



January 28, 2015

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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'¹ monthly report for December 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 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

¹ 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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SERVICE LIST
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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 December 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 December 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 November. 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 December.

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's demand response activations for system events are provided in Attachment 5. 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. Currently, Hawaiian Electric activates the demand response program for Maui Electric in conjunction with Oahu. The number of activations vary from month to month depending on Oahu's system need or for program testing. This program is not currently used in response to actual system events on Maui since the program is too small to provide meaningful system impact.

- (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 December 31, 2014):

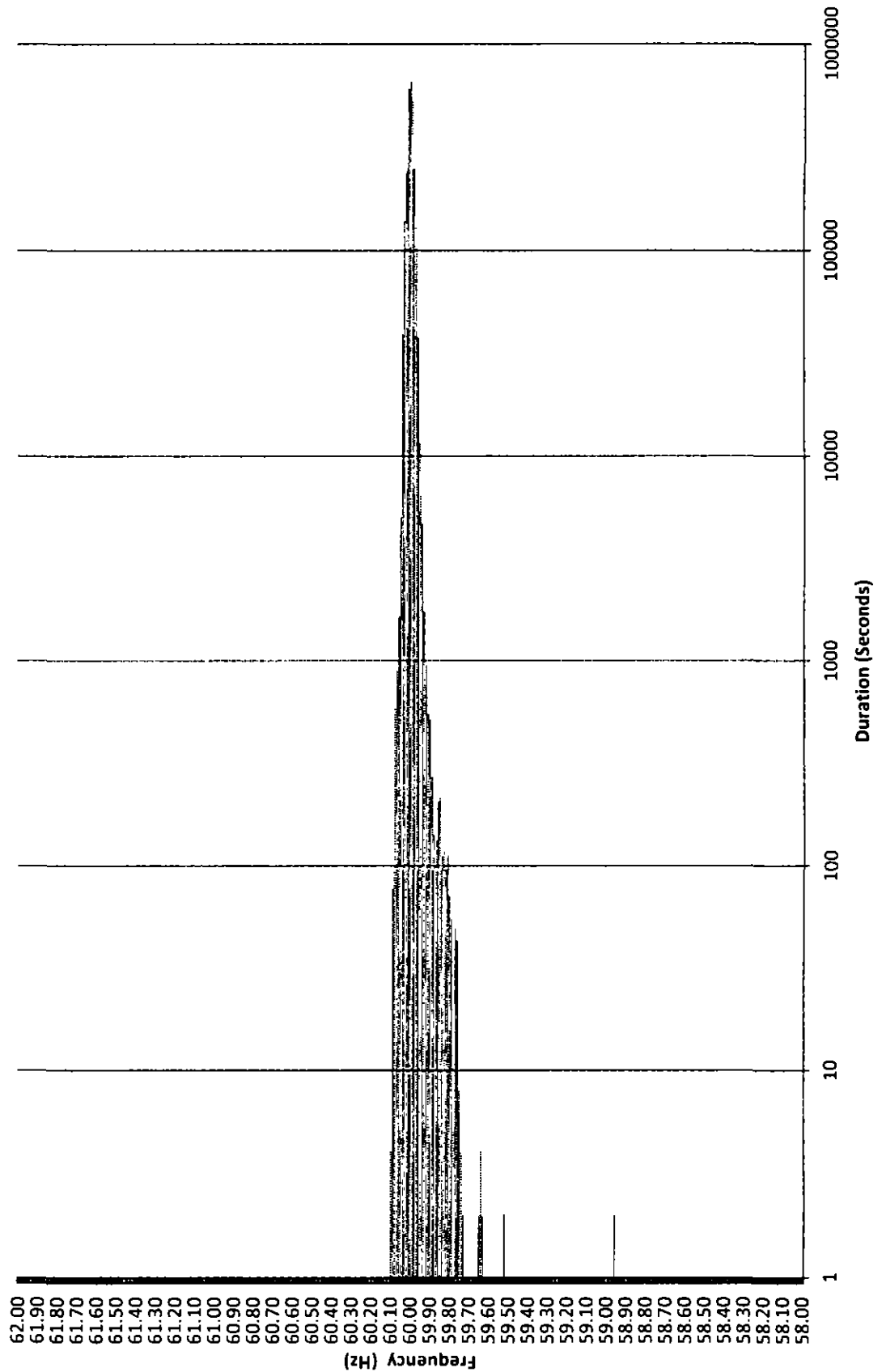
3a) Tabulation of each curtailment event for each resource including the starting date and time, duration, megawatt hours curtailed, peak MW curtailed, and reason for curtailment:

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

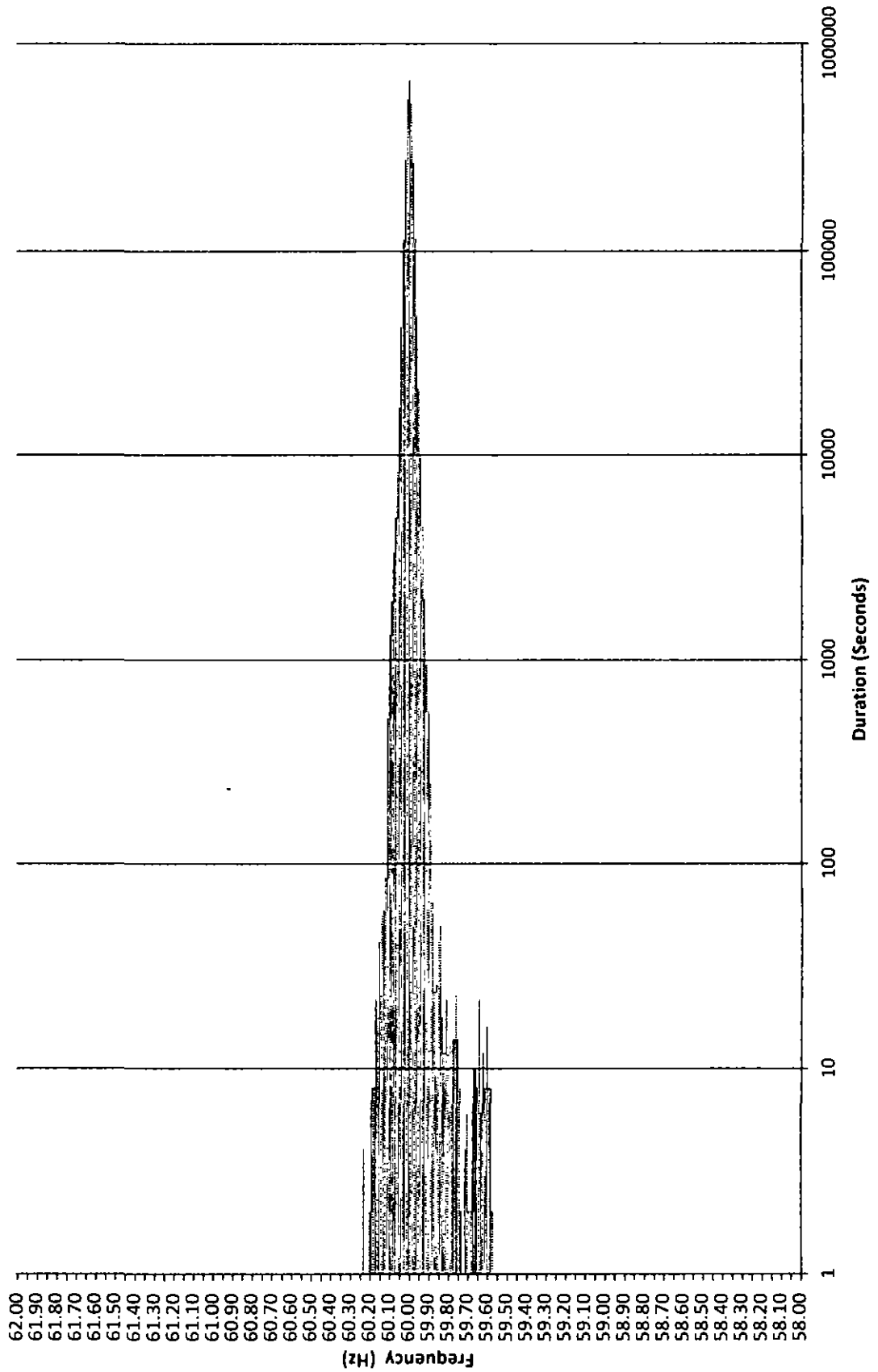
3b) Total MWh of non-dispatchable renewable resources curtailed for the month:

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.

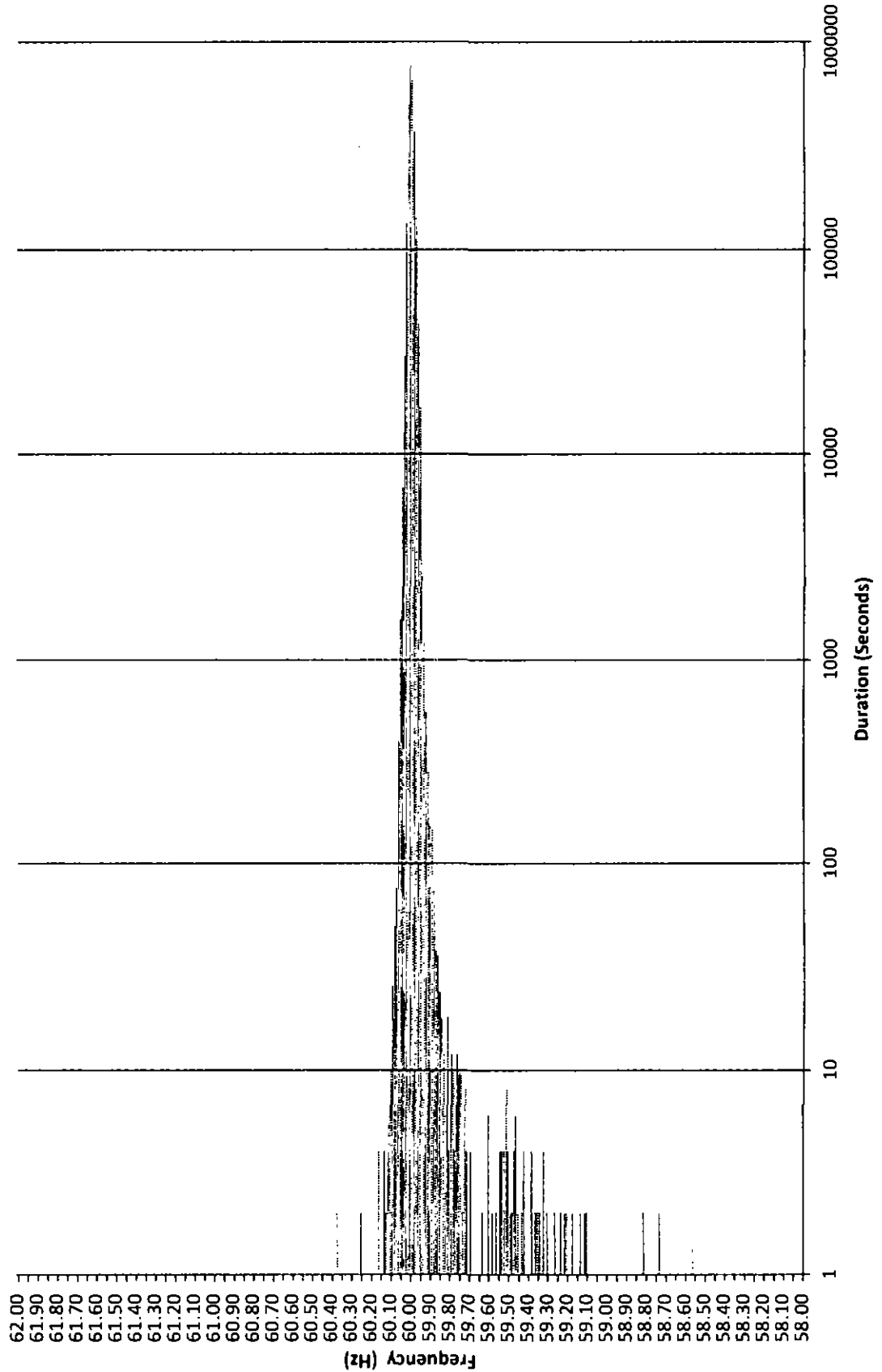
Frequency Distribution Plot - Hawaiian Electric December 2014



Maui Electric Frequency Distribution Plot - Maui December 2014



Frequency Distribution Plot - Hawai'i Electric Light December 2014



Hawaiian Electric Frequency Excursion Statistics December 2014		
Data Rounded to the nearest	<59.95 Hz	>60.05 Hz
Number of Excursions	967	330
Maximum Duration (sec)	878	560
Maximum Deviation (Hz)	58.956	60.098
Total Duration of Excursions (sec)	14012	4682

Maui Electric Frequency Excursion Statistics December 2014		
	<59.95 Hz	>60.05 Hz
Number of Excursions	3891	2914
Maximum Duration (sec)	448	422
Maximum Deviation (Hz)	59.5731	60.2269
Total Duration of Excursions (sec)	27224	27440

Hawai'i Electric Light Frequency Excursion Statistics December 2014		
	<59.95 Hz	>60.05 Hz
Number of Excursions	2069	277
Maximum Duration (sec)	298	32
Maximum Deviation (Hz)	58.558	60.365
Total Duration of Excursions (sec)	14120	1116

HAWAIIAN ELECTRIC COMPANY, INC.
CONTINGENCY RESERVE ACTIVATION EVENTS
DECEMBER 2014

Event #	Date & Time	Frequency (Hz)			Spinning Reserve Shortfall (MW)	Duration (HH:MM)	Description
		Prior to Event	Nadir	Trigger			
1	12/09/14 17:45	59.998	59.521	N/A	-45.00	0:01	KPLP CT2 tripped offline while generating ~73 MW. RDLC activated.
2	12/14/14 06:13	59.987	59.801	N/A	-9.00	0:18	AES decreased output from ~150 MW to ~80 MW due to loss of a boiler.
3	12/19/14 18:05	59.977	59.639	N/A	-70.00	0:04	Waiau 5 tripped offline while generating ~48 MW. RDLC activated.

Hawaiian Electric Curtailment Report December 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
12/01/14 06:44	0.0	0.00	12/01/14 08:25	0	*	KREP	Replacement work
12/01/14 16:51	0.0	0.60	12/01/14 17:25	0	*	KREP	Replacement work
12/02/14 06:33	0.0	0.00	12/02/14 07:59	0	*	KREP	Replacement work
12/02/14 07:24	0.0	10.60	12/02/14 08:23	0	*	KWF	Replacement work
12/02/14 07:25	0.0	0.10	12/02/14 08:24	0	*	Makai	Replacement work
12/02/14 16:04	0.0	17.00	12/02/14 17:26	0	*	KWF	Replacement work
12/02/14 16:07	0.0	10.00	12/02/14 17:26	0	*	Makai	Replacement work
12/02/14 17:21	0.0	0.20	12/02/14 17:51	0	*	KREP	Replacement work
12/03/14 06:22	0.0	0.00	12/03/14 06:52	0	*	KREP	Replacement work
12/03/14 06:41	0.0	1.00	12/03/14 07:37	0	*	KWF	Replacement work
12/03/14 06:43	0.0	1.00	12/03/14 07:37	0	*	Makai	Replacement work
12/03/14 16:29	0.0	2.30	12/03/14 17:12	0	*	KWF	Replacement work
12/03/14 16:30	0.0	1.00	12/03/14 17:13	0	*	Makai	Replacement work
12/04/14 06:26	0.0	0.00	12/04/14 07:19	0	*	KREP	Replacement work
12/04/14 07:07	0.0	9.00	12/04/14 08:05	0	*	KWF	Replacement work
12/04/14 07:07	0.0	0.00	12/04/14 08:05	0	*	Makai	Replacement work
12/04/14 15:38	0.0	6.40	12/04/14 16:18	0	*	KWF	Replacement work
12/04/14 15:39	0.0	11.40	12/04/14 16:18	0	*	Makai	Replacement work
12/05/14 06:08	0.0	0.00	12/05/14 06:32	0	*	KREP	Replacement work
12/05/14 16:39	0.0	0.60	12/05/14 16:55	0	*	KREP	Replacement work
12/06/14 06:09	0.0	0.00	12/06/14 07:15	0	*	KREP	Replacement work
12/06/14 17:19	0.0	0.10	12/06/14 17:39	0	*	KREP	Replacement work
12/08/14 06:53	0.0	0.00	12/08/14 07:49	0	*	KREP	Maintenance work
12/09/14 05:43	0.0	0.00	12/09/14 06:23	0	*	KREP	Replacement work
12/09/14 06:38	0.0	0.00	12/09/14 07:36	0	*	KWF	Replacement work
12/09/14 06:38	0.0	0.00	12/09/14 07:36	0	*	Makai	Replacement work
12/09/14 15:40	0.0	0.00	12/09/14 16:21	0	*	KWF	Replacement work
12/09/14 15:41	0.0	0.00	12/09/14 16:21	0	*	Makai	Replacement work
12/10/14 06:31	0.0	0.00	12/10/14 07:13	0	*	KWF	Replacement work
12/10/14 06:31	0.0	0.00	12/10/14 07:14	0	*	Makai	Replacement work
12/10/14 07:02	0.0	0.00	12/10/14 07:33	0	*	KREP	Maintenance work
12/10/14 09:36	0.0	0.00	12/10/14 11:10	0	*	Mauka	Customer maintenance work
12/10/14 15:52	0.0	13.00	12/10/14 16:21	0	*	KWF	Replacement work
12/10/14 15:52	0.0	5.50	12/10/14 16:22	0	*	Makai	Replacement work
12/10/14 16:26	0.0	0.80	12/10/14 16:46	0	*	KREP	Maintenance work
12/11/14 05:15	0.0	0.00	12/11/14 05:43	0	*	KREP	Maintenance work
12/11/14 07:16	0.0	9.00	12/11/14 08:07	0	*	KWF	Replacement work
12/11/14 07:16	0.0	0.80	12/11/14 08:07	0	*	Makai	Replacement work
12/11/14 15:36	0.0	7.50	12/11/14 16:17	0	*	KWF	Replacement work
12/11/14 15:36	0.0	5.00	12/11/14 16:17	0	*	Makai	Replacement work
12/18/14 09:52	0.0	20.20	12/18/14 10:31	0	*	Mauka	Customer maintenance work
12/30/14 07:17	0.0	0.00	12/30/14 07:43	0	*	KLS2	Maintenance work
12/30/14 07:19	0.0	0.00	12/30/14 07:46	0	*	KREP	Maintenance work
12/30/14 14:41	0.0	4.50	12/30/14 15:25	0	*	KLS2	Maintenance work
12/30/14 14:43	0.0	2.40	12/30/14 15:26	0	*	KREP	Maintenance work
12/30/14 18:44	0.0	6.00	12/30/14 20:55	0	*	KWF	Maintenance work
12/30/14 18:45	0.0	7.00	12/30/14 20:56	0	*	Makai	Maintenance work
12/31/14 07:00	0.0	8.70	12/31/14 07:41	0	*	KWF	Maintenance work
12/31/14 07:00	0.0	6.50	12/31/14 07:41	0	*	Makai	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 December 2014



Start Date and Time	Duration	IPP Curtailed	Estimated Curtailed MWh	Peak MW Curtailed	Reasons for Curtailment
12/28/2014 18 54	0:11	KWPII	0:154	18:579	AGC MAVG - calculated
12/28/2014 19 11	0:08	KWPII	0:103	19:008	AGC MAVG - calculated
12/28/2014 19 31	0:02	KWPII	0:003	19:774	AGC MAVG - calculated
12/28/2014 19 41	0:02	KWPII	0:011	20:292	AGC MAVG - calculated
12/29/2014 3 36	1:13	KWPII	5:755	19:750	AGC MAVG - calculated
12/29/2014 8 26	0:03	KWPII	0:088	6:269	AGC MAVG - calculated
12/29/2014 8 44	0:01	KWPII	0:023	6:621	AGC MAVG - calculated
12/29/2014 9 10	0:01	KWPII	0:018	4:613	AGC MAVG - calculated
12/29/2014 9 17	0:02	KWPII	0:021	5:304	AGC MAVG - calculated
12/29/2014 9 26	0:01	KWPII	0:002	5:453	AGC MAVG - calculated
12/29/2014 9 37	0:02	KWPII	0:028	6:718	AGC MAVG - calculated
12/29/2014 10 00	0:02	KWPII	0:017	7:616	AGC MAVG - calculated
12/29/2014 10 03	0:03	KWPII	0:056	6:970	AGC MAVG - calculated
12/29/2014 10 10	0:02	KWPII	0:021	4:088	AGC MAVG - calculated
12/29/2014 10 23	0:01	KWPII	0:022	4:025	AGC MAVG - calculated
12/29/2014 10 30	0:02	KWPII	0:036	3:216	AGC MAVG - calculated
12/29/2014 10 57	0:01	KWPII	0:003	1:784	AGC MAVG - calculated
12/29/2014 11 20	0:01	KWPII	0:004	1:730	AGC MAVG - calculated
12/29/2014 14 00	0:01	KWPII	0:000	0:006	AGC MAVG - calculated
12/30/2014 13 10	0:01	KWPII	0:002	7:767	AGC MAVG - calculated
12/30/2014 13 26	0:01	KWPII	0:005	11:062	AGC MAVG - calculated
12/30/2014 13 35	0:01	KWPII	0:000	17:298	AGC MAVG - calculated
12/30/2014 13 38	0:01	KWPII	0:030	13:179	AGC MAVG - calculated
12/30/2014 13 40	0:01	KWPII	0:015	13:230	AGC MAVG - calculated
12/30/2014 13 43	0:01	KWPII	0:019	13:956	AGC MAVG - calculated
12/30/2014 13 45	0:02	KWPII	0:020	13:093	AGC MAVG - calculated
12/30/2014 13 52	0:02	KWPII	0:029	15:662	AGC MAVG - calculated
12/30/2014 13 59	0:04	KWPII	0:160	16:774	AGC MAVG - calculated
12/30/2014 14 24	0:01	KWPII	0:000	14:508	AGC MAVG - calculated
12/30/2014 14 41	0:31	KWPII	1:000	15:605	AGC MAVG - calculated
12/30/2014 15 13	0:05	KWPII	0:117	17:418	AGC MAVG - calculated
12/30/2014 15 21	0:01	KWPII	0:018	18:271	AGC MAVG - calculated
12/30/2014 15 25	0:05	KWPII	0:101	18:895	AGC MAVG - calculated
12/30/2014 15 31	0:01	KWPII	0:004	18:404	AGC MAVG - calculated
12/30/2014 15 40	0:05	KWPII	0:195	18:478	AGC MAVG - calculated
12/30/2014 15 47	0:04	KWPII	0:045	17:702	AGC MAVG - calculated
12/30/2014 15 52	0:07	KWPII	0:198	16:761	AGC MAVG - calculated
12/30/2014 16 01	0:07	KWPII	0:144	16:356	AGC MAVG - calculated
12/30/2014 16 06	0:01	KWPII	0:028	16:068	AGC MAVG - calculated
12/30/2014 16 13	0:04	KWPII	0:083	17:507	AGC MAVG - calculated
12/30/2014 16 19	0:10	KWPII	0:196	17:919	AGC MAVG - calculated
12/30/2014 16 48	0:05	KWPII	0:083	19:345	AGC MAVG - calculated
12/30/2014 16 58	0:02	KWPII	0:011	19:505	AGC MAVG - calculated
12/30/2014 20 33	0:01	KWPII	0:001	20:229	AGC MAVG - calculated
12/30/2014 20 35	0:08	KWPII	0:176	18:268	AGC MAVG - calculated
12/30/2014 20 42	0:02	KWPII	0:030	18:580	AGC MAVG - calculated
12/31/2014 0 58	0:01	KWPII	0:013	1:955	AGC MAVG - calculated
12/31/2014 1 19	0:01	AWE	0:000	3:277	AGC MAVG - calculated
12/31/2014 14 00	0:01	KWPII	0:001	10:957	AGC MAVG - calculated
12/31/2014 14 04	0:01	KWPII	0:006	10:290	AGC MAVG - calculated
12/31/2014 14 10	0:02	KWPII	0:035	9:992	AGC MAVG - calculated
12/31/2014 14 16	0:02	KWPII	0:020	11:176	AGC MAVG - calculated
12/31/2014 14 21	0:03	KWPII	0:051	12:104	AGC MAVG - calculated
12/31/2014 14 27	0:04	KWPII	0:085	11:027	AGC MAVG - calculated
12/31/2014 14 51	0:01	KWPII	0:028	7:337	AGC MAVG - calculated
12/31/2014 14 58	0:02	KWPII	0:023	7:391	AGC MAVG - calculated
12/31/2014 15 52	0:01	KWPII	0:008	4:407	AGC MAVG - calculated
12/31/2014 16 38	0:01	KWPII	0:007	2:506	AGC MAVG - calculated
12/31/2014 16 41	0:01	KWPII	0:011	1:865	AGC MAVG - calculated
12/31/2014 17 11	0:01	KWPII	0:005	2:155	AGC MAVG - calculated
12/31/2014 23 08	0:03	KWPII	0:056	8:503	AGC MAVG - calculated
12/31/2014 23 16	0:02	KWPII	0:025	6:933	AGC MAVG - calculated
12/31/2014 23 21	0:01	KWPII	0:006	7:088	AGC MAVG - calculated
12/31/2014 23 27	0:03	KWPII	0:046	8:124	AGC MAVG - calculated
12/31/2014 23 31	0:01	KWPII	0:000	7:653	AGC MAVG - calculated
12/31/2014 23 33	0:03	KWPII	0:039	7:726	AGC MAVG - calculated
12/31/2014 23 38	0:02	KWPII	0:017	7:869	AGC MAVG - calculated
12/31/2014 23 48	0:04	KWPII	0:088	6:524	AGC MAVG - calculated
12/31/2014 23 51	0:01	KWPII	0:004	6:845	AGC MAVG - calculated
12/31/2014 23 53	0:03	KWPII	0:033	6:601	AGC MAVG - calculated
12/31/2014 23 59	0:01	KWPII	0:006	5:929	AGC MAVG - calculated

Notes
- Curtailment for Kahewa Wind Power ("KWP"), Mahele Hydroelectric ("MH"), AAAAA Rent-A-Space Maui LTD ("SA"), Boreal Solar, LLC ("BS"), Auwahi Wind Energy ("AWE"), and Kahewa Wind Power II ("KWPII") may now be controlled by Maui Electric.
- The Estimated Curtailed MWh and Peak MW Curtailed 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 Curtailed MWh and Peak MW Curtailed 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.



LanaI Curtailment Report December 2014

Start Date/Time	Stop Date/Time	Duration (h:mm)	IPP Curtailed	Estimated MWH Curtailed	Peak MW Curtailed	Reasons for Curtailment
12/31/2014 9:37	12/31/2014 9:55	0:18	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
12/31/2014 10:00	12/31/2014 10:13	0:14	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
12/31/2014 10:19	12/31/2014 10:24	0:06	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
12/31/2014 10:31	12/31/2014 10:31	0:01	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
12/31/2014 10:35	12/31/2014 10:43	0:09	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
12/31/2014 10:50	12/31/2014 11:58	1:09	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
12/31/2014 12:01	12/31/2014 12:04	0:04	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
12/31/2014 12:07	12/31/2014 12:30	0:24	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
12/31/2014 12:32	12/31/2014 13:23	0:52	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
12/31/2014 13:25	12/31/2014 14:30	1:06	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices
12/31/2014 14:32	12/31/2014 16:48	2:17	LSR	Data is not available	Data is not available	Good Engineering and Operating Practices

Notes

On June 27, 2012, Maul Electric notified LSR that although LSR has not operated in compliance with the revised ramp rate of 360 kW/minute, Maul Electric would conditionally allow LSR to operate at the allowed capacity of 1.2 MW while the Maul Electric-LanaI Diesel Operator was in the control room. LSR possible output data is not available. Therefore, Maul 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 December 2014

Start Date/Time	MW output prior to start of curtailment	End Date/Time	MW output after curtailment released	Reason for Curtailment
12/15/14 22:22	18.9 MW	12/16/14 05:13	18.8 MW	High wind curtailment at Tawhin's request.

¹ 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 Waituku may take longer to return to scheduled or full available output levels.