

CA-IR-19

Ref: T-4, Pages 81 and 82 (DG at HELCO Substation Sites).

Did HECO consider other generation options such as installing larger generators at HECO substations? Specifically, did HECO consider:

- a. Installing a combustion turbine at a single site?
 1. If yes, please provide copies of all documentation and/or analysis performed together with an explanation as to why this option is not being pursued.
 2. If no, please explain why not.
- b. Installing smaller combustion turbines at multiple substation sites?
 1. If yes, please provide copies of all documentation and/or analysis performed together with an explanation as to why this option is not being pursued.
 2. If no, please explain why not.
- c. Installing larger (larger than 1 MW) diesel generators at multiple sites?
 1. If yes, please provide copies of all documentation and/or analysis performed together with an explanation as to why this option is not being pursued.
 2. If no, please explain why not.

HECO Response:

- a. No, installing a combustion turbine (“CT”) at a single HECO substation was not evaluated. Characteristics such as land space and unit costs, make this alternative prohibitive. In addition, noise level and air permitting issues may preclude the installation of a CT at a substation. The DG evaluation in Appendix C of Exhibit 6 provides some of the details on the various requirements that must be met to install DG at the HECO substations and, therefore, selection of a 1 MW diesel in a self contained 8’ x 40’ trailer was the generator used for the analysis. Sensitivities were done to incorporate developing technologies, however, the conclusion is the same. Some HECO sites could support DG at the

substations, however, the amount of DG that can be installed does not meet the minimum amount required to resolve the Koolau/Pukele Line Overload Situation.

If HECO were to hypothetically consider a CT, the CT would be required at one of the HECO substations in the East Oahu Area. An evaluation of the land available at HECO substations in the East Oahu Area is included in Appendix C of Exhibit 6 to the Application. Each site was evaluated for its ability to accommodate an 8' x 40' shipping-type container (64 square feet and a set back of 23 feet from the substation fence in order to comply with the Community Noise Control levels, based on the site zoning, at the property/fence line and taking into account existing substation facilities such as control buildings, switchgear and transformers. Half of the candidate substations (23 of the 46 substation sites) were eliminated due to lack of space to accommodate a 64 square feet trailer. For the remaining substations, the maximum amount of DG units at each substation site was determined based on the permitted noise levels, which would be measured at the fence line. The maximum amount of units that could be installed at one HECO substation site was three 1 MW 64 square foot units. Appendix I of Docket No. 99-0004 (MECO IRP-2), filed with the Commission on May 31, 2000, contains unit information sheets for a General Electric LM2500 CT on page I-110. The minimum land requirements specified for the CT is 2.3 acres or 100,188 square feet, which is well above the 192 square feet available at the Moiliili Substation, which is one of the substations that could accommodate three 1 MW diesel units. In addition, the GE LM2500 is rated at 21.46 MW gross and the estimated cost to install the unit is \$31.46 million. In order to defer the Koolau/Pukele Line Overload, approximately 47MW for the base case and 52 MW for the high load forecast case of generation would need to be installed at HECO Substations. Refer to HECO-407. Therefore, based on

information from HECO IRP-2, three CT units would be required to resolve the Koolau/Pukele overload, which would require over 300,000 square feet of space (which is not available) and the approximate cost, without considering additional 46kV and 138kV lines to distribute the power, would be over \$90 million dollars.

- b. HECO did not consider installing smaller CTs at multiple substation sites. Minimum land requirements and costs have not been developed in any of the HECO, MECO or HELCO IRP analysis for a small CT, however, it is expected that if the data were available, similar reasons such as space and costs would prohibit the installation of smaller CT units from addressing the Koolau/Pukele Overload Situation.
- c. No, larger diesel generators at multiple sites was not evaluated. The DG evaluation in Appendix C of Exhibit 6 provides some of the details on the various requirements that must be met in order to install DG at HECO substations and, therefore, selection of a 1 MW diesel in a self contained 8' x 40' trailer was selected as the generator to use for the analysis. In a hypothetical situation where a larger diesel generator was used for the analysis, a larger generator would probably increase the size of the trailer, which would decrease the number of installed DG units. The result is the same, that DG at HECO substations is not able to resolve the Koolau/Pukele Line Overload Situation.