



September 26, 2017

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PUBLIC UTILITIES
COMMISSION

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

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 August 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".

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, 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 August 31, 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's under frequency load shed activations are provided in Attachment 4. Hawai'i Electric Light and Maui Electric did not have any under frequency load shed activations 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'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. 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, 2017):

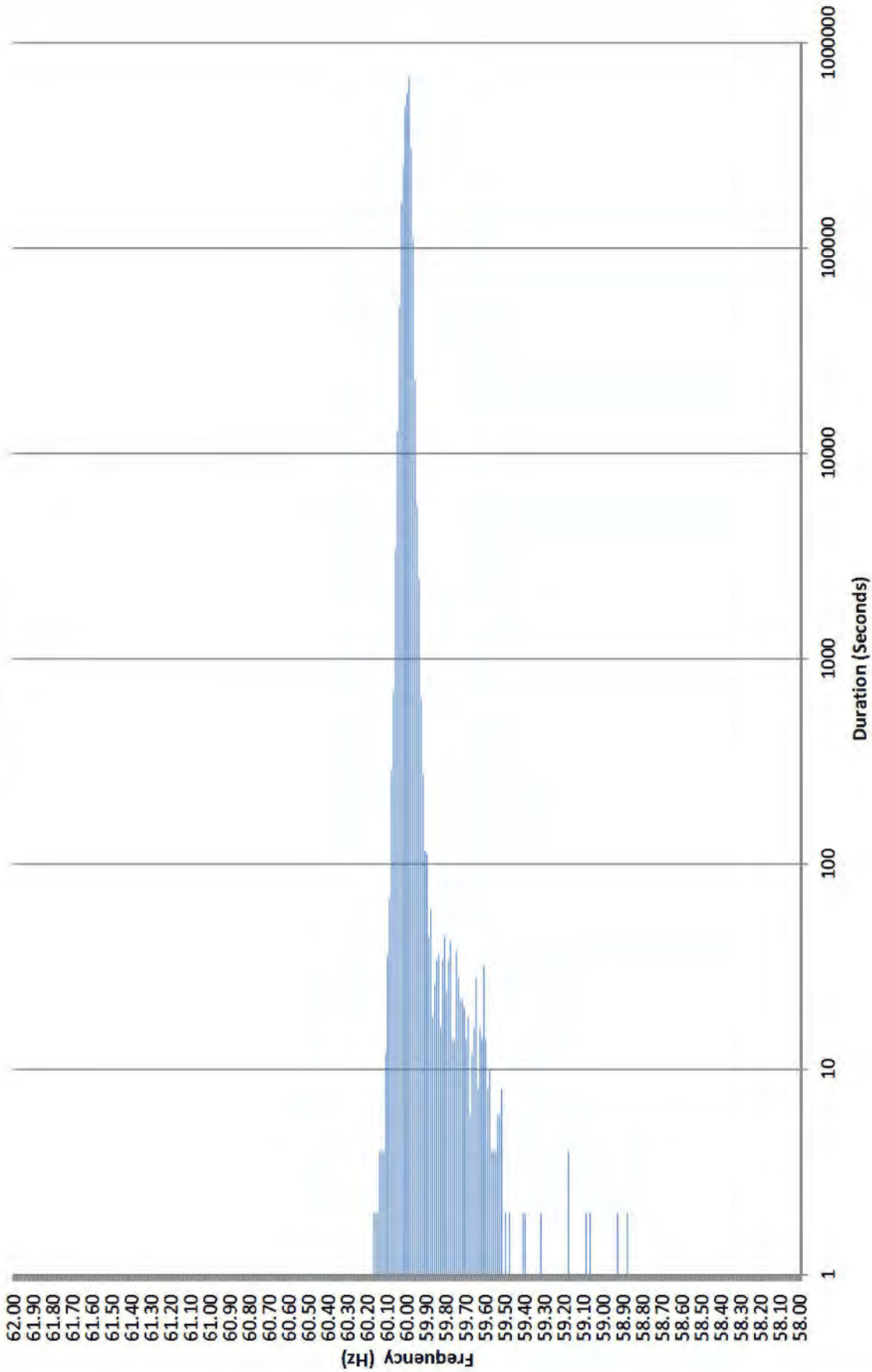
3a) Tabulation of each curtailment event for each resource including the starting date and time, duration, megawatt hours curtailed, peak MW curtailed, and reason for curtailment:

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

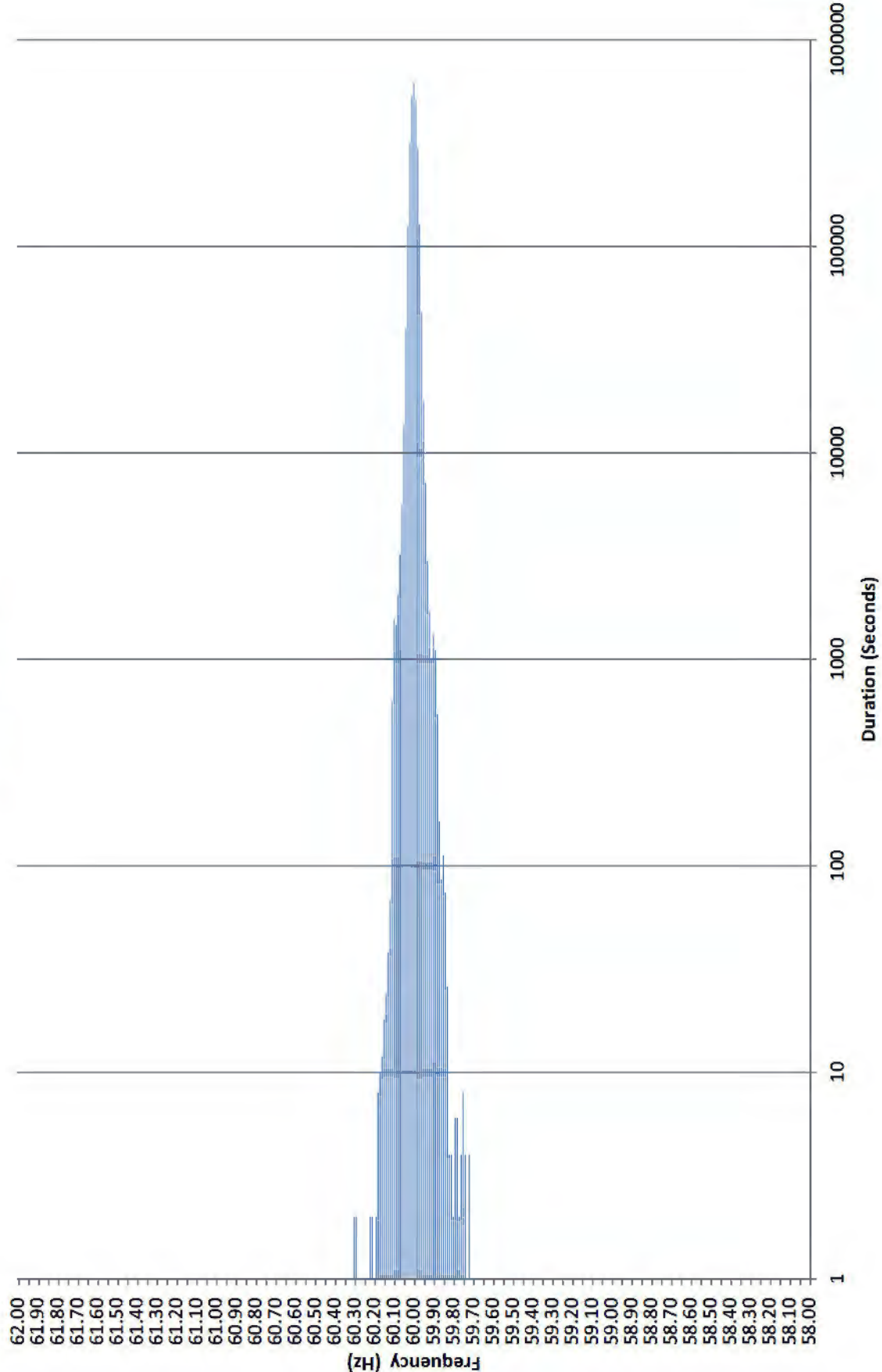
3b) Total MWh of non-dispatchable renewable resources curtailed for the month:

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.

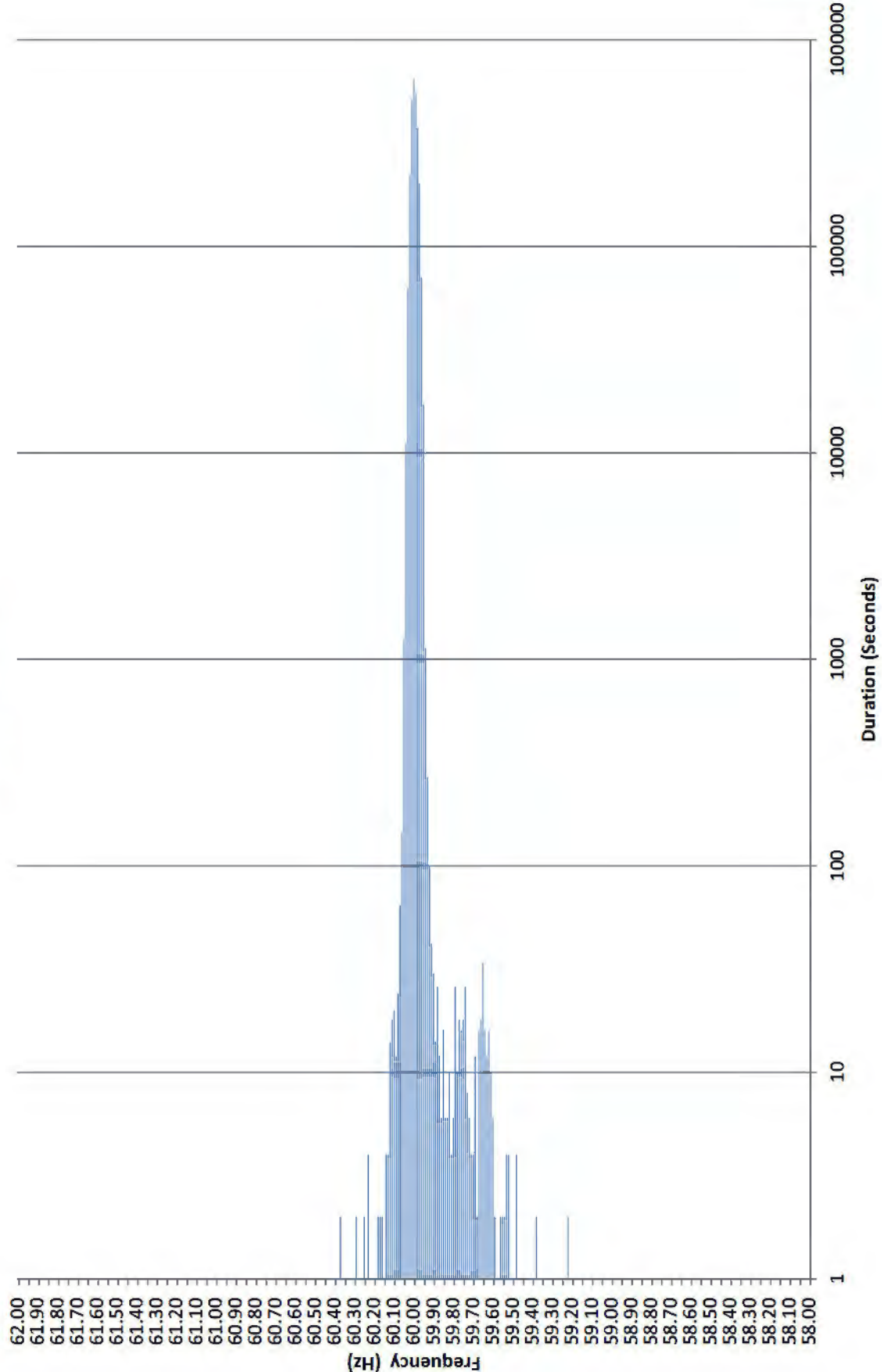
**Frequency Distribution Plot - Hawaiian Electric
August 2017**



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



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



Hawaiian Electric Frequency Excursion Statistics August 2017		
Data Rounded to the nearest	<59.95 Hz	>60.05 Hz
Number of Excursions	521	1322
Maximum Duration (sec)	332	170
Maximum Deviation (Hz)	58.885	60.165
Total Duration of Excursions (sec)	6206	7976

Maui Electric Frequency Excursion Statistics August 2017		
	<59.95 Hz	>60.05 Hz
Number of Excursions	4740	3028
Maximum Duration (sec)	388	480
Maximum Deviation (Hz)	59.719	60.297
Total Duration of Excursions (sec)	23284	19938

Hawai'i Electric Light Frequency Excursion Statistics August 2017		
	<59.95 Hz	>60.05 Hz
Number of Excursions	1930	169
Maximum Duration (sec)	386	24
Maximum Deviation (Hz)	59.217	60.365
Total Duration of Excursions (sec)	8404	594

Hawaiian Electric Curtailment Report August 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
08/01/17 05:36	0.0	0.00	08/01/17 18:48	0	*	North	System constraints
08/01/17 05:37	0.0	0.00	08/01/17 18:48	0	*	South	System constraints
08/01/17 05:53	0.0	0.00	08/01/17 08:23	0	*	Waianae	System constraints
08/01/17 05:45	0.0	0.00	08/01/17 08:22	0	*	Aloha1	System constraints
08/01/17 06:06	0.0	1.10	08/01/17 06:34	0	*	KWF	System constraints
08/01/17 06:08	0.0	0.00	08/01/17 06:36	0	*	Makai	System constraints
08/01/17 06:18	0.0	0.00	08/01/17 07:34	0	*	KREP	System constraints
08/01/17 14:40	0.0	4.00	08/01/17 15:33	0	*	KWF	System constraints
08/01/17 14:41	0.0	3.00	08/01/17 15:35	0	*	Makai	System constraints
08/01/17 16:04	0.0	3.00	08/01/17 16:16	0	*	KREP	System constraints
08/01/17 16:34	0.0	19.00	08/01/17 18:10	0	*	Waianae	System constraints
08/01/17 16:35	0.0	3.00	08/01/17 18:10	0	*	Aloha1	System constraints
08/02/17 05:18	0.0	0.00	08/02/17 17:26	0	*	North	System constraints
08/02/17 05:19	0.0	0.00	08/02/17 17:27	0	*	South	System constraints
08/02/17 05:47	0.0	0.00	08/02/17 07:22	0	*	Waianae	System constraints
08/02/17 05:50	0.0	0.00	08/02/17 07:17	0	*	Aloha1	System constraints
08/02/17 17:06	0.0	16.00	08/02/17 17:41	0	*	Waianae	System constraints
08/02/17 17:11	0.0	0.40	08/02/17 17:42	0	*	Aloha1	System constraints
08/03/17 04:50	0.0	0.00	08/03/17 16:44	0	*	North	System constraints
08/03/17 04:51	0.0	0.00	08/03/17 16:45	0	*	South	System constraints
08/03/17 08:34	0.0	2.30	08/04/17 07:27	0	*	KREP	System constraints
08/05/17 08:25	0.0	15.00	08/05/17 09:44	0	*	Makai	System constraints
08/05/17 08:28	0.0	23.40	08/05/17 09:45	0	*	KWF	System constraints
08/05/17 17:22	0.0	6.00	08/05/17 17:49	0	*	Makai	System constraints
08/05/17 17:25	0.0	23.00	08/05/17 17:47	0	*	KWF	System constraints
08/07/17 06:35	0.0	3.50	08/07/17 17:29	0	*	KWF	System constraints
08/07/17 06:42	0.0	6.30	08/07/17 08:42	0	*	Mauka	System constraints
08/07/17 06:43	0.0	2.80	08/07/17 08:42	0	*	Makai	System constraints
08/07/17 16:58	0.0	3.40	08/07/17 17:31	0	*	Makai	System constraints
08/07/17 16:59	0.0	14.10	08/07/17 17:31	0	*	Mauka	System constraints
08/08/17 07:17	0.0	0.00	08/08/17 19:44	0	*	KWF	System constraints
08/08/17 07:31	0.0	12.70	08/08/17 08:22	0	*	Mauka	System constraints
08/08/17 07:43	0.0	2.00	08/08/17 08:22	0	*	Makai	System constraints
08/08/17 18:51	0.0	9.60	08/08/17 19:42	0	*	Makai	System constraints
08/08/17 18:51	0.0	18.50	08/08/17 19:42	0	*	Mauka	System constraints
08/09/17 07:25	0.0	6.10	08/09/17 17:58	0	*	KWF	System constraints
08/09/17 07:30	0.0	15.30	08/09/17 08:15	0	*	Mauka	System constraints
08/09/17 07:30	0.0	3.60	08/09/17 08:15	0	*	Makai	System constraints
08/09/17 16:36	0.0	2.90	08/09/17 17:59	0	*	Makai	System constraints
08/09/17 16:37	0.0	16.00	08/09/17 18:00	0	*	Mauka	System constraints
08/10/17 08:27	0.0	17.50	08/10/17 18:36	0	*	KWF	System constraints
08/10/17 08:29	0.0	29.40	08/10/17 09:10	0	*	Mauka	System constraints
08/10/17 08:30	0.0	6.10	08/10/17 09:10	0	*	Makai	System constraints
08/10/17 17:23	0.0	8.40	08/10/17 18:38	0	*	Makai	System constraints
08/10/17 17:23	0.0	15.30	08/10/17 18:38	0	*	Mauka	System constraints
08/11/17 06:46	0.0	0.00	08/11/17 07:14	0	*	KREP	System constraints
08/11/17 07:00	0.0	27.50	08/11/17 16:14	0	*	KWF	System constraints
08/11/17 07:02	0.0	24.90	08/11/17 08:00	0	*	Mauka	System constraints
08/11/17 07:04	0.0	5.90	08/11/17 08:00	0	*	Makai	System constraints
08/11/17 15:09	0.0	27.20	08/11/17 16:16	0	*	Mauka	System constraints
08/11/17 15:10	0.0	9.50	08/11/17 16:16	0	*	Makai	System constraints
08/11/17 16:01	0.0	3.00	08/11/17 16:41	0	*	KREP	System constraints
08/14/17 07:18	0.0	1.10	08/15/17 01:32	0	*	KWF	System constraints
08/14/17 07:20	0.0	23.30	08/14/17 07:52	0	*	Mauka	System constraints
08/14/17 07:21	0.0	5.80	08/14/17 07:53	0	*	Makai	System constraints
08/14/17 22:43	0.0	21.00	08/15/17 01:30	0	*	Mauka	System constraints
08/14/17 22:43	0.0	3.50	08/15/17 01:31	0	*	Makai	System constraints
08/15/17 11:54	0.0	4.30	08/15/17 12:05	0	*	Aloha1	System constraints
08/21/17 15:04	0.0	10.00	08/21/17 17:41	0	*	Waianae	System constraints
08/21/17 15:29	0.0	1.00	08/21/17 17:43	0	*	Aloha1	System constraints

Hawaiian Electric Curtailment Report August 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
08/22/17 13:24	0.0	11.00	08/22/17 13:57	0	*	Waianae	System constraints
08/22/17 13:24	0.0	4.00	08/22/17 13:58	0	*	Aloha1	System constraints
08/23/17 05:39	0.0	20.00	08/23/17 07:42	0	*	KWF	System constraints
08/23/17 05:40	0.0	2.00	08/23/17 07:44	0	*	Makai	System constraints
08/23/17 15:31	0.0	19.00	08/23/17 16:49	0	*	KWF	System constraints
08/23/17 15:32	0.0	7.00	08/23/17 16:50	0	*	Makai	System constraints
08/23/17 18:12	0.0	3.90	08/23/17 18:36	0	*	Waianae	System constraints
08/23/17 18:14	0.0	0.40	08/23/17 18:49	0	*	Aloha1	System constraints
08/24/17 17:11	0.0	18.20	08/24/17 17:30	0	*	Waianae	System constraints
08/24/17 17:13	0.0	1.50	08/24/17 17:31	0	*	Aloha1	System constraints
08/28/17 06:32	0.0	0.00	08/28/17 18:40	0	*	Waianae	System constraints
08/28/17 06:36	0.0	0.00	08/28/17 07:41	0	*	Aloha1	System constraints
08/28/17 18:15	0.0	0.20	08/28/17 18:41	0	*	Aloha1	System constraints
08/29/17 05:58	0.0	0.00	08/29/17 09:54	0	*	Waianae	System constraints
08/29/17 06:01	0.0	0.00	08/29/17 07:40	0	*	Aloha1	System constraints
08/29/17 09:03	0.0	1.40	08/29/17 09:57	0	*	Aloha1	System constraints
08/31/17 05:22	0.0	0.00	08/31/17 05:49	0	*	Aloha1	System constraints
08/31/17 05:25	0.0	0.00	08/31/17 05:52	0	*	Waianae	System constraints
08/31/17 15:38	0.0	27.10	08/31/17 16:18	0	*	Waianae	System constraints
08/31/17 15:41	0.0	3.20	08/31/17 16:16	0	*	Aloha1	System constraints

Aloha1 = Aloha Solar 1 PV Farm

KLS2 = Kalaeloa Solar 2 PV Farm

KREP = Kalaeloa Renewable Energy Park

KWF = Kahuku Wind Farm

Makai = Kawaihoa Makai Wind Farm

Mauka = Kawaihoa 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 Kawaihoa 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
8/1/2017 0:14	0:48	KWP	7.257	19.934	System Constraint
8/1/2017 0:20	0:01	AWE	0.014	16.500	System Constraint
8/3/2017 14:09	0:01	KWP	0.000	0.004	System Constraint
8/3/2017 18:34	0:01	KWP	0.001	0.061	System Constraint
8/4/2017 2:14	0:01	KWP	0.000	0.003	System Constraint
8/4/2017 3:35	0:01	KWP	0.001	0.051	System Constraint
8/4/2017 4:48	0:01	KWP	0.006	4.753	System Constraint
8/4/2017 4:54	0:27	KWP	0.743	9.720	System Constraint
8/4/2017 5:51	0:04	KWP	0.086	12.380	System Constraint
8/4/2017 6:21	0:07	BS250	Data is not available	Data is not available	System Constraint
8/4/2017 6:22	0:06	KWP	0.304	17.997	System Constraint
8/4/2017 6:29	0:01	BS250	Data is not available	Data is not available	System Constraint
8/4/2017 6:29	0:02	KWP	0.014	17.630	System Constraint
8/5/2017 1:29	0:02	KWP	0.139	17.798	System Constraint
8/5/2017 5:12	0:34	KWP	2.814	20.651	System Constraint
8/5/2017 5:47	0:04	KWP	0.050	20.628	System Constraint
8/5/2017 5:53	0:02	KWP	0.011	20.493	System Constraint
8/5/2017 6:14	1:36	BS250	Data is not available	Data is not available	System Constraint
8/5/2017 6:14	1:36	KWP	7.741	20.708	System Constraint
8/5/2017 7:51	0:02	BS250	Data is not available	Data is not available	System Constraint
8/5/2017 7:52	0:01	KWP	0.003	20.690	System Constraint
8/5/2017 7:55	0:05	BS250	Data is not available	Data is not available	System Constraint
8/5/2017 7:57	0:03	KWP	0.056	20.706	System Constraint
8/5/2017 8:12	0:03	BS250	Data is not available	Data is not available	System Constraint
8/5/2017 8:14	0:02	KWP	0.010	20.707	System Constraint
8/5/2017 8:17	5:57	BS250	Data is not available	Data is not available	System Constraint
8/5/2017 8:18	5:56	KWP	69.110	20.708	System Constraint
8/5/2017 10:44	0:31	AWE	0.687	20.600	System Constraint
8/5/2017 11:16	0:41	AWE	2.733	20.700	System Constraint
8/5/2017 14:16	0:09	BS250	Data is not available	Data is not available	System Constraint
8/5/2017 14:16	0:09	KWP	0.146	20.629	System Constraint
8/5/2017 14:53	0:03	BS250	Data is not available	Data is not available	System Constraint
8/5/2017 14:54	0:02	KWP	0.030	20.620	System Constraint
8/5/2017 22:20	0:04	KWP	0.095	20.708	System Constraint
8/5/2017 23:55	1:31	KWP	10.590	20.707	System Constraint
8/8/2017 1:27	0:01	KWP	0.001	18.507	Oversupply
8/8/2017 1:47	0:36	KWP	3.438	20.674	Oversupply
8/8/2017 2:24	0:02	KWP	0.018	17.670	Oversupply
8/8/2017 2:34	1:06	KWP	7.036	20.708	Oversupply
8/8/2017 3:41	0:02	KWP	0.021	20.319	Oversupply
8/8/2017 3:44	0:02	KWP	0.030	20.295	Oversupply
8/8/2017 7:49	0:03	BS250	Data is not available	Data is not available	Oversupply
8/8/2017 7:50	0:03	KWP	0.020	20.359	Oversupply
8/8/2017 7:54	0:01	KWP	0.003	19.683	Oversupply
8/8/2017 14:54	0:04	BS250	Data is not available	Data is not available	Oversupply
8/8/2017 14:56	0:03	KWP	0.023	20.663	Oversupply
8/7/2017 8:08	0:01	AWE	0.005	0.300	Oversupply
8/9/2017 13:28	0:06	BS250	Data is not available	Data is not available	Oversupply
8/9/2017 13:29	0:05	KWP	0.186	18.662	Oversupply
8/9/2017 23:11	0:01	KWP	0.010	0.622	Oversupply
8/10/2017 1:37	0:01	KWP	0.000	0.002	Oversupply
8/10/2017 3:01	0:09	KWP	0.513	12.111	Oversupply
8/10/2017 3:12	0:12	KWP	0.315	15.215	Oversupply
8/10/2017 3:27	0:03	KWP	0.047	15.131	Oversupply
8/10/2017 3:31	0:03	KWP	0.033	15.519	Oversupply
8/10/2017 3:36	0:03	KWP	0.077	15.219	Oversupply
8/10/2017 3:40	0:29	KWP	3.407	17.271	Oversupply
8/10/2017 4:16	0:17	KWP	1.199	17.679	Oversupply
8/10/2017 4:36	0:01	KWP	0.010	17.517	Oversupply
8/10/2017 4:43	0:16	KWP	0.646	17.603	Oversupply
8/10/2017 5:05	0:26	KWP	1.432	17.714	Oversupply
8/10/2017 5:34	0:01	KWP	0.002	17.657	Oversupply
8/10/2017 23:56	0:29	KWP	1.473	20.708	Oversupply
8/11/2017 0:57	0:15	KWP	0.180	20.708	Oversupply
8/11/2017 4:30	0:01	AWE	0.003	0.200	Oversupply
8/11/2017 8:52	0:01	BS250	Data is not available	Data is not available	Oversupply
8/11/2017 8:53	0:01	KWP	0.015	20.708	Oversupply
8/11/2017 10:19	0:01	KWP	0.000	20.708	Oversupply
8/11/2017 10:48	0:02	BS250	Data is not available	Data is not available	Oversupply
8/11/2017 10:49	0:12	KWP	0.398	20.706	Oversupply
8/11/2017 10:51	0:10	BS250	Data is not available	Data is not available	Oversupply
8/11/2017 11:20	0:01	BS250	Data is not available	Data is not available	Oversupply
8/11/2017 11:22	0:03	BS250	Data is not available	Data is not available	Oversupply
8/11/2017 11:22	0:04	KWP	0.039	20.708	Oversupply
8/11/2017 11:44	0:01	BS250	Data is not available	Data is not available	Oversupply
8/11/2017 11:45	0:01	KWP	0.002	20.698	Oversupply
8/12/2017 7:38	0:04	AWE	0.124	18.600	System Constraint



Maui Curtailment Report

Start Date and Time	Duration	IPP Curtailed	Estimated Curtailed MWH	Peak MW Curtailed	Reasons for Curtailment
8/12/2017 7:40	0:02	BS250	Data is not available	Data is not available	Oversupply
8/12/2017 10:08	1:22	BS250	Data is not available	Data is not available	Oversupply
8/12/2017 10:10	0:26	KWPPII	0.656	19.211	Oversupply
8/12/2017 10:37	0:05	KWPPII	0.095	19.202	Oversupply
8/12/2017 10:43	0:47	KWPPII	5.198	19.211	Oversupply
8/12/2017 12:38	0:04	BS250	Data is not available	Data is not available	Oversupply
8/12/2017 12:41	0:01	KWPPII	0.000	19.178	Oversupply
8/12/2017 13:01	0:02	KWPPII	0.006	18.594	Oversupply
8/12/2017 13:02	0:01	BS250	Data is not available	Data is not available	Oversupply
8/12/2017 13:05	0:06	KWPPII	0.075	19.133	Oversupply
8/12/2017 13:06	0:04	BS250	Data is not available	Data is not available	Oversupply
8/13/2017 9:45	0:02	BS250	Data is not available	Data is not available	Oversupply
8/13/2017 9:45	0:03	KWPPII	0.010	16.933	Oversupply
8/14/2017 0:46	0:17	KWPPII	0.702	19.211	Oversupply
8/14/2017 1:07	0:05	KWPPII	0.065	19.211	Oversupply
8/14/2017 2:47	0:01	KWPPII	0.013	18.354	Oversupply
8/14/2017 2:49	0:03	KWPPII	0.023	18.274	Oversupply
8/14/2017 2:53	0:02	KWPPII	0.006	18.184	Oversupply
8/14/2017 4:58	0:10	KWPPII	0.342	17.790	Oversupply
8/15/2017 0:15	0:06	KWPPII	0.031	20.380	Oversupply
8/15/2017 0:25	0:56	KWPPII	2.197	20.708	Oversupply
8/15/2017 1:43	1:18	KWPPII	6.227	20.708	Oversupply
8/15/2017 3:11	0:01	KWPPII	0.002	16.838	Oversupply
8/15/2017 5:06	0:02	KWPPII	0.044	14.366	Oversupply
8/15/2017 5:26	0:19	KWPPII	0.863	19.715	Oversupply
8/15/2017 5:53	0:01	KWPPII	0.008	20.296	Oversupply
8/15/2017 5:57	0:01	KWPPII	0.009	20.472	Oversupply
8/15/2017 7:18	0:08	BS250	Data is not available	Data is not available	Oversupply
8/15/2017 7:20	0:06	KWPPII	0.056	20.594	Oversupply
8/15/2017 8:03	0:01	BS250	Data is not available	Data is not available	Oversupply
8/15/2017 8:03	0:01	KWPPII	0.003	19.096	Oversupply
8/15/2017 8:05	0:01	KWPPII	0.003	18.523	Oversupply
8/15/2017 10:38	0:01	BS250	Data is not available	Data is not available	Oversupply
8/15/2017 10:38	0:02	KWPPII	0.010	18.277	Oversupply
8/15/2017 12:59	0:04	BS250	Data is not available	Data is not available	Oversupply
8/15/2017 13:00	0:03	KWPPII	0.032	19.775	Oversupply
8/15/2017 13:06	0:03	BS250	Data is not available	Data is not available	Oversupply
8/15/2017 13:06	0:04	KWPPII	0.067	19.671	Oversupply
8/16/2017 8:27	0:06	BS250	Data is not available	Data is not available	Oversupply
8/16/2017 8:28	0:06	KWPPII	0.147	20.232	Oversupply
8/16/2017 10:02	0:02	BS250	Data is not available	Data is not available	Oversupply
8/16/2017 10:03	0:01	KWPPII	0.003	19.993	Oversupply
8/16/2017 11:07	0:01	BS250	Data is not available	Data is not available	Oversupply
8/16/2017 11:09	0:01	BS250	Data is not available	Data is not available	Oversupply
8/16/2017 11:22	0:05	BS250	Data is not available	Data is not available	Oversupply
8/16/2017 11:23	0:05	KWPPII	0.125	20.643	Oversupply
8/16/2017 11:29	0:06	BS250	Data is not available	Data is not available	Oversupply
8/16/2017 11:29	0:07	KWPPII	0.260	20.473	Oversupply
8/16/2017 11:38	1:06	BS250	Data is not available	Data is not available	Oversupply
8/16/2017 11:39	1:05	KWPPII	5.355	20.647	Oversupply
8/16/2017 12:47	0:01	BS250	Data is not available	Data is not available	Oversupply
8/16/2017 13:23	0:06	BS250	Data is not available	Data is not available	Oversupply
8/16/2017 13:24	0:05	KWPPII	0.111	20.671	Oversupply
8/16/2017 13:33	0:16	BS250	Data is not available	Data is not available	Oversupply
8/16/2017 13:34	0:15	KWPPII	0.394	20.696	Oversupply
8/17/2017 10:05	0:01	BS250	Data is not available	Data is not available	Oversupply
8/17/2017 23:30	0:01	AWE	0.002	0.100	Oversupply
8/17/2017 23:53	0:01	AWE	0.005	0.300	Oversupply
8/18/2017 11:12	0:02	BS250	Data is not available	Data is not available	Oversupply
8/18/2017 11:13	0:02	KWPPII	0.057	19.257	Oversupply
8/18/2017 12:32	0:01	KWPPII	0.004	18.367	Oversupply
8/18/2017 13:16	0:01	BS250	Data is not available	Data is not available	Oversupply
8/19/2017 0:32	0:01	AWE	0.003	0.200	Oversupply
8/19/2017 8:51	0:14	BS250	Data is not available	Data is not available	Oversupply
8/19/2017 8:53	0:12	KWPPII	0.356	20.707	Oversupply
8/19/2017 9:41	0:42	BS250	Data is not available	Data is not available	Oversupply
8/19/2017 9:41	0:44	KWPPII	4.323	20.703	Oversupply
8/19/2017 10:27	0:03	BS250	Data is not available	Data is not available	Oversupply
8/19/2017 10:28	0:02	KWPPII	0.014	20.561	Oversupply
8/19/2017 10:34	0:01	BS250	Data is not available	Data is not available	Oversupply
8/19/2017 10:36	0:06	BS250	Data is not available	Data is not available	Oversupply
8/19/2017 10:38	0:07	KWPPII	0.088	20.541	Oversupply
8/19/2017 10:47	0:01	BS250	Data is not available	Data is not available	Oversupply
8/19/2017 11:03	0:17	BS250	Data is not available	Data is not available	Oversupply
8/19/2017 11:04	0:17	KWPPII	0.631	20.673	Oversupply
8/19/2017 11:31	1:02	BS250	Data is not available	Data is not available	Oversupply
8/19/2017 11:32	1:02	KWPPII	4.698	20.679	Oversupply



Maui Curtailment Report

August 2017

Start Date and Time	Duration	IPP Curtailed	Estimated Curtailed MWH	Peak MW Curtailed	Reasons for Curtailment
8/19/2017 14:09	0:01	BS250	Data is not available	Data is not available	Oversupply
8/19/2017 14:11	0:08	BS250	Data is not available	Data is not available	Oversupply
8/19/2017 14:12	0:07	KWPPI	0.326	19.322	Oversupply
8/19/2017 14:25	0:01	BS250	Data is not available	Data is not available	Oversupply
8/19/2017 14:27	0:05	BS250	Data is not available	Data is not available	Oversupply
8/19/2017 14:27	0:02	KWPPI	0.023	19.833	Oversupply
8/19/2017 14:31	0:01	KWPPI	0.000	19.823	Oversupply
8/22/2017 2:22	0:06	KWPPI	0.143	15.450	Oversupply
8/22/2017 2:38	0:05	KWPPI	0.103	14.434	Oversupply
8/22/2017 9:18	0:01	BS250	Data is not available	Data is not available	Oversupply
8/22/2017 9:20	0:16	BS250	Data is not available	Data is not available	Oversupply
8/22/2017 9:21	0:16	KWPPI	0.474	20.647	Oversupply
8/23/2017 0:10	0:02	KWPPI	0.006	20.363	Oversupply
8/23/2017 2:16	0:07	KWPPI	0.050	20.634	Oversupply
8/23/2017 2:24	0:01	KWPPI	0.006	20.386	Oversupply
8/23/2017 2:39	0:05	KWPPI	0.047	20.687	Oversupply
8/23/2017 3:11	0:03	KWPPI	0.006	20.707	Oversupply
8/23/2017 3:15	0:01	KWPPI	0.000	20.707	Oversupply
8/23/2017 3:17	0:14	KWPPI	0.421	20.703	Oversupply
8/23/2017 3:41	0:03	KWPPI	0.024	20.703	Oversupply
8/23/2017 3:50	0:09	KWPPI	0.143	20.703	Oversupply
8/23/2017 4:00	0:02	KWPPI	0.020	20.706	Oversupply
8/23/2017 4:06	0:07	KWPPI	0.181	20.706	Oversupply
8/23/2017 9:15	0:03	BS250	Data is not available	Data is not available	Oversupply
8/23/2017 9:17	0:01	KWPPI	0.000	20.706	Oversupply
8/23/2017 9:24	0:02	BS250	Data is not available	Data is not available	Oversupply
8/23/2017 9:26	0:01	KWPPI	0.007	20.706	Oversupply
8/24/2017 3:51	0:18	KWPPI	0.279	20.706	Oversupply
8/24/2017 10:57	0:01	BS250	Data is not available	Data is not available	Oversupply
8/24/2017 12:12	0:02	BS250	Data is not available	Data is not available	Oversupply
8/24/2017 12:13	0:02	KWPPI	0.012	20.706	Oversupply
8/24/2017 12:15	0:03	BS250	Data is not available	Data is not available	Oversupply
8/24/2017 12:16	0:02	KWPPI	0.011	20.706	Oversupply
8/25/2017 2:46	0:18	KWPPI	0.216	20.706	Oversupply
8/25/2017 9:54	0:08	BS250	Data is not available	Data is not available	Oversupply
8/25/2017 9:55	0:07	KWPPI	0.184	20.706	Oversupply
8/25/2017 10:12	0:05	BS250	Data is not available	Data is not available	Oversupply
8/25/2017 10:14	0:03	KWPPI	0.066	20.692	Oversupply
8/25/2017 10:20	0:03	BS250	Data is not available	Data is not available	Oversupply
8/25/2017 10:22	0:01	KWPPI	0.002	20.702	Oversupply
8/25/2017 10:27	0:02	BS250	Data is not available	Data is not available	Oversupply
8/25/2017 10:27	0:02	KWPPI	0.003	20.696	Oversupply
8/25/2017 10:31	0:01	BS250	Data is not available	Data is not available	Oversupply
8/25/2017 10:31	0:01	KWPPI	0.000	20.702	Oversupply
8/25/2017 10:33	0:12	BS250	Data is not available	Data is not available	Oversupply
8/25/2017 10:34	0:12	KWPPI	0.633	20.704	Oversupply
8/25/2017 10:46	0:01	BS250	Data is not available	Data is not available	Oversupply
8/25/2017 10:58	0:08	BS250	Data is not available	Data is not available	Oversupply
8/25/2017 11:00	0:06	KWPPI	0.044	20.692	Oversupply
8/25/2017 11:08	0:01	BS250	Data is not available	Data is not available	Oversupply
8/25/2017 11:12	0:01	BS250	Data is not available	Data is not available	Oversupply
8/25/2017 11:12	0:02	KWPPI	0.011	20.678	Oversupply
8/25/2017 11:14	0:01	BS250	Data is not available	Data is not available	Oversupply
8/25/2017 11:15	0:01	KWPPI	0.008	20.657	Oversupply
8/25/2017 11:16	0:01	BS250	Data is not available	Data is not available	Oversupply
8/25/2017 11:18	0:01	KWPPI	0.009	20.286	Oversupply
8/25/2017 11:19	0:02	BS250	Data is not available	Data is not available	Oversupply
8/25/2017 11:20	0:01	KWPPI	0.007	20.283	Oversupply
8/25/2017 11:25	0:04	BS250	Data is not available	Data is not available	Oversupply
8/25/2017 11:28	0:01	KWPPI	0.010	20.616	Oversupply
8/25/2017 11:31	0:02	BS250	Data is not available	Data is not available	Oversupply
8/25/2017 11:32	0:01	KWPPI	0.001	20.466	Oversupply
8/25/2017 11:37	0:14	BS250	Data is not available	Data is not available	Oversupply
8/25/2017 11:37	0:15	KWPPI	0.278	20.620	Oversupply
8/25/2017 11:54	0:03	BS250	Data is not available	Data is not available	Oversupply
8/25/2017 11:55	0:02	KWPPI	0.021	20.577	Oversupply
8/25/2017 11:58	0:04	BS250	Data is not available	Data is not available	Oversupply
8/25/2017 11:59	0:08	KWPPI	0.076	20.605	Oversupply
8/25/2017 12:03	0:04	BS250	Data is not available	Data is not available	Oversupply
8/25/2017 12:11	0:01	BS250	Data is not available	Data is not available	Oversupply
8/25/2017 12:11	0:02	KWPPI	0.006	20.492	Oversupply
8/28/2017 3:08	0:23	KWPPI	0.562	20.706	Oversupply
8/27/2017 0:58	0:01	KWPPI	0.001	19.096	Oversupply
8/27/2017 1:24	0:03	KWPPI	0.047	19.259	Oversupply
8/27/2017 1:28	0:02	KWPPI	0.022	18.437	Oversupply
8/28/2017 3:14	0:05	KWPPI	0.087	3.712	Oversupply
8/29/2017 9:54	0:01	KWP	0.064	3.686	Oversupply



Maui Curtailment Report

Start Date and Time	Duration	IPP Curtailed	Estimated Curtailed MWH	Peak MW Curtailed	Reasons for Curtailment
8/29/2017 18:12	0:01	KWP	0.000	0.016	Oversupply
8/30/2017 9:52	0:01	KWP	0.000	0.003	Oversupply
8/30/2017 12:38	0:01	KWP	0.000	0.008	Oversupply
8/31/2017 0:07	0:01	KWP	0.000	13.402	Oversupply
8/31/2017 0:38	0:12	KWP	0.386	17.363	Oversupply
8/31/2017 1:15	0:06	KWP	0.062	20.131	Oversupply
8/31/2017 1:48	0:01	KWP	0.003	18.756	Oversupply
8/31/2017 2:36	1:06	KWP	3.835	20.423	Oversupply
8/31/2017 5:28	0:01	KWP	0.008	14.228	Oversupply
8/31/2017 15:15	0:01	KWP	0.000	0.018	Oversupply

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 HPUC Docket No. 2013-0141 Decoupling for HECO companies metrics.



Lanai Curtailment Report

August 2017

Start Date and Time	Duration	IPP Curtailed	Estimated MWh Curtailed	Peak MW Curtailed	Reasons for Curtailment
8/4/2017 10:14	1:32	LSR	Data is not available	Data is not available	Oversupply
8/5/2017 10:27	0:09	LSR	Data is not available	Data is not available	Oversupply
8/5/2017 10:38	0:16	LSR	Data is not available	Data is not available	Oversupply
8/5/2017 10:55	0:02	LSR	Data is not available	Data is not available	Oversupply
8/5/2017 10:58	0:03	LSR	Data is not available	Data is not available	Oversupply
8/5/2017 11:02	0:34	LSR	Data is not available	Data is not available	Oversupply
8/5/2017 11:37	0:35	LSR	Data is not available	Data is not available	Oversupply
8/5/2017 13:02	0:02	LSR	Data is not available	Data is not available	Oversupply
8/5/2017 13:14	0:02	LSR	Data is not available	Data is not available	Oversupply
8/5/2017 13:26	0:02	LSR	Data is not available	Data is not available	Oversupply
8/5/2017 13:33	0:03	LSR	Data is not available	Data is not available	Oversupply
8/5/2017 13:39	0:03	LSR	Data is not available	Data is not available	Oversupply
8/5/2017 13:54	0:02	LSR	Data is not available	Data is not available	Oversupply
8/5/2017 13:57	0:01	LSR	Data is not available	Data is not available	Oversupply
8/5/2017 14:00	0:02	LSR	Data is not available	Data is not available	Oversupply
8/5/2017 14:03	0:13	LSR	Data is not available	Data is not available	Oversupply
8/10/2017 7:06	1:00	LSR	Data is not available	Data is not available	Oversupply
8/10/2017 8:08	0:01	LSR	Data is not available	Data is not available	Oversupply
8/10/2017 8:11	0:03	LSR	Data is not available	Data is not available	Oversupply
8/10/2017 8:54	0:04	LSR	Data is not available	Data is not available	Oversupply
8/10/2017 9:10	1:44	LSR	Data is not available	Data is not available	Oversupply
8/10/2017 10:56	0:14	LSR	Data is not available	Data is not available	Oversupply
8/10/2017 11:12	0:26	LSR	Data is not available	Data is not available	Oversupply
8/10/2017 12:00	0:07	LSR	Data is not available	Data is not available	Oversupply
8/10/2017 12:09	0:04	LSR	Data is not available	Data is not available	Oversupply
8/10/2017 12:33	0:02	LSR	Data is not available	Data is not available	Oversupply
8/10/2017 12:44	0:06	LSR	Data is not available	Data is not available	Oversupply
8/10/2017 13:13	0:03	LSR	Data is not available	Data is not available	Oversupply
8/10/2017 13:23	0:01	LSR	Data is not available	Data is not available	Oversupply
8/10/2017 13:54	0:02	LSR	Data is not available	Data is not available	Oversupply
8/10/2017 14:09	0:01	LSR	Data is not available	Data is not available	Oversupply
8/10/2017 14:11	0:02	LSR	Data is not available	Data is not available	Oversupply
8/10/2017 14:27	0:03	LSR	Data is not available	Data is not available	Oversupply
8/12/2017 6:44	2:00	LSR	Data is not available	Data is not available	Oversupply
8/12/2017 6:48	0:02	LSR	Data is not available	Data is not available	Oversupply
8/12/2017 6:56	0:17	LSR	Data is not available	Data is not available	Oversupply
8/12/2017 9:29	0:02	LSR	Data is not available	Data is not available	Oversupply
8/12/2017 11:29	0:11	LSR	Data is not available	Data is not available	Oversupply
8/12/2017 11:41	0:02	LSR	Data is not available	Data is not available	Oversupply
8/12/2017 11:57	0:10	LSR	Data is not available	Data is not available	Oversupply
8/12/2017 12:08	0:05	LSR	Data is not available	Data is not available	Oversupply
8/12/2017 12:21	0:31	LSR	Data is not available	Data is not available	Oversupply
8/12/2017 12:53	0:01	LSR	Data is not available	Data is not available	Oversupply
8/12/2017 12:57	0:01	LSR	Data is not available	Data is not available	Oversupply
8/12/2017 12:59	0:01	LSR	Data is not available	Data is not available	Oversupply
8/12/2017 13:02	0:01	LSR	Data is not available	Data is not available	Oversupply
8/12/2017 13:14	0:01	LSR	Data is not available	Data is not available	Oversupply
8/12/2017 13:24	0:04	LSR	Data is not available	Data is not available	Oversupply
8/12/2017 13:31	0:42	LSR	Data is not available	Data is not available	Oversupply
8/12/2017 14:14	0:01	LSR	Data is not available	Data is not available	Oversupply
8/12/2017 14:17	0:02	LSR	Data is not available	Data is not available	Oversupply
8/12/2017 15:10	0:04	LSR	Data is not available	Data is not available	Oversupply
8/12/2017 15:20	0:01	LSR	Data is not available	Data is not available	Oversupply
8/12/2017 15:23	0:11	LSR	Data is not available	Data is not available	Oversupply
8/12/2017 15:35	0:02	LSR	Data is not available	Data is not available	Oversupply
8/12/2017 16:35	0:01	LSR	Data is not available	Data is not available	Oversupply
8/12/2017 16:37	0:06	LSR	Data is not available	Data is not available	Oversupply
8/12/2017 16:44	0:02	LSR	Data is not available	Data is not available	Oversupply
8/12/2017 16:47	0:01	LSR	Data is not available	Data is not available	Oversupply
8/12/2017 16:53	0:06	LSR	Data is not available	Data is not available	Oversupply
8/12/2017 17:00	0:50	LSR	Data is not available	Data is not available	Oversupply
8/13/2017 6:35	1:13	LSR	Data is not available	Data is not available	Oversupply
8/13/2017 7:50	1:24	LSR	Data is not available	Data is not available	Oversupply
8/13/2017 9:17	0:50	LSR	Data is not available	Data is not available	Oversupply
8/13/2017 10:08	0:43	LSR	Data is not available	Data is not available	Oversupply
8/13/2017 10:56	0:01	LSR	Data is not available	Data is not available	Oversupply
8/13/2017 11:31	0:01	LSR	Data is not available	Data is not available	Oversupply
8/13/2017 11:33	0:01	LSR	Data is not available	Data is not available	Oversupply
8/13/2017 11:41	0:01	LSR	Data is not available	Data is not available	Oversupply
8/13/2017 11:48	0:17	LSR	Data is not available	Data is not available	Oversupply
8/13/2017 12:06	0:01	LSR	Data is not available	Data is not available	Oversupply
8/16/2017 6:26	0:09	LSR	Data is not available	Data is not available	Oversupply
8/16/2017 7:10	1:06	LSR	Data is not available	Data is not available	Oversupply
8/16/2017 8:17	0:05	LSR	Data is not available	Data is not available	Oversupply
8/16/2017 8:38	0:01	LSR	Data is not available	Data is not available	Oversupply
8/16/2017 8:44	0:01	LSR	Data is not available	Data is not available	Oversupply
8/16/2017 9:04	0:06	LSR	Data is not available	Data is not available	Oversupply
8/16/2017 9:24	0:05	LSR	Data is not available	Data is not available	Oversupply
8/16/2017 10:38	0:01	LSR	Data is not available	Data is not available	Oversupply
8/16/2017 11:18	0:03	LSR	Data is not available	Data is not available	Oversupply
8/16/2017 11:39	0:15	LSR	Data is not available	Data is not available	Oversupply
8/16/2017 11:57	0:05	LSR	Data is not available	Data is not available	Oversupply
8/16/2017 13:53	0:02	LSR	Data is not available	Data is not available	Oversupply
8/19/2017 9:31	0:14	LSR	Data is not available	Data is not available	Oversupply
8/19/2017 10:00	0:04	LSR	Data is not available	Data is not available	Oversupply
8/19/2017 10:16	0:01	LSR	Data is not available	Data is not available	Oversupply
8/19/2017 10:49	0:04	LSR	Data is not available	Data is not available	Oversupply
8/19/2017 11:39	0:01	LSR	Data is not available	Data is not available	Oversupply
8/19/2017 11:45	0:04	LSR	Data is not available	Data is not available	Oversupply
8/31/2017 6:22	0:34	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 August 2017

Start Date/Time	MW Output Prior to Start of Curtailment	End Date/Time	MW Output After Curtailment Released ¹	IPP	Reason for Curtailment
08/14/17 11:11	6.8 MW	08/14/17 12:04	8.0 MW	HRD	System constraint
08/29/17 15:15	0.0 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 Waituku may take longer to return to scheduled or full available output levels.

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