



July 25, 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 June 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 June 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 June 30, 2017):

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 for the month of June. 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:

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

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 June. 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 June 30, 2017):

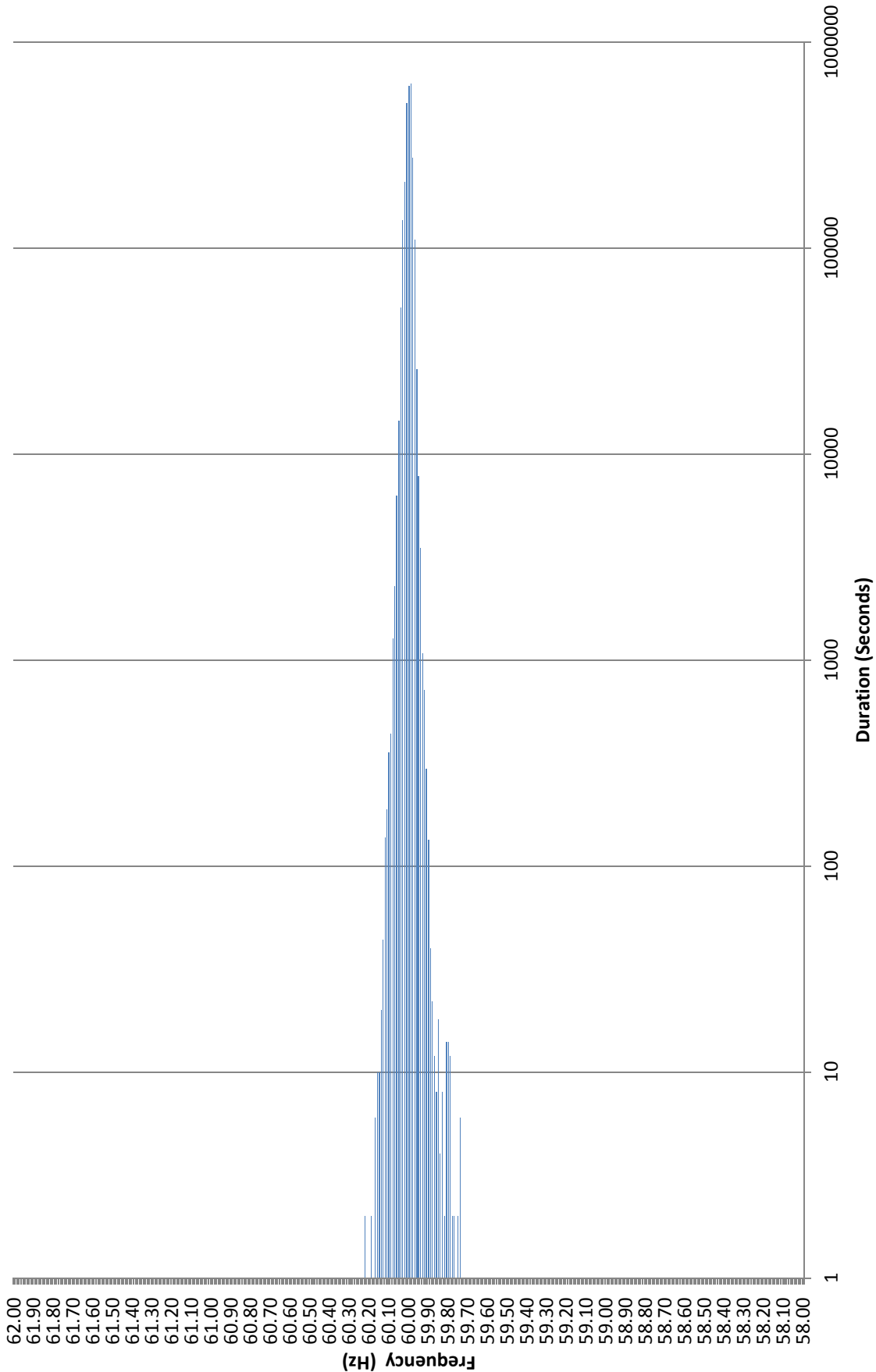
3a) Tabulation of each curtailment event for each resource including the starting date and time, duration, megawatt hours curtailed, peak MW curtailed, and reason for curtailment:

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

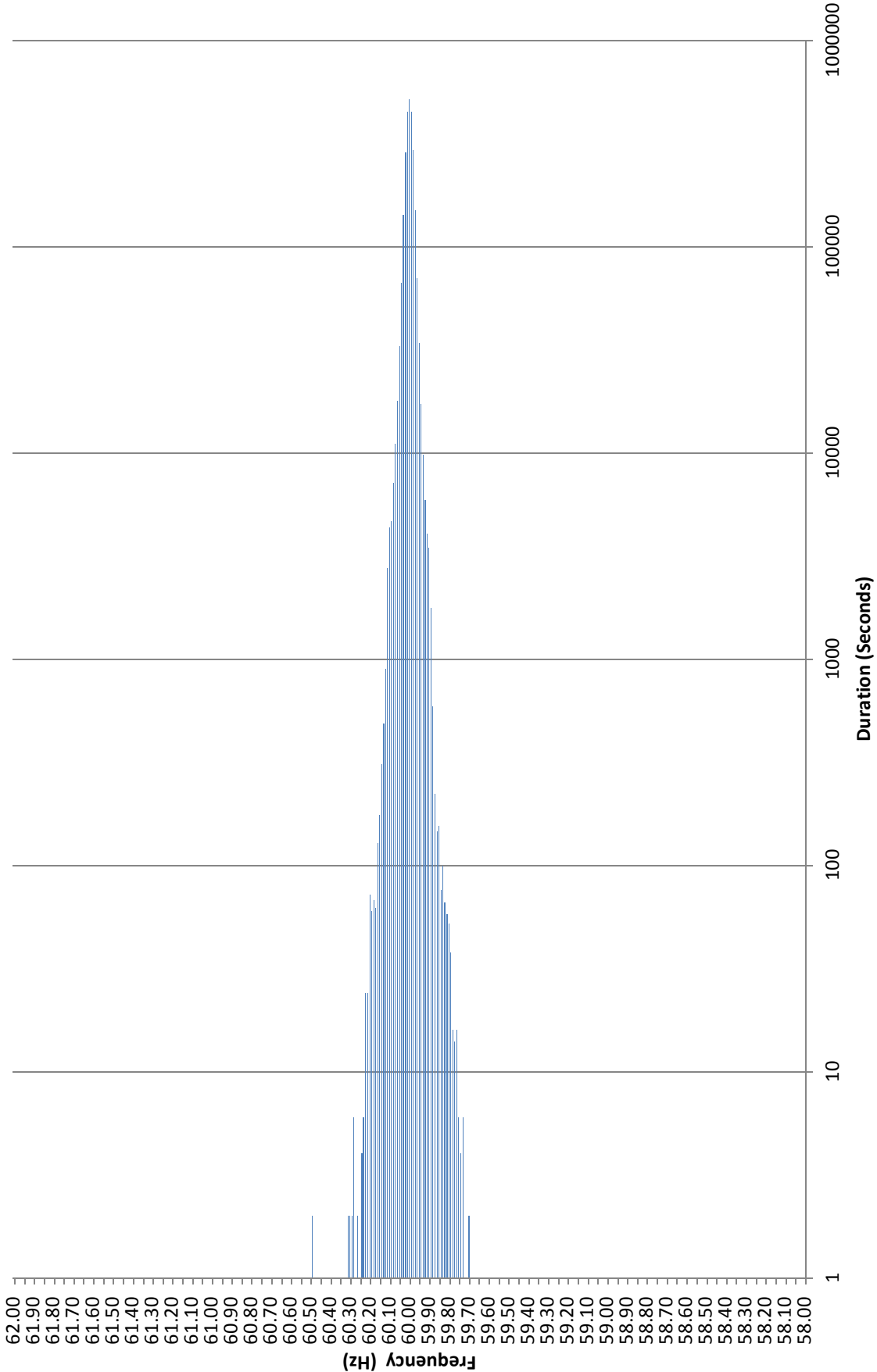
3b) Total MWh of non-dispatchable renewable resources curtailed for the month:

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.

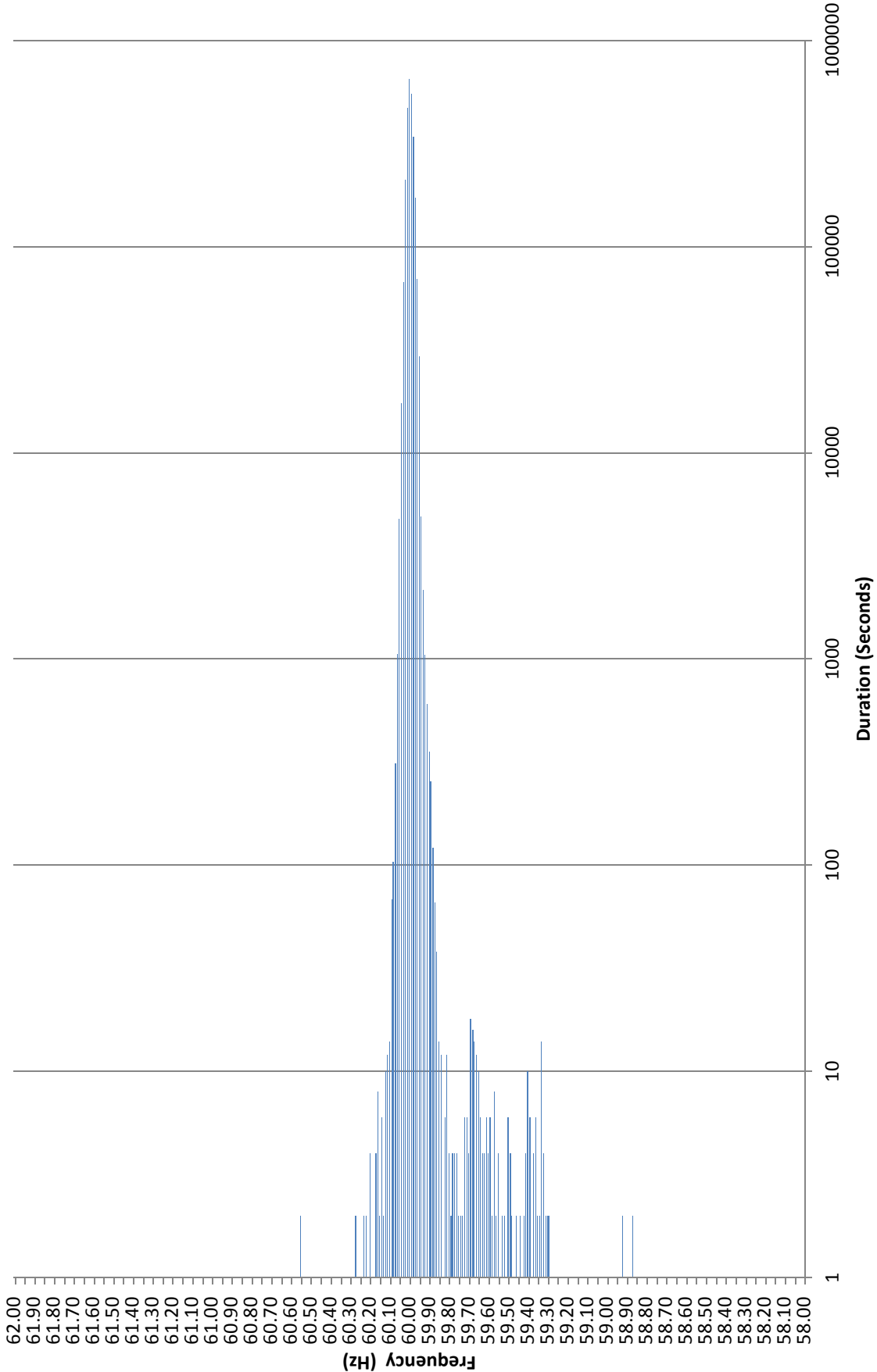
Frequency Distribution Plot - Hawaiian Electric June 2017



Frequency Distribution Plot - Maui Electric June 2017



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



| Hawaiian Electric Frequency Excursion Statistics June 2017 | | |
|---|-----------|-----------|
| Data Rounded to the nearest | <59.95 Hz | >60.05 Hz |
| Number of Excursions | 742 | 1548 |
| Maximum Duration (sec) | 386 | 352 |
| Maximum Deviation (Hz) | 59.735 | 60.221 |
| Total Duration of Excursions (sec) | 8494 | 15718 |

| Maui Electric Frequency Excursion Statistics June 2017 | | |
|---|-----------|-----------|
| | <59.95 Hz | >60.05 Hz |
| Number of Excursions | 9260 | 8639 |
| Maximum Duration (sec) | 602 | 724 |
| Maximum Deviation (Hz) | 59.704 | 60.486 |
| Total Duration of Excursions (sec) | 57676 | 63896 |

| Hawai'i Electric Light Frequency Excursion Statistics June 2017 | | |
|--|-----------|-----------|
| | <59.95 Hz | >60.05 Hz |
| Number of Excursions | 3833 | 752 |
| Maximum Duration (sec) | 512 | 120 |
| Maximum Deviation (Hz) | 58.871 | 60.551 |
| Total Duration of Excursions (sec) | 23932 | 3214 |

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Hawaiian Electric Curtailment Report June 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 |
|-----------------|-----------------------|---|----------------|--------------------------------------|--|---------|------------------------|
| 06/03/17 06:02 | 0.0 | 0.00 | 06/03/17 07:21 | 0 | * | Aloha | System constraints |
| 06/03/17 06:06 | 0.0 | 0.00 | 06/03/17 07:23 | 0 | * | Waianae | System constraints |
| 06/03/17 12:27 | 0.0 | 19.70 | 06/03/17 13:11 | 0 | * | Waianae | System constraints |
| 06/03/17 12:30 | 0.0 | 1.60 | 06/03/17 13:09 | 0 | * | Aloha | System constraints |
| 06/08/17 08:35 | 0.0 | 6.60 | 06/08/17 08:59 | 0 | * | KWF | System constraints |
| 06/08/17 08:37 | 0.0 | 1.40 | 06/08/17 09:01 | 0 | * | Makai | System constraints |
| 06/08/17 12:35 | 0.0 | 6.00 | 06/08/17 14:38 | 0 | * | KWF | System constraints |
| 06/08/17 12:38 | 0.0 | 7.00 | 06/08/17 14:40 | 0 | * | Makai | System constraints |
| 06/19/17 05:49 | 0.0 | 0.00 | 06/19/17 18:37 | 0 | * | Makai | System constraints |
| 06/19/17 05:49 | 0.0 | 3.80 | 06/19/17 17:40 | 0 | * | Mauka | System constraints |
| 06/19/17 05:55 | 0.0 | 0.40 | 06/19/17 18:41 | 0 | * | KWF | System constraints |
| 06/21/17 06:54 | 0.0 | 4.90 | 06/21/17 08:04 | 0 | * | KWF | System constraints |
| 06/21/17 07:13 | 0.0 | 3.50 | 06/21/17 08:06 | 0 | * | Makai | System constraints |
| 06/21/17 15:32 | 0.0 | 7.20 | 06/21/17 16:32 | 0 | * | KWF | System constraints |
| 06/21/17 15:42 | 0.0 | 5.10 | 06/21/17 16:34 | 0 | * | Makai | System constraints |
| 06/22/17 06:09 | 0.0 | 0.00 | 06/22/17 06:22 | 0 | * | KREP | System constraints |
| 06/22/17 12:45 | 0.0 | 26.20 | 06/23/17 07:49 | 0 | * | Waianae | System constraints |
| 06/22/17 12:46 | 0.0 | 4.60 | 06/22/17 13:55 | 0 | * | Aloha | System constraints |
| 06/22/17 15:50 | 0.0 | 1.40 | 06/22/17 16:00 | 0 | * | KREP | System constraints |
| 06/23/17 07:00 | 0.0 | 0.00 | 06/23/17 07:51 | 0 | * | Aloha | System constraints |
| 06/23/17 07:12 | 0.0 | 1.40 | 06/23/17 07:18 | 0 | * | KREP | System constraints |
| 06/23/17 15:47 | 0.0 | 0.10 | 06/23/17 15:51 | 0 | * | KREP | System constraints |
| 06/26/17 05:23 | 0.0 | 0.00 | 06/26/17 05:49 | 0 | * | KREP | System constraints |
| 06/26/17 15:22 | 0.0 | 3.90 | 06/26/17 16:03 | 0 | * | KREP | System constraints |
| 06/28/17 06:44 | 0.0 | 0.00 | 06/28/17 08:03 | 0 | * | KREP | System constraints |
| 06/28/17 17:37 | 0.0 | 1.10 | 6/28/17 18:33 | 0 | * | KREP | System constraints |

Aloha = Aloha Solar PV Farm
KLS2 = Kalaeloa Solar 2 PV Farm
KREP = Kalaeloa Renewable Energy Park
KWF = Kahuku Wind Farm
Makai = Kawaiiloa Makai Wind Farm
Mauka = Kawaiiloa 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 Kawaiiloa Wind Farm, and HECO does not make any representations as to its accuracy.

* Data has not been provided by IPP.



Maui Curtailment Report

June
2017

| Start Date and Time | Duration | IPP Curtailed | Estimated Curtailed MWH | Peak MW Curtailed | Reasons for Curtailment |
|---------------------|----------|---------------|-------------------------|-----------------------|-------------------------|
| 6/1/2017 3:04 | 0:01 | KWP | 0.000 | 0.011 | System constraint |
| 6/1/2017 3:26 | 0:01 | KWP/II | 0.004 | 2.375 | System constraint |
| 6/1/2017 3:30 | 0:05 | KWP/II | 0.316 | 6.708 | Oversupply |
| 6/1/2017 4:35 | 0:17 | KWP/II | 1.438 | 9.700 | Oversupply |
| 6/1/2017 4:46 | 0:01 | AWE | 0.010 | 19.790 | System constraint |
| 6/1/2017 5:08 | 0:01 | KWP/II | 0.007 | 7.282 | System constraint |
| 6/1/2017 5:10 | 0:15 | KWP/II | 1.644 | 13.577 | Oversupply |
| 6/1/2017 5:27 | 0:01 | KWP/II | 0.008 | 11.383 | System constraint |
| 6/1/2017 7:05 | 0:01 | BS250 | Data is not available | Data is not available | System constraint |
| 6/1/2017 7:05 | 0:01 | KWP/II | 0.014 | 9.741 | System constraint |
| 6/1/2017 7:09 | 0:01 | KWP/II | 0.014 | 12.220 | System constraint |
| 6/1/2017 7:10 | 0:01 | BS250 | Data is not available | Data is not available | System constraint |
| 6/1/2017 7:35 | 0:02 | BS250 | Data is not available | Data is not available | System constraint |
| 6/1/2017 7:41 | 0:10 | BS250 | Data is not available | Data is not available | System constraint |
| 6/1/2017 7:41 | 0:09 | KWP/II | 0.434 | 14.449 | Oversupply |
| 6/1/2017 7:53 | 1:50 | BS250 | Data is not available | Data is not available | Oversupply |
| 6/1/2017 7:53 | 8:32 | KWP/II | 103.841 | 20.708 | Oversupply |
| 6/1/2017 8:27 | 0:01 | AWE | 0.014 | 20.127 | System constraint |
| 6/1/2017 9:56 | 0:01 | KWP | 0.006 | 10.364 | System constraint |
| 6/1/2017 9:58 | 0:02 | KWP | 0.018 | 10.651 | System constraint |
| 6/1/2017 10:02 | 0:03 | KWP | 0.051 | 11.959 | System constraint |
| 6/1/2017 10:31 | 0:02 | KWP | 0.003 | 10.123 | System constraint |
| 6/1/2017 10:34 | 0:04 | KWP | 0.070 | 11.789 | System constraint |
| 6/1/2017 10:39 | 2:22 | KWP | 11.005 | 23.179 | Oversupply |
| 6/1/2017 13:01 | 0:11 | BS250 | Data is not available | Data is not available | Oversupply |
| 6/1/2017 13:01 | 0:57 | AWE | 3.956 | 20.540 | Oversupply |
| 6/1/2017 13:59 | 0:02 | AWE | 0.009 | 20.363 | System constraint |
| 6/1/2017 23:22 | 0:16 | KWP/II | 0.511 | 20.702 | System constraint |
| 6/1/2017 23:50 | 4:36 | KWP/II | 32.367 | 20.708 | Oversupply |
| 6/2/2017 4:27 | 0:06 | KWP/II | 0.128 | 20.706 | System constraint |
| 6/2/2017 4:37 | 0:14 | KWP/II | 0.286 | 20.703 | System constraint |
| 6/2/2017 4:57 | 0:10 | KWP/II | 0.419 | 20.708 | Oversupply |
| 6/2/2017 5:09 | 0:03 | KWP/II | 0.050 | 20.549 | System constraint |
| 6/2/2017 7:02 | 0:02 | BS250 | Data is not available | Data is not available | System constraint |
| 6/2/2017 7:03 | 0:01 | KWP/II | 0.002 | 20.702 | System constraint |
| 6/2/2017 7:08 | 0:01 | BS250 | Data is not available | Data is not available | System constraint |
| 6/2/2017 7:23 | 0:01 | BS250 | Data is not available | Data is not available | System constraint |
| 6/2/2017 7:30 | 0:10 | BS250 | Data is not available | Data is not available | System constraint |
| 6/2/2017 7:30 | 0:03 | KWP/II | 0.008 | 20.649 | System constraint |
| 6/2/2017 7:34 | 0:06 | KWP/II | 0.047 | 20.649 | System constraint |
| 6/2/2017 7:45 | 5:08 | BS250 | Data is not available | Data is not available | Oversupply |
| 6/2/2017 7:45 | 5:10 | KWP/II | 73.372 | 20.708 | Oversupply |
| 6/2/2017 10:53 | 0:02 | AWE | 0.010 | 20.440 | System constraint |
| 6/2/2017 10:58 | 0:01 | AWE | 0.001 | 20.320 | System constraint |
| 6/2/2017 11:02 | 0:02 | AWE | 0.008 | 19.633 | System constraint |
| 6/2/2017 11:05 | 0:02 | AWE | 0.008 | 20.647 | System constraint |
| 6/2/2017 11:08 | 0:01 | AWE | 0.003 | 20.027 | System constraint |
| 6/2/2017 11:18 | 0:06 | AWE | 0.075 | 20.593 | System constraint |
| 6/2/2017 11:28 | 0:05 | AWE | 0.041 | 20.560 | System constraint |
| 6/2/2017 11:36 | 0:51 | AWE | 0.989 | 20.423 | System constraint |
| 6/2/2017 12:29 | 0:03 | AWE | 0.013 | 20.610 | System constraint |
| 6/2/2017 12:37 | 0:01 | AWE | 0.004 | 20.367 | System constraint |
| 6/2/2017 12:41 | 0:01 | AWE | 0.004 | 20.653 | System constraint |
| 6/2/2017 12:56 | 0:43 | BS250 | Data is not available | Data is not available | Oversupply |
| 6/2/2017 12:56 | 2:23 | KWP/II | 25.863 | 20.708 | Oversupply |
| 6/2/2017 15:24 | 0:31 | KWP/II | 1.209 | 20.708 | System constraint |
| 6/2/2017 21:16 | 0:02 | KWP/II | 0.016 | 20.708 | System constraint |
| 6/2/2017 23:11 | 0:03 | KWP/II | 0.016 | 20.708 | System constraint |
| 6/3/2017 0:22 | 0:05 | KWP/II | 0.036 | 20.708 | System constraint |
| 6/3/2017 0:32 | 5:33 | KWP/II | 41.686 | 20.708 | Oversupply |
| 6/3/2017 5:44 | 0:21 | BS250 | Data is not available | Data is not available | Oversupply |
| 6/3/2017 7:35 | 0:29 | BS250 | Data is not available | Data is not available | Oversupply |
| 6/3/2017 7:35 | 0:29 | KWP/II | 1.169 | 20.708 | System constraint |
| 6/3/2017 8:40 | 0:09 | BS250 | Data is not available | Data is not available | System constraint |
| 6/3/2017 8:40 | 0:11 | KWP/II | 0.157 | 20.708 | System constraint |
| 6/3/2017 8:52 | 0:03 | BS250 | Data is not available | Data is not available | System constraint |
| 6/3/2017 8:52 | 0:01 | KWP/II | 0.002 | 20.708 | System constraint |
| 6/3/2017 8:58 | 0:03 | BS250 | Data is not available | Data is not available | System constraint |
| 6/3/2017 8:58 | 0:55 | KWP/II | 4.262 | 20.708 | Oversupply |
| 6/3/2017 9:04 | 0:02 | BS250 | Data is not available | Data is not available | System constraint |
| 6/3/2017 9:09 | 0:43 | BS250 | Data is not available | Data is not available | Oversupply |
| 6/3/2017 9:57 | 3:11 | BS250 | Data is not available | Data is not available | Oversupply |
| 6/3/2017 9:57 | 3:12 | KWP/II | 46.806 | 20.708 | Oversupply |
| 6/3/2017 11:40 | 1:25 | AWE | 8.266 | 20.493 | Oversupply |
| 6/3/2017 13:11 | 0:07 | BS250 | Data is not available | Data is not available | Oversupply |
| 6/3/2017 13:11 | 1:02 | KWP/II | 20.465 | 20.708 | Oversupply |
| 6/3/2017 13:18 | 0:23 | AWE | 1.057 | 20.593 | Oversupply |
| 6/3/2017 13:43 | 0:04 | AWE | 0.050 | 20.263 | System constraint |
| 6/3/2017 13:49 | 0:02 | AWE | 0.019 | 19.620 | System constraint |
| 6/3/2017 13:52 | 0:17 | AWE | 0.918 | 20.177 | Oversupply |
| 6/3/2017 14:09 | 0:03 | BS250 | Data is not available | Data is not available | Oversupply |
| 6/3/2017 14:15 | 1:18 | BS250 | Data is not available | Data is not available | Oversupply |
| 6/3/2017 14:15 | 1:19 | KWP/II | 9.926 | 20.708 | Oversupply |
| 6/3/2017 15:36 | 0:01 | BS250 | Data is not available | Data is not available | System constraint |
| 6/4/2017 2:40 | 0:16 | KWP/II | 0.392 | 20.708 | Oversupply |
| 6/4/2017 3:33 | 0:24 | KWP/II | 0.942 | 20.708 | Oversupply |
| 6/4/2017 4:28 | 0:04 | KWP/II | 0.081 | 20.700 | Oversupply |
| 6/4/2017 8:24 | 0:04 | BS250 | Data is not available | Data is not available | Oversupply |
| 6/4/2017 8:24 | 0:37 | KWP/II | 1.140 | 20.701 | Oversupply |
| 6/4/2017 8:31 | 0:17 | BS250 | Data is not available | Data is not available | Oversupply |
| 6/4/2017 8:51 | 0:10 | BS250 | Data is not available | Data is not available | Oversupply |
| 6/4/2017 9:04 | 0:01 | KWP/II | 0.006 | 20.591 | Oversupply |
| 6/4/2017 9:11 | 5:56 | KWP/II | 59.054 | 20.708 | Oversupply |
| 6/4/2017 9:13 | 0:39 | BS250 | Data is not available | Data is not available | Oversupply |
| 6/5/2017 1:09 | 0:01 | AWE | 0.000 | 0.003 | Oversupply |
| 6/5/2017 1:14 | 0:01 | AWE | 0.000 | 0.007 | Oversupply |
| 6/5/2017 10:05 | 0:51 | KWP/II | 4.590 | 19.927 | Oversupply |
| 6/5/2017 14:21 | 0:12 | KWP/II | 0.304 | 20.485 | Oversupply |
| 6/5/2017 14:43 | 0:06 | KWP/II | 0.124 | 19.958 | Oversupply |
| 6/5/2017 15:00 | 0:18 | KWP/II | 0.729 | 20.297 | Oversupply |
| 6/6/2017 9:27 | 1:16 | KWP/II | 7.917 | 20.627 | System constraint |
| 6/6/2017 9:30 | 1:14 | BS250 | Data is not available | Data is not available | System constraint |
| 6/6/2017 11:36 | 0:01 | BS250 | Data is not available | Data is not available | System constraint |
| 6/6/2017 13:53 | 0:01 | BS250 | Data is not available | Data is not available | System constraint |



Maui Curtailment Report

June
2017

| Start Date and Time | Duration | IPP Curtailed | Estimated Curtailed MWH | Peak MW Curtailed | Reasons for Curtailment |
|---------------------|----------|---------------|-------------------------|-----------------------|-------------------------|
| 6/6/2017 14:22 | 0:02 | AWE | 0.006 | 20.653 | Facility Requested |
| 6/6/2017 15:39 | 0:03 | KWP11 | 0.018 | 20.499 | System constraint |
| 6/6/2017 15:59 | 0:24 | KWP11 | 1.027 | 20.383 | System constraint |
| 6/6/2017 23:54 | 0:08 | KWP11 | 0.250 | 19.170 | System constraint |
| 6/7/2017 0:10 | 0:05 | AWE | 0.165 | 19.460 | System constraint |
| 6/7/2017 0:11 | 0:10 | KWP11 | 0.348 | 19.138 | System constraint |
| 6/7/2017 0:51 | 3:33 | KWP11 | 35.507 | 19.211 | System constraint |
| 6/7/2017 4:56 | 0:01 | KWP11 | 0.006 | 19.175 | System constraint |
| 6/7/2017 5:25 | 0:02 | KWP11 | 0.009 | 18.572 | System constraint |
| 6/7/2017 5:44 | 0:03 | BS250 | Data is not available | Data is not available | System constraint |
| 6/7/2017 5:44 | 0:02 | KWP11 | 0.034 | 18.359 | System constraint |
| 6/7/2017 5:55 | 0:01 | BS250 | Data is not available | Data is not available | System constraint |
| 6/7/2017 7:34 | 0:04 | BS250 | Data is not available | Data is not available | System constraint |
| 6/7/2017 7:37 | 0:02 | KWP11 | 0.008 | 19.180 | System constraint |
| 6/7/2017 7:41 | 0:03 | BS250 | Data is not available | Data is not available | System constraint |
| 6/7/2017 10:01 | 0:01 | BS250 | Data is not available | Data is not available | System constraint |
| 6/7/2017 12:38 | 0:01 | BS250 | Data is not available | Data is not available | System constraint |
| 6/7/2017 14:08 | 1:15 | KWP11 | 7.177 | 19.087 | System constraint |
| 6/8/2017 2:08 | 0:01 | KWP11 | 0.004 | 20.493 | System constraint |
| 6/8/2017 2:11 | 0:32 | KWP11 | 0.705 | 20.654 | System constraint |
| 6/8/2017 2:44 | 0:22 | KWP11 | 0.801 | 20.626 | System constraint |
| 6/8/2017 3:09 | 0:09 | KWP11 | 0.104 | 20.595 | System constraint |
| 6/8/2017 4:51 | 0:02 | KWP11 | 0.007 | 20.439 | System constraint |
| 6/8/2017 6:59 | 0:03 | BS250 | Data is not available | Data is not available | System constraint |
| 6/8/2017 7:00 | 0:01 | KWP11 | 0.001 | 20.064 | System constraint |
| 6/8/2017 7:05 | 0:01 | BS250 | Data is not available | Data is not available | System constraint |
| 6/8/2017 7:24 | 0:02 | BS250 | Data is not available | Data is not available | System constraint |
| 6/8/2017 7:24 | 0:03 | KWP11 | 0.027 | 20.627 | System constraint |
| 6/8/2017 7:29 | 0:02 | BS250 | Data is not available | Data is not available | System constraint |
| 6/8/2017 7:29 | 0:01 | KWP11 | 0.001 | 20.656 | System constraint |
| 6/8/2017 7:42 | 0:02 | BS250 | Data is not available | Data is not available | System constraint |
| 6/8/2017 7:42 | 0:01 | KWP11 | 0.004 | 20.654 | System constraint |
| 6/8/2017 7:56 | 1:10 | BS250 | Data is not available | Data is not available | System constraint |
| 6/8/2017 7:56 | 1:10 | KWP11 | 4.601 | 20.602 | System constraint |
| 6/8/2017 9:10 | 0:13 | BS250 | Data is not available | Data is not available | System constraint |
| 6/8/2017 9:10 | 0:14 | KWP11 | 0.386 | 20.371 | System constraint |
| 6/8/2017 9:26 | 0:09 | BS250 | Data is not available | Data is not available | System constraint |
| 6/8/2017 9:27 | 0:08 | KWP11 | 0.266 | 20.100 | System constraint |
| 6/8/2017 9:40 | 1:31 | BS250 | Data is not available | Data is not available | System constraint |
| 6/8/2017 9:40 | 1:32 | KWP11 | 4.048 | 20.413 | System constraint |
| 6/8/2017 11:14 | 0:39 | BS250 | Data is not available | Data is not available | System constraint |
| 6/8/2017 11:15 | 0:35 | KWP11 | 2.098 | 19.902 | System constraint |
| 6/8/2017 11:51 | 0:02 | KWP11 | 0.059 | 17.322 | System constraint |
| 6/8/2017 11:59 | 0:02 | BS250 | Data is not available | Data is not available | System constraint |
| 6/8/2017 11:59 | 0:01 | KWP11 | 0.009 | 16.380 | System constraint |
| 6/8/2017 16:06 | 0:01 | BS250 | Data is not available | Data is not available | System constraint |
| 6/8/2017 23:34 | 0:01 | KWP11 | 0.004 | 20.099 | System constraint |
| 6/8/2017 23:37 | 0:05 | KWP11 | 0.054 | 19.957 | System constraint |
| 6/8/2017 23:51 | 0:01 | KWP11 | 0.003 | 19.973 | System constraint |
| 6/8/2017 23:53 | 0:16 | KWP11 | 0.292 | 19.873 | System constraint |
| 6/9/2017 0:10 | 0:26 | KWP11 | 1.388 | 19.933 | System constraint |
| 6/9/2017 0:43 | 0:02 | KWP11 | 0.027 | 18.388 | System constraint |
| 6/9/2017 0:51 | 0:02 | KWP11 | 0.023 | 18.414 | System constraint |
| 6/9/2017 1:19 | 0:01 | KWP11 | 0.014 | 19.512 | System constraint |
| 6/9/2017 1:26 | 0:02 | KWP11 | 0.018 | 19.039 | System constraint |
| 6/9/2017 1:32 | 0:01 | KWP11 | 0.002 | 18.696 | System constraint |
| 6/9/2017 1:34 | 0:14 | KWP11 | 0.393 | 18.997 | System constraint |
| 6/9/2017 2:07 | 0:20 | KWP11 | 1.284 | 14.876 | System constraint |
| 6/9/2017 2:28 | 0:11 | KWP11 | 0.411 | 17.928 | System constraint |
| 6/9/2017 3:03 | 0:02 | KWP11 | 0.015 | 16.042 | System constraint |
| 6/9/2017 3:13 | 0:20 | KWP11 | 0.678 | 15.821 | System constraint |
| 6/9/2017 6:37 | 0:02 | BS250 | Data is not available | Data is not available | System constraint |
| 6/9/2017 6:42 | 0:21 | BS250 | Data is not available | Data is not available | System constraint |
| 6/9/2017 6:42 | 0:01 | KWP11 | 0.001 | 15.813 | System constraint |
| 6/9/2017 6:44 | 0:11 | KWP11 | 0.293 | 17.094 | System constraint |
| 6/9/2017 6:56 | 0:01 | KWP11 | 0.000 | 16.373 | System constraint |
| 6/9/2017 7:01 | 0:02 | KWP11 | 0.033 | 19.458 | System constraint |
| 6/9/2017 7:06 | 0:01 | BS250 | Data is not available | Data is not available | System constraint |
| 6/9/2017 7:13 | 0:10 | BS250 | Data is not available | Data is not available | System constraint |
| 6/9/2017 7:13 | 0:02 | KWP11 | 0.019 | 20.264 | System constraint |
| 6/9/2017 7:16 | 0:07 | KWP11 | 0.157 | 20.195 | System constraint |
| 6/9/2017 7:28 | 0:04 | BS250 | Data is not available | Data is not available | System constraint |
| 6/9/2017 7:28 | 0:05 | KWP11 | 0.134 | 16.630 | System constraint |
| 6/9/2017 7:35 | 0:21 | BS250 | Data is not available | Data is not available | System constraint |
| 6/9/2017 7:37 | 0:01 | KWP11 | 0.001 | 14.156 | System constraint |
| 6/9/2017 7:40 | 0:04 | KWP11 | 0.137 | 12.022 | System constraint |
| 6/9/2017 7:47 | 0:08 | KWP11 | 0.513 | 14.966 | System constraint |
| 6/9/2017 7:59 | 0:01 | BS250 | Data is not available | Data is not available | System constraint |
| 6/9/2017 8:01 | 0:01 | BS250 | Data is not available | Data is not available | System constraint |
| 6/9/2017 8:01 | 0:01 | KWP11 | 0.023 | 14.516 | System constraint |
| 6/9/2017 9:45 | 0:01 | BS250 | Data is not available | Data is not available | System constraint |
| 6/9/2017 10:21 | 0:01 | BS250 | Data is not available | Data is not available | System constraint |
| 6/10/2017 19:01 | 0:02 | BS250 | Data is not available | Data is not available | System constraint |
| 6/10/2017 19:01 | 1:15 | KWP11 | 7.045 | 20.594 | System constraint |
| 6/11/2017 8:16 | 0:01 | BS250 | Data is not available | Data is not available | Oversupply |
| 6/12/2017 3:45 | 0:54 | KWP11 | 6.489 | 17.013 | Oversupply |
| 6/12/2017 11:22 | 0:01 | BS250 | Data is not available | Data is not available | Oversupply |
| 6/12/2017 11:22 | 0:51 | KWP11 | 3.043 | 20.695 | Oversupply |
| 6/12/2017 11:25 | 0:05 | AWE | 0.112 | 19.733 | Oversupply |
| 6/12/2017 11:27 | 0:01 | KWP | 0.000 | 20.532 | Oversupply |
| 6/12/2017 12:33 | 2:46 | KWP11 | 13.566 | 19.211 | Oversupply |
| 6/12/2017 23:40 | 5:23 | KWP11 | 70.010 | 20.626 | Oversupply |
| 6/13/2017 1:37 | 0:23 | AWE | 0.934 | 17.303 | Oversupply |
| 6/13/2017 2:11 | 1:29 | AWE | 7.580 | 17.867 | Oversupply |
| 6/13/2017 3:41 | 0:01 | AWE | 0.005 | 15.313 | Oversupply |
| 6/13/2017 3:46 | 0:29 | AWE | 1.723 | 16.990 | Oversupply |
| 6/13/2017 4:17 | 0:02 | AWE | 0.009 | 11.393 | Oversupply |
| 6/13/2017 5:48 | 0:35 | KWP11 | 3.810 | 18.074 | System constraint |
| 6/13/2017 6:26 | 0:02 | KWP11 | 0.019 | 15.605 | System constraint |
| 6/13/2017 8:54 | 0:16 | KWP11 | 1.375 | 16.316 | System constraint |
| 6/13/2017 9:57 | 0:01 | BS250 | Data is not available | Data is not available | System constraint |
| 6/13/2017 9:59 | 0:01 | BS250 | Data is not available | Data is not available | System constraint |
| 6/13/2017 9:59 | 0:01 | KWP11 | 0.011 | 14.714 | System constraint |
| 6/13/2017 10:05 | 0:07 | BS250 | Data is not available | Data is not available | System constraint |



Maui Curtailment Report

June
2017

| Start Date and Time | Duration | IPP Curtailed | Estimated Curtailed MWH | Peak MW Curtailed | Reasons for Curtailment |
|---------------------|----------|---------------|-------------------------|-----------------------|-------------------------|
| 6/13/2017 10:06 | 0:32 | KWP/II | 2.076 | 16.976 | System constraint |
| 6/13/2017 13:28 | 0:01 | BS250 | Data is not available | Data is not available | System constraint |
| 6/13/2017 13:34 | 0:01 | BS250 | Data is not available | Data is not available | System constraint |
| 6/13/2017 13:41 | 0:15 | BS250 | Data is not available | Data is not available | System constraint |
| 6/13/2017 13:42 | 0:16 | KWP/II | 1.234 | 16.357 | System constraint |
| 6/13/2017 13:59 | 0:09 | BS250 | Data is not available | Data is not available | System constraint |
| 6/13/2017 14:00 | 0:10 | KWP/II | 0.360 | 17.699 | System constraint |
| 6/13/2017 14:11 | 0:11 | BS250 | Data is not available | Data is not available | System constraint |
| 6/13/2017 14:11 | 0:09 | KWP/II | 0.316 | 15.922 | System constraint |
| 6/13/2017 14:21 | 0:01 | KWP/II | 0.013 | 14.479 | System constraint |
| 6/13/2017 22:24 | 0:06 | KWP/II | 0.344 | 20.532 | Oversupply |
| 6/14/2017 0:08 | 0:16 | KWP/II | 1.104 | 16.216 | Oversupply |
| 6/14/2017 0:46 | 4:21 | KWP/II | 61.531 | 19.692 | Oversupply |
| 6/14/2017 1:54 | 0:54 | AWE | 2.613 | 13.317 | Oversupply |
| 6/14/2017 2:49 | 0:02 | AWE | 0.018 | 7.633 | Oversupply |
| 6/14/2017 2:55 | 0:42 | AWE | 2.135 | 11.813 | Oversupply |
| 6/14/2017 3:44 | 0:12 | AWE | 0.177 | 8.760 | Oversupply |
| 6/14/2017 5:28 | 0:29 | KWP/II | 1.889 | 18.793 | Oversupply |
| 6/14/2017 9:42 | 0:01 | BS250 | Data is not available | Data is not available | System constraint |
| 6/14/2017 10:30 | 0:04 | BS250 | Data is not available | Data is not available | System constraint |
| 6/14/2017 10:32 | 0:01 | KWP/II | 0.012 | 11.479 | System constraint |
| 6/14/2017 10:35 | 0:01 | BS250 | Data is not available | Data is not available | System constraint |
| 6/14/2017 13:04 | 0:03 | BS250 | Data is not available | Data is not available | System constraint |
| 6/14/2017 13:04 | 0:02 | KWP/II | 0.080 | 13.559 | System constraint |
| 6/14/2017 21:49 | 0:18 | KWP/II | 0.802 | 20.545 | System constraint |
| 6/14/2017 22:33 | 6:32 | KWP/II | 116.267 | 20.708 | Oversupply |
| 6/15/2017 0:22 | 4:37 | AWE | 36.883 | 20.467 | Oversupply |
| 6/15/2017 5:06 | 1:52 | KWP/II | 13.388 | 20.693 | System constraint |
| 6/15/2017 11:36 | 0:01 | BS250 | Data is not available | Data is not available | System constraint |
| 6/15/2017 11:37 | 0:01 | KWP/II | 0.007 | 4.852 | System constraint |
| 6/15/2017 19:55 | 0:01 | KWP | 0.000 | 0.008 | System constraint |
| 6/16/2017 5:14 | 0:01 | KWP | 0.000 | 0.002 | Oversupply |
| 6/16/2017 8:22 | 0:01 | KWP | 0.000 | 0.001 | System constraint |
| 6/16/2017 11:53 | 0:01 | KWP/II | 0.013 | 8.623 | System constraint |
| 6/16/2017 12:04 | 0:05 | KWP/II | 0.312 | 13.646 | System constraint |
| 6/16/2017 14:07 | 0:01 | KWP | 0.000 | 0.001 | System constraint |
| 6/16/2017 14:17 | 0:01 | KWP | 0.000 | 0.004 | System constraint |
| 6/17/2017 1:30 | 0:18 | KWP/II | 0.436 | 20.666 | Oversupply |
| 6/17/2017 2:43 | 0:08 | KWP/II | 0.108 | 20.217 | Oversupply |
| 6/17/2017 9:21 | 0:03 | KWP/II | 0.124 | 15.126 | Oversupply |
| 6/17/2017 13:44 | 0:03 | KWP/II | 0.108 | 11.662 | Oversupply |
| 6/17/2017 13:46 | 0:02 | BS250 | Data is not available | Data is not available | System constraint |
| 6/17/2017 16:25 | 0:05 | KWP/II | 0.164 | 17.146 | System constraint |
| 6/18/2017 5:19 | 1:00 | KWP/II | 9.997 | 20.706 | System constraint |
| 6/18/2017 5:59 | 0:19 | BS250 | Data is not available | Data is not available | System constraint |
| 6/18/2017 6:21 | 0:01 | BS250 | Data is not available | Data is not available | System constraint |
| 6/18/2017 6:26 | 0:01 | BS250 | Data is not available | Data is not available | System constraint |
| 6/18/2017 6:26 | 0:01 | KWP/II | 0.003 | 19.594 | System constraint |
| 6/18/2017 8:19 | 0:02 | BS250 | Data is not available | Data is not available | System constraint |
| 6/18/2017 8:20 | 0:02 | KWP/II | 0.013 | 15.599 | System constraint |
| 6/18/2017 8:24 | 0:01 | BS250 | Data is not available | Data is not available | System constraint |
| 6/18/2017 8:31 | 0:03 | BS250 | Data is not available | Data is not available | System constraint |
| 6/18/2017 8:31 | 0:04 | BS250 | Data is not available | Data is not available | System constraint |
| 6/18/2017 8:31 | 0:03 | KWP/II | 0.066 | 18.253 | System constraint |
| 6/18/2017 13:05 | 0:20 | BS250 | Data is not available | Data is not available | System constraint |
| 6/18/2017 13:05 | 0:50 | KWP/II | 2.953 | 20.230 | System constraint |
| 6/18/2017 13:56 | 0:01 | BS250 | Data is not available | Data is not available | System constraint |
| 6/19/2017 1:40 | 0:01 | KWP | 0.000 | 0.004 | System constraint |
| 6/19/2017 3:32 | 0:01 | KWP/II | 0.019 | 9.003 | System constraint |
| 6/19/2017 3:36 | 1:22 | KWP/II | 8.882 | 17.720 | System constraint |
| 6/19/2017 6:53 | 0:01 | KWP/II | 0.053 | 10.659 | System constraint |
| 6/19/2017 6:57 | 0:06 | KWP/II | 0.846 | 16.009 | System constraint |
| 6/19/2017 7:04 | 0:02 | BS250 | Data is not available | Data is not available | System constraint |
| 6/19/2017 7:04 | 0:03 | KWP/II | 0.429 | 16.175 | System constraint |
| 6/19/2017 7:13 | 0:02 | BS250 | Data is not available | Data is not available | System constraint |
| 6/19/2017 7:44 | 0:01 | BS250 | Data is not available | Data is not available | System constraint |
| 6/19/2017 7:52 | 0:02 | BS250 | Data is not available | Data is not available | System constraint |
| 6/19/2017 7:53 | 0:01 | KWP/II | 0.017 | 13.191 | System constraint |
| 6/19/2017 9:34 | 0:05 | BS250 | Data is not available | Data is not available | System constraint |
| 6/19/2017 9:35 | 0:04 | KWP/II | 0.284 | 9.929 | System constraint |
| 6/19/2017 9:54 | 0:38 | KWP/II | 3.411 | 17.772 | System constraint |
| 6/19/2017 10:06 | 0:26 | BS250 | Data is not available | Data is not available | System constraint |
| 6/19/2017 11:26 | 0:01 | BS250 | Data is not available | Data is not available | System constraint |
| 6/19/2017 11:26 | 0:02 | AWE | 0.073 | 20.993 | System constraint |
| 6/19/2017 11:26 | 0:04 | KWP/II | 0.083 | 6.951 | System constraint |
| 6/19/2017 11:33 | 0:06 | KWP/II | 0.185 | 7.318 | System constraint |
| 6/19/2017 11:43 | 1:36 | BS250 | Data is not available | Data is not available | System constraint |
| 6/19/2017 11:44 | 0:04 | KWP/II | 0.080 | 6.064 | System constraint |
| 6/19/2017 11:50 | 0:05 | KWP/II | 0.052 | 8.129 | System constraint |
| 6/19/2017 12:04 | 0:03 | KWP/II | 0.074 | 11.208 | System constraint |
| 6/19/2017 12:14 | 0:06 | KWP/II | 0.096 | 10.863 | System constraint |
| 6/19/2017 12:28 | 0:51 | KWP/II | 7.074 | 14.410 | System constraint |
| 6/19/2017 12:47 | 0:22 | AWE | 0.890 | 20.250 | System constraint |
| 6/19/2017 13:22 | 0:43 | BS250 | Data is not available | Data is not available | System constraint |
| 6/19/2017 13:22 | 0:08 | KWP/II | 0.118 | 7.235 | System constraint |
| 6/19/2017 13:31 | 0:19 | KWP/II | 0.810 | 7.957 | System constraint |
| 6/19/2017 13:35 | 0:01 | AWE | 0.000 | 19.997 | System constraint |
| 6/19/2017 13:51 | 0:03 | KWP/II | 0.023 | 5.107 | System constraint |
| 6/19/2017 13:55 | 0:07 | KWP/II | 0.091 | 4.424 | System constraint |
| 6/19/2017 14:25 | 0:01 | BS250 | Data is not available | Data is not available | System constraint |
| 6/19/2017 14:42 | 0:05 | BS250 | Data is not available | Data is not available | System constraint |
| 6/19/2017 14:43 | 0:04 | KWP/II | 0.065 | 10.160 | System constraint |
| 6/19/2017 15:50 | 0:01 | BS250 | Data is not available | Data is not available | System constraint |
| 6/19/2017 18:21 | 0:11 | KWP | 0.243 | 18.167 | System constraint |
| 6/19/2017 18:35 | 1:23 | KWP | 8.568 | 24.329 | System constraint |
| 6/19/2017 20:03 | 0:12 | KWP | 0.250 | 17.643 | System constraint |
| 6/19/2017 20:20 | 0:15 | KWP | 0.847 | 20.528 | System constraint |
| 6/19/2017 20:38 | 0:11 | KWP | 0.487 | 19.822 | System constraint |
| 6/19/2017 20:51 | 0:01 | KWP | 0.007 | 15.429 | System constraint |
| 6/19/2017 20:55 | 1:20 | KWP | 7.032 | 25.618 | System constraint |
| 6/19/2017 22:17 | 0:02 | KWP | 0.018 | 15.665 | Oversupply |
| 6/19/2017 22:21 | 0:03 | KWP | 0.031 | 16.087 | Oversupply |
| 6/19/2017 22:26 | 0:01 | KWP | 0.003 | 15.193 | Oversupply |
| 6/19/2017 22:28 | 0:03 | KWP | 0.015 | 15.465 | Oversupply |



Maui Curtailment Report

| Start Date and Time | Duration | IPP Curtailed | Estimated Curtailed MWH | Peak MW Curtailed | Reasons for Curtailment |
|---------------------|----------|---------------|-------------------------|-----------------------|-------------------------|
| 6/19/2017 23:45 | 0:01 | KWP | 0.002 | 15.136 | Oversupply |
| 6/19/2017 23:52 | 0:11 | KWP | 0.350 | 18.801 | Oversupply |
| 6/19/2017 23:57 | 0:08 | KWP | 0.670 | 15.724 | Oversupply |
| 6/20/2017 0:12 | 0:01 | KWP | 0.010 | 15.722 | Oversupply |
| 6/20/2017 0:26 | 0:03 | KWP | 0.113 | 18.306 | Oversupply |
| 6/20/2017 0:30 | 0:03 | KWP | 0.021 | 11.634 | Oversupply |
| 6/20/2017 0:39 | 0:11 | KWP | 1.043 | 14.751 | Oversupply |
| 6/20/2017 0:53 | 0:02 | KWP | 0.030 | 2.161 | Oversupply |
| 6/20/2017 1:25 | 0:05 | AWE | 0.021 | 20.703 | Oversupply |
| 6/20/2017 1:31 | 0:02 | AWE | 0.010 | 20.600 | Oversupply |
| 6/20/2017 5:15 | 0:01 | KWP | 0.000 | 0.001 | Oversupply |
| 6/20/2017 16:58 | 0:01 | KWP | 0.000 | 0.001 | System constraint |
| 6/21/2017 0:59 | 0:20 | KWP | 1.381 | 16.651 | Oversupply |
| 6/21/2017 2:01 | 0:51 | KWP | 7.417 | 16.493 | Oversupply |
| 6/21/2017 2:36 | 0:09 | AWE | 0.274 | 12.160 | Oversupply |
| 6/21/2017 2:54 | 1:06 | KWP | 14.669 | 20.150 | Oversupply |
| 6/21/2017 3:28 | 0:26 | AWE | 1.251 | 12.570 | Oversupply |
| 6/21/2017 4:02 | 0:39 | KWP | 4.501 | 20.362 | Oversupply |
| 6/21/2017 5:10 | 0:03 | KWP | 0.077 | 10.930 | Oversupply |
| 6/21/2017 6:03 | 1:10 | KWP | 6.492 | 20.159 | Oversupply |
| 6/21/2017 10:58 | 0:17 | KWP | 0.947 | 17.737 | Oversupply |
| 6/21/2017 11:23 | 0:28 | KWP | 1.946 | 17.981 | Oversupply |
| 6/22/2017 2:06 | 2:39 | KWP | 10.547 | 20.595 | Oversupply |
| 6/22/2017 5:00 | 0:27 | KWP | 0.917 | 20.502 | Oversupply |
| 6/22/2017 10:44 | 0:23 | KWP | 1.931 | 18.571 | Oversupply |
| 6/22/2017 11:11 | 0:07 | KWP | 0.298 | 17.952 | Oversupply |
| 6/22/2017 11:32 | 0:17 | KWP | 1.056 | 17.342 | Oversupply |
| 6/22/2017 12:01 | 0:35 | KWP | 2.007 | 19.014 | Oversupply |
| 6/23/2017 0:59 | 0:39 | KWP | 5.347 | 20.551 | Oversupply |
| 6/23/2017 1:42 | 1:03 | KWP | 2.758 | 20.558 | Oversupply |
| 6/23/2017 2:50 | 0:03 | KWP | 0.034 | 18.795 | Oversupply |
| 6/23/2017 3:38 | 1:27 | KWP | 11.725 | 20.400 | Oversupply |
| 6/23/2017 11:36 | 0:05 | KWP | 0.222 | 18.192 | Oversupply |
| 6/23/2017 23:15 | 0:01 | KWP | 0.071 | 17.108 | Oversupply |
| 6/24/2017 0:20 | 0:08 | KWP | 0.307 | 6.843 | Oversupply |
| 6/24/2017 0:55 | 0:07 | KWP | 0.193 | 11.095 | Oversupply |
| 6/24/2017 2:53 | 0:04 | KWP | 0.051 | 13.620 | Oversupply |
| 6/26/2017 18:35 | 0:06 | KWP | 0.195 | 16.734 | System constraint |
| 6/27/2017 0:36 | 0:23 | KWP | 1.377 | 20.588 | Oversupply |
| 6/27/2017 0:37 | 0:03 | AWE | 0.028 | 16.683 | Oversupply |
| 6/27/2017 10:38 | 0:01 | BS250 | Data is not available | Data is not available | Oversupply |
| 6/27/2017 10:42 | 0:01 | BS250 | Data is not available | Data is not available | Oversupply |
| 6/27/2017 10:48 | 0:01 | BS250 | Data is not available | Data is not available | Oversupply |
| 6/27/2017 22:36 | 0:08 | KWP | 0.293 | 20.702 | Oversupply |
| 6/27/2017 23:55 | 0:30 | KWP | 1.697 | 20.708 | Oversupply |
| 6/28/2017 0:24 | 0:04 | KWP | 0.011 | 25.474 | Oversupply |
| 6/28/2017 0:29 | 0:19 | KWP | 0.256 | 26.703 | Oversupply |
| 6/28/2017 0:49 | 0:01 | KWP | 0.003 | 26.219 | Oversupply |
| 6/28/2017 0:53 | 0:06 | KWP | 0.044 | 26.703 | Oversupply |
| 6/28/2017 1:01 | 0:46 | KWP | 0.470 | 27.084 | Oversupply |
| 6/28/2017 1:05 | 0:02 | KWP | 0.010 | 20.708 | Oversupply |
| 6/28/2017 1:09 | 0:22 | KWP | 0.671 | 20.708 | Oversupply |
| 6/28/2017 1:39 | 0:01 | KWP | 0.005 | 20.708 | Oversupply |
| 6/28/2017 2:00 | 3:10 | KWP | 34.412 | 20.708 | Oversupply |
| 6/28/2017 2:43 | 3:00 | KWP | 8.408 | 27.194 | Oversupply |
| 6/28/2017 5:44 | 0:02 | KWP | 0.008 | 20.708 | Oversupply |
| 6/28/2017 5:54 | 0:10 | BS250 | Data is not available | Data is not available | Oversupply |
| 6/28/2017 5:55 | 0:11 | KWP | 0.256 | 20.708 | Oversupply |
| 6/28/2017 7:26 | 0:08 | KWP | 0.112 | 20.708 | System constraint |
| 6/28/2017 7:27 | 0:06 | BS250 | Data is not available | Data is not available | System constraint |
| 6/28/2017 7:40 | 0:43 | KWP | 1.352 | 20.708 | System constraint |
| 6/28/2017 8:20 | 0:03 | BS250 | Data is not available | Data is not available | Oversupply |
| 6/28/2017 9:37 | 5:37 | KWP | 67.973 | 20.708 | Oversupply |
| 6/28/2017 12:04 | 0:54 | AWE | 0.905 | 20.800 | Oversupply |
| 6/29/2017 1:38 | 0:01 | AWE | 0.000 | 0.007 | Oversupply |
| 6/29/2017 2:52 | 0:01 | AWE | 0.000 | 0.013 | Oversupply |
| 6/29/2017 3:15 | 0:01 | AWE | 0.000 | 0.007 | Oversupply |
| 6/29/2017 8:59 | 0:01 | BS250 | Data is not available | Data is not available | Oversupply |
| 6/29/2017 9:02 | 0:24 | KWP | 0.832 | 19.211 | Oversupply |
| 6/29/2017 9:47 | 0:06 | KWP | 0.115 | 19.211 | Oversupply |
| 6/29/2017 9:58 | 0:59 | KWP | 3.638 | 19.211 | Oversupply |
| 6/29/2017 11:17 | 0:01 | BS250 | Data is not available | Data is not available | Oversupply |
| 6/29/2017 11:19 | 4:12 | KWP | 47.422 | 19.211 | Oversupply |
| 6/29/2017 22:19 | 0:01 | AWE | 0.000 | 0.007 | Oversupply |
| 6/30/2017 5:38 | 0:01 | AWE | 0.000 | 0.013 | Oversupply |
| 6/30/2017 10:43 | 0:02 | BS250 | Data is not available | Data is not available | Oversupply |
| 6/30/2017 10:44 | 4:09 | KWP | 43.808 | 19.211 | Oversupply |

Notes:

- Curtailment for Kaheawa Wind Power ("KWP"), Makila Hydroelectric ("MH"), AAAAA Rent-A-Space Maui LTD ("5A"), 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 5A, BS, BS 250 or MH.
- Curtailment signals sent to 5A, 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

June 2017

| Start Date and Time | Duration | IPP Curtailed | Estimated MWh Curtailed | Peak MW Curtailed | Reasons for Curtailment |
|---------------------|----------|---------------|-------------------------|-----------------------|-------------------------|
| 6/1/2017 8:11 | 0:04 | LSR | Data is not available | Data is not available | |
| 6/1/2017 8:32 | 0:15 | LSR | Data is not available | Data is not available | |
| 6/1/2017 9:02 | 0:01 | LSR | Data is not available | Data is not available | |
| 6/1/2017 9:05 | 0:01 | LSR | Data is not available | Data is not available | |
| 6/1/2017 9:17 | 0:02 | LSR | Data is not available | Data is not available | |
| 6/1/2017 9:20 | 0:01 | LSR | Data is not available | Data is not available | |
| 6/1/2017 10:48 | 0:02 | LSR | Data is not available | Data is not available | |
| 6/1/2017 11:00 | 0:01 | LSR | Data is not available | Data is not available | |
| 6/1/2017 11:09 | 0:01 | LSR | Data is not available | Data is not available | |
| 6/8/2017 8:55 | 0:02 | LSR | Data is not available | Data is not available | |
| 6/8/2017 8:58 | 0:20 | LSR | Data is not available | Data is not available | |
| 6/8/2017 9:41 | 0:22 | LSR | Data is not available | Data is not available | |
| 6/8/2017 10:04 | 0:01 | LSR | Data is not available | Data is not available | |
| 6/8/2017 10:17 | 0:03 | LSR | Data is not available | Data is not available | |
| 6/8/2017 10:23 | 0:02 | LSR | Data is not available | Data is not available | |
| 6/8/2017 10:40 | 0:05 | LSR | Data is not available | Data is not available | |
| 6/8/2017 10:46 | 0:14 | LSR | Data is not available | Data is not available | |
| 6/8/2017 11:01 | 0:50 | LSR | Data is not available | Data is not available | |
| 6/8/2017 11:52 | 0:17 | LSR | Data is not available | Data is not available | |
| 6/8/2017 12:10 | 0:02 | LSR | Data is not available | Data is not available | |
| 6/8/2017 12:14 | 0:02 | LSR | Data is not available | Data is not available | |
| 6/8/2017 12:18 | 0:01 | LSR | Data is not available | Data is not available | |
| 6/8/2017 12:23 | 0:03 | LSR | Data is not available | Data is not available | |
| 6/8/2017 12:28 | 0:03 | LSR | Data is not available | Data is not available | |
| 6/8/2017 12:39 | 0:01 | LSR | Data is not available | Data is not available | |
| 6/8/2017 13:12 | 0:01 | LSR | Data is not available | Data is not available | |
| 6/8/2017 13:17 | 0:01 | LSR | Data is not available | Data is not available | |
| 6/8/2017 14:07 | 0:02 | LSR | Data is not available | Data is not available | |
| 6/8/2017 14:12 | 0:01 | LSR | Data is not available | Data is not available | |
| 6/8/2017 14:29 | 0:01 | LSR | Data is not available | Data is not available | |
| 6/8/2017 14:42 | 0:01 | LSR | Data is not available | Data is not available | |
| 6/8/2017 14:55 | 0:01 | LSR | Data is not available | Data is not available | |
| 6/9/2017 15:28 | 0:04 | LSR | Data is not available | Data is not available | |
| 6/13/2017 10:59 | 0:03 | LSR | Data is not available | Data is not available | |
| 6/13/2017 11:11 | 0:03 | LSR | Data is not available | Data is not available | |
| 6/13/2017 11:17 | 0:08 | LSR | Data is not available | Data is not available | |
| 6/13/2017 11:30 | 0:03 | LSR | Data is not available | Data is not available | |
| 6/13/2017 11:34 | 0:02 | LSR | Data is not available | Data is not available | |
| 6/13/2017 11:53 | 0:03 | LSR | Data is not available | Data is not available | |
| 6/13/2017 12:57 | 0:04 | LSR | Data is not available | Data is not available | |
| 6/13/2017 15:14 | 0:11 | LSR | Data is not available | Data is not available | |
| 6/14/2017 10:56 | 0:01 | LSR | Data is not available | Data is not available | |
| 6/15/2017 17:00 | 1:03 | LSR | Data is not available | Data is not available | |
| 6/16/2017 7:31 | 0:07 | LSR | Data is not available | Data is not available | |
| 6/16/2017 9:22 | 0:01 | LSR | Data is not available | Data is not available | |
| 6/16/2017 9:36 | 0:25 | LSR | Data is not available | Data is not available | |
| 6/16/2017 10:17 | 0:42 | LSR | Data is not available | Data is not available | |
| 6/16/2017 13:13 | 0:45 | LSR | Data is not available | Data is not available | |
| 6/22/2017 10:27 | 0:01 | LSR | Data is not available | Data is not available | |
| 6/23/2017 8:14 | 0:01 | LSR | Data is not available | Data is not available | |
| 6/23/2017 8:19 | 0:13 | LSR | Data is not available | Data is not available | |
| 6/23/2017 8:33 | 0:43 | LSR | Data is not available | Data is not available | |
| 6/23/2017 9:21 | 0:32 | LSR | Data is not available | Data is not available | |
| 6/23/2017 10:17 | 0:22 | LSR | Data is not available | Data is not available | |
| 6/23/2017 10:52 | 0:39 | LSR | Data is not available | Data is not available | |
| 6/27/2017 9:21 | 0:01 | LSR | Data is not available | Data is not available | |
| 6/27/2017 9:23 | 1:13 | LSR | Data is not available | Data is not available | |
| 6/27/2017 10:42 | 3:57 | LSR | Data is not available | Data is not available | |
| 6/27/2017 17:11 | 0:01 | LSR | Data is not available | Data is not available | |
| 6/27/2017 17:22 | 0:33 | LSR | Data is not available | Data is not available | |
| 6/28/2017 6:40 | 2:37 | LSR | Data is not available | Data is not available | |
| 6/28/2017 11:47 | 0:01 | LSR | Data is not available | Data is not available | |
| 6/28/2017 12:51 | 0:04 | LSR | Data is not available | Data is not available | |
| 6/29/2017 6:48 | 0:06 | LSR | Data is not available | Data is not available | |
| 6/29/2017 6:59 | 0:12 | LSR | Data is not available | Data is not available | |
| 6/29/2017 8:13 | 0:03 | LSR | Data is not available | Data is not available | |
| 6/29/2017 9:30 | 0:02 | LSR | Data is not available | Data is not available | |
| 6/29/2017 9:40 | 0:02 | LSR | Data is not available | Data is not available | |
| 6/29/2017 9:44 | 0:01 | LSR | Data is not available | Data is not available | |
| 6/29/2017 9:48 | 0:03 | LSR | Data is not available | Data is not available | |
| 6/29/2017 12:26 | 0:07 | LSR | Data is not available | Data is not available | |
| 6/29/2017 13:25 | 0:08 | LSR | Data is not available | Data is not available | |
| 6/29/2017 13:34 | 0:09 | LSR | Data is not available | Data is not available | |
| 6/29/2017 13:44 | 0:02 | LSR | Data is not available | Data is not available | |
| 6/29/2017 13:48 | 0:15 | LSR | Data is not available | Data is not available | |
| 6/30/2017 17:28 | 0:20 | LSR | Data is not available | Data is not available | |

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 June 2017

| Start Date/Time | MW Output Prior to Start of Curtailment | End Date/Time | MW Output After Curtailment Released ¹ | IPP | Reason for Curtailment |
|-----------------|---|----------------|---|--------|------------------------|
| 06/15/17 09:10 | 0.8 MW | 06/15/17 10:56 | 0.0 MW | TGUH11 | System constraint |
| 06/15/17 13:27 | 0.7 MW | 06/15/17 15:22 | 0.0 MW | TGUH11 | System constraint |

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.

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(Docket No. 2011-0206)

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