



May 19, 2017

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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 April 2017 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 Companies are 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@hawaiianelectric.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

c: 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
(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 April 30, 2017):

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 April 30, 2017):

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

Hawaiian Electric's contingency reserve activations are provided in Attachment 3. Maui Electric and Hawai'i Electric Light do not operate with contingency reserve requirements.

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

Hawaiian Electric, Maui Electric, and Hawai'i Electric Light did not have any under frequency load shed activations for the month of April. Therefore, Attachment 4 is not being provided for this reporting period.

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 a 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.

- (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 April 30, 2017):

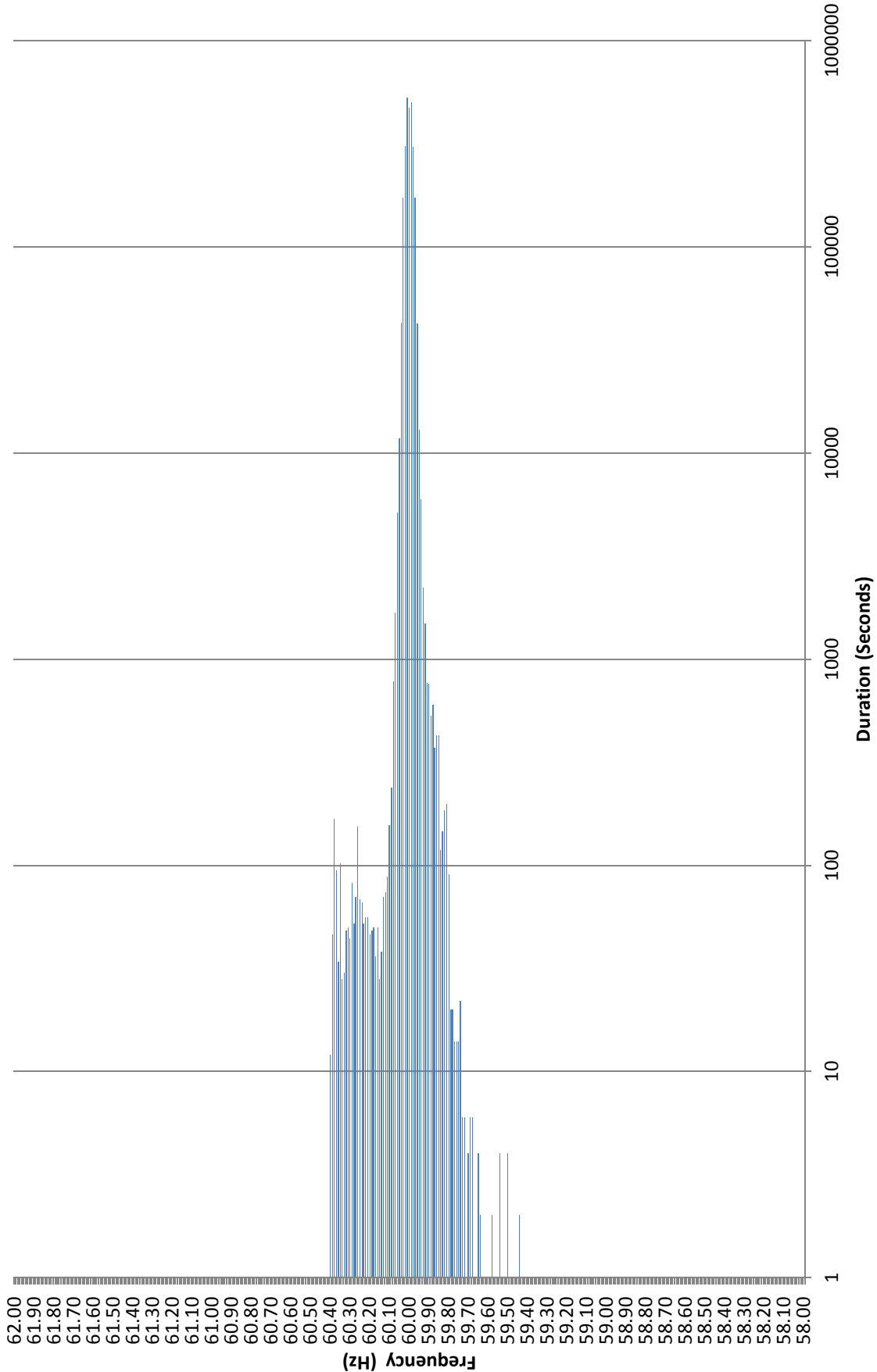
3a) Tabulation of each curtailment event for each resource including the starting date and time, duration, megawatt hours curtailed, peak MW curtailed, and reason for curtailment:

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

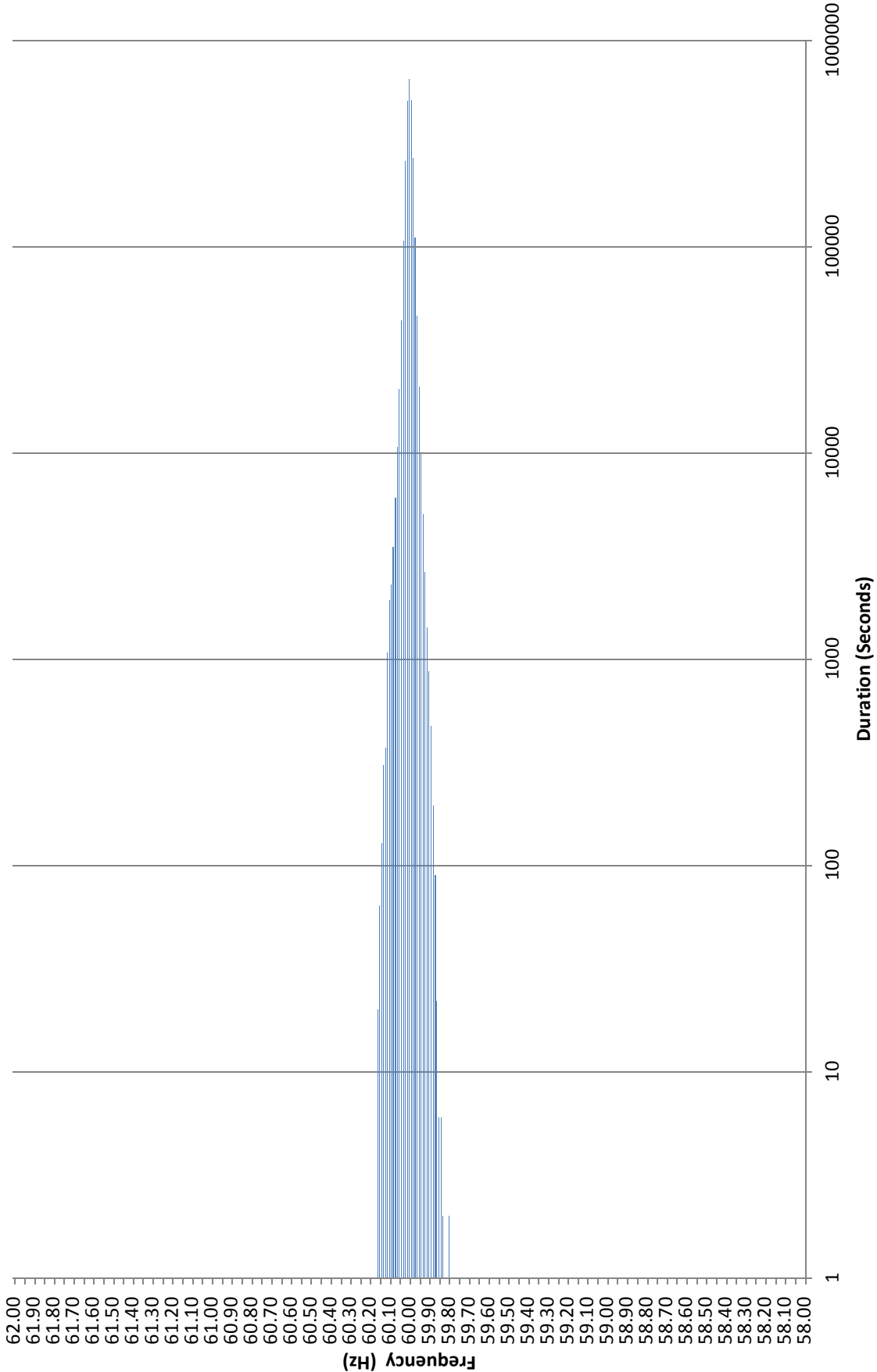
3b) Total MWh of non-dispatchable renewable resources curtailed for the month:

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. 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.

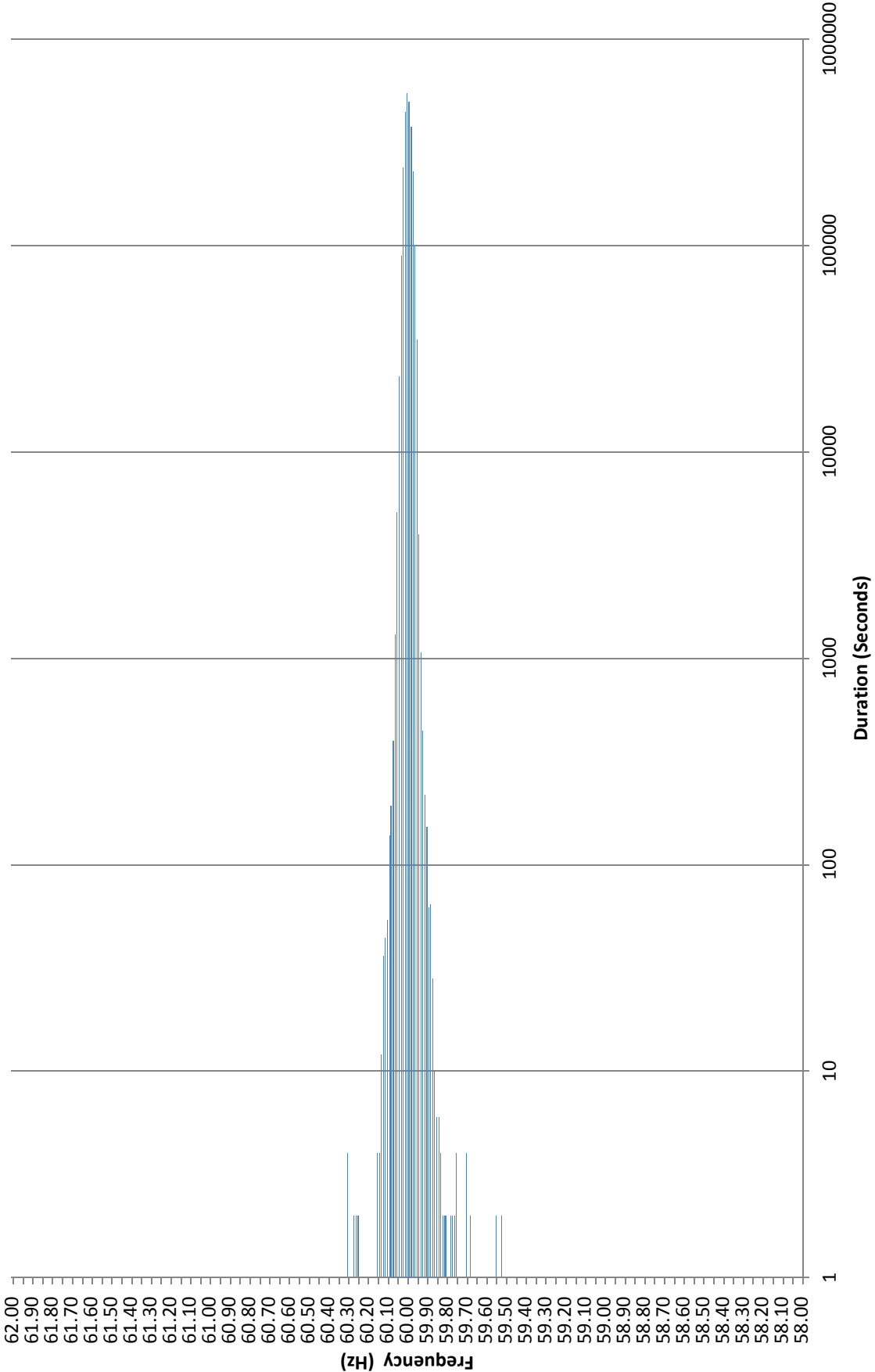
Frequency Distribution Plot - Hawaiian Electric April 2017



**Maui Electric Frequency Distribution Plot - Maui
April 2017**



**Frequency Distribution Plot - Hawai'i Electric Light
April 2017**



Hawaiian Electric Frequency Excursion Statistics April 2017		
Data Rounded to the nearest	<59.95 Hz	>60.05 Hz
Number of Excursions	1070	1154
Maximum Duration (sec)	1732	1340
Maximum Deviation (Hz)	59.444	60.398
Total Duration of Excursions (sec)	18542	13546

Maui Electric Frequency Excursion Statistics April 2017		
	<59.95 Hz	>60.05 Hz
Number of Excursions	6585	6603
Maximum Duration (sec)	664	1306
Maximum Deviation (Hz)	59.7988	60.1636
Total Duration of Excursions (sec)	29152	34630

Hawai'i Electric Light Frequency Excursion Statistics April 2017		
	<59.95 Hz	>60.05 Hz
Number of Excursions	4565	790
Maximum Duration (sec)	204	58
Maximum Deviation (Hz)	59.515	60.302
Total Duration of Excursions (sec)	21152	3858

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Hawaiian Electric Curtailment Report April 2017

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
04/11/17 06:30	0.0	17.10	04/11/17 07:19	0	*	KWF	System constraints
04/11/17 06:32	0.0	2.00	04/11/17 07:21	0	*	Makai	System constraints
04/11/17 14:42	0.0	14.00	04/11/17 15:20	0	*	KWF	System constraints
04/11/17 14:45	0.0	6.30	04/11/17 15:21	0	*	Makai	System constraints
04/12/17 02:44	0.0	1.90	04/12/17 03:21	0	*	KWF	System constraints
04/12/17 15:26	0.0	7.20	04/12/17 16:03	0	*	KWF	System constraints
04/12/17 15:28	0.0	7.20	04/12/17 16:04	0	*	Makai	System constraints
04/13/17 08:27	0.0	1.30	04/13/17 09:51	0	*	KREP	System constraints
04/13/17 13:15	0.0	4.70	04/13/17 13:45	0	*	KREP	System constraints
04/24/17 05:24	0.0	0.00	04/24/17 06:04	0	*	Waianae	System constraints
04/24/17 05:31	0.0	0.00	04/24/17 05:53	0	*	Aloha	System constraints
04/24/17 14:43	0.0	4.10	04/24/17 15:22	0	*	Aloha	System constraints
04/24/17 14:46	0.0	5.60	04/24/17 15:21	0	*	Waianae	System constraints

Aloha = Aloha Solar PV Farm
KLS2 = Kalaeloa Solar 2 PV Farm
KREP = Kalaeloa Renewable Energy Park
KWF = Kahuku Wind Farm
Makai = Kawailoa Makai Wind Farm
Mauka = Kawailoa Mauka Wind Farm
North = Waihonu North PV Farm
South = Waihonu South PV Farm
Waianae = Waianae Solar PV Farm

(1) The estimated MWh of energy curtailed during the event is supplied by Kahuku Wind Farm and/or Kawailoa Wind Farm, and HECO does not make any representations as to its accuracy.

* Data has not been provided by IPP.



Maui Curtailment Report

Start Date and Time	Duration	IPP Curtailed	Estimated Curtailed MWH	Peak MW Curtailed	Reasons for Curtailment
4/1/2017 0:04	6:22	KWPPI	78.841	20.708	Oversupply
4/1/2017 8:25	0:04	KWPPI	0.235	18.382	Oversupply
4/1/2017 8:44	0:02	KWPPI	0.075	20.251	System constraint
4/1/2017 8:50	0:23	KWPPI	1.512	19.865	Oversupply
4/1/2017 9:24	0:04	KWPPI	0.170	12.175	Oversupply
4/1/2017 9:30	0:03	KWPPI	0.122	12.713	System constraint
4/1/2017 9:38	2:55	KWPPI	44.628	19.972	Oversupply
4/1/2017 11:24	0:53	AWE	6.146	21.000	Oversupply
4/1/2017 12:21	0:08	AWE	0.242	20.873	System constraint
4/1/2017 12:35	0:23	KWPPI	3.004	15.794	Oversupply
4/1/2017 13:12	1:26	KWPPI	9.586	19.101	Oversupply
4/1/2017 14:43	0:03	KWPPI	0.089	18.584	System constraint
4/1/2017 15:00	0:13	KWPPI	1.182	20.333	Oversupply
4/1/2017 23:44	6:06	KWPPI	80.152	20.708	Oversupply
4/2/2017 5:54	0:21	KWPPI	0.978	20.708	Oversupply
4/2/2017 7:19	6:57	KWPPI	112.016	20.708	Oversupply
4/2/2017 9:50	4:05	AWE	41.399	21.000	Oversupply
4/2/2017 14:17	0:27	KWPPI	4.666	19.269	Oversupply
4/3/2017 0:18	1:10	KWPPI	5.487	20.671	Oversupply
4/3/2017 1:30	4:07	KWPPI	39.504	20.708	Oversupply
4/3/2017 23:55	0:42	KWPPI	5.129	20.213	Oversupply
4/4/2017 2:10	2:58	KWPPI	30.406	20.652	Oversupply
4/4/2017 8:40	0:49	KWPPI	3.786	20.702	Oversupply
4/4/2017 9:53	0:12	KWPPI	0.441	14.751	System constraint
4/4/2017 10:15	0:09	KWPPI	0.393	11.288	Oversupply
4/4/2017 15:36	0:07	KWPPI	0.495	13.532	Oversupply
4/4/2017 15:46	0:18	KWPPI	1.381	16.924	Oversupply
4/4/2017 16:10	0:04	KWPPI	0.253	18.151	Oversupply
4/5/2017 0:49	1:13	KWPPI	6.727	20.488	Oversupply
4/5/2017 2:07	2:49	KWPPI	23.790	20.651	Oversupply
4/5/2017 5:08	0:13	KWPPI	0.523	18.560	System constraint
4/5/2017 18:24	0:16	AWE	0.160	4.600	System constraint
4/5/2017 18:24	0:16	KWP	3.740	17.024	Oversupply
4/5/2017 18:24	0:16	KWPPI	0.090	10.339	System constraint
4/5/2017 18:43	0:08	KWP	1.873	17.024	Oversupply
4/5/2017 18:44	0:07	AWE	0.094	5.427	System constraint
4/5/2017 18:44	0:07	KWPPI	0.034	10.339	System constraint
4/6/2017 2:45	0:46	KWPPI	1.515	20.621	System constraint
4/6/2017 5:35	1:39	KWPPI	3.661	20.707	System constraint
4/6/2017 8:21	0:03	KWPPI	0.163	19.215	Oversupply
4/6/2017 8:45	0:02	KWPPI	0.016	19.360	System constraint
4/6/2017 8:48	1:49	BS250	Data is not available	Data is not available	Oversupply
4/6/2017 8:48	1:49	KWPPI	6.601	20.355	Oversupply
4/6/2017 10:32	0:06	AWE	0.180	21.000	System constraint
4/6/2017 10:51	0:06	KWPPI	0.269	10.421	Oversupply
4/9/2017 6:30	0:01	AWE	0.000	0.007	System constraint
4/9/2017 6:36	0:01	AWE	0.000	0.003	System constraint
4/9/2017 12:34	0:01	AWE	0.000	0.010	System constraint
4/9/2017 12:36	0:01	AWE	0.000	0.007	System constraint
4/9/2017 12:44	0:01	AWE	0.000	0.010	System constraint
4/9/2017 13:09	0:01	AWE	0.000	0.007	System constraint
4/9/2017 13:11	0:01	AWE	0.000	0.003	System constraint
4/9/2017 19:46	0:01	AWE	0.000	0.010	System constraint
4/9/2017 20:01	0:01	AWE	0.000	0.007	System constraint
4/10/2017 2:53	0:01	AWE	0.000	0.007	System constraint
4/10/2017 23:56	0:17	KWPPI	1.021	20.304	Oversupply
4/11/2017 0:34	0:14	KWPPI	1.344	20.458	Oversupply
4/11/2017 1:46	0:04	KWPPI	0.149	11.500	System constraint
4/11/2017 2:05	0:01	KWPPI	0.027	11.159	System constraint
4/11/2017 2:11	0:05	KWPPI	0.128	12.587	System constraint
4/11/2017 2:46	0:30	KWPPI	2.237	9.321	Oversupply
4/11/2017 3:09	0:02	AWE	0.051	19.170	System constraint
4/11/2017 3:17	0:06	AWE	0.174	18.100	System constraint
4/11/2017 3:19	0:07	KWPPI	0.528	7.528	Oversupply
4/11/2017 4:52	1:17	KWPPI	9.079	20.080	Oversupply
4/11/2017 6:15	0:11	KWPPI	0.386	20.701	System constraint
4/12/2017 2:39	0:47	KWPPI	6.690	14.242	Oversupply
4/12/2017 3:07	0:07	AWE	0.406	12.793	Oversupply
4/12/2017 3:28	0:05	KWPPI	0.332	12.848	Oversupply
4/12/2017 3:40	0:14	KWPPI	1.269	15.869	Oversupply
4/15/2017 2:19	0:01	AWE	0.000	0.013	System constraint
4/16/2017 9:43	0:23	KWPPI	1.006	9.139	Oversupply
4/16/2017 13:34	0:58	KWPPI	5.879	16.471	Oversupply
4/16/2017 23:19	0:04	KWPPI	0.082	20.552	System constraint
4/16/2017 23:27	6:40	KWPPI	90.887	20.708	Oversupply
4/17/2017 5:46	0:01	AWE	0.000	0.007	System constraint
4/17/2017 9:50	4:27	KWPPI	70.394	20.708	Oversupply
4/17/2017 11:39	1:14	AWE	6.983	19.587	Oversupply
4/17/2017 12:56	1:06	AWE	7.192	19.143	Oversupply
4/17/2017 14:03	0:05	AWE	0.145	14.877	System constraint
4/17/2017 14:18	0:42	KWPPI	13.941	20.708	Oversupply
4/17/2017 14:37	0:18	AWE	0.437	20.250	System constraint
4/17/2017 15:02	0:14	KWPPI	2.201	20.708	Oversupply
4/17/2017 23:21	7:27	KWPPI	106.585	20.708	Oversupply
4/18/2017 1:52	0:02	AWE	0.009	0.443	System constraint
4/18/2017 2:06	0:01	AWE	0.000	1.413	System constraint
4/18/2017 2:09	0:27	AWE	0.552	2.653	System constraint
4/18/2017 3:19	0:02	AWE	0.001	0.027	System constraint
4/18/2017 3:27	0:01	AWE	0.001	0.050	System constraint
4/18/2017 3:51	0:04	AWE	0.011	0.207	System constraint
4/18/2017 7:12	1:03	KWPPI	7.670	20.555	Oversupply
4/18/2017 8:51	0:24	KWPPI	1.075	14.588	Oversupply
4/18/2017 9:59	1:10	KWPPI	15.243	16.663	Oversupply
4/18/2017 10:29	0:31	AWE	1.772	21.000	Oversupply
4/18/2017 11:10	1:17	KWPPI	12.223	15.824	Oversupply
4/19/2017 22:42	0:01	AWE	0.000	0.007	System constraint
4/21/2017 23:55	0:08	KWPPI	0.265	19.211	System constraint
4/22/2017 0:26	2:47	KWPPI	30.868	20.689	Oversupply
4/22/2017 13:26	0:06	KWPPI	0.280	17.597	Oversupply
4/22/2017 13:37	0:24	KWPPI	2.500	16.391	Oversupply
4/22/2017 14:05	0:04	BS250	Data is not available	Data is not available	System constraint
4/22/2017 14:06	0:02	KWPPI	0.033	9.885	System constraint
4/22/2017 14:10	0:01	BS250	Data is not available	Data is not available	System constraint
4/22/2017 16:58	0:04	BS250	Data is not available	Data is not available	Oversupply
4/22/2017 16:58	0:04	KWPPI	0.199	10.830	Oversupply
4/22/2017 23:02	1:05	KWPPI	5.825	20.701	Oversupply



Maui Curtailment Report

Start Date and Time	Duration	IPP Curtailed	Estimated Curtailed MWH	Peak MW Curtailed	Reasons for Curtailment
4/23/2017 0:27	1:08	KWP	6.068	20.675	Oversupply
4/23/2017 2:52	0:42	KWP	3.249	9.025	Oversupply
4/23/2017 9:34	0:07	AWE	0.259	19.490	System constraint
4/23/2017 9:38	0:03	KWP	0.003	0.089	System constraint
4/23/2017 9:49	0:01	KWP	0.003	5.648	System constraint
4/23/2017 9:51	0:07	KWP	0.291	5.827	System constraint
4/23/2017 11:12	0:13	KWP	1.077	10.935	Oversupply
4/23/2017 11:28	0:11	KWP	0.799	13.727	Oversupply
4/23/2017 12:20	0:10	AWE	0.182	20.457	System constraint
4/23/2017 12:21	0:10	KWP	0.081	0.689	System constraint
4/24/2017 4:52	1:16	KWP	10.579	18.662	Oversupply
4/24/2017 9:48	1:38	KWP	21.523	19.537	Oversupply
4/24/2017 10:49	0:31	AWE	1.558	20.577	Oversupply
4/24/2017 11:28	0:58	KWP	10.472	16.349	Oversupply
4/24/2017 12:00	0:21	AWE	0.630	20.800	System constraint
4/24/2017 12:28	0:12	KWP	1.156	13.229	Oversupply
4/24/2017 12:41	0:02	KWP	0.032	9.502	System constraint
4/24/2017 12:47	0:02	KWP	0.008	11.327	System constraint
4/24/2017 12:52	0:06	KWP	0.240	13.299	System constraint
4/24/2017 13:06	0:06	KWP	0.101	9.540	System constraint
4/24/2017 13:24	0:07	KWP	0.135	10.094	System constraint
4/24/2017 23:19	0:11	KWP	0.948	17.261	Oversupply
4/24/2017 23:52	1:09	KWP	3.182	17.294	Oversupply
4/25/2017 1:37	3:36	KWP	23.319	17.714	Oversupply
4/25/2017 8:47	3:46	KWP	45.971	19.206	Oversupply
4/25/2017 9:57	0:54	AWE	2.336	20.657	Oversupply
4/25/2017 11:40	0:48	AWE	3.863	20.653	Oversupply
4/25/2017 14:40	0:02	AWE	0.007	20.803	System constraint
4/26/2017 5:21	0:12	AWE	0.333	7.797	System constraint
4/26/2017 5:21	0:42	KWP	4.864	12.931	Oversupply
4/26/2017 8:54	0:23	KWP	0.389	19.207	System constraint
4/26/2017 9:28	1:24	KWP	18.485	18.893	Oversupply
4/26/2017 10:06	0:39	AWE	3.420	17.053	Oversupply
4/26/2017 10:54	1:02	KWP	15.202	18.809	Oversupply
4/26/2017 11:30	0:17	AWE	0.539	19.133	System constraint
4/26/2017 11:58	0:23	KWP	1.391	13.446	Oversupply
4/28/2017 22:01	0:01	AWE	0.000	0.007	System constraint
4/28/2017 22:04	0:01	AWE	0.000	0.007	System constraint
4/29/2017 11:25	0:01	AWE	0.000	0.003	System constraint
4/29/2017 15:48	0:01	KWP	0.000	0.000	System constraint
4/30/2017 0:12	0:01	AWE	0.000	0.007	System constraint
4/30/2017 6:25	0:01	AWE	0.000	0.007	System constraint
4/30/2017 11:44	0:01	KWP	0.001	0.032	System constraint
4/30/2017 14:30	0:04	KWP	0.148	18.519	System constraint

Notes:

- Curtailment for Kaheawa Wind Power ("KWP"), Makila Hydroelectric ("MH"), AAAAA Rent-A-Space Maui LTD ("SA"), Bioreal Solar, LLC ("BS"), Auwahi Wind Energy ("AWE"), Kaheawa Wind Power II ("KWPII") Bioreal Solar 250, LLC ("BS250") 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 (RRDR 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 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, BS 250 or MH.
- Curtailment signals sent to SA, BS, or BS250 during nighttime hours are not recorded as curtailment events because no energy generation is possible during that time.
- The curtailment reasons have been modified to oversupply, system constraints, and facility requested, to provide continuity with HPUK Docket No. 2013-0141 Decoupling for HECO companies metrics.



Lanai Curtailment Report

April 2017

Start Date and Time	Duration	IPP Curtailed	Estimated MWh Curtailed	Peak MW Curtailed	Reasons for Curtailment
4/16/2017 6:57	2:09	LSR	Data is not available	Data is not available	Oversupply
4/16/2017 16:24	0:03	LSR	Data is not available	Data is not available	Oversupply
4/16/2017 16:28	0:12	LSR	Data is not available	Data is not available	Oversupply
4/16/2017 16:48	0:01	LSR	Data is not available	Data is not available	Oversupply
4/16/2017 17:23	0:03	LSR	Data is not available	Data is not available	Oversupply
4/17/2017 7:11	0:02	LSR	Data is not available	Data is not available	Oversupply
4/17/2017 7:15	0:14	LSR	Data is not available	Data is not available	Oversupply
4/17/2017 7:30	0:01	LSR	Data is not available	Data is not available	Oversupply
4/17/2017 7:52	0:06	LSR	Data is not available	Data is not available	Oversupply
4/17/2017 8:01	0:29	LSR	Data is not available	Data is not available	Oversupply
4/17/2017 8:34	0:41	LSR	Data is not available	Data is not available	Oversupply
4/17/2017 9:20	0:03	LSR	Data is not available	Data is not available	Oversupply
4/17/2017 9:24	0:02	LSR	Data is not available	Data is not available	Oversupply
4/17/2017 9:36	2:19	LSR	Data is not available	Data is not available	Oversupply
4/17/2017 11:59	0:04	LSR	Data is not available	Data is not available	Oversupply
4/17/2017 12:05	0:56	LSR	Data is not available	Data is not available	Oversupply
4/17/2017 13:06	0:20	LSR	Data is not available	Data is not available	Oversupply
4/17/2017 13:31	0:21	LSR	Data is not available	Data is not available	Oversupply
4/17/2017 13:57	0:19	LSR	Data is not available	Data is not available	Oversupply
4/17/2017 14:32	0:01	LSR	Data is not available	Data is not available	Oversupply
4/17/2017 14:35	0:01	LSR	Data is not available	Data is not available	Oversupply
4/17/2017 14:52	0:02	LSR	Data is not available	Data is not available	Oversupply
4/17/2017 15:02	0:01	LSR	Data is not available	Data is not available	Oversupply
4/17/2017 15:13	0:01	LSR	Data is not available	Data is not available	Oversupply
4/17/2017 15:17	0:01	LSR	Data is not available	Data is not available	Oversupply
4/17/2017 15:19	0:01	LSR	Data is not available	Data is not available	Oversupply
4/17/2017 15:25	0:01	LSR	Data is not available	Data is not available	Oversupply
4/17/2017 15:28	0:01	LSR	Data is not available	Data is not available	Oversupply
4/17/2017 15:31	0:01	LSR	Data is not available	Data is not available	Oversupply
4/17/2017 15:37	0:02	LSR	Data is not available	Data is not available	Oversupply
4/17/2017 15:40	0:17	LSR	Data is not available	Data is not available	Oversupply
4/17/2017 16:03	0:13	LSR	Data is not available	Data is not available	Oversupply
4/17/2017 16:17	0:01	LSR	Data is not available	Data is not available	Oversupply
4/17/2017 17:07	0:12	LSR	Data is not available	Data is not available	Oversupply
4/20/2017 17:15	0:01	LSR	Data is not available	Data is not available	Oversupply
4/21/2017 10:08	0:02	LSR	Data is not available	Data is not available	Oversupply
4/22/2017 16:24	0:01	LSR	Data is not available	Data is not available	Oversupply
4/22/2017 16:31	0:02	LSR	Data is not available	Data is not available	Oversupply
4/22/2017 16:35	0:01	LSR	Data is not available	Data is not available	Oversupply
4/25/2017 13:17	0:02	LSR	Data is not available	Data is not available	Oversupply
4/25/2017 13:20	0:01	LSR	Data is not available	Data is not available	Oversupply
4/25/2017 13:29	0:02	LSR	Data is not available	Data is not available	Oversupply
4/25/2017 15:30	0:01	LSR	Data is not available	Data is not available	Oversupply
4/26/2017 8:03	0:11	LSR	Data is not available	Data is not available	Oversupply
4/26/2017 8:42	0:01	LSR	Data is not available	Data is not available	Oversupply
4/26/2017 8:45	0:08	LSR	Data is not available	Data is not available	Oversupply
4/26/2017 8:57	0:03	LSR	Data is not available	Data is not available	Oversupply
4/26/2017 9:37	0:03	LSR	Data is not available	Data is not available	Oversupply
4/26/2017 9:56	0:10	LSR	Data is not available	Data is not available	Oversupply
4/26/2017 10:07	0:08	LSR	Data is not available	Data is not available	Oversupply
4/26/2017 11:53	0:03	LSR	Data is not available	Data is not available	Oversupply
4/26/2017 12:05	0:08	LSR	Data is not available	Data is not available	Oversupply
4/26/2017 12:30	0:01	LSR	Data is not available	Data is not available	Oversupply
4/26/2017 12:36	0:11	LSR	Data is not available	Data is not available	Oversupply
4/26/2017 12:48	0:02	LSR	Data is not available	Data is not available	Oversupply
4/26/2017 12:51	0:04	LSR	Data is not available	Data is not available	Oversupply
4/26/2017 13:19	0:01	LSR	Data is not available	Data is not available	Oversupply
4/26/2017 14:17	0:08	LSR	Data is not available	Data is not available	Oversupply
4/26/2017 14:26	0:05	LSR	Data is not available	Data is not available	Oversupply
4/26/2017 14:33	0:01	LSR	Data is not available	Data is not available	Oversupply
4/26/2017 14:48	0:22	LSR	Data is not available	Data is not available	Oversupply
4/26/2017 15:11	0:07	LSR	Data is not available	Data is not available	Oversupply
4/26/2017 16:07	0:06	LSR	Data is not available	Data is not available	Oversupply
4/27/2017 6:44	1:57	LSR	Data is not available	Data is not available	Oversupply
4/27/2017 8:44	0:10	LSR	Data is not available	Data is not available	Oversupply
4/27/2017 8:56	0:18	LSR	Data is not available	Data is not available	Oversupply
4/27/2017 9:18	0:26	LSR	Data is not available	Data is not available	Oversupply
4/27/2017 9:48	0:06	LSR	Data is not available	Data is not available	Oversupply
4/27/2017 10:02	0:03	LSR	Data is not available	Data is not available	Oversupply
4/27/2017 10:11	0:01	LSR	Data is not available	Data is not available	Oversupply
4/27/2017 10:19	0:01	LSR	Data is not available	Data is not available	Oversupply
4/29/2017 8:07	0:07	LSR	Data is not available	Data is not available	Oversupply
4/30/2017 14:00	0:02	LSR	Data is not available	Data is not available	Oversupply

Notes:

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.

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.

The curtailment reasons have been modified to oversupply, system constraints, and facility requested, to provide continuity with HPUC Docket No. 2013-0141 Decoupling for HECO companies metrics.

Hawai'i Electric Light Company Curtailment Report April 2017

Start Date/Time	MW Output Prior to Start of Curtailment	End Date/Time	MW Output After Curtailment Released ¹	IPP	Reason for Curtailment
04/07/17 06:58	10.4 MW	04/07/17 12:37	10.4 MW	Tawhiri	Facility requested
04/25/17 09:08	15.7 MW	04/25/17 09:37	15.5 MW	Tawhiri	System constraint
04/26/17 09:59	15.7 MW	04/26/17 13:58	5.7 MW	Tawhiri	Facility requested

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