

Data Consolidation and Model Feasibility Analysis on the Island of Maui

Prepared for the

**U.S. Department of Energy
Office of Electricity Delivery and Energy Reliability**

**Under Award No. DE-FC-06NT42847
Task 5 Deliverable –
Letter Report on Data Consolidation and
Model Feasibility Analysis
on the Island of Maui**

By

**GE Global Research
Niskayuna, New York**

And

**University of Hawaii
Hawaii Natural Energy Institute
School of Ocean and Earth Science and Technology**

June 2008

Acknowledgement: This material is based upon work supported by the United States Department of Energy under Award Number DE-FC-06NT42847.

Disclaimer: This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

Introduction

Adequate modeling of the Maui Electric Company (MECO) grid is an essential first step of the work needed to investigate grid operation with a high content of as-available energy. This deliverable outlines the data requested by GE Global Research (GE) and data submitted by MECO to develop transient performance and production cost models of the MECO system.

In this task, GE has confirmed the feasibility of developing system models that can be used for future state analysis. The GE team would like to begin analyzing the data and submit a subsequent data request to MECO based on the data already received.

Task 6: Data Consolidation and Preliminary Model Feasibility Analysis on the Island of Maui

A kick-off meeting for Tasks 6 through 10 was held on January 31st. This meeting was attended by the Hawaii Natural Energy Institute, Hawaiian Electric Company (HECO), MECO, and GE.

After receipt of the primary power flow and production cost databases, from MECO, detailed in Appendix 1, a two-day meeting was held on March 31st and April 1st. This meeting was held to discuss the data submitted by HECO and MECO, modeling assumptions, MECO's current and planned system capabilities, operating rules and nuances (unit commitment, spinning reserve requirements, etc), and other relevant items, and to familiarize GE with MECO's generation assets and to familiarize MECO with GE's models. The objective of this task was to identify missing data and evaluate the adequacy of the available data for the modeling activity. Based on the data delivered by MECO to GE, GE was comfortable with the data and believes sufficient data is available to initiate Task 7.

NOTE: MECO/HECO agreed with the GE recommendations and approve release of HECO cost-share funding for Task 7.

Appendix 1– List of Data Provided to GE

The following folders have been provided by HECO/MECO:

AGC Data – McNeff

This folder contains AGC block diagrams, unit-by-unit ramp rates, KWP curtailment amounts, reasons and timing

HC&S Production Data – Reynolds

This folder contains 2007 and 2008-present hourly HC&S production data and financials, and information about the dispatch, droop settings and units at HC&S.

High-Fidelity Wind Data – Reynolds

This folder contains 2-second KWP data for 2007 and 2008-present.

LoadFlow & Transmission Planning – Matsuura

This folder contains the PSSE load flow, transmission planning criteria and single line diagrams for the MECO system.

Planned Generation & Commitment Order – Matsuura

This folder contains the system data for the March 15th fault, unit parameters (unit limits), and unit commitment order.

PPAs – McNeff

This folder contains the avoided cost filings and power purchase agreements for KWP, HC&S and Makila.

Production Cost – McNeff

This folder contains the power supply reports, Maalaea emissions, unit-by-unit heatrate curves, Pmonth database, fuel use, MECO IRP, and a document describing the challenges of operating the MECO system.

Wind Power – Reynolds

This folder contains 2-sec KWP wind power data, aligned with frequency, load and production for six days in 2007.

Governor Responses and System Event Data – Yau

This folder contains the governor responses from a few units and the system data from the March 15th event. A list of contingencies was also received.