



Hawaiian Electric Company

**N E W S • R E L E A S E**

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### **Maui and Big Island utilities file October earthquake outage reports**

(Honolulu, HI) – Maui Electric Company (MECO) and Hawaii Electric Light Company (HELCO) today submitted to the Hawaii Public Utilities Commission (PUC) their reports on the investigation of the October 15, 2006 earthquake power outages and restoration on Maui and the Big Island.

The investigation consultants, POWER Engineers, Inc. of Hailey, Idaho, concluded that MECO and HELCO actions prior to and during the outages were “reasonable, responsible and in the public interest.” The consultants also made some primarily technical recommendations regarding each island’s electric systems to address some of the conditions encountered on October 15.

In summary, POWER Engineers concluded:

- The MECO and HELCO systems were in proper operating condition and appropriately staffed at the time that the earthquake struck. The earthquake was the direct and proximate cause of the outages, causing vibration sensors to trip Maalaea units 14 and 16 on Maui, and tripping relays which separated a portion of the transmission system from the rest of the grid on the Big Island. This set in motion a series of events (through the operation of automatic relays and through operators’ actions to protect the equipment) which resulted in loss of generation that eventually led to the system shutdown on Maui and a power outage initially affecting about 81% of customers on the Big Island.
- In POWER Engineers’ opinion, MECO and HELCO personnel reacted to the circumstances in a reasonable, responsible and professional manner. They applied their training and experience in reacting properly to the changing system conditions based on the system configuration and on established company operating practices to attempt to prevent an island-wide outage and to restore power as quickly as practical.
- In the restoration, MECO operated reasonably and in the public interest by following a systematic, orderly and methodical approach to add customer load to the system as quickly as generators could be started and connected. Similarly, for HELCO, the system restoration plan developed by the operations staff was prioritized, reasonable and well executed.

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POWER Engineers' specific recommendations for MECO include evaluating emergency power systems for internal communications systems (an action begun by MECO soon after the outage); assessing possible streamlining of the communication protocols between the dispatch center and the individual power plants; and evaluating an upgrade of the system frequency and voltage recording equipment to allow for more data capture. The consultants also recommended that MECO assess automating the process of opening breakers to prepare the transmission and distribution system for black starting.

For HELCO, recommendations include evaluating protective relays, fuses and level indicators for possible alternatives that are less likely to operate improperly during seismic events and assessing improvements to prevent potential failure of the internal paging/text messaging system, although this was not a limiting factor during the October outage.

### Comparison of HECO, HELCO and MECO outages and restoration

In a supplemental report comparing the Hawaiian Electric Company (HECO), HELCO and MECO earthquake outages and restoration, POWER Engineers noted that the initial events on the HELCO system differed from events on the HECO and MECO systems.

On Hawaii Island, where the seismic activity was closest and strongest, the earthquake immediately tripped relays at transmission substations which separated the island's transmission system, turning off power to customers on the island's west side. This substantial reduction in system load caused available generation to exceed customer load on the east side, resulting in trips of several generators and automatic load shedding that enabled the system to stabilize and retain a sector or "island" of power online in the east.

By contrast, the transmission systems on Maui and Oahu remained intact during the earthquake. Instead, the earthquake caused generators to go offline, resulting in customer load that exceeded available generation. In both the Maui and Oahu cases, the rapidly declining frequency on the electric system -- despite rapid load shedding -- led to loss of the remaining generators and the island-wide blackouts.

POWER Engineers noted it was difficult to make meaningful comparisons amongst the restoration times for the three utilities because of differences in the size and characteristics of each electric system and the events that transpired on each island. HECO serves about five times as many customers as MECO and four times as many as HELCO. Also, the fact that HELCO did not experience an island-wide outage meant the utility did not have to black-start the electric system. At the same time, restoration for a small percentage of HELCO customers was delayed because repairs at substations and for some power lines could not be made earlier because road closures blocked access for the trouble crews.

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Because of the smaller size of their customer bases, the MECO and HELCO generating fleets are mainly diesel engines and combustion turbines versus primarily steam units on Oahu. Although the diesels and combustion turbines can be started faster, they are less economical than the larger steam units for serving around-the-clock base loads on the larger Oahu system. These factors all contributed to the longer total outage on Oahu (on Hawaii Island, substantially all customers were restored by 12:45 p.m. (with less than 2% which couldn't be restored until about 11 p.m. due to blocked roads) versus 2:32 p.m. on Maui and 1:55 a.m. the next morning on Oahu).

POWER Engineers concluded that "operations personnel on all three systems responded in an appropriate and professional manner to protect equipment and prevent system-wide collapse where possible." In addition, considering the different factors contributing to the varying restoration times on each island, "there were no discernable delays in restoring power to the HECO system compared to the HELCO and MECO systems."

The MECO and HELCO outage reviews, along with a similar report filed in December 2006 for HECO on the Oahu island-wide outage, are part of a formal PUC investigative docket about last October's earthquake outages. Immediately following the October 15 outage, HECO committed to do a full investigation of the outage using the services of an outside industry-expert firm. Subsequently, the Division of Consumer Advocacy asked the PUC to open a formal investigative docket. The PUC did initiate an investigation on October 27, 2006. This formal investigative docket is expected to continue through the Fall 2007.

Copies of the MECO and HELCO POWER Engineers reports as well as External Communications reports prepared for both companies will be posted on [www.heco.com](http://www.heco.com) and copies will be available for review at MECO and HELCO customer service locations.

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