:02	0.0	3.00	08/05/14 16:09	0	*	KREP	Maintenance work
08/06/14 05:28	0.0	0.00	08/06/14 06:05	0	*	KREP	Replacement work
08/06/14 16:34	0.0	2.60	08/06/14 16:52	0	*	KREP	Replacement work
08/09/14 09:00	0.0	3.70	08/09/14 09:18	0	*	KWF	Replacement work
08/09/14 09:01	0.0	0.80	08/09/14 09:19	0	*	Makai	Replacement work
08/19/14 06:42	0.0	0.40	08/19/14 07:08	0	*	KLS2	Replacement work
08/26/14 06:51	0.0	0.00	08/26/14 07:26	0	*	KLS2	Maintenance work
08/26/14 06:53	0.0	0.00	08/26/14 16:50	0	*	KREP	Maintenance work
08/26/14 16:07	0.0	3.30	08/26/14 16:52	0	*	KLS2	Maintenance work
08/27/14 07:49	0.0	0.00	08/27/14 15:58	0	*	KREP	Maintenance work

KLS2 = Kalaheo Solar 2 PV Farm  
 KREP = Kalaheo Renewable Energy Park  
 KWF = Kahuku Wind Farm  
 Makai = Kawaiolo Makai Wind Farm  
 Mauka = Kawaiolo Mauka Wind Farm

(1) The estimated MWh of energy curtailed during the event is supplied by Kahuku Wind Farm and/or Kawaiolo Wind Farm, and HECO does not make any representations as to its accuracy.  
 \* Data has not been provided by IPP.

RSWG Maui Curtailment Report August 2014



Start Date and Time	Duration	IPP Curtailed	Estimated Curtailed MWH	Peak MW Curtailed	Reasons for Curtailment
8/1/2014 0 00	3 11	KWPII	30 104	20 383	AGC MAVG - calculated
8/1/2014 3 12	0 04	KWPII	0 172	15 306	AGC MAVG - calculated
8/1/2014 3 17	0 18	KWPII	1 058	14 754	AGC MAVG - calculated
8/1/2014 3 45	0 01	KWPII	0 003	10 582	AGC MAVG - calculated
8/1/2014 3 49	0 02	KWPII	0 021	12 284	AGC MAVG - calculated
8/1/2014 4 31	0 01	KWPII	0 091	14 179	AGC MAVG - calculated
8/1/2014 4 33	0 17	KWPII	0 843	12 023	AGC MAVG - calculated
8/1/2014 4 52	0 01	KWPII	0 001	4 936	AGC MAVG - calculated
8/1/2014 6 53	0 07	KWPII	0 124	14 077	AGC MAVG - calculated
8/1/2014 7 19	0 05	KWPII	0 217	8 230	AGC MAVG - calculated
8/1/2014 7 46	0 01	KWPII	0 008	12 358	AGC MAVG - calculated
8/1/2014 7 51	0 02	KWPII	0 036	13 701	AGC MAVG - calculated
8/1/2014 7 57	0 01	KWPII	0 003	12 608	AGC MAVG - calculated
8/1/2014 23 16	0 09	KWPII	0 161	20 421	AGC MAVG - calculated
8/1/2014 23 28	0 37	KWPII	2 028	20 613	AGC MAVG - calculated
8/2/2014 0 07	1 34	KWPII	9 837	16 244	AGC MAVG - calculated
8/2/2014 1 49	0 01	KWPII	0 015	10 586	AGC MAVG - calculated
8/2/2014 1 51	0 02	KWPII	0 031	11 038	AGC MAVG - calculated
8/2/2014 1 54	0 04	KWPII	0 092	12 450	AGC MAVG - calculated
8/2/2014 2 19	0 03	KWPII	0 031	7 868	AGC MAVG - calculated
8/2/2014 2 23	0 01	KWPII	0 037	7 485	AGC MAVG - calculated
8/2/2014 2 25	0 49	KWPII	2 390	18 886	AGC MAVG - calculated
8/2/2014 3 27	0 02	KWPII	0 062	13 153	AGC MAVG - calculated
8/2/2014 3 30	0 30	KWPII	2 903	17 144	AGC MAVG - calculated
8/2/2014 4 01	0 18	KWPII	0 578	17 513	AGC MAVG - calculated
8/2/2014 4 14	0 01	KWPII	0 013	15 274	AGC MAVG - calculated
8/2/2014 4 16	0 01	KWPII	0 011	14 861	AGC MAVG - calculated
8/2/2014 4 18	0 01	KWPII	0 018	15 698	AGC MAVG - calculated
8/2/2014 4 39	3 22	KWPII	41 812	20 662	AGC MAVG - calculated
8/2/2014 8 03	0 01	KWPII	0 002	17 869	AGC MAVG - calculated
8/2/2014 8 05	0 01	KWPII	0 024	17 471	AGC MAVG - calculated
8/2/2014 8 38	0 02	KWPII	0 072	18 649	AGC MAVG - calculated
8/2/2014 8 41	0 01	KWPII	0 061	18 484	AGC MAVG - calculated
8/2/2014 8 48	0 01	KWPII	0 034	17 022	AGC MAVG - calculated
8/2/2014 15 34	0 01	KWPII	0 000	0 018	AGC MAVG - calculated
8/2/2014 22 01	0 02	KWPII	0 071	13 569	AGC MAVG - calculated
8/2/2014 22 05	0 02	KWPII	0 084	16 727	AGC MAVG - calculated
8/2/2014 22 06	0 01	KWPII	0 007	17 003	AGC MAVG - calculated
8/2/2014 23 25	0 51	KWPII	11 729	19 833	AGC MAVG - calculated
8/2/2014 23 46	0 02	AWE	0 073	17 000	AGC MAVG - calculated
8/2/2014 23 49	0 02	AWE	0 063	16 200	AGC MAVG - calculated
8/2/2014 23 57	0 08	AWE	0 202	21 000	AGC MAVG - calculated
8/2/2014 23 58	0 09	AWE	0 354	21 000	AGC MAVG - calculated
8/2/2014 0 09	0 02	AWE	0 056	18 800	AGC MAVG - calculated
8/2/2014 0 12	0 01	AWE	0 013	20 100	AGC MAVG - calculated
8/2/2014 0 19	0 31	KWPII	8 122	19 973	AGC MAVG - calculated
8/2/2014 0 32	0 01	AWE	0 021	21 000	AGC MAVG - calculated
8/2/2014 0 34	0 02	AWE	0 035	21 000	AGC MAVG - calculated
8/2/2014 0 51	5 40	KWPII	89 540	20 709	AGC MAVG - calculated
8/2/2014 2 04	0 01	AWE	0 000	21 000	Good Engineering and Operating Practices
8/2/2014 2 11	0 02	AWE	0 050	20 200	Good Engineering and Operating Practices
8/2/2014 2 14	0 02	AWE	0 029	20 600	Good Engineering and Operating Practices
8/2/2014 2 18	0 02	AWE	0 032	21 000	Good Engineering and Operating Practices
8/2/2014 8 32	0 03	KWPII	0 025	18 951	AGC MAVG - calculated
8/2/2014 8 38	0 21	KWPII	1 148	20 136	AGC MAVG - calculated
8/2/2014 7 02	0 01	KWPII	0 002	14 802	AGC MAVG - calculated
8/2/2014 7 33	0 09	KWPII	0 607	17 694	AGC MAVG - calculated and Good Engineering and Operating Practices
8/2/2014 8 15	0 10	KWPII	0 718	15 878	AGC MAVG - calculated and Good Engineering and Operating Practices
8/2/2014 8 18	0 02	KWPII	0 039	11 493	AGC MAVG - calculated, Good Engineering and Operating Practices, and Testing
8/2/2014 8 37	0 01	KWPII	0 036	14 367	AGC MAVG - calculated, Good Engineering and Operating Practices, and Testing
8/2/2014 8 39	0 03	KWPII	0 091	14 343	AGC MAVG - calculated, Good Engineering and Operating Practices, and Testing
8/2/2014 8 48	0 01	KWPII	0 039	13 670	AGC MAVG - calculated and Good Engineering and Operating Practices
8/2/2014 8 54	0 03	KWPII	0 040	17 206	AGC MAVG - calculated and Good Engineering and Operating Practices
8/3/2014 13 49	0 01	KWPII	0 001	0 073	AGC MAVG - calculated and Testing
8/3/2014 22 36	0 01	KWPII	0 002	19 059	AGC MAVG - calculated
8/3/2014 22 38	0 03	KWPII	0 050	19 886	AGC MAVG - calculated
8/3/2014 22 47	0 39	KWPII	2 476	20 494	AGC MAVG - calculated
8/3/2014 23 33	8 18	KWPII	85 878	20 708	AGC MAVG - calculated
8/4/2014 3 03	0 01	AWE	0 005	21 000	AGC MAVG - calculated
8/4/2014 8 18	0 01	KWPII	0 001	20 488	AGC MAVG - calculated
8/4/2014 8 54	0 01	KWPII	0 012	20 670	AGC MAVG - calculated
8/4/2014 7 13	0 19	KWPII	0 415	20 842	AGC MAVG - calculated
8/4/2014 7 33	0 13	KWPII	0 789	20 508	AGC MAVG - calculated
8/4/2014 23 25	0 06	KWPII	0 344	20 223	AGC MAVG - calculated
8/4/2014 23 56	0 02	KWPII	0 039	18 233	AGC MAVG - calculated
8/4/2014 23 59	1 17	KWPII	10 381	20 279	Good Engineering and Operating Practices
8/5/2014 1 17	0 01	KWPII	0 028	17 888	Good Engineering and Operating Practices
8/5/2014 1 19	4 57	KWPII	45 818	20 700	Good Engineering and Operating Practices and AGC MAVG - calculated
8/5/2014 8 17	0 01	KWPII	0 001	20 672	AGC MAVG - calculated
8/5/2014 8 22	0 02	KWPII	0 006	20 659	AGC MAVG - calculated
8/5/2014 8 25	0 02	KWPII	0 015	20 830	AGC MAVG - calculated
8/5/2014 8 32	0 01	KWPII	0 007	20 533	AGC MAVG - calculated
8/5/2014 8 39	0 01	KWPII	0 001	18 087	AGC MAVG - calculated
8/5/2014 8 40	1 07	KWPII	3 822	20 708	AGC MAVG - calculated
8/5/2014 7 48	0 06	KWPII	0 183	20 509	AGC MAVG - calculated
8/5/2014 8 02	0 04	KWPII	0 044	20 870	AGC MAVG - calculated
8/5/2014 8 08	0 02	KWPII	0 032	20 708	AGC MAVG - calculated
8/5/2014 8 11	0 01	KWPII	0 009	20 708	AGC MAVG - calculated
8/5/2014 8 15	0 01	KWPII	0 002	20 708	AGC MAVG - calculated
8/5/2014 12 28	0 02	KWPII	0 075	20 652	AGC MAVG - calculated
8/5/2014 12 31	0 01	KWPII	0 018	20 813	AGC MAVG - calculated
8/5/2014 13 33	0 13	KWPII	0 303	20 317	AGC MAVG - calculated
8/5/2014 12 48	0 02	KWPII	0 072	20 650	AGC MAVG - calculated
8/5/2014 22 40	0 01	KWPII	0 001	20 709	AGC MAVG - calculated
8/5/2014 22 42	6 18	KWPII	72 674	20 708	AGC MAVG - calculated
8/6/2014 8 12	0 01	KWPII	0 004	20 708	AGC MAVG - calculated
8/6/2014 8 47	0 25	KWPII	3 866	20 708	AGC MAVG - calculated
8/6/2014 8 13	0 21	KWPII	1 844	20 708	AGC MAVG - calculated
8/6/2014 8 40	1 12	KWPII	7 162	20 708	AGC MAVG - calculated
8/6/2014 7 54	0 03	KWPII	0 027	20 708	AGC MAVG - calculated
8/6/2014 11 54	0 02	KWPII	0 047	20 068	AGC MAVG - calculated and Good Engineering and Operating Practices
8/6/2014 22 32	0 20	KWPII	0 636	20 890	AGC MAVG - calculated
8/6/2014 23 08	0 18	KWPII	1 384	20 704	AGC MAVG - calculated
8/6/2014 23 24	0 01	KWPII	0 005	20 518	AGC MAVG - calculated
8/6/2014 23 27	0 02	KWPII	0 013	20 353	AGC MAVG - calculated
8/6/2014 23 30	0 01	KWPII	0 006	20 150	AGC MAVG - calculated
8/6/2014 23 33	0 01	KWPII	0 013	20 323	AGC MAVG - calculated
8/6/2014 23 36	0 01	KWPII	0 002	20 363	AGC MAVG - calculated
8/6/2014 23 44	0 03	KWPII	0 068	20 682	AGC MAVG - calculated
8/6/2014 23 48	2 24	KWPII	19 873	20 708	AGC MAVG - calculated
8/7/2014 2 14	0 18	KWPII	0 782	20 067	AGC MAVG - calculated
8/7/2014 2 32	0 07	KWPII	0 314	20 703	AGC MAVG - calculated
8/7/2014 2 40	0 02	KWPII	0 075	20 341	AGC MAVG - calculated
8/7/2014 3 47	0 01	KWPII	0 008	20 886	AGC MAVG - calculated
8/7/2014 3 49	0 02	KWPII	0 021	20 879	AGC MAVG - calculated

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Start Date and Time	Duration	IPP Curtailed	Estimated Curtailed MWh	Peak MW Curtailed	Reasons for Curtailment
8/7/2014 3:52	0:02	KWPII	0.018	20 669	AGC MAVG - calculated
8/7/2014 3:55	0:01	KWPII	0.013	20 674	AGC MAVG - calculated
8/7/2014 4:03	0:01	KWPII	0.029	20 664	AGC MAVG - calculated
8/7/2014 4:08	0:01	KWPII	0.008	20 671	AGC MAVG - calculated
8/7/2014 4:10	0:08	KWPII	0.184	20 707	AGC MAVG - calculated
8/7/2014 5:30	0:02	KWPII	0.012	20 708	AGC MAVG - calculated
8/7/2014 5:38	0:10	KWPII	0.272	20 708	AGC MAVG - calculated
8/7/2014 5:49	0:09	KWPII	0.162	20 708	AGC MAVG - calculated
8/7/2014 10:40	0:02	KWPII	0.044	20 708	AGC MAVG - calculated and Testing
8/7/2014 10:48	0:03	KWPII	0.038	20 708	AGC MAVG - calculated and Testing
8/7/2014 11:37	0:01	KWPII	0.013	20 708	AGC MAVG - calculated and Testing
8/7/2014 11:41	0:01	KWPII	0.008	20 708	AGC MAVG - calculated and Testing
8/7/2014 11:43	0:10	KWPII	0.403	20 708	AGC MAVG - calculated and Testing
8/7/2014 11:54	0:01	KWPII	0.003	20 708	AGC MAVG - calculated and Testing
8/7/2014 12:37	0:08	KWPII	0.320	20 708	AGC MAVG - calculated and Testing
8/7/2014 13:00	0:02	KWPII	0.035	20 708	AGC MAVG - calculated and Testing
8/7/2014 13:04	0:01	KWPII	0.008	20 708	AGC MAVG - calculated and Testing
8/7/2014 13:06	0:03	KWPII	0.021	20 708	AGC MAVG - calculated and Testing
8/7/2014 13:10	0:01	KWPII	0.030	20 708	AGC MAVG - calculated and Testing
8/7/2014 13:44	0:10	KWPII	0.384	20 708	AGC MAVG - calculated and Testing
8/7/2014 13:58	0:28	KWPII	1.806	20 708	AGC MAVG - calculated Testing and Good Engineering and Operating Practices
8/7/2014 14:27	0:04	KWPII	0.140	20 708	AGC MAVG - calculated Testing and Good Engineering and Operating Practices
8/7/2014 14:32	0:04	KWPII	0.110	20 708	AGC MAVG - calculated Testing and Good Engineering and Operating Practices
8/7/2014 14:40	0:03	KWPII	0.102	20 708	AGC MAVG - calculated Testing and Good Engineering and Operating Practices
8/7/2014 14:45	0:02	KWPII	0.031	20 708	AGC MAVG - calculated Testing and Good Engineering and Operating Practices
8/7/2014 14:50	0:02	KWPII	0.013	20 708	AGC MAVG - calculated Testing and Good Engineering and Operating Practices
8/7/2014 15:30	0:02	KWPII	0.005	20 708	AGC MAVG - calculated and Testing
8/7/2014 15:54	3:13	KWPII	10.165	20 708	Testing and Good Engineering and Operating Practices
8/7/2014 16:33	0:17	KWPII	0.028	14 720	Good Engineering and Operating Practices
8/7/2014 16:53	0:14	KWPII	0.227	13 223	Good Engineering and Operating Practices
8/7/2014 18:28	0:13	KWPII	0.050	10 229	Good Engineering and Operating Practices
8/7/2014 20:28	1:08	KWPII	1.261	8 732	Good Engineering and Operating Practices
8/8/2014 1:51	0:17	KWPII	0.086	4 241	Good Engineering and Operating Practices
8/8/2014 2:32	0:08	AWE	0.040	7 400	Good Engineering and Operating Practices
8/8/2014 2:40	0:02	AWE	0.013	7 400	Good Engineering and Operating Practices
8/8/2014 2:42	0:29	AWE	0.185	7 400	Good Engineering and Operating Practices
8/8/2014 2:43	2:32	KWPII	36.111	19 211	Good Engineering and Operating Practices
8/8/2014 3:48	0:41	AWE	3.578	18 000	Good Engineering and Operating Practices
8/8/2014 4:31	0:07	AWE	0.262	10 500	Good Engineering and Operating Practices
8/8/2014 4:56	0:19	AWE	1.447	14 000	Good Engineering and Operating Practices
8/8/2014 8:02	0:12	KWPII	0.478	10 019	Good Engineering and Operating Practices
8/8/2014 8:18	0:12	KWPII	0.418	11 238	Good Engineering and Operating Practices
8/8/2014 8:19	0:01	KWPII	0.005	17 899	AGC MAVG - calculated
8/10/2014 13:00	0:01	KWPII	0.008	0 014	AGC MAVG - calculated
8/11/2014 14:24	0:01	KWPII	0.006	0 080	AGC MAVG - calculated and Good Engineering and Operating Practices
8/13/2014 12:33	0:01	KWPII	0.006	0 086	AGC MAVG - calculated
8/14/2014 2:53	0:03	KWPII	0.076	2 757	AGC MAVG - calculated
8/14/2014 3:08	0:02	KWPII	0.031	2 820	AGC MAVG - calculated
8/14/2014 3:09	1:41	KWPII	17.715	17 008	AGC MAVG - calculated
8/14/2014 3:18	0:02	AWE	0.009	17 300	AGC MAVG - calculated
8/14/2014 3:22	0:21	AWE	1.804	21 000	AGC MAVG - calculated
8/14/2014 3:48	0:04	AWE	0.185	18 800	AGC MAVG - calculated
8/14/2014 3:52	0:01	AWE	0.027	17 900	AGC MAVG - calculated
8/14/2014 3:54	0:32	AWE	2.220	21 000	AGC MAVG - calculated
8/14/2014 4:27	0:02	AWE	0.067	18 800	AGC MAVG - calculated
8/14/2014 4:30	0:01	AWE	0.003	18 000	AGC MAVG - calculated
8/14/2014 4:32	0:02	AWE	0.031	18 100	AGC MAVG - calculated
8/14/2014 4:36	0:01	AWE	0.037	18 400	AGC MAVG - calculated
8/14/2014 4:38	0:04	AWE	0.211	20 700	AGC MAVG - calculated
8/14/2014 4:52	0:02	KWPII	0.153	18 978	AGC MAVG - calculated
8/14/2014 4:55	0:01	KWPII	0.017	18 888	AGC MAVG - calculated
8/14/2014 4:57	0:04	KWPII	0.154	17 300	AGC MAVG - calculated
8/14/2014 5:18	0:03	KWPII	0.083	11 425	AGC MAVG - calculated
8/14/2014 5:20	0:18	KWPII	2.123	18 215	AGC MAVG - calculated
8/14/2014 5:44	0:13	KWPII	0.839	17 464	AGC MAVG - calculated
8/14/2014 5:58	0:02	KWPII	0.043	17 441	AGC MAVG - calculated
8/14/2014 6:03	0:01	KWPII	0.023	18 945	AGC MAVG - calculated
8/14/2014 6:06	0:06	KWPII	0.470	18 720	AGC MAVG - calculated
8/14/2014 6:16	0:08	KWPII	0.121	18 287	AGC MAVG - calculated
8/14/2014 6:23	0:11	KWPII	0.415	18 788	AGC MAVG - calculated
8/14/2014 6:40	0:03	KWPII	0.040	18 280	AGC MAVG - calculated
8/14/2014 6:44	0:01	KWPII	0.031	17 808	AGC MAVG - calculated
8/14/2014 6:49	0:01	KWPII	0.018	18 250	AGC MAVG - calculated
8/14/2014 6:52	0:08	KWPII	0.148	18 214	AGC MAVG - calculated
8/14/2014 7:08	0:02	KWPII	0.038	18 084	AGC MAVG - calculated
8/14/2014 8:28	0:03	KWPII	0.110	18 083	AGC MAVG - calculated
8/14/2014 8:30	0:04	KWPII	0.040	17 817	AGC MAVG - calculated
8/14/2014 8:36	0:01	KWPII	0.006	18 911	AGC MAVG - calculated
8/14/2014 8:52	0:02	KWPII	0.028	17 433	AGC MAVG - calculated
8/14/2014 8:41	0:01	KWPII	0.008	18 002	AGC MAVG - calculated
8/14/2014 11:18	0:01	KWPII	0.012	18 437	AGC MAVG - calculated
8/14/2014 12:18	0:01	KWPII	0.018	19 931	AGC MAVG - calculated
8/14/2014 12:20	0:01	KWPII	0.017	19 630	AGC MAVG - calculated
8/14/2014 12:35	0:01	KWPII	0.003	18 027	AGC MAVG - calculated
8/14/2014 19:34	0:02	KWPII	0.029	17 933	AGC MAVG - calculated
8/14/2014 19:37	0:03	KWPII	0.067	17 514	AGC MAVG - calculated
8/14/2014 19:42	0:01	KWPII	0.030	17 803	AGC MAVG - calculated
8/14/2014 23:21	0:27	KWPII	1.702	20 640	AGC MAVG - calculated
8/14/2014 23:53	0:33	KWPII	3.356	20 510	AGC MAVG - calculated
8/15/2014 0:54	0:08	KWPII	1.258	18 178	AGC MAVG - calculated
8/15/2014 1:12	0:40	KWPII	5.998	19 752	AGC MAVG - calculated
8/15/2014 1:52	0:01	AWE	0.008	18 400	AGC MAVG - calculated
8/15/2014 1:54	0:02	AWE	0.005	18 100	AGC MAVG - calculated
8/15/2014 2:52	0:03	KWPII	0.171	8 109	AGC MAVG - calculated
8/15/2014 2:57	0:01	KWPII	0.031	7 332	AGC MAVG - calculated
8/15/2014 4:48	0:24	KWPII	1.335	13 808	AGC MAVG - calculated
8/15/2014 5:11	0:03	KWPII	0.184	14 143	AGC MAVG - calculated
8/15/2014 5:19	0:02	KWPII	0.077	15 400	AGC MAVG - calculated
8/15/2014 5:22	0:01	KWPII	0.011	13 891	AGC MAVG - calculated
8/15/2014 5:27	0:32	KWPII	2.771	15 734	AGC MAVG - calculated
8/15/2014 6:00	0:08	KWPII	0.350	12 650	AGC MAVG - calculated
8/15/2014 6:18	0:01	KWPII	0.005	14 304	AGC MAVG - calculated
8/15/2014 6:20	0:04	KWPII	0.063	14 811	AGC MAVG - calculated
8/15/2014 6:27	0:08	KWPII	0.313	18 110	AGC MAVG - calculated
8/15/2014 6:36	0:03	KWPII	0.110	18 943	AGC MAVG - calculated
8/15/2014 6:40	0:04	KWPII	0.148	18 862	AGC MAVG - calculated
8/15/2014 6:47	0:03	KWPII	0.050	19 488	AGC MAVG - calculated
8/15/2014 7:10	0:01	KWPII	0.001	19 876	AGC MAVG - calculated
8/15/2014 7:50	0:01	KWPII	0.001	9 773	AGC MAVG - calculated
8/15/2014 8:10	0:03	KWPII	0.048	13 029	AGC MAVG - calculated
8/15/2014 8:30	0:01	KWPII	0.011	18 503	AGC MAVG - calculated
8/15/2014 8:32	0:11	KWPII	0.342	20 282	AGC MAVG - calculated
8/15/2014 8:43	0:01	KWPII	0.003	20 440	AGC MAVG - calculated
8/15/2014 8:54	0:01	KWPII	0.008	20 171	AGC MAVG - calculated
8/15/2014 8:41	0:02	KWPII	0.034	18 092	AGC MAVG - calculated

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Start Date and Time	Duration	IPP Curtailed	Estimated Curtailed MWh	Peak MW Curtailed	Reasons for Curtailment
8/15/2014 9:40	0:01	KWPH	0:018	19 704	AGC MAVG - calculated
8/15/2014 9:48	0:04	KWPH	0:100	20 353	AGC MAVG - calculated
8/15/2014 9:54	0:03	KWPH	0:027	20 187	AGC MAVG - calculated
8/15/2014 9:58	0:08	KWPH	0:254	20 284	AGC MAVG - calculated
8/15/2014 10:06	0:01	KWPH	0:005	19 348	AGC MAVG - calculated
8/15/2014 10:11	0:04	KWPH	0:160	20 236	AGC MAVG - calculated
8/15/2014 10:18	0:07	KWPH	0:223	19 637	AGC MAVG - calculated
8/15/2014 10:26	0:01	KWPH	0:030	19 405	AGC MAVG - calculated
8/15/2014 10:29	0:01	KWPH	0:007	19 800	AGC MAVG - calculated
8/15/2014 11:18	0:01	KWPH	0:037	17 954	AGC MAVG - calculated and Good Engineering and Operating Practices
8/15/2014 11:24	0:01	KWPH	0:071	17 526	AGC MAVG - calculated and Good Engineering and Operating Practices
8/15/2014 12:43	0:01	KWPH	0:005	17 481	AGC MAVG - calculated
8/15/2014 13:18	0:01	KWPH	0:020	18 441	AGC MAVG - calculated
8/15/2014 13:33	0:02	KWPH	0:018	18 780	AGC MAVG - calculated
8/15/2014 21:25	0:03	KWPH	0:074	20 708	AGC MAVG - calculated
8/15/2014 22:36	0:01	KWPH	0:006	20 381	AGC MAVG - calculated
8/15/2014 22:47	0:01	KWPH	0:006	20 219	AGC MAVG - calculated
8/15/2014 22:49	0:02	KWPH	0:027	20 500	AGC MAVG - calculated
8/15/2014 22:55	0:01	KWPH	0:002	20 428	AGC MAVG - calculated
8/15/2014 23:04	2:12	KWPH	18 705	20 701	AGC MAVG - calculated
8/16/2014 1:17	1:56	KWPH	31 748	20 454	AGC MAVG - calculated
8/16/2014 2:07	0:01	AWE	0:008	21 000	AGC MAVG - calculated
8/16/2014 2:13	0:04	AWE	0:049	21 000	AGC MAVG - calculated
8/16/2014 2:28	0:02	AWE	0:024	21 000	AGC MAVG - calculated
8/16/2014 2:32	0:01	AWE	0:002	20 800	AGC MAVG - calculated
8/16/2014 2:34	0:07	AWE	0:067	19 800	AGC MAVG - calculated
8/16/2014 2:43	0:18	AWE	0:753	21 000	AGC MAVG - calculated
8/16/2014 3:03	0:01	AWE	0:028	20 400	AGC MAVG - calculated
8/16/2014 3:14	0:48	KWPH	10 180	19 068	AGC MAVG - calculated
8/16/2014 3:28	0:01	AWE	0:014	20 500	AGC MAVG - calculated
8/16/2014 3:34	0:02	AWE	0:060	21 000	AGC MAVG - calculated
8/16/2014 3:38	0:05	AWE	0:114	21 000	AGC MAVG - calculated
8/16/2014 3:48	0:01	AWE	0:013	21 000	AGC MAVG - calculated
8/16/2014 3:52	0:01	AWE	0:023	21 000	AGC MAVG - calculated
8/16/2014 4:02	0:59	KWPH	8 160	18 854	AGC MAVG - calculated
8/16/2014 5:02	0:01	KWPH	0:007	11 740	AGC MAVG - calculated
8/16/2014 6:06	0:02	KWPH	0:102	17 127	AGC MAVG - calculated
8/16/2014 6:12	0:37	KWPH	3 545	20 423	AGC MAVG - calculated
8/16/2014 6:58	0:01	KWPH	0:022	18 064	AGC MAVG - calculated
8/16/2014 7:02	0:32	KWPH	3 252	20 630	AGC MAVG - calculated
8/16/2014 7:35	0:03	KWPH	0:062	20 323	AGC MAVG - calculated
8/16/2014 7:39	0:02	KWPH	0:042	20 484	AGC MAVG - calculated
8/16/2014 7:42	0:03	KWPH	0:023	20 447	AGC MAVG - calculated
8/16/2014 13:27	0:01	KWPH	0:008	18 869	AGC MAVG - calculated
8/16/2014 14:06	0:01	KWPH	0:019	17 584	AGC MAVG - calculated
8/16/2014 23:06	0:09	KWPH	2 388	20 708	AGC MAVG - calculated
8/16/2014 23:30	0:16	KWPH	1 218	20 708	AGC MAVG - calculated
8/17/2014 0:16	0:01	KWPH	0:008	20 708	AGC MAVG - calculated
8/17/2014 0:28	0:01	KWPH	0:000	20 708	AGC MAVG - calculated
8/17/2014 0:24	0:02	KWPH	0:023	20 708	AGC MAVG - calculated
8/17/2014 0:27	0:02	KWPH	0:045	20 708	AGC MAVG - calculated
8/17/2014 0:30	0:52	KWPH	4 491	20 708	AGC MAVG - calculated
8/17/2014 1:27	3:26	KWPH	31 819	20 708	AGC MAVG - calculated
8/17/2014 4:22	0:02	AWE	0:018	20 800	AGC MAVG - calculated
8/17/2014 5:01	0:01	KWPH	0:009	20 708	AGC MAVG - calculated
8/17/2014 5:23	0:34	KWPH	1 871	20 708	AGC MAVG - calculated
8/17/2014 5:58	1:16	KWPH	4 077	20 708	AGC MAVG - calculated
8/17/2014 7:10	0:26	KWPH	0:796	20 708	AGC MAVG - calculated
8/17/2014 7:42	0:01	KWPH	0:002	20 708	AGC MAVG - calculated
8/17/2014 7:48	0:02	KWPH	0:018	20 708	AGC MAVG - calculated
8/17/2014 7:51	0:02	KWPH	0:017	20 708	AGC MAVG - calculated
8/17/2014 7:58	0:01	KWPH	0:008	18 211	AGC MAVG - calculated
8/17/2014 8:00	0:05	KWPH	0:060	20 708	AGC MAVG - calculated
8/17/2014 11:14	0:01	KWPH	0:000	20 708	AGC MAVG - calculated
8/17/2014 11:18	0:01	KWPH	0:001	20 708	AGC MAVG - calculated
8/17/2014 11:27	0:01	KWPH	0:005	20 708	AGC MAVG - calculated
8/17/2014 11:30	0:03	KWPH	0:032	20 708	AGC MAVG - calculated
8/17/2014 11:34	0:05	KWPH	0:057	20 708	AGC MAVG - calculated
8/17/2014 11:40	0:01	KWPH	0:010	20 708	AGC MAVG - calculated
8/17/2014 11:42	0:05	KWPH	0:054	20 708	AGC MAVG - calculated
8/17/2014 11:57	0:02	KWPH	0:012	20 708	AGC MAVG - calculated
8/17/2014 12:04	0:01	KWPH	0:000	20 708	AGC MAVG - calculated
8/17/2014 23:05	0:02	KWPH	0:032	20 708	AGC MAVG - calculated
8/18/2014 1:21	0:05	KWPH	0:072	20 708	AGC MAVG - calculated
8/18/2014 1:27	0:01	KWPH	0:006	20 703	AGC MAVG - calculated
8/18/2014 1:34	0:01	KWPH	0:012	20 704	AGC MAVG - calculated
8/18/2014 1:39	0:13	KWPH	0:355	20 708	AGC MAVG - calculated
8/18/2014 2:26	0:01	KWPH	0:013	20 868	AGC MAVG - calculated
8/18/2014 2:38	0:01	KWPH	0:006	20 703	AGC MAVG - calculated
8/18/2014 2:41	0:44	KWPH	2 153	20 708	AGC MAVG - calculated
8/18/2014 3:45	0:16	KWPH	0:326	20 707	AGC MAVG - calculated
8/18/2014 4:57	0:35	KWPH	3 843	20 708	AGC MAVG - calculated
8/18/2014 12:29	0:09	KWPH	0:178	19 989	AGC MAVG - calculated and Testing
8/18/2014 12:40	0:01	KWPH	0:024	19 389	AGC MAVG - calculated and Testing
8/18/2014 12:42	0:01	KWPH	0:008	18 746	AGC MAVG - calculated and Testing
8/18/2014 12:46	0:04	KWPH	0:066	18 813	AGC MAVG - calculated and Testing
8/18/2014 23:20	0:01	KWPH	0:005	20 598	AGC MAVG - calculated
8/18/2014 23:31	0:05	KWPH	0:100	20 678	AGC MAVG - calculated
8/18/2014 23:51	0:01	KWPH	0:012	18 748	AGC MAVG - calculated
8/19/2014 0:02	0:07	KWPH	0:175	20 465	AGC MAVG - calculated
8/19/2014 0:10	0:11	KWPH	0:003	20 410	AGC MAVG - calculated
8/19/2014 0:21	0:02	KWPH	0:003	20 572	AGC MAVG - calculated
8/19/2014 0:58	0:27	KWPH	1 827	20 678	AGC MAVG - calculated
8/19/2014 1:30	0:04	KWPH	0:071	17 196	AGC MAVG - calculated
8/19/2014 1:37	0:21	KWPH	1 282	20 544	AGC MAVG - calculated
8/19/2014 1:58	0:24	KWPH	2 358	20 551	AGC MAVG - calculated
8/19/2014 2:24	0:01	KWPH	0:414	24 818	AGC MAVG - calculated
8/19/2014 2:25	0:01	KWPH	0:077	20 378	AGC MAVG - calculated
8/19/2014 2:27	0:01	KWPH	0:114	20 483	AGC MAVG - calculated
8/19/2014 2:28	0:01	KWPH	0:478	28 580	AGC MAVG - calculated
8/19/2014 2:30	0:03	KWPH	0:482	20 451	AGC MAVG - calculated
8/19/2014 2:34	0:18	KWPH	2 662	20 555	AGC MAVG - calculated
8/19/2014 2:54	0:02	KWPH	0:268	20 420	AGC MAVG - calculated
8/19/2014 2:57	0:08	KWPH	0:753	20 397	AGC MAVG - calculated
8/19/2014 3:06	0:15	KWPH	1 297	20 475	AGC MAVG - calculated
8/19/2014 3:23	0:02	KWPH	0:036	17 605	AGC MAVG - calculated
8/19/2014 3:28	0:14	KWPH	0 900	17 849	AGC MAVG - calculated
8/19/2014 3:41	1:11	KWPH	5 875	20 319	AGC MAVG - calculated
8/19/2014 4:53	0:01	KWPH	0:019	20 356	AGC MAVG - calculated
8/19/2014 4:56	0:01	KWPH	0:002	20 295	AGC MAVG - calculated
8/19/2014 5:20	0:26	KWPH	1 183	20 871	AGC MAVG - calculated
8/19/2014 6:48	0:01	KWPH	0:006	20 204	AGC MAVG - calculated
8/19/2014 7:04	0:01	KWPH	0:003	20 228	AGC MAVG - calculated
8/19/2014 7:07	0:01	KWPH	0:019	20 214	AGC MAVG - calculated
8/19/2014 7:38	0:01	KWPH	0:004	18 862	AGC MAVG - calculated

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Start Date and Time	Duration	IPP Curtailed	Estimated Curtailed MWh	Peak MW Curtailed	Reasons for Curtailment
8/19/2014 7:40	0:01	KWPII	0.018	19.614	AGC MAVG - calculated
8/19/2014 7:40	0:01	KWPII	0.038	19.668	AGC MAVG - calculated
8/19/2014 7:50	0:01	KWPII	0.008	19.863	AGC MAVG - calculated
8/19/2014 7:57	0:01	KWPII	0.007	20.374	AGC MAVG - calculated
8/19/2014 8:12	0:01	KWPII	0.020	20.269	AGC MAVG - calculated
8/19/2014 8:14	0:30	KWPII	3.371	20.708	AGC MAVG - calculated
8/19/2014 8:53	0:01	KWPII	0.024	20.876	AGC MAVG - calculated
8/19/2014 9:04	0:02	KWPII	0.003	20.593	AGC MAVG - calculated
8/19/2014 9:03	0:02	KWPII	0.019	20.555	AGC MAVG - calculated
8/19/2014 9:17	0:02	KWPII	0.048	20.458	AGC MAVG - calculated
8/19/2014 9:23	0:01	KWPII	0.009	20.479	AGC MAVG - calculated
8/19/2014 9:28	0:01	KWPII	0.003	20.348	AGC MAVG - calculated
8/19/2014 9:28	0:03	KWPII	0.091	20.311	AGC MAVG - calculated
8/19/2014 9:32	0:01	KWPII	0.001	19.241	AGC MAVG - calculated
8/19/2014 9:34	0:01	KWPII	0.004	18.381	AGC MAVG - calculated
8/19/2014 9:38	0:02	KWPII	0.033	18.397	AGC MAVG - calculated
8/19/2014 11:10	0:01	KWPII	0.006	15.803	AGC MAVG - calculated
8/19/2014 11:41	0:02	KWPII	0.081	16.690	AGC MAVG - calculated
8/19/2014 11:40	0:02	KWPII	0.071	17.210	AGC MAVG - calculated
8/19/2014 12:12	0:01	KWPII	0.009	18.854	AGC MAVG - calculated
8/19/2014 12:16	0:01	KWPII	0.002	19.677	AGC MAVG - calculated
8/20/2014 0:17	0:01	KWPII	0.018	14.753	AGC MAVG - calculated
8/20/2014 0:34	0:02	KWPII	0.037	18.855	AGC MAVG - calculated
8/20/2014 0:37	0:08	KWPII	0.313	15.308	AGC MAVG - calculated
8/20/2014 1:08	0:48	KWPII	3.490	18.582	AGC MAVG - calculated
8/20/2014 2:32	0:31	KWPII	3.483	20.158	AGC MAVG - calculated
8/20/2014 3:24	1:25	KWPII	11.308	20.044	AGC MAVG - calculated
8/20/2014 4:50	0:01	KWPII	0.029	15.072	AGC MAVG - calculated
8/20/2014 7:42	0:01	KWPII	0.013	15.153	AGC MAVG - calculated
8/20/2014 7:40	0:02	KWPII	0.047	16.879	AGC MAVG - calculated
8/20/2014 10:53	0:01	KWPII	0.010	18.854	AGC MAVG - calculated
8/20/2014 11:04	0:00	KWPII	0.153	18.728	AGC MAVG - calculated
8/21/2014 0:07	0:01	KWPII	0.004	20.470	AGC MAVG - calculated
8/21/2014 0:13	0:04	KWPII	0.077	20.618	AGC MAVG - calculated
8/21/2014 0:18	0:01	KWPII	0.008	20.064	AGC MAVG - calculated
8/21/2014 0:24	0:02	KWPII	0.094	20.374	AGC MAVG - calculated
8/21/2014 0:27	0:05	KWPII	0.108	18.720	AGC MAVG - calculated
8/21/2014 0:34	0:08	KWPII	0.224	19.123	AGC MAVG - calculated
8/21/2014 0:44	0:04	KWPII	0.249	17.974	AGC MAVG - calculated
8/21/2014 0:49	0:05	KWPII	0.218	18.500	AGC MAVG - calculated
8/21/2014 0:55	0:03	KWPII	0.290	17.177	AGC MAVG - calculated
8/21/2014 0:58	0:05	KWPII	0.173	15.710	AGC MAVG - calculated
8/21/2014 1:08	0:07	KWPII	0.139	18.352	AGC MAVG - calculated
8/21/2014 1:22	0:01	KWPII	0.032	18.216	AGC MAVG - calculated
8/21/2014 1:48	0:39	KWPII	5.393	20.403	AGC MAVG - calculated
8/21/2014 2:28	0:01	KWPII	0.008	16.344	AGC MAVG - calculated
8/21/2014 3:58	0:01	KWPII	0.017	13.381	AGC MAVG - calculated
8/21/2014 3:52	0:01	KWPII	0.003	11.308	AGC MAVG - calculated
8/21/2014 3:54	0:01	KWPII	0.017	12.716	AGC MAVG - calculated
8/21/2014 5:54	0:01	KWPII	0.001	0.080	AGC MAVG - calculated
8/21/2014 15:25	0:01	KWPII	0.009	13.187	AGC MAVG - calculated
8/21/2014 15:34	0:03	KWPII	0.035	17.452	AGC MAVG - calculated
8/21/2014 15:41	0:01	KWPII	0.002	17.477	AGC MAVG - calculated
8/21/2014 15:47	0:09	KWPII	0.208	16.486	AGC MAVG - calculated
8/21/2014 21:18	0:01	AWE	0.002	0.100	AGC MAVG - calculated
8/21/2014 22:00	0:08	KWPII	0.147	20.882	AGC MAVG - calculated
8/21/2014 22:07	0:01	KWPII	0.003	20.605	AGC MAVG - calculated
8/21/2014 22:06	0:01	KWPII	0.002	20.706	AGC MAVG - calculated
8/21/2014 22:55	0:01	KWPII	0.003	20.699	AGC MAVG - calculated
8/21/2014 22:58	5:36	KWPII	72.436	20.708	AGC MAVG - calculated
8/22/2014 0:42	0:05	AWE	0.024	15.100	AGC MAVG - calculated
8/22/2014 0:52	0:03	AWE	0.067	15.000	AGC MAVG - calculated
8/22/2014 3:50	0:01	AWE	0.003	0.200	AGC MAVG - calculated
8/22/2014 3:52	0:01	AWE	0.002	0.100	AGC MAVG - calculated
8/22/2014 4:02	0:09	AWE	0.549	14.800	AGC MAVG - calculated
8/22/2014 4:13	0:14	AWE	0.508	14.800	AGC MAVG - calculated
8/22/2014 4:30	0:01	AWE	0.013	11.900	AGC MAVG - calculated
8/22/2014 4:37	0:35	KWPII	4.803	20.708	AGC MAVG - calculated
8/22/2014 5:13	0:04	KWPII	0.112	20.598	AGC MAVG - calculated
8/22/2014 5:18	0:25	KWPII	2.187	20.705	AGC MAVG - calculated
8/22/2014 5:48	0:02	KWPII	0.041	20.679	AGC MAVG - calculated
8/22/2014 5:51	0:01	KWPII	0.001	20.639	AGC MAVG - calculated
8/22/2014 11:22	0:01	KWPII	0.021	20.691	AGC MAVG - calculated
8/22/2014 11:24	0:01	KWPII	0.011	20.687	AGC MAVG - calculated
8/22/2014 11:38	0:01	KWPII	0.000	20.708	AGC MAVG - calculated
8/22/2014 22:41	0:01	AWE	0.002	0.100	AGC MAVG - calculated
8/23/2014 0:02	0:03	KWPII	0.078	20.708	AGC MAVG - calculated
8/23/2014 0:11	0:01	KWPII	0.001	20.708	AGC MAVG - calculated
8/23/2014 0:15	2:18	KWPII	12.840	20.708	AGC MAVG - calculated
8/23/2014 2:42	0:01	KWPII	0.018	17.673	AGC MAVG - calculated
8/23/2014 2:51	0:03	KWPII	0.108	19.798	AGC MAVG - calculated
8/23/2014 2:58	2:08	KWPII	10.187	20.637	AGC MAVG - calculated
8/23/2014 3:53	0:01	AWE	0.002	0.100	AGC MAVG - calculated
8/23/2014 4:05	0:01	AWE	0.002	0.100	AGC MAVG - calculated
8/23/2014 4:09	0:01	AWE	0.002	0.100	AGC MAVG - calculated
8/23/2014 4:12	0:01	AWE	0.002	0.100	AGC MAVG - calculated
8/23/2014 5:03	0:03	KWPII	0.091	20.637	AGC MAVG - calculated
8/23/2014 5:06	0:13	KWPII	0.332	20.639	AGC MAVG - calculated
8/23/2014 5:23	0:01	KWPII	0.004	20.584	AGC MAVG - calculated
8/23/2014 5:28	0:03	KWPII	0.018	20.808	AGC MAVG - calculated
8/23/2014 5:30	0:01	KWPII	0.008	20.402	AGC MAVG - calculated
8/23/2014 8:50	0:02	KWPII	0.004	18.717	AGC MAVG - calculated
8/23/2014 10:10	0:01	KWPII	0.054	19.554	AGC MAVG - calculated
8/23/2014 13:05	0:01	KWPII	0.020	17.737	AGC MAVG - calculated
8/23/2014 13:08	0:01	KWPII	0.054	18.449	AGC MAVG - calculated
8/23/2014 13:12	0:02	KWPII	0.081	20.307	AGC MAVG - calculated
8/23/2014 13:15	0:27	KWPII	2.178	20.617	AGC MAVG - calculated
8/23/2014 13:43	0:04	KWPII	0.083	20.641	AGC MAVG - calculated
8/23/2014 13:50	0:02	KWPII	0.033	20.598	AGC MAVG - calculated
8/23/2014 13:56	0:01	KWPII	0.010	20.832	AGC MAVG - calculated
8/23/2014 13:58	0:01	KWPII	0.014	20.833	AGC MAVG - calculated
8/23/2014 14:52	0:01	KWPII	0.009	19.211	AGC MAVG - calculated
8/23/2014 14:54	0:01	KWPII	0.014	19.202	AGC MAVG - calculated
8/23/2014 15:21	0:02	KWPII	0.045	20.708	AGC MAVG - calculated
8/23/2014 15:22	0:01	KWPII	0.010	20.659	AGC MAVG - calculated
8/23/2014 22:43	0:02	KWPII	0.030	18.272	AGC MAVG - calculated
8/23/2014 22:47	0:08	KWPII	0.473	17.795	AGC MAVG - calculated
8/23/2014 22:58	0:01	KWPII	0.011	17.532	AGC MAVG - calculated
8/23/2014 23:00	0:01	KWPII	0.009	18.172	AGC MAVG - calculated
8/23/2014 23:08	0:01	KWPII	0.003	19.707	AGC MAVG - calculated
8/23/2014 23:13	0:20	KWPII	1.448	18.642	AGC MAVG - calculated
8/23/2014 23:34	0:03	KWPII	0.110	17.431	AGC MAVG - calculated
8/23/2014 23:44	0:01	KWPII	0.007	18.208	AGC MAVG - calculated
8/24/2014 1:41	0:01	KWPII	0.004	12.889	AGC MAVG - calculated
8/24/2014 4:58	0:01	AWE	0.002	0.100	AGC MAVG - calculated

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Start Date and Time	Duration	IPP Curtained	Estimated Curtained MWH	Peak MW Curtained	Reasons for Curtailment
8/24/2014 7:59	0:01	AWE	0.002	0.100	AGC MAVG - calculated
8/24/2014 13:28	0:01	KWPII	0.000	0.002	AGC MAVG - calculated
8/24/2014 23:17	0:03	KWPII	0.053	12.776	AGC MAVG - calculated
8/25/2014 0:47	0:01	KWPII	0.012	18.408	AGC MAVG - calculated
8/25/2014 0:51	0:01	KWPII	0.012	17.361	AGC MAVG - calculated
8/25/2014 0:53	0:04	KWPII	0.054	18.804	AGC MAVG - calculated
8/25/2014 0:59	0:01	KWPII	0.003	18.371	AGC MAVG - calculated
8/25/2014 1:25	0:01	KWPII	0.012	20.168	AGC MAVG - calculated
8/25/2014 1:28	3:05	KWPII	17.240	20.867	AGC MAVG - calculated
8/25/2014 4:34	0:05	KWPII	0.110	20.062	AGC MAVG - calculated
8/25/2014 4:40	0:03	KWPII	0.058	20.814	AGC MAVG - calculated
8/25/2014 4:44	0:01	KWPII	0.009	20.564	AGC MAVG - calculated
8/25/2014 4:46	0:02	KWPII	0.020	20.580	AGC MAVG - calculated
8/25/2014 4:48	0:18	KWPII	0.537	20.548	AGC MAVG - calculated
8/25/2014 5:08	0:03	KWPII	0.048	20.270	AGC MAVG - calculated
8/25/2014 5:12	0:02	KWPII	0.018	20.410	AGC MAVG - calculated
8/25/2014 5:15	0:01	KWPII	0.011	20.325	AGC MAVG - calculated
8/25/2014 6:01	0:02	KWPII	0.037	20.023	AGC MAVG - calculated
8/25/2014 22:35	0:01	AWE	0.002	0.100	AGC MAVG - calculated
8/25/2014 23:02	0:01	AWE	0.003	0.200	AGC MAVG - calculated
8/26/2014 5:40	0:01	AWE	0.002	0.100	AGC MAVG - calculated
8/26/2014 6:18	0:03	AWE	0.457	21.000	AGC MAVG - calculated
8/26/2014 6:25	0:07	AWE	0.956	21.000	AGC MAVG - calculated
8/26/2014 6:04	0:01	AWE	0.005	0.300	AGC MAVG - calculated
8/26/2014 10:36	0:02	AWE	0.049	19.000	AGC MAVG - calculated
8/26/2014 10:48	0:08	AWE	0.258	18.000	Good Engineering and Operating Practices
8/26/2014 12:42	0:02	AWE	0.039	20.800	AGC MAVG - calculated
8/26/2014 12:46	0:01	AWE	0.018	20.000	AGC MAVG - calculated
8/26/2014 13:06	0:01	AWE	0.002	20.000	AGC MAVG - calculated
8/26/2014 13:12	0:01	AWE	0.009	19.800	AGC MAVG - calculated
8/26/2014 13:21	0:01	AWE	0.004	20.200	AGC MAVG - calculated
8/26/2014 13:27	0:02	AWE	0.022	21.100	AGC MAVG - calculated
8/26/2014 13:31	0:02	AWE	0.024	20.000	AGC MAVG - calculated
8/26/2014 13:34	0:03	AWE	0.027	20.800	AGC MAVG - calculated
8/26/2014 13:36	0:18	AWE	0.521	20.600	AGC MAVG - calculated and Testing
8/26/2014 18:26	0:01	AWE	0.003	19.400	AGC MAVG - calculated
8/26/2014 23:22	0:01	AWE	0.003	0.200	AGC MAVG - calculated
8/26/2014 23:54	0:01	AWE	0.003	0.200	AGC MAVG - calculated
8/27/2014 0:26	0:02	AWE	0.028	5.000	AGC MAVG - calculated
8/27/2014 0:32	0:02	AWE	0.045	6.200	AGC MAVG - calculated
8/27/2014 1:41	0:06	AWE	0.067	3.900	AGC MAVG - calculated
8/27/2014 2:22	0:03	AWE	0.133	7.800	AGC MAVG - calculated
8/27/2014 2:28	0:03	AWE	0.045	5.000	AGC MAVG - calculated
8/27/2014 4:46	0:01	AWE	0.003	0.200	AGC MAVG - calculated
8/27/2014 5:20	0:01	AWE	0.002	0.900	AGC MAVG - calculated
8/27/2014 6:04	0:02	AWE	0.081	6.400	AGC MAVG - calculated
8/27/2014 6:07	0:04	AWE	0.044	8.000	AGC MAVG - calculated
8/27/2014 7:47	0:01	AWE	0.012	9.300	AGC MAVG - calculated
8/27/2014 7:49	0:02	AWE	0.049	10.700	AGC MAVG - calculated
8/27/2014 7:52	0:01	AWE	0.004	9.300	AGC MAVG - calculated
8/27/2014 9:22	0:01	AWE	0.025	14.000	AGC MAVG - calculated
8/27/2014 9:24	0:07	AWE	0.181	15.100	AGC MAVG - calculated
8/27/2014 9:32	0:02	AWE	0.025	15.300	AGC MAVG - calculated
8/27/2014 9:47	0:03	AWE	0.077	19.200	AGC MAVG - calculated
8/27/2014 9:56	0:04	AWE	0.093	19.100	AGC MAVG - calculated
8/27/2014 10:14	0:01	AWE	0.021	18.900	AGC MAVG - calculated
8/27/2014 10:32	0:02	AWE	0.025	19.200	AGC MAVG - calculated
8/27/2014 10:46	0:03	AWE	0.120	19.800	AGC MAVG - calculated
8/27/2014 10:55	0:01	AWE	0.007	19.200	AGC MAVG - calculated
8/27/2014 10:57	0:01	AWE	0.007	18.100	AGC MAVG - calculated
8/27/2014 11:43	0:02	AWE	0.037	18.900	AGC MAVG - calculated
8/27/2014 11:46	0:02	AWE	0.047	19.700	AGC MAVG - calculated
8/28/2014 0:11	0:02	KWPII	0.011	17.266	AGC MAVG - calculated
8/28/2014 0:18	0:01	KWPII	0.003	17.070	AGC MAVG - calculated
8/28/2014 0:18	0:01	AWE	0.003	0.200	AGC MAVG - calculated
8/28/2014 0:20	0:01	KWPII	0.035	17.441	AGC MAVG - calculated
8/28/2014 0:22	0:02	KWPII	0.056	17.915	AGC MAVG - calculated
8/28/2014 0:27	0:01	KWPII	0.012	17.868	AGC MAVG - calculated
8/28/2014 0:39	0:03	KWPII	0.018	18.437	AGC MAVG - calculated
8/28/2014 0:43	0:04	KWPII	0.050	18.447	AGC MAVG - calculated
8/28/2014 0:48	0:07	KWPII	0.088	18.133	AGC MAVG - calculated
8/28/2014 0:57	0:07	KWPII	0.088	17.407	AGC MAVG - calculated
8/28/2014 1:05	0:04	KWPII	0.054	16.434	AGC MAVG - calculated
8/28/2014 1:10	0:06	KWPII	0.187	16.721	AGC MAVG - calculated
8/28/2014 1:17	0:02	KWPII	0.019	16.871	AGC MAVG - calculated
8/28/2014 1:20	0:06	KWPII	0.195	17.993	AGC MAVG - calculated
8/28/2014 1:27	0:37	KWPII	2.008	18.824	AGC MAVG - calculated
8/28/2014 2:05	0:01	KWPII	0.003	16.487	AGC MAVG - calculated
8/28/2014 2:07	0:02	KWPII	0.042	17.407	AGC MAVG - calculated
8/28/2014 2:10	0:01	KWPII	0.001	16.315	AGC MAVG - calculated
8/28/2014 2:39	0:01	AWE	0.003	0.200	AGC MAVG - calculated
8/28/2014 12:55	0:01	AWE	0.002	0.100	AGC MAVG - calculated
8/28/2014 13:05	0:01	AWE	0.002	0.100	AGC MAVG - calculated
8/28/2014 18:11	0:01	AWE	0.002	0.100	AGC MAVG - calculated
8/28/2014 22:51	0:02	KWPII	0.014	14.187	AGC MAVG - calculated
8/28/2014 22:56	0:01	KWPII	0.043	13.528	AGC MAVG - calculated
8/28/2014 23:03	0:02	KWPII	0.072	17.308	AGC MAVG - calculated
8/28/2014 23:06	0:15	KWPII	0.902	17.951	AGC MAVG - calculated
8/29/2014 0:17	0:01	KWPII	0.009	15.862	AGC MAVG - calculated
8/29/2014 0:18	0:01	KWPII	0.005	15.608	AGC MAVG - calculated
8/29/2014 0:27	0:01	KWPII	0.005	14.921	AGC MAVG - calculated
8/29/2014 0:31	0:06	KWPII	0.180	16.620	AGC MAVG - calculated
8/29/2014 0:43	0:01	KWPII	0.003	15.962	AGC MAVG - calculated
8/29/2014 0:49	0:02	KWPII	0.020	17.532	AGC MAVG - calculated
8/29/2014 0:49	0:07	KWPII	0.092	18.062	AGC MAVG - calculated
8/29/2014 5:20	0:09	KWPII	0.221	13.270	AGC MAVG - calculated
8/29/2014 5:30	0:01	KWPII	0.012	13.475	AGC MAVG - calculated
8/29/2014 5:32	0:10	KWPII	0.423	13.750	AGC MAVG - calculated
8/29/2014 10:14	0:01	AWE	0.005	0.300	AGC MAVG - calculated and Testing
8/29/2014 23:00	0:03	KWPII	0.042	17.318	AGC MAVG - calculated
8/29/2014 23:11	0:24	KWPII	1.540	18.881	AGC MAVG - calculated
8/29/2014 23:36	0:07	KWPII	0.313	18.408	AGC MAVG - calculated
8/30/2014 4:28	0:01	AWE	0.003	0.200	AGC MAVG - calculated
8/30/2014 9:29	0:01	KWPII	0.000	0.080	AGC MAVG - calculated
8/30/2014 13:23	0:01	AWE	0.003	0.200	AGC MAVG - calculated
8/31/2014 14:16	0:01	KWPII	0.000	0.080	AGC MAVG - calculated

Notes  
 - Curtailment for Kahawa Wind Power ("KWP"), Maui Hydroelectric ("MH"), AAAAA Rent-A-Space Maui LTD ("SA"), Boreal Solar LLC ("BS"), Auwahi Wind Energy ("AWE") and Kahawa Wind Power II ("KWPII") may now be controlled by Maui Electric's Automatic Generation Control System ("AGC") or a Maui Electric operator-entered curtailment limit. The AGC curtailment control automatically calculates the amount of Maximum Allowable Variable Generation ("MAVG") that Maui Electric can accept into the Maui system, based on the system current available variable generation ("CAVG"), regulating reserve down requirement ("RRDR") and available regulating reserve down ("ARRD"). Thus the AGC MAVG - calculated is equal to CAVG less ARRD. Additionally, the AGC curtailment control allows the Maui Electric operator to enter an AGC MAVG value. The AGC curtailment control will employ the lesser of the AGC MAVG - calculated and AGC MAVG - entered values in the control logic.  
 - The Estimated Curtained MWH and Peak MW Curtained are calculated with information provided by AWE, KWP, and KWPII. Maui Electric does not make any representation as to its accuracy.  
 - The data to calculate the Estimated Curtained MWH and Peak MW Curtained is not provided by SA, BS, or MH.  
 - Curtailment signals sent to SA or BS during nighttime hours are not recorded as curtailment events because no energy generation is possible during that time.

















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Start Date/Time	Stop Date/Time	Duration (h mm)	IPP Curtailed	Estimated MWH Curtailed	Peak MW Curtailed	Reasons for Curtailment
8/28/2014 14 54	8/28/2014 14 58	0 05	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/28/2014 15 04	8/28/2014 15 08	0 06	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/28/2014 15 18	8/28/2014 15 18	0 01	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/28/2014 15 20	8/28/2014 15 39	0 20	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/28/2014 15 43	8/28/2014 15 45	0 03	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/28/2014 15 58	8/28/2014 15 59	0 02	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/28/2014 16 03	8/28/2014 16 09	0 07	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/28/2014 16 24	8/28/2014 16 25	0 02	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/28/2014 17 02	8/28/2014 17 30	0 29	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/29/2014 7 11	8/29/2014 8 27	1 17	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/29/2014 8 41	8/29/2014 8 50	0 10	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/29/2014 8 58	8/29/2014 9 03	0 08	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/29/2014 9 27	8/29/2014 9 27	0 01	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/29/2014 9 46	8/29/2014 9 48	0 01	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/29/2014 9 48	8/29/2014 9 53	0 08	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/29/2014 9 58	8/29/2014 9 58	0 01	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/29/2014 10 03	8/29/2014 10 03	0 01	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/29/2014 10 26	8/29/2014 10 26	0 01	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/29/2014 10 32	8/29/2014 10 34	0 03	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/29/2014 10 45	8/29/2014 10 47	0 03	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/29/2014 10 51	8/29/2014 11 08	0 18	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/29/2014 11 13	8/29/2014 11 16	0 04	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/29/2014 11 22	8/29/2014 11 24	0 03	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/29/2014 11 36	8/29/2014 11 38	0 01	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/29/2014 14 33	8/29/2014 14 35	0 03	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/29/2014 14 37	8/29/2014 14 38	0 02	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/30/2014 7 02	8/30/2014 7 02	0 01	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/30/2014 7 05	8/30/2014 8 34	1 30	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/30/2014 8 57	8/30/2014 8 57	0 01	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/30/2014 9 00	8/30/2014 9 05	0 06	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/30/2014 9 16	8/30/2014 9 22	0 07	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/30/2014 9 26	8/30/2014 10 17	0 52	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/30/2014 10 27	8/30/2014 10 35	0 09	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/30/2014 10 37	8/30/2014 10 40	0 04	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/30/2014 12 13	8/30/2014 12 18	0 04	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/30/2014 12 29	8/30/2014 12 30	0 02	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/30/2014 14 23	8/30/2014 14 50	0 28	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/30/2014 15 03	8/30/2014 15 05	0 03	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/30/2014 15 19	8/30/2014 15 20	0 02	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/31/2014 7 15	8/31/2014 8 20	1 06	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/31/2014 8 22	8/31/2014 8 23	0 02	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/31/2014 8 25	8/31/2014 13 43	5 19	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/31/2014 14 53	8/31/2014 14 55	0 03	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
8/31/2014 14 58	8/31/2014 15 01	0 03	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices

Notes

1. On June 27, 2012, Maui Electric notified LSR that although LSR has not operated in compliance with the revised ramp rate of 360 kW/minute, Maui Electric would conditionally allow LSR to operate at the allowed capacity of 1.2 MW while the Maui Electric-Lanai Diesel Operator was in the control room.
2. LSR possible output data is not available. Therefore, Maui Electric assumes LSR is curtailed if the LSR curtailment set point is less than 1,200 kW and LSR's output is within 50 kW of the curtailment set point.

Hawai'i Electric Light Company Curtailment Report August 2014

Start Date/Time	MW output prior to start of curtailment	End Date/Time	MW output after curtailment released <sup>1</sup>	Reason for Curtailment
08/07/14 16:19	8.8 MW	08/09/14 13:26	0.0 MW	Wailuku curtailed - 7400 line trip Tropical Storm Iselle
08/09/14 20:30	10.4 MW	08/15/14 10:58	0.0 MW	Wailuku curtailed - 7400 line open Tropical Storm Iselle

<sup>1</sup> The MW output values are taken soon after curtailment is released by Hawai'i Electric Light and may not reflect their full output depending on ramp rate for the facility. The wind farms generally return immediately to full available levels, whereas PGV and Wailuku may take longer to return to scheduled or full available output levels.