

CA-IR-1

**Ref: HECO T-1, Page 13.**

Mr. Joaquin states that “the 138 kV Underground Alternative is the best alternative to fully address all the transmission problems effectively in the long-term, but not in the near term due to the estimated time to implement (2010).”

- a. Is HECO presently taking any action to pursue this option either now or in the future? Explain.
- b. Please explain how installing the 46 kV upgrades in the instant docket meets or exceeds the transmission needs for the near term and why installation of a 138 kV underground transmission infrastructure is not viable in the near term? Explain and provide copies of all documentation supporting the response.
- c. How long does HECO anticipate it will be before additional 138 kV improvements are required based on current load projections? Provide copies of all documentation supporting the response.

**HECO Response:**

- a. HECO is not presently taking any action to pursue the 138kV Underground Alternative now or in the future. As stated in HECO T-1 (pages 11-16), an Executive Team was formed and given the responsibility to select an alternative to pursue and present in its application to the PUC to resolve the Koolau/Pukele Line Overload, the Downtown Line Overload, the Pukele Substation Reliability and the Downtown Substation Reliability concerns. The Executive Team evaluated the major factors surrounding the alternatives, which included the effectiveness, timeliness, construction and other impacts, and public sentiment for the project, and the Executive Team selected the Kamoku 46kV Underground Alternative – Expanded and recommended that it be implemented in two phases.

The Kamoku 46kV Underground Alternative – Expanded is adequate in addressing the four transmission problems identified above for the 20-year period studied (2003-2022). If the project is installed and the Honolulu Power Plant continues to operate, there are no

identified problems that could require the installation of the 138kV Underground Alternative. (HECO's long-term integrated resource plan covering the years 2006-2025 is currently being studied in HECO's IRP-3 process. Because of past generation asset management studies and recent technical information obtained through recent overhauls of Honolulu 8 and Honolulu 9, among the base assumptions of HECO's IRP-3 is that the Honolulu Power Plant will continue to operate through 2025.)

- b. The advantage of the Kamoku 46kV Underground Alternative - Expanded is that it can be installed sooner, although the duration of its effectiveness is not as long as that of the Kamoku-Pukele 138kV Underground Alternative and, therefore, reduces the amount of time that HECO is at risk of an overload situation on the Koolau/Pukele lines. Refer to HECO T-4 (pages 56-63). The schedule and schedule uncertainty for the Kamoku-Pukele 138kV Underground Alternative are addressed at length in other testimonies (HECO T-6, pages 7-12) and exhibits (HECO-602, pages 2-19; HECO-801). The consideration of these factors in the selection of the 46kV Phased Project was also addressed in the testimonies (for example, HECO T-1, pages 12-17, and HECO T-6, pages 21-22) and in the Application (for example, pages 26-27).

Phase I of the Kamoku 46kV Underground Alternative – Expanded is adequate to reduce the Koolau/Pukele line overload situation by mid-2007, as stated in HECO ST-6 (page 5). Phase I also defers the Downtown Overload Situation for several years beyond the 20-year planning period if the Honolulu Power Plant continues to operate. With the installation of Phase II, the Pukele Substation and Archer Substation Reliability concerns are addressed in early 2009 (although some customers served by the Pukele Substation would still incur a 6-second outage if the second Koolau-Pukele 138kV transmission line

experienced a forced outage while the first Koolau-Pukele 138kV line was out for maintenance).

From an engineering standpoint, the Kamoku-Pukele 138kV Underground Alternative is the best long-term solution for solving all of the transmission overloads and reliability concerns, as stated in HECO T-1 (pages 10-11) and Exhibit 5 (page 8). It is estimated that this alternative could be implemented in 2010 with the use of the High Pressure Fluid Filled (“HPFF”) technology. (Refer to HECO T-6, page 12.) Thus, there is a vulnerability period to the Koolau/Pukele Overload Situation (starting in 2005) if this alternative was to be implemented.

- c. In response to this question, HECO is assuming the question is referring to 138kV improvements to address the Koolau/Pukele Line Overload and the Downtown Overload concerns, which are based on HECO’s August 2002 load forecast. Exhibit 5 and Exhibit 6 of the Application are the planning studies which reviewed the effectiveness of the Kamoku 46kV Underground Alternative – Expanded. The studies covered a 20-year period from 2003-2022. Based on the analysis, the Kamoku 46kV Underground Alternative – Expanded effectively resolved the Koolau/Pukele Overload Situation for the period studied, which was from 2003-2022. Beyond the 20-year period, additional actions such as utility and 3<sup>rd</sup> party CHP in addition to what has been forecasted, additional DSM, reconductoring and the addition of transmission facilities on the 138kV system (not necessarily the 138kV Underground Alternative) may be required, depending on the rate of load growth for East Oahu substations and other factors such as the retirement of the Honolulu Power Plant. As stated in HECO T-4 (page 59), the Kamoku 46kV Underground Alternative – Expanded will not resolve the Downtown Overload Situation in the event that the Honolulu Power Plant is

retired or cannot operate. However, HECO does not have plans to retire the Honolulu Power Plant, as stated in HECO T-4 (page 26).

The Downtown Overload is forecasted to occur near the end of the 20-year planning period with the Honolulu Power Plant in service. As stated on page 3-44 of HECO's draft Environmental Assessment for the Kamoku 46kV Underground Alternative – Expanded, HECO is monitoring the situation and if the Downtown Overload Situation continues to develop as projected, HECO could create the flexibility with minor circuit modifications, on the 46kV system, in addition to the installation of the Kamoku 46kV Underground – Expanded Alternative to shift additional load to the Pukele Substation when one of the 138kV transmission lines feeding the Downtown Substations is taken out of service for maintenance, which could further defer the line overload situation for up to a few years. Therefore, 138kV improvements to address the Downtown Overload with the Honolulu Power Plant in service is not anticipated for the 20-year period studied from 2003-2022.

If the Honolulu Power Plant is retired or cannot operate, the Downtown Line Overload Situation is forecasted to occur beginning in 2006. Additional improvements such as reconductoring and/or addition of transmission facilities on the 138kV system may be required in this instance. However, HECO does not have plans to retire the Honolulu Power Plant, as stated in HECO T-4 (page 26). In addition, the long-term integration resource plan covering the years 2006-2025 is currently being studied in HECO's IRP-3 process, to which the CA is a participant in the Technical Committees and on the Advisory Group, and the base assumption is that the Honolulu Power Plant will continue to operate.