BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF HAWAII

In the Matter of the Application of	)	
	)	
MAUI ELECTRIC COMPANY, LIMITED	)	Docket No. 2006-0387
	)	
For Approval of Rate Increases and Revised Rate Schedule and Rules	)	
	)	

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MECO
2007 TEST YEAR

DIRECT TESTIMONIES AND EXHIBITS

Book 2 of 5

February 23, 2007

MECO T-2
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TESTIMONY OF
JOANNE A. IDE

SUPERVISOR, INTEGRATED RESOURCE PLANNING/
CUSTOMER EFFICIENCY PROGRAMS DIVISION
CUSTOMER SERVICE DEPARTMENT
MAUI ELECTRIC COMPANY, LIMITED

Subject: Electricity Sales and Average Number of Customers

INTRODUCTION

Q. Please state your name and business address.

A. My name is Joanne A. Ide and my business address is 210 West Kamehameha Avenue, Kahului, Maui, Hawaii.

Q. By whom are you employed and in what capacity?

A. I am employed by Maui Electric Company, Limited ("MECO") as the Supervisor of the Integrated Resource Planning and Customer Efficiency Programs Division in the Customer Service Department. My experience and educational background are listed in MECO-200.

Q. What is the scope of this testimony?

A. In this testimony, I will cover MECO's test year estimates of megawatt-hour sales and average number of customers for Maui, Lanai, and Molokai Divisions individually and MECO consolidated.

TEST YEAR MEGAWATT-HOUR SALES AND AVERAGE NUMBER OF CUSTOMERS

Q. What is the 2007 test year estimate of megawatt-hour ("MWh") sales?

A. The 2007 test year estimate of megawatt-hour sales is:

	2007 Test Year (MWh)
Maui Division	1,212,929
Lanai Division	29,779
Molokai Division	36,548
MECO Consolidated	1,279,256

The test year sales forecast by rate schedule is shown in MECO-201.

Q. What is the 2007 test year estimate of average number of customers?

A. The 2007 test year estimate of average monthly number of customers is:

	2007 Test Year
Maui Division	60,694
Lanai Division	1,606
Molokai Division	3,141
Total	65,441

The test year customer forecast by rate schedule is shown in MECO-201.

Q. What sales forecast is the test year sales estimate based upon?

A. The test year sales estimate is based on MECO's 2006-2011 Sales and Peaks Forecast, adopted in July 2006 ("July 2006 Forecast"). (See MECO-WP-201a)

Q. What are the major topics of discussion in your testimony on test year sales and customers?

A. To support the test year estimates of sales and customers, I will:

1) describe the forecasting process,
2) describe the underlying assumptions used including the economic outlook for the test year,
3) describe the forecast methods used in the derivation of the sales and customers forecasts,
4) discuss adjustments and normalizations made,
5) discuss the sales and customer forecasts, by division, by rate schedule, and
6) discuss the accuracy of previous forecasts.

Forecasting Process

Q. How was MECO's July 2006 Forecast developed?

A. The development of the July 2006 Forecast started in March 2006 with the identification of key assumptions such as the economic outlook, the identification of customers undergoing major changes, and future projects. A comprehensive

review of the historical and forecasted data series was undertaken. The identification and execution of appropriate forecasting models and methods followed. A draft forecast was developed and subjected to multiple levels of review before approval.

Q. Who was responsible for identifying the key elements that drive the forecast, collecting the data, executing the models, and ultimately developing the draft forecast?

A. Members from the Forecast Planning Subcommittee ("FPSC") are responsible for developing the data or a component of the forecast. However, MECO's Customer Service Department was primarily responsible for this work.

Q. Who comprises MECO's FPSC?

A. The FPSC is comprised of employees from the following MECO and Hawaiian Electric Company, Inc. ("HECO") departments and divisions: 1) MECO Customer Service; 2) MECO Engineering; 3) MECO Power Supply; 4) MECO Accounting; 5) HECO Forecasts and Research Division; 6) HECO Generation Planning Division; and 7) HECO Energy Projects Department. The FPSC members are involved in the day-to-day operations within their respective fields. They provide the information, knowledge and experience at a working group level to support the development of the forecast.

Q. Does the draft forecast undergo a review?

A. Yes. The draft forecast undergoes multiple levels of review to ensure that the forecast receives maximum exposure and evaluation. The first level of review is conducted by the FPSC. The FPSC evaluates the draft forecast from a technical standpoint, recommends adjustments as needed, then forwards the forecast to the Forecast Planning Committee ("FPC").

Q. Who comprises MECO's FPC?

A. The FPC consists of seven members. Six members from MECO include the President, and Managers of Accounting, Customer Service, Engineering, Power Supply, and Transmission & Distribution. The seventh member is the Director of HECO's Forecasts and Research Division, who provides technical assistance to the forecasting process, particularly in the area of economic, end-use, and peak forecasting models.

Q. Does the general public have input into the development of the forecast?

A. Yes. An important component of the forecast process is to gather input directly from customers and community and business sectors as a whole. This is done through one-on-one meetings with key customers as well as through MECO's annual "Outlook on the Maui Economy Meeting", which was held on May 8, 2006. The Outlook meeting brings together MECO's Integrated Resource Planning ("IRP") Advisory Group as well as additional individuals within Maui County's key industries such as developers, visitor industry, real estate, and agriculture, to name a few, to provide input into the economic model as well as validate the output of short term forecasts.

<u>Underlying Economic Assumptions</u>

Q. What are the underlying economic assumptions for the 2007 test year sales and customer forecast?

A. During the preparation of the July 2006 Forecast, the overall outlook for the state was for moderately strong growth in the near term, with tourism, construction, and non-tourism services all contributing. (See MECO-WP-201) Since then, several local economists have adjusted their projections downward for job growth and income and suggested that the six-year run of economic growth is winding down.

Many factors contribute to this adjustment such as a tightening labor market, slowdown in the pace of real estate sales, lower visitor growth, rising concerns about inflation and a possible slow down of the U.S. economy. (See MECO-WP-202)

Q. What is the outlook for the tourism industry on Maui?

A. Over the longer term, the aging U.S. and Japanese population, along with local development constraints, will bring lower average growth rates for tourism on Maui, and for the overall local economy. The August 2006 Blue Chip Economic Consensus forecasts expect the economic growth for both the U.S. and Japanese economies to remain strong in 2006, followed by somewhat moderate growth in 2007. The Federal Reserve has begun to express rising concerns about inflation risks, signaling that further interest rate hikes are likely. Financial markets have reacted negatively to this, with stock markets recently giving up most of their year to date gains. Slowing tourism growth may represent an indirect reaction to rising energy costs. Although rising energy costs are often a pass through to consumers, it could affect discretionary luxury goods like leisure destination travel.

Maui will be adding a few new accommodations in the late 2008-2010 time frame. However, in the near term, hotel room inventory may pose a problem as hotels such as the Renaissance Wailea (345 rooms)and Kapalua Bay Hotel (210 rooms) are demolished in order to make way for new properties. Other properties such as the Maui Marriott's Ocean Club are being converted to time-shares or condo units which result in a reduction in hotel room inventory. (See MECO-WP-203)

Q. What is the outlook for the construction industry on Maui?

A. Construction continues on a growth path with residential projects being one of the economy's hottest sectors as supply tries to catch up with demand. The challenge

for Maui builders and developers, as with other sectors, is finding qualified workers in the skilled building trades. Another challenge is the length of time it takes to receive a permit or go through the entitlement process. Despite these challenges, many projects are already in the building phase in Central, South and West Maui as shown in MECO-202.

Q. Despite the favorable outlook for the local economy, are there possible hurdles that may dampen economic growth?

A. Yes. Low interest rates have been the catalyst for much of the local economic strength. Interest rates have been increasing as inflationary pressures increase. Also, crude oil prices have hit never seen before highs, exceeding $78 per barrel in mid-July 2006 and currently settling in the $60's. (See MECO-WP-204) Many economists fear that high energy prices and the likelihood of higher interest rates are already beginning to cool off the U.S. and local economy. Locally, higher fuel prices have an impact by increasing the cost of transportation and electricity prices. (See MECO-WP-202)

Q. How does the economic outlook affect MECO's sales and customer forecast?

A. The economic outlook affects expectations for the forecast as electricity sales and number of customer are generally related to economic activity.

Q. What other sources of information support the expectation of economic growth for Maui County?

A. In addition to economic indicators and forecasts compiled by economists, MECO's own historical customer and electricity usage series indicate slower growth rates as compared to the last few years. (See MECO-203, MECO-204, MECO-205)

MECO's projections for future projects obtained from requests for electric

service show additional new projects and start dates. (See MECO-202) These projections are a more reliable measure of construction activity over building permits since authorizations don't necessarily translate into activity. Another supporting source is information obtained directly from customers, developers, contractors and other trade allies. Further, there is no substitute for being able to see for ones' self on a daily basis the economic activities manifesting in the amount of tourist on the island, increase in traffic, and new commercial and residential construction projects. This hands on observation helps to validate the forecast.

Forecast Methodologies

Q. What methodologies were considered in the preparation of the 2007 test year sales estimates?

A. Five methodologies were considered in the preparation of MECO's forecasts.

1) Time series analysis,
2) Econometric analysis,
3) Residential end-use analysis,
4) Market analysis, and
5) Customer Service analysis.

Q. What is time series analysis?

A. Time series analysis refers to analyzing data associated with a sequential series of data over a period of time. The data analyzed included historical monthly electricity sales and number of customers for each rate schedule. Specific time series models considered included ARIMA (Box-Jenkins) and linear exponential smoothing.

Q. What is econometric analysis?

A. Econometric analysis relies on econometric models, which relate a variable such as electricity sales to economic or other variables such as resident population, personal income, or cooling degree-days.

Q. What is residential end-use analysis?

A. The residential end-use analysis examines the residential customer energy consumption at the appliance or "end-use" level. The analysis looks at appliance saturation in the market place, the energy consumption of the individual appliances, and considers exogenous variables such as the price of energy, personal income, efficiency standards and population growth.

Q. What is the Market Analysis methodology?

A. The Market Analysis is based on analysis of the market conditions influencing the different rate schedules with special emphasis on customer-by-customer accounting of loads in Large Power Schedule P. Market analysis is the primary accepted forecasting method for Schedule P because the relatively small number of large power customers allows for in depth customer-by-customer analysis. Market analysis for Schedule P consists of identification of known or expected changes in each customer's consumption attributable to factors such as adjustments in a customer's demand load or operating characteristics, energy efficiency, added load and new construction.

Also considered were influences on Residential Schedule R, including new construction outlook for multi-family individual metered units and single family residential developments.

Q. What is the Customer Service Analysis methodology?

A. The Customer Service Analysis is based on judgmental analysis and considerations of area growth based on day-to-day working knowledge of

customers, customer billing data, and other customer-related factors that affect MWh sales and the customer count from month to month. Although judgmental, this type of analysis addresses the factors that affect smaller segments of the service areas such as Lanai and Molokai, thereby minimizing the margin of error in the two-year to three-year short-term forecasting horizon.

Q. Are the same methodologies used to develop the electric sales and customer forecasts for Maui, Lanai, and Molokai?

A. Yes. All five methodologies are considered for developing the electric sales and customer forecast for Maui, Lanai, and Molokai. However, due to the smaller size of Lanai and Molokai's customer base and less diversified economies, the analysis is conducted in a less rigorous manner than Maui's.

Q. Can you provide an example where Lanai and Molokai's analysis is conducted in a less rigorous manner than for Maui?

A. The econometric analysis for Lanai and Molokai are typically run as the whole system and not by individual rate schedules as is done with Maui.

Q. Are utility DSM programs included in the test year sales estimates?

A. Yes. The test year sales estimates are adjusted to include the future impact of MECO's four currently approved DSM programs ("future DSM") (Commercial and Industrial Customized Rebate Program, Docket No. 95-0142; Commercial and Industrial New Construction Program, Docket No. 95-0141; Commercial and Industrial Energy Efficiency Program, Docket No. 95-0140; Residential Efficient Water Heating, Docket No. 95-0139.) The estimate of future DSM includes savings from DSM measures installed in 2006 and thereafter. The impact of DSM measures installed prior to 2006 ("acquired DSM") is embedded in the recorded sales data, and therefore, already included in the sales forecast estimates.

Q. Are the impacts from the newly proposed DSM programs, as identified in MECO's IRP-3 process, included in the forecast?

A. No. The proposed direct load control programs and the new energy efficiency programs (Residential ENERGY STAR® Qualified New Homes, Residential ENERGY STAR® Qualified Products and Efficient Lighting, and Residential Low Income Energy Efficiency Programs) were assumed to be implemented after the test year.

Q. What is the impact of including future DSM in the test year sales estimate?

A. The inclusion of future DSM reduces electricity sales in the test year.

Q. What is the status of the Energy Efficiency Docket (Docket No. 05-0069)?

A. The Commission issued Decision and Order No. 23258 on February 13, 2007. As discussed in MECO T-1, due to the proximity of the timing of the issuance of the decision and order and the preparation of the testimonies, exhibits and workpapers in this docket, MECO has not had the opportunity to fully evaluate D&O 23258. Following MECO's completion of its review of D&O No. 23258, MECO will take into account the impacts of D&O No. 23258, as appropriate, at the next opportunity.

Q. Do the test year sales estimates include the impact of combined heat and power ("CHP")?

A. Yes. The test year sales estimates were adjusted for the forecasted impact of future 3rd party CHP installed in 2007. The impact of CHP units installed prior to 2006 is embedded in the recorded sales data, and is, therefore already included in the sales estimates. Refer to MECO-206.

<u>Adjustments and Normalizations</u>

Q. Were any adjustments and/or normalizations made to the July 2006 Forecast for the purposes of this rate case?

A. Yes. MECO anticipated one new Maui Rate Schedule P customer (a timeshare on the west side of Maui) to come online during the middle of 2007. For purposes of this rate case, sales for this customer was annualized from 1,000 MWh's to 2,000 MWh's to reflect a full year of sales, as shown in MECO-201, Page 2.

Q. Why is the normalization done for Schedule P only?

A. This normalization is only applied to Schedule P customers because they can be individually identified, and the large levels of consumption can make a significant difference in the level of total system sales.

Test Year Forecast by Rate Schedules

Q. What is the source of the test year sales and average number of customer estimates?

A. The test year sales and average number of customer estimate is based on a detailed analysis of each rate schedule and is the sum of the adopted projections for each rate schedule.

Q. What are MECO's rate schedules for Maui, Lanai, and Molokai Divisions?

A. MECO has six primary rate schedules for Maui, Lanai, and Molokai Divisions including:

1) Schedule R - Residential Service, available to residential lighting, heating, cooking, air conditioning and power in a single family dwelling unit individually metered and billed (includes Schedule E – Electrical Service for Employees),

2) Schedule G - General Service, Non-demand, available to customers for general light and/or power loads less than or equal to 5,000 kWh per month, and less than or equal to 25 kilowatts, and supplied through a single meter,

3) Schedule J - General Service Demand, available for loads which exceed 5,000 kWh per month three times within a twelve-month period, or 25 kilowatts, and supplied through a single meter,

4) Schedule H - Commercial Cooking, Heating, Air Conditioning, and Refrigeration Service available to customers (with voltage supplied by MECO of less than 600 volts), for commercial cooking, heating (including heat pump water heaters), air conditioning, and refrigeration service,

5) Schedule P - Large Power Service, available to large light and/or power service supplied and metered at a single voltage and delivery point (with a minimum billing demand of 200 kilowatts for Maui and Lanai and 100 kilowatts for Molokai),

6) Schedule F – Public Street Lighting Service, available to public street and highway lighting service for street and highway lighting where the Company owns, maintains and operates the street lighting facilities.

For purposes of forecasting and reporting, Rates G and J were combined.

MAUI DIVISION

TEST YEAR SALES AND CUSTOMERS

Q. What is the 2007 test year MWh sales estimate for Maui Division?

A. Maui Division's 2007 test year sales estimate 1,212,929 MWh, as shown in MECO-201, page 2.

Q. What is the 2007 test year estimate of average number of customers for Maui Division?

A. Maui Division's 2007 test year estimate for average monthly number of customers is 60,694, as shown in MECO-201, page 2.

Schedule R - Residential Service

Q. What is the 2007 test year MWh sales estimate for Maui Division's Schedule R?

A. The estimate of 2007 test year MWh sales for Maui Division's Schedule R is 430,167 MWh as shown in MECO-201, Page 2.

Q. How did MECO derive its MWh sales estimate for Schedule R?

A. The test year sales estimate for Schedule R was based on the assumption that electricity sales in 2006 would remain at the same level as 2005 primarily due to the cooler, less humid weather in the first half of 2006 compounded by the effects of the increasing cost of energy. MECO then used the growth rates from the Box-Jenkins time series model to project sales going forward.

Q. Why was the Box-Jenkins model chosen?

A. The Box-Jenkins model was chosen because it was found to fit well with the historical data as well as provide reasonably moderate growth rates which were consistent with the future economic outlook and known projects. (See MECO-203, pages 1-2)

Q. Why wasn't the Box-Jenkins model used to derive the MWh sales for 2006?

A. MECO felt that although the 2% year over year growth rates from the Box-Jenkins model were reasonable over the next few years, it did not adequately capture the dampening effects on sales of the cooler weather or higher price of electricity given the May 2006 year-to-date sales increase of 0.4% over 2005.

Q. What is the 2007 test year MWh average number of customer estimate for Maui Division's Schedule R?

A. The estimate of 2007 test year average number of residential customers is 51,398, as shown in MECO-201, Page 2.

Q. How was the test year estimate for the average number of Maui Division's Schedule R customers derived?

A. The estimate was derived using MECO's Customer Service Analysis forecast. This entailed reviewing recent historical trends in the number of Schedule R customers, new meter set orders, and meters that are not assigned to any customer. Additionally, MECO reviewed construction and market information. MECO's Engineering requests for new service and developer and contractor contacts by Engineering and Customer Service representatives provide comprehensive and reasonably accurate information.

Q. Why are the test year Schedule R estimates reasonable?

A. The Schedule R test year estimates are reasonable because it is consistent with the economic outlook for Maui given recent historical trends. Although Maui has experienced several years of 5% growth in sales (2002-2004), the most recent years have been below 1% (2005-2006) even with the continuation of a strong new home construction market. This has been primarily due to the lower use per residential customer rather than number of customers. The projected 2% growth in sales in the test year reflects the continued addition of new homes for at least a few more years. However, the use per customer will be somewhat moderate as disposable income growth stabilizes. (See MECO-203, pages 1-2)

<u>Schedules G and J - General Service</u>

Q. What is the 2007 test year MWh sales estimate for Maui Division's Schedules G and J?

A. The 2007 test year MWh sales estimate for Maui Divisions' Schedules G and J is 364,386 MWH as shown in MECO-201, Page 2.

Q. How did MECO derive its MWh sales estimate for Schedules G and J?

A. The test year sales estimate for Schedules G and J was based on the assumption that electricity sales in 2006 would increase by 0.5% over 2005 primarily due to the cooler, less humid weather in the first half of 2006 compounded by the effects of the increasing cost of energy. The growth rates from an econometric model were then applied to arrive at the estimated test year sales.

Q. Why was an econometric model chosen?

A. An econometric model was selected due to the link between the performance of small and medium commercial businesses and economic cycles.

Q. What economic variable was used in the model?

A. Schedule G and J electricity sales was found to be dependent on the resident population.

Q. Why doesn't the econometric model include variables such as job counts, electricity price, or personal income?

A. Other economic drivers were not specifically included in the econometric model because inclusion of those variables resulted in models that were not as statistically robust as the model eventually chosen. Beyond the test statistics lies the practical explanation. The small and medium sized businesses are hugely dependent on the number of people that live and work on the island and frequent their establishments. Many of the economic drivers such as job counts or personal income are closely related to resident population.

Q. What is the 2007 test year average number of customer estimate for Maui Division's Schedules G and J?

A. The 2007 test year average number of customers is 8,773, as shown in MECO-201, Page 2.

Q. How was the test year estimate for the average number of Maui Division's Schedules G and J customers determined?

A. MECO used the Box-Jenkins time series model to derive the average number of customers for Maui Division's Schedules G and J combined. The resulting increase in number of customers was then validated against the list of new projects.

Q. How do the test year sales and average number of customers compare to historical increases?

A. The estimated increase in number of average customers of 206 in 2007 is consistent with the historical trends. The average annual increase in number of Schedule G and J customers over the past five to ten years is about 200-230 as shown in MECO-203, Page 4.

<u>Schedule H - Commercial Cooking, Heating, Air Conditioning, and Refrigeration Service</u>

Q. What is the 2007 test year MWh sales estimate for Maui Division's Schedule H?

A. The estimate of 2007 test year MWh sales for Maui Division's Schedule H is 21,075 MWh as shown in MECO-201, Page 2.

Q. How did MECO derive its MWH sales estimate for Schedule H?

A. The test year sales estimate for Schedule H was based on the assumption that electricity sales in 2006 would decrease by 0.5% over 2005 primarily due to the cooler, less humid weather compounded by the effects of the increasing cost of

energy. Schedule H's historical sales shows no consistent pattern other than it is decreasing, which reflect rate class transfers or the effects of weather. MECO felt there were negligible changes in the sales growth and given the relatively small contribution of sales from Schedule H to the total, a 0% growth rate was determined to be reasonable.

Q. What is the 2007 test year average number of customer estimate for Maui Division's Schedule H?

A. The estimate of 2007 test year average number of customers is 233, as shown in MECO-201, Page 2.

Q. How was the test year estimate for the average number of Maui Division's Schedule H customers determined?

A. As with the sales forecast for Schedule H, the FPSC felt a 0% growth rate for average number of customers was also reasonable as shown in MECO-203, pages 5-6.

<u>Schedule P - Large Power Service</u>

Q. What is the 2007 test year MWh sales estimate for Maui Division's Schedule P?

A. The estimate of 2007 test year MWh sales for Maui Division's Schedule P is 391,961 MWh as shown in MECO-201, Page 2.

Q. How did MECO derive its MWh sales estimate for Schedule P?

A. The Schedule P forecast for MWh sales was based on conducting a Marketing Analysis which entails a customer-by-customer assessment by the customer's assigned MECO Account Manager and has been the most accurate method in projecting one to three year look ahead for this rate class.

Q. Were any other adjustments made to the test year MWh sales estimates?

A. Yes. The sales for a new Schedule P customer, who is assumed to start midyear, was annualized. This results in an increase of 1,000 MWh, as shown in MECO-201, Page 2.

Q. What is the 2007 test year average number of customer estimates for Maui Division's Schedule P?

A. The estimate of 2007 test year average number of Schedule P customers is 121, as shown in MECO-201, Page 2.

Q. How was the test year estimate for the average number of Maui Division's Schedule P customers determined?

A. The forecast for Maui Division's Schedule P number of customers was based on the customer-by-customer analysis, which examines each Schedule P customer and follows the status and expected service date for potential new Schedule P accounts.

Q. Why are the test year estimates for Schedule P reasonable?

A. The Schedule P forecast is reasonable because of the detailed customer-by-customer contact and analyses by MECO's Account Managers and the relatively small number of customers in each business classification.

<u>Schedule F – Public Street Lighting Service</u>

Q. What is the 2007 test year MWh sales estimate for the Maui Division's Schedule F?

A. The estimate of 2007 test year MWh sales for Maui Division's Schedule F is 5,340 MWh as shown in MECO-201, Page 2.

Q. How did MECO derive its MWh sales estimate for Schedule F?

A. The test year sales estimate for Schedule F was based on the assumption that electricity sales in 2006 would be at the same level as 2005 given the May year-

to-date growth rate of -0.4% over the same period in the prior year and accounting for new construction in the remaining months of the year. The Customer Service Analysis method was then applied which resulted in an average growth rate of +1.0% thereafter to account for new projects.

Q. Does the test year sales include impacts from the possible conversion from high pressure sodium lamps to low pressure sodium?

A. No, it does not. At the time the forecast was being developed, the draft Maui County bill to establish outdoor lighting standards, reduce light pollution, and enhance the night sky for astronomical research and preservation of wildlife was still in the discussion stage within the County's Public Works Committee.

Q. What is the 2007 test year average number of customer estimates for the Maui Division's Schedule F?

A. The estimate of 2007 test year average number of Schedule F customers is 169, as shown in MECO-201, Page 2.

Q. How was the test year estimate for the average number of Schedule F customers determined?

A. MECO used the Customer Service forecast, which took into account recent trends in the customer counts as well as potential projects requiring street lighting.

Q. Why are the test year estimates for Schedule F reasonable?

A. The test year estimates for Schedule F are reasonable because they reflect the economic outlook for Maui and recent historical trends. (See MECO-203, pages 9-10) The 1.0% growth rate expected for the test year reflects the expectation that sales will increase with growth in construction, primarily tied to new residential subdivisions.

LANAI DIVISION

TEST YEAR SALES AND CUSTOMERS

Q. What is the 2007 test year MWh sales estimate for Lanai Division?

A. Lanai Division's 2007 test year sales estimate 29,779.4 MWh, as shown in MECO-201, page 3.

Q. What is the 2007 test year estimate of average number of customers for Lanai Division?

A. Lanai Division's 2007 test year estimate for average monthly number of customers is 1,606, as shown in MECO-201, page 3.

Q. Are the underlying economic assumptions for developing the 2007 test year sales and customer forecast for Lanai similar to that of Maui?

A. Yes, to the extent that the overall state and U.S. economy has an effect on the number of visitors to the island as well as buyers of luxury homes. Many homes are purchased as second or third residences. Energy costs are higher on Lanai than Maui, which affects discretionary income for residents.

Q. What are the main drivers of Lanai's economy?

A. After the closing of the pineapple plantation in 1992, Lanai's economy has revolved around the activities surrounding the hotel and lodge and the selling of high-end homes. Electricity sales are primarily tied to those activities and whether it rains or not, in order to offset the pumping loads.

Q. Has there been any significant changes to the island?

A. Yes. Four Seasons Resorts recently took over operation of the hotel and lodge. Room renovations and some facility upgrades and expansions have already taken place or will be occurring soon at both properties. The take over has resulted in higher occupancy rates, most likely tied to the marketing of a Four Seasons Resort

property. Castle and Cooke Resorts, LLC, the owners of the hotel and lodge, have announced plans to build a spa and wellness center targeting the baby-boomer generation originally planned for a mid-2007 opening and recently changed to open in mid-2008.

Schedule R - Residential Sales

Q. What is the 2007 test year MWh sales estimate for Lanai Division's residential class, Schedule R?

A. The estimate of 2007 test year MWh sales for Lanai Division's Schedule R is 8,182.7 MWh as shown in MECO-201, Page 3.

Q. How did MECO derive its MWh sales estimate for Schedule R?

A. The Customer Service Analysis method was used to develop Lanai's Schedule R sales estimate. This method relies upon reviewing historical trends as well as information from known, new construction projects, individual customers and new service request information provided by MECO's Engineering Department. Meetings with Castle and Cooke Resorts also provided direct customer contact for the most accurate and current information available. (See MECO-202, page 3)

Q. What is the 2007 test year average number of customer estimates for Lanai Division's residential class, Schedule R?

A. The estimate of 2007 test year average number of residential customers is 1,372, as shown in MECO-201, Page 3.

Q. How was the test year estimate for the average number of Lanai Division Schedule R customers determined?

A. The estimate of the average number of Lanai Division Schedule R customers was based on the Customer Service forecast recommendation, which considers construction and market information. Employees on island, as well as the

Account Manager assigned to Castle and Cooke Resorts, closely monitor activity on Lanai.

Q. Why are these forecasts reasonable?

A. The test year estimates for Schedule R are reasonable because they reflect the economic outlook for the residential sector on Lanai and are consistent with recent historical trends. (See MECO-204, pages 1-2) Most of the new homes built on island are typically higher end single family or townhomes that remain unoccupied during much of the year. Although left unoccupied, many of the homes remain conditioned for humidity control. Future activity will include a 45-unit Hawaiian Homes project projected to start construction in 2007 and be completed over the next few years.

Schedule G and J - General Service

Q. What is the 2007 test year MWh sales estimate for Lanai Division's general service, Schedules G and J?

A. The estimate of 2007 test year MWh sales for Lanai Division's Schedules G and J is 8,164.0 MWh's as shown in MECO-201, Page 3.

Q. How did MECO derive its MWh sales estimate for Schedules G and J?

A. The Customer Service Analysis method was used to develop the sales estimate. This method relies upon information from current activity and known, new construction projects provided by MECO's Engineering Department and Castle and Cooke Resorts. (See MECO-202, page 3)

Q. What is the 2007 test year average number of customer estimates for Lanai Division's general service, Schedules G and J?

A. The estimate of 2007 test year average number for Schedules G and J customers is 224, as shown in MECO-201, Page 3.

Q. How did MECO derive its average number of customer estimate for Schedules G and J in the test year?

A. The Customer Service Analysis method was used to develop the average number of customers. This method relies upon information from current activity and known, new construction projects provided by MECO's Engineering Department and Castle and Cooke Resorts.

Q. Why are these forecasts reasonable?

A. The test year estimates for Schedules G and J are reasonable because they reflect the economic outlook for the small and medium commercial sector on Lanai.

<u>Schedule H - Commercial Cooking, Heating, Air Conditioning, and Refrigeration Service</u>

Q. What is the 2007 test year MWh sales estimate for Lanai Division's commercial cooking, heating, air conditioning, and refrigeration service, Schedule H?

A. The estimate of 2007 test year MWh sales for Lanai Division's Schedule H is 545.0 MWh as shown in MECO-201, Page 3.

Q. How did MECO derive its MWh sales estimate for Schedule H?

A. The Customer Service Analysis method was used to develop the sales estimate. MECO does not expect any additional Schedule H customers in the test year and therefore, the level of sales is anticipated to remain the same as 2006.

Q. What is the 2007 test year average number of customer estimates for Lanai Division's Schedule H?

A. The estimate of 2007 test year average number for Schedule H customers is four as shown in MECO-201, Page 3.

Q. How did MECO derive its average number of customer estimate for Schedules H in the test year?

A. The Customer Service Analysis method was used to develop the average number of customers. MECO does not expect to have any new Schedule H customers in the test year and therefore, the average number of customers is anticipated to remain the same as 2006.

Q. Why are these forecasts reasonable?

A. The test year estimates for Schedule H are reasonable because they are consistent with recent historical trends. (See MECO-204, pages 5-6)

Schedule P - Large Power Service

Q. What is the 2007 test year MWh sales estimate for Lanai Division's Schedule P?

A. The estimate of 2007 test year MWh sales for Lanai Division's Schedule P is 12,773.9 MWh as shown in MECO-201, Page 3.

Q. How did MECO derive its MWH sales estimate for Schedule P?

A. The test year sales estimate for Schedule P was based on the Customer Service Analysis method, which represents a customer-by-customer market assessment and has proven to be the most accurate method in projecting one to two year look ahead for this rate class. As mentioned earlier, Four Seasons Resorts recently took over operation of the hotel and lodge, which seems to have resulted in higher occupancy rates, which translates into higher sales. Having said that, the new operational management of the hotel is focused on energy savings. Room renovations and some facility upgrades and expansions have already taken place or will be occurring soon at both properties. The uncertainty surrounding rainfall has increased variability at water pumping facilities. Nonetheless, the Customer Service Analysis is still the most reliable method because of the customer contact and detailed monthly analysis by a MECO Account Manager, and the fact that there are only three accounts.

Q. Were any adjustments made to the test year MWh sales estimates?

A. No. There are no new Schedule P customers expected in the test year.

Q. How was the test year estimate for the average number of Lanai Division's Schedule P customers derived?

A. The Lanai Division's Schedule P average number of customer estimate is expected to remain at three accounts, based on information and ongoing contacts with personnel from Castle and Cooke Resorts, as shown in MECO-201, Page 3.

Q. Why are these forecasts reasonable?

A. The test year estimates for Schedule P is reasonable because it reflects the economic outlook for Lanai, recent historical trends, and information obtained directly from Caste and Cooke Resorts for the three accounts. (See MECO-204, pages 7-8)

<u>Schedule F - Street Lighting Service</u>

Q. What is the 2007 test year MWh sales estimate for Lanai Division's street lighting service, Schedule F?

A. The estimate of 2007 test year MWh sales for Lanai Division's Schedule F is 113.7 MWh as shown in MECO-201, Page 3.

Q. How did MECO derive its MWh sales estimate for Schedule F?

A. The Customer Service Analysis method was used to develop the sales estimate. The estimate was based on the historical pattern of constant, negligible growth over the years, as shown in MECO-204, pages 9-10.

Q. What is the 2007 test year average number of customer estimates for Lanai Division's Schedule F?

A. The estimate of 2007 test year average number for Schedule F customers is three as shown in MECO-201, Page 3.

Q. How did MECO derive its average number of customers estimate for Schedules F in the test year?

A. The estimate for 2007 is three which has been constant over the last six years.

Q. Why are these forecasts reasonable?

A. The test year estimates for Schedule F are reasonable because they reflect the economic outlook for Lanai and recent historical trends.

The relatively flat growth rate expected for the test year reflects the expectation that although several residential homes will be built, the sales from street lights will be negligible. (See MECO-204, pages 9-10)

MOLOKAI DIVISION

TEST YEAR SALES AND CUSTOMERS

Q. What is the 2007 test year MWh sales estimate for Molokai Division?

A. Molokai Division's 2007 test year sales estimate 36,548.2 MWh, as shown in MECO-201, page 4.

Q. What is the 2007 test year estimate of average number of customers for Molokai Division?

A. Molokai Division's 2007 test year estimate for average monthly number of customers is 3,141, as shown in MECO-201, page 4.

Q. Are the underlying economic assumptions for developing the 2007 test year sales and customer forecast for Molokai similar to that of Maui and Lanai?

A. Yes, similar to Maui and Lanai, the overall state and U.S. economy has an effect on the number of visitors to the island as well as purchasers of land to build their homes. Unlike Lanai, these homes are being built as primary residences. Energy

costs are higher on Molokai than Maui, which affects both disposable and discretionary income.

Q. What is the economic outlook for Molokai?

A. The economic outlook for Molokai is one of future changes on an island that takes pride in maintaining a rural lifestyle. The changing demographics are causing an increase in the price of land, making it unaffordable for many. The residents are in the process of developing a community based Master Land Use Plan along with the land owner, Molokai Ranch, which addresses the future of over 65,000 acres of the ranch's land. The plan stresses the protection of precious resources. The development of a five-year plan encouraging tourism as a viable economic base for the residents is occurring. The plan looks at the revival of the Kaluakoi Hotel. This will increase jobs and provide opportunities for small businesses for the residents of Molokai. Water is an important issue requiring focus on improving irrigation systems to put lands into production. Not surprisingly, the main driver of electricity sales on Molokai is rain, or lack of rain. Increases or decreases in electricity sales are typically tied to whether it rains or not, in order to offset the pumping loads.

Q. Has there been any significant changes to the island?

A. No. Aside from the construction of a few new homes, not much activity has occurred on Molokai which would result in a significant change to electricity sales.

<u>Schedule R - Residential Sales</u>

Q. What is Molokai Division's 2007 test year sales estimate for the residential class, Schedule R?

A. Molokai Division's 2007 sales estimate for Schedule R is 13,077.0 MWh, as shown in MECO-201, page 4.

Q. How did MECO estimate Molokai's rate Schedule R sales?

A. The Customer Service Analysis method was used which is based on an assessment of known residential developments and historical data. As with Lanai, Molokai's new construction projects are few in number and generally easy to track individually. New construction information is available from service request submitted to MECO's Engineering Department, direct customer contact by the Power Supply Supervisor on Molokai, and trade allies.

Q. What is Molokai Division's 2007 test year estimate of Schedule R customers?

A. The 2007 estimate of Schedule R customers for Molokai Division is 2,546, as shown in MECO-201, page 4.

Q. How did MECO estimate the number of Schedule R customers?

A. The number of customers was estimated based on the Customer Service forecast recommendation which looks at the expected number of planned residential developments and historical data. Development is occurring around the whole island however, most homes are being built on the east side. Service requests are coming in at a rate of about two a month.

Q. Why are these forecasts reasonable?

A. The test year estimates for Schedule R are reasonable because they reflect the economic outlook for the residential sector on Molokai and are consistent with recent historical trends. Molokai's new construction projects are few in number and easy to track individually. (See MECO-205, pages 1-2)

<u>Schedule G and J – General Service</u>

Q. What is Molokai Division's 2007 sales estimate for Schedules G and J, General Service?

A. The Molokai Division 2007 test year sales estimate for the General Service rate schedules is 11,979.0 MWh, as shown in MECO-201, page 4.

Q. How did MECO estimate Schedule G and J sales?

A. MECO estimated Schedule G and J sales using the Customer Service Analysis method. The information on existing customer usage and new commercial projects was the basis for this forecast. (See MECO-205, pages 3-4)

Q. What is Molokai Division's 2007 test year estimate of Schedule G and J customers?

A. Molokai Division's Schedule G and J customer estimate is 540, as shown in MECO-201, page 4.

Q. How did MECO estimate the number of Schedule G and J customers?

A. The customer forecast was based on specific new construction service request information available to MECO's Engineering Department and the Power Supply Supervisor on Molokai.

Q. Why are these forecasts reasonable?

A. The test year estimates for Schedule G and J are reasonable because they reflect the economic outlook for the small and medium commercial sector on Molokai and are consistent with recent historical trends. Molokai's new construction projects are few in number and generally easy to track individually. (See MECO-205, pages 3-4)

<u>Schedule H - Commercial Cooking, Heating, Air Conditioning, and Refrigeration</u>

Q. What is Molokai Division's 2007 test year sales estimate for Schedule H, Commercial Cooking, Heating, Air Conditioning, and Refrigeration Service?

A. The Molokai Division 2007 MWh sales estimate is 1,994.2 MWh, as shown in MECO-201, page 4.

Q. How did MECO estimate rate Schedule H sales?

A. MECO estimated the Schedule H sales using the Customer Service Analysis method based on historical billing data and information available concerning new projects or planned usage increases by existing customers. MECO does not expect any additional Schedule H customers in the test year and therefore, the level of sales is anticipated to remain constant.

Q. What is Molokai Division's 2007 test year estimate of Schedule H customers?

A. The number of Schedule H customers estimated for the Molokai Division for 2007 is 32, as shown in MECO-201, page 4.

Q. How did MECO estimate the number of Schedule H customers?

A. MECO's customer forecast was based on historical data and information available concerning new projects. MECO does not expect any additional Schedule H customers in the test year. (See MECO-205, pages 5-6)

<u>Schedule P - Large Power Service</u>

Q. What is Molokai Division's 2007 test year sales estimate for Schedule P, Large Power Service?

A. Molokai Division's 2007 sales estimate for Schedule P is 9,019.4 MWh, as shown in MECO-201, page 4.

Q. How did MECO estimate rate Schedule P sales?

A. The Market Analysis method was used, as was done for Maui and Lanai Divisions, because the customer-by-customer market assessment has proven to be the most accurate technique to use for this rate schedule. With the small sales base for the Molokai Division, any Schedule P customer will impact the sales

results significantly. The personal customer contact and customer-by-customer market approach therefore, is the most reasonable approach to sales forecasting for Schedule P customers.

Q. What accounted for the significant jump of 11.4% in MWh sales in 2004 as shown in MECO-205, page 8?

A. In the latter part of 2003, the entire load for Kalaupapa was moved from rate Schedule G/J to Schedule P. The sales for Schedule G/J decreased 13.2% in 2004 accordingly. (See MECO-205, page 4)

Q. What is Molokai Division's 2007 test year estimate of Schedule P customers?

A. The Molokai Division's Schedule P customer estimate for 2007 is 14, as shown in MECO-201, page 4. MECO does not project any additions or changes in test year 2007. Based on the customer information obtained through ongoing customer contacts and the Market Analysis approach, the number of customers for Schedule P is reasonable.

Q. Why are these forecasts reasonable?

A. The test year estimates for Schedule P is reasonable because it reflects the economic outlook for Molokai, recent historical trends, and information obtained from the customer and MECO staff on island. (See MECO-205, pages 7-8)

<u>Rate Schedule F - Street Lighting</u>

Q. What is Molokai's 2007 test year sales estimate for Schedule F?

A. The Molokai Division's 2007 sales estimate is 478.5 MWh, as shown in MECO-201, page 4.

Q. How did MECO estimate Schedule F sales?

A. MECO's estimate is based on the historical pattern of constant, negligible growth over years, (see MECO-205, page 9).

Q. What is Molokai Division's 2007 estimate of Schedule F customers?

A. The Molokai Division's Schedule F customer estimate for test year 2007 is nine, as shown in MECO-201, page 4.

Q. Why are these forecasts reasonable?

A. The test year estimates for Schedule F is reasonable because they reflect the economic outlook for Molokai and recent historical trends.

The relatively flat growth rate expected for the test year reflects the expectation that although several residential homes will be built, the sales from street lights will be negligible. (See MECO-205, pages 9-10)

Sales Forecast Accuracy

Q. How accurate have past sales forecast been when looking one year ahead?

A. The average variance between the five most recent forecasts looking ahead one year and the actual billed sales is -0.5% for Maui Division, -0.2% for Lanai Division and +2.0% for Molokai Division as shown in MECO-207.

Q. How accurate have past forecasts for average number of customers been when looking one year ahead?

The average variance between the five most recent forecasts for a one year look ahead and the actual number of customers is -0.2% for Maui Division, +1.3% for Lanai Division, and -0.3% for Molokai Division as shown in MECO-208.

SUMMARY

Q. Please summarize your testimony on the test year sales and customers estimates.

A. MECO uses a comprehensive set of forecasting methods that are evaluated through a rigorous forecasting process to develop its sales and customers

forecasts. The sales and customer estimate for the test year is based on detailed evaluations for each rate schedule and is based on methods which have proven to be accurate. The 2007 test year estimate of megawatt-hour sales is:

	2007 Test Year (MWh)
Maui Division	1,212,929
Lanai Division	29,779
Molokai Division	36,548
MECO Consolidated	1,279,256

The 2007 test year estimate of average monthly number of customers is:

	2007 Test Year
Maui Division	60,694
Lanai Division	1,606
Molokai Division	3,141
Total	65,441

The test year estimates are reasonable for ratemaking purposes because they reflect the economic outlook for Maui County, the inclusion of estimated large construction projects, and recent historical trends.

Q. Does this conclude your testimony?

A. Yes, it does.

Maui Electric Company, Limited

JOANNE A. IDE

Educational Background and Experience

BUSINESS ADDRESS: Maui Electric Company, Limited
210 West Kamehameha Avenue, Kahului, HI 96732

POSITION: Supervisor, IRP and Customer Efficiency Programs
Customer Service Department
(2002 - Present)

EXPERIENCE: Supervisor, Integrated Resource Planning Division
Customer Service Department
Maui Electric Company, Limited
(1999 - 2002)

Forecast Planning Data Analyst
Customer Service Department
Maui Electric Company, Limited
(1996 - 1999)

Research and Evaluation Analyst, Research and Evaluation Division
Energy Services Department
Hawaiian Electric Company, Inc.
(1995 - 1996)

Forecast Planning Analyst, Forecasting Division
Rate & Regulatory Affairs Department,
Hawaiian Electric Company, Inc.
(1993 - 1995)

Rate Analyst, Rates and Load Research Division
Rate & Regulatory Affairs Department,
Hawaiian Electric Company, Inc.
(1991 - 1993)

EDUCATION: M.S. Degree in Applied Mathematics
California State University, Hayward

B.S. Degree in Physics
University of Hawaii

B.S. Degree in Mathematics
University of Hawaii

Maui Electric Company, Limited

JOANNE A. IDE

Educational Background and Experience *(continued)*

OTHER CURRICULUM: Marginal Cost Method for Utilities
National Economic Research Association

Basics of Rate Design
The Center for Public Utilitites, New Mexico State University

Utility Finance & Accounting Seminar
Financial Accounting Institute

MAUI ELECTRIC COMPANY, LIMITED

2007 TEST YEAR
SALES AND CUSTOMERS
CONSOLIDATED

Col.		A	B
Line	Rate Schedule	2007 Test Year Annual Sales (MWh)	2007 Test Year Average Monthly Number of Customers
1	R	451,427	55,316
2	G/J	384,529	9,537
3	H	23,614	269
4	P	412,754	138
5	F	5,933	181
6	Total	1,278,257	65,441

Source:

MECO-WP-201a

MAUI ELECTRIC COMPANY, LIMITED

2007 TEST YEAR
SALES AND CUSTOMERS
MAUI DIVISION

Col.		A	B	C	D
Line	Rate Schedule	2007 Test Year Sales Forecast (MWh)	Test Year Normalization (MWh)	2007 Test Year Annual Sales (MWh)	2007 Test Year Average Monthly Number of Customers
1	R	430,167		430,167	51,398
2	G/J	364,386		364,386	8,773
3	H	21,075		21,075	233
4	P	390,961	1,000	391,961	121
5	F	5,340		5,340	169
6	Total	1,211,929	1,000	1,212,929	60,694

Source:

MECO-WP-201a

MAUI ELECTRIC COMPANY, LIMITED

2007 TEST YEAR
SALES AND CUSTOMERS
LANAI DIVISION

Col.		A	B
Line	Rate Schedule	2007 Test Year Annual Sales (MWh)	2007 Test Year Average Monthly Number of Customers
1	R	8,182.7	1,372
2	G/J	8,164.0	224
3	H	545.0	4
4	P	12,773.9	3
5	F	113.7	3
6	Total	29,779.4	1,606

Source:

MECO-WP-201a

MAUI ELECTRIC COMPANY, LIMITED

2007 TEST YEAR
SALES AND CUSTOMERS
MOLOKAI DIVISION

Col.		A	B
Line	Rate Schedule	2007 Test Year Annual Sales (MWh)	2007 Test Year Average Monthly Number of Customers
1	R	13,077.0	2,546
2	G/J	11,979.0	540
3	H	1,994.2	32
4	P	9,019.4	14
5	F	478.5	9
6	Total	36,548.2	3,141

Source:

MECO-WP-201a

MAUI PROJECTS (5/31/2006)				
PROJECTS	ESTIMATED DATE OF POWER FOR CONSTRUCTION DATE	PROJECTED START OF LOAD DATE	NO. OF LOTS or UNITS	COMMENTS
SINGLE-FAMILY				
LAHAINA SUBD. PH. 1	Aug-06		67	Lots only; No projected date for full load
LAHAINA SUBD. PH. 2	Aug-06		65	Lots only; No projected date for full load
KIHEI VILLAS	Dec-06	Dec-08	152	Condo Lot w/ 152 Individual Homes. Homes to be completed in 3 phases over two years.
KIHEI SUBD.	Dec-06		31	Lots only; No projected date for full load
KIHEI OCEAN SUBD.	Jul-06		90	Lots only; No projected date for full load
KIHEI VILLAGE SUBD.	Mar-07		65	Lots only; No projected date for full load
KEOKEA-WAIOHULI	Mar-07		164	Lots only; No projected date for full load. Tenants have one year from service date to start construction.
WAIKAPU SUBD.	Oct-07	Nov-07	392	Service date projects total build out of 5 phases. Phase 1 (59 homes) completed. Remaining 4 phases to be completed within two years. Phase 5 pending transmission line relocation.
WAILUKU SITE 11	May-07	Jan-08	114	Hse/Lot Subd. - Homes to be energized from service date to actual load date.
WAILEA MF-5	Jun-06	May-07	38	Condo Lot w/ 38 Individual Homes & Rec Center
WAILEA MF-9	Dec-06	Dec-07	120	Hse/Lot Subd. - Homes to be energized from service date to actual load date.
KIHEI SUBD.	Sep-06	Apr-07	60	Hse/Lot Subd. - Homes to be energized from service date to actual load date.
WAILUKU SITE 10	Sep-06		97	Lots only; No projected date for full load
WAILUKU SITE 22	Sep-06		44	Lots only; No projected date for full load
WAIKAPU SUBD.	Jan-07		105	Lots only; No projected date for full load
KAPAULA PH. 2	Oct-06		21	Lots only; No projected date for full load
WAILUKU SUBD.	Completed		108	Lots only; No projected date for full load
KAPALUA MAUKA	Jun-07		51	Lots only; No projected date for full load
KAANAPALI SUBD.	Jun-07		60	Lots only; No projected date for full load
MAUI LANI PH. 7 INCR. 2	Jul-06	Jul-07	134	Hse/Lot Subd. - Homes to be energized from service date to actual load date.
SPRECKELSVILLE SUBD.	Sep-06		19	Lots only; No projected date for full load
MAUI LANI PH. 1D	Dec-06		48	Lots only; No projected date for full load
HAIKU SUBD.	Dec-06		16	Lots only; No projected date for full load. Require substation installation.
MAUI LANI PH. 7 INCR. 3	Dec-06	Dec-07	161	Hse/Lot Subd. - Homes to be energized from service date to actual load date.
KAANAPALI LOT 10-H	Jun-07		23	Lots only; No projected date for full load
KULA SUBD.	Jul-06		64	Lots only; No projected date for full load
UKUMEHAME SUBD.	May-07		46	Lots only; No projected date for full load
WAIKAPU SUBD.	Nov-06		36	Lots only; No projected date for full load
UPCOUNTRY SUBD	Nov-06		49	Lots only; No projected date for full load
WAIEHU SUBD	Jul-07	Sep-07	99	House & lot package
KULA SUBD.	Dec-07		37	Lots only; No projected date for full load
MULTI-FAMILY				
KIHEI CONDOS	Oct-06		112	Individual meter
LAHAINA VILLAS PH. 1	May-07	Nov-07	125	Individual meter
KIHEI ESTATES	Jul-07		144	Single & Multi-family mixture, individual meters
KIHEI VILLAS	Dec-06	Jan-07	33	Individual meter
KIHEI VILLAS	Nov-06	Dec-06	144	Individual meter
WAILEA	Dec-06	Jun-07	152	Individual metered duplex units. Project is done in 4 phases. Phase 1 units (36) to be energized in 12/2006.
WAILUKU MODULE 5	May-07	Nov-07	80	Individual meter
KAHULUI STUDENT HOUSING	Aug-07	Sep-07	104	Master meter dorms
WAILUKU MODULE 23	Jan-07	May-07	94	Afforadable housing
KIHEI VILLAGE	Jun-07	Dec-07	99	Individual meter
KIHEI VILLAGE	Mar-07	Dec-07	77	Individual meter
KAANAPALI	Jun-07	Jun-08	93	Individual metered condos. Half load to be energized around 7/2007.
KIHEI ESTATES	Mar-07	Aug-07	32	Multi-family project.
LAHAINA LOT 3	Oct-07	Nov-07	100	Individual meter
WAILEA	Oct-06	Mar-07	24	Individual meter
WAILUKU CONDOS	Apr-07	May-07	28	Individual meter

COMMERCIAL				
KAHULUI MULTIPLE USE PROJECT	Dec-06	Dec-06		Project down sized for office only.
LAHAINA MULTIPLE USE PROJECT	Aug-06		11 Units	Tenants have not been identified to determine full load usage.
KAHULUI SERVICES BUILDING	Jan-07	Jan-07		This project may be pushed out. We have no confirmation that this project has been contracted.
WAILUKU HEALTH CENTER	Feb-07	Feb-07		
WAILUKU MULTIPLE USE FACILITY	Sep-06	Sep-06		
KULA EDUCATION BUILDING	Feb-07	Feb-07		Office building for Upcountry Commecial Sub'd.
HALEAKALA SERVICES FACILITY	Feb-07	Feb-07		No work by MECO. Customer to add load only.
KAHULUI RETAIL	Jul-06	Jul-06		Additional load to existing customer in Kahului.
OTHER PUMPING	Jul-06	Jul-06		Expect full load in 7/2006.
KIHEI SERVICES CENTER	Jun-06	Aug-06		800 kW immediately with 700 kW future load (no timeframe).
KAHULUI EDUCATION	Dec-06	Dec-06		School should be open for 2007 school year.
FOOD SERVICE	Jun-06			
WAILEA RETAIL	Oct-07	Oct-07		Retail units. Expectation is that individual stalls to be energized by early 12/2006.
KIHEI EDUCATION	Jul-06	Jul-06		Additional load for A/C units.
KAHULUI CONCRETE WHOLE PRODUCTS	Sep-06			Project to be cancelled. No confimation from customer on service date.
HANA RETAIL	Dec-06	Dec-06		Additional load to existing customer.
OTHER PUMPING	Completed	Jan-07		Tranmission water line to be completed by 12/2006.
KAHULUI OFFICE SPACE	Aug-06		8	Office spaces; No projected date for full load
KIHEI SERVICES ANNEX	Jun-07	Jun-07		
KAHULUI RETAIL - FOOD	Sep-07	Sep-07		
KAPALUA SUBD	Nov-06	Nov-06		Good chance that full load may be achieved by 1st quarter 2007. We understand that all available retail spaces have a perspective tenant.
KIHEI RETAIL - NONFOOD	Mar-07		13	Retail spaces; No projected date for full load
KIHEI OFFICE SPACE	Oct-06		9	Office spaces; No projected date for full load
OFFICE SPACE	Jun-07		12	Office spaces; No projected date for full load
COMMERCIAL SUBD./COMPLEX				
LAHAINA MULTIPLE USE	Aug-06		27 LOTS	Lots only; No projected date for full load
LAHAINA RETAIL - NONFOOD	done		16 UNITS	Retail spaces; house meter energized
KAHULUI HOTEL RENOVATION	Apr-07	Apr-07	135 UNITS	Service upgrade
KAANAPALI HOTEL	Aug-06	Aug-07	256 UNITS	
WAIKAPU HOUSING	Jul-06		18 LOTS	Lots only; No projected date for full load
KIHEI MUILTIPLE USE	Jun-07		73 UNITS	Individual owned commercial units. No full load date available.
KIHEI HOUSING	Oct-06		99 UNITS	Individual metered condos. Some units will be live/work units. No full load date available.
KAANAPALI HOTEL	Jan-07	Jan-07	78 UNITS	New master meter.
WEST MAUI MULTIPLE USE	Mar-07	Dec-07	86 RES./27 COMM.	Half commercial and half residential units.
KAANAPALI HOTEL	Jan-08	Jan-08	71 UNITS	New master meter.
KAANAPALI HOUSING - PHASE 1	Dec-08	Dec-08	318 UNITS	First building only.
KAANAPALI HOUSING - PHASE 2	Dec-09	Dec-09	320 UNITS	Second building only.
KAANAPALI HOUSING - PHASE 3	Dec-08	Dec-08	76 UNITS	4-unit clusters - 19 clusters.
LAHAINA GATEWAY				Project service request under review.
WAIKAPU BASEYARD	Jun-07			
KULA MULTIPLE USE	Jan-07		12 Bldgs	

LANAI (5/1/2006)

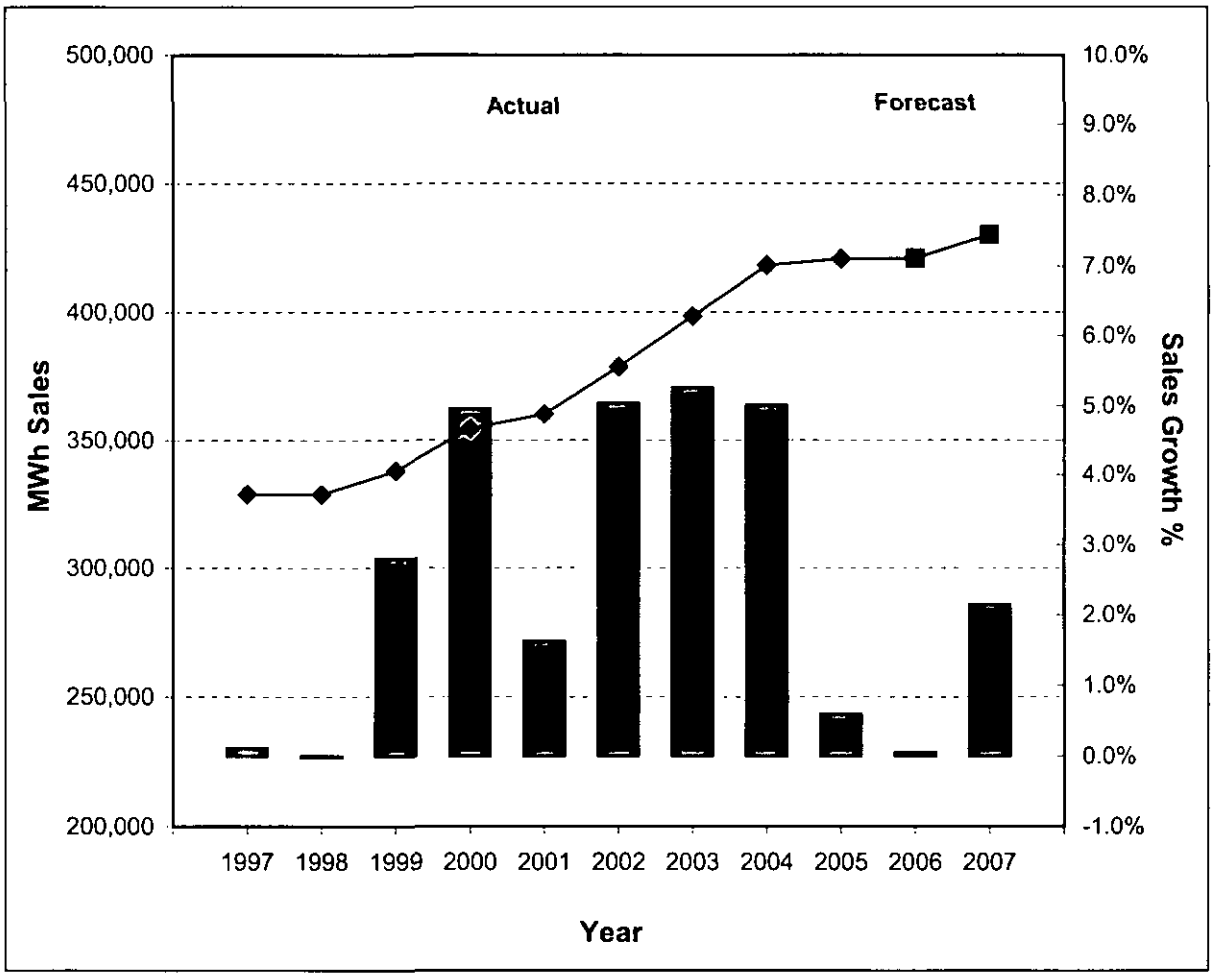
PROJECTS	ESTIMATED DATE OF POWER FOR CONSTRUCTION DATE	# OF LOTS/UNITS	COMMENTS
SINGLE-FAMILY			
		LOTS	
LANAI SUBD	Oct-06	4	
MULTI-FAMILY			
		UNITS	
LANAI HOUSING	Jul-06	48	
MANELE SUBD	Oct-06	34	
COMMERCIAL			
SANDWICH ISLES	Jun-06		
LANAI SERVICES	Oct-06		
MANELE RETAIL	Nov-06		
LANAI SERVICES	Jan-07		
HOTEL UPGRADE	Mar-07		
LANAI SERVICES	TBD		
COMMERCIAL SUBD./COMPLEX			
		LOTS/UNITS	
RESIDENCES			
MANELE LOT	Apr-07		
MANELE LOT	Dec-07		

MOLOKAI (5/1/2006)

PROJECTS	ESTIMATED DATE OF POWER FOR CONSTRUCTION DATE	# OF LOTS/UNITS	COMMENTS
SINGLE-FAMILY			
		LOTS	
MULTI-FAMILY			
		UNITS	
COMMERCIAL			
COMMUNICATIONS FACILITY	Dec-06		
MOLOKAI RETAIL	Dec-06		
KAUNAKAKAI SERVICES	Dec-06		
KAUNAKAKAI RETAIL	Dec-06		
KUALAPUU RETAIL	Dec-06		
MOLOKAI EDUCATION	Jan-07		
KAUNAKAKAI RETAIL	Jun-07		

Maui Electric Company, Inc.

SCHEDULE R - RESIDENTIAL SERVICE
ACTUAL & FORECAST SALES (MWH) & SALES GROWTH %
MAUI DIVISION



										Forecast	
Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
MWh Sales	######	######	######	######	######	######	######	######	######	######	######
Customers	42,843	43,374	44,048	44,940	45,908	46,788	47,736	48,692	49,648	50,548	51,398
Growth %	0.12%	-0.02%	2.80%	4.96%	1.63%	5.04%	5.26%	5.01%	0.59%	0.05%	2.15%

Maui Electric Company, Ltd.
Maui Division

BILLED DATA

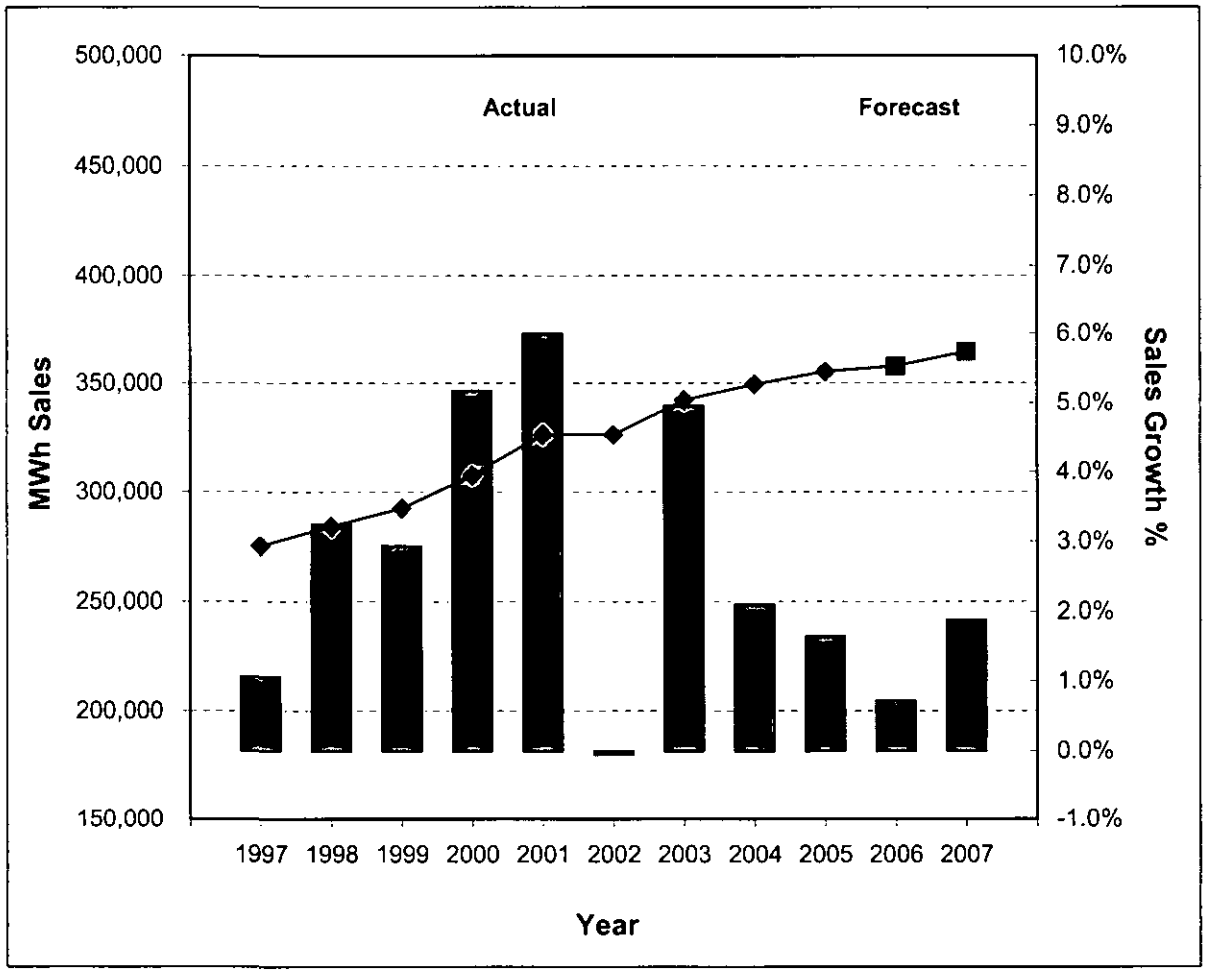
SCHEDULE R : RESIDENTIAL SERVICE

Year	Billed Sales			Average Customers			Use / Average Customer		
	Mwh	Chg	% Chg	No.	Chg	% Chg	Kwh	Chg	% Chg
1975 *	105,058			16,631			6,317		
1976	114,664	9,606	9.1%	18,004	1,373	8.3%	6,369	52	0.8%
1977	124,250	9,586	8.4%	19,001	997	5.5%	6,539	170	2.7%
1978	134,508	10,258	8.3%	20,030	1,029	5.4%	6,715	176	2.7%
1979	145,351	10,843	8.1%	21,639	1,609	8.0%	6,717	2	0.0%
1980	147,432	2,081	1.4%	23,447	1,808	8.4%	6,288	(429)	-6.4%
1981	156,287	8,855	6.0%	25,204	1,757	7.5%	6,201	(87)	-1.4%
1982	158,700	2,413	1.5%	26,062	858	3.4%	6,089	(112)	-1.8%
1983	160,663	1,963	1.2%	27,391	1,329	5.1%	5,866	(223)	-3.7%
1984	167,620	6,957	4.3%	28,076	685	2.5%	5,970	104	1.8%
1985	174,240	6,620	4.0%	28,674	598	2.1%	6,077	107	1.8%
1986 **	189,519	15,279	8.8%	29,432	758	2.6%	6,439	362	6.0%
1987	202,704	13,185	7.0%	30,597	1,165	4.0%	6,625	186	2.9%
1988	215,646	12,942	6.4%	31,911	1,314	4.3%	6,758	133	2.0%
1989	233,802	18,156	8.4%	33,680	1,769	5.5%	6,942	184	2.7%
1990	253,484	19,682	8.4%	35,521	1,841	5.5%	7,136	194	2.8%
1991	262,523	9,039	3.6%	37,355	1,834	5.2%	7,028	(108)	-1.5%
1992	276,396	13,873	5.3%	38,934	1,579	4.2%	7,099	71	1.0%
1993	285,575	9,179	3.3%	39,943	1,009	2.6%	7,150	51	0.7%
1994	301,585	16,010	5.6%	41,017	1,074	2.7%	7,353	203	2.8%
1995	312,743	11,158	3.7%	41,794	777	1.9%	7,483	130	1.8%
1996	328,386	15,643	5.0%	42,322	528	1.3%	7,759	276	3.7%
1997	328,772	386	0.1%	42,843	522	1.2%	7,674	(85)	-1.1%
1998	328,697	(75)	0.0%	43,374	531	1.2%	7,578	(96)	-1.3%
1999	337,898	9,201	2.8%	44,048	674	1.6%	7,671	93	1.2%
2000	354,648	16,750	5.0%	44,940	892	2.0%	7,892	221	2.9%
2001	360,423	5,775	1.6%	45,908	968	2.2%	7,851	(41)	-0.5%
2002	378,588	18,165	5.0%	46,788	880	1.9%	8,092	241	3.1%
2003	398,494	19,906	5.3%	47,736	948	2.0%	8,348	256	3.2%
2004	418,450	19,956	5.0%	48,692	956	2.0%	8,594	246	3.0%
2005	420,903	2,453	0.6%	49,648	956	2.0%	8,478	(116)	-1.4%
2005 @	136,396			49,380			2,762		
2006 @	137,945	1,549	1.1%	50,340	960	1.9%	2,740	(22)	-0.8%

* Formerly called Schedule D.
** Includes refolio adjustment of 494 mwh.
@ April year-to-date

Maui Electric Company, Inc.

SCHEDULE G/J - GENERAL SERVICE
ACTUAL & FORECAST SALES (MWH) & SALES GROWTH %
MAUI DIVISION



										Forecast	
Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
MWh Sales	275,350	######	######	######	######	######	######	######	######	######	######
Customers	6,604	6,752	6,927	7,198	7,491	7,657	7,902	8,105	8,342	8,567	8,773
Growth %	1.06%	3.25%	2.94%	5.17%	6.00%	-0.05%	4.95%	2.10%	1.64%	0.71%	1.88%

Maui Electric Company, Ltd.
Maui Division

BILLED DATA

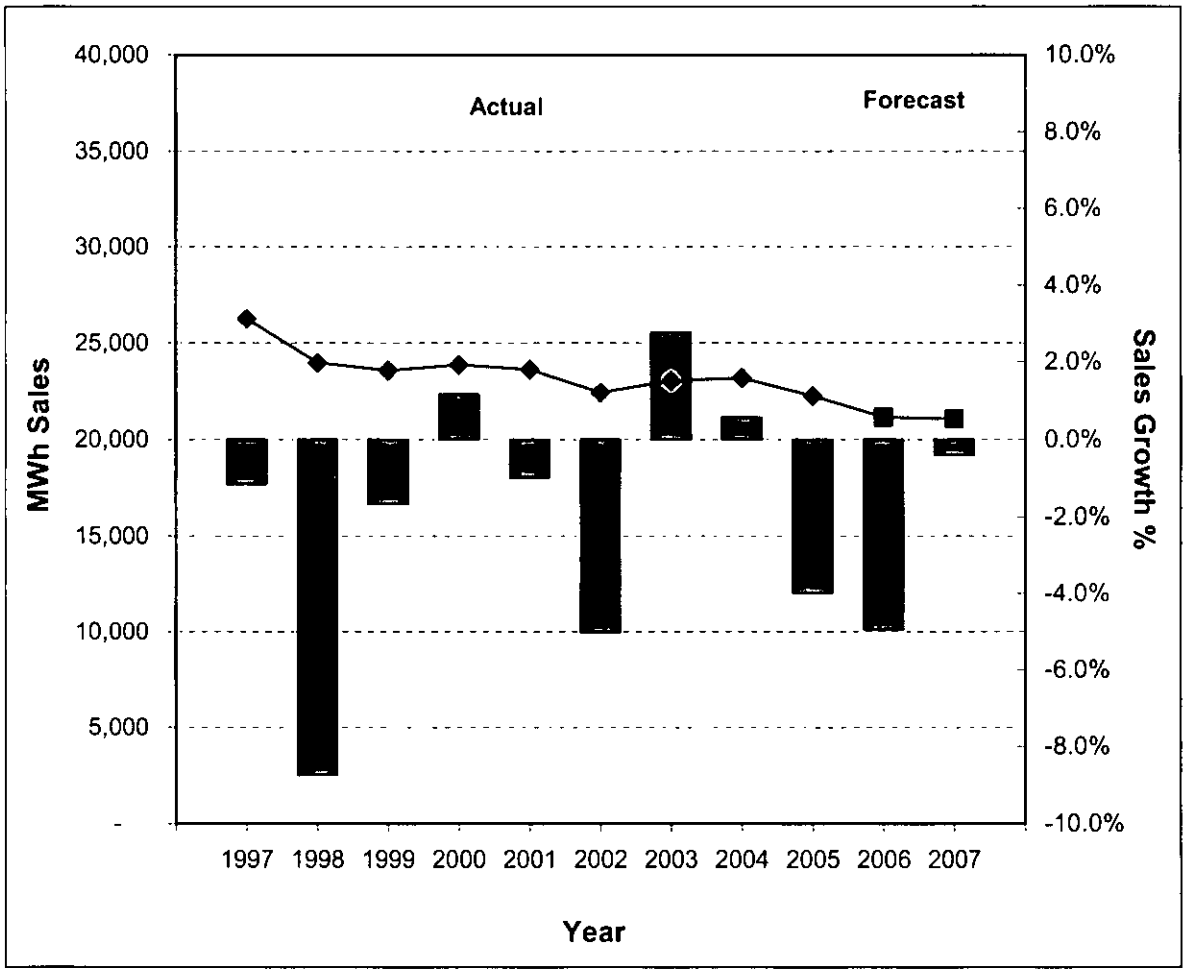
SCHEDULE G/J : GENERAL SERVICE

Year	Billed Sales			Average Customers			Use / Average Customer		
	Mwh	Chg	% Chg	No.	Chg	% Chg	Kwh	Chg	% Chg
1975 *	74,754			2,718			27,503		
1976	93,907	19,153	25.6%	2,905	187	6.9%	32,326	4,823	17.5%
1977	103,305	9,398	10.0%	3,113	208	7.2%	33,185	859	2.7%
1978	115,916	12,611	12.2%	3,401	288	9.3%	34,083	898	2.7%
1979	126,644	10,728	9.3%	3,679	278	8.2%	34,423	340	1.0%
1980	132,773	6,129	4.8%	3,808	129	3.5%	34,867	444	1.3%
1981	147,846	15,073	11.4%	3,906	98	2.6%	37,851	2,984	8.6%
1982	136,463	(11,383)	-7.7%	3,964	58	1.5%	34,426	(3,425)	-9.1%
1983	142,946	6,483	4.8%	4,070	106	2.7%	35,122	696	2.0%
1984	154,140	11,194	7.8%	4,236	166	4.1%	36,388	1,266	3.6%
1985	155,593	1,453	0.9%	4,383	147	3.5%	35,499	(889)	-2.4%
1986 **	173,663	18,070	11.6%	4,540	157	3.6%	38,252	2,753	7.8%
1987	190,634	16,971	9.8%	4,891	351	7.7%	38,976	724	1.9%
1988	203,973	13,339	7.0%	5,135	244	5.0%	39,722	746	1.9%
1989	212,423	8,450	4.1%	5,419	284	5.5%	39,200	(522)	-1.3%
1990	221,592	9,169	4.3%	5,699	280	5.2%	38,883	(317)	-0.8%
1991	232,230	10,638	4.8%	5,828	129	2.3%	39,847	964	2.5%
1992	239,552	7,322	3.2%	6,000	172	3.0%	39,925	78	0.2%
1993	245,037	5,485	2.3%	6,103	103	1.7%	40,150	225	0.6%
1994	256,946	11,909	4.9%	6,256	153	2.5%	41,072	922	2.3%
1995	262,489	5,543	2.2%	6,368	112	1.8%	41,220	148	0.4%
1996	272,453	9,964	3.8%	6,459	91	1.4%	42,179	959	2.3%
1997	275,350	2,898	1.1%	6,604	144	2.2%	41,698	(481)	-1.1%
1998	284,303	8,953	3.3%	6,752	149	2.3%	42,107	409	1.0%
1999	292,652	8,349	2.9%	6,927	175	2.6%	42,248	141	0.3%
2000	307,796	15,144	5.2%	7,198	271	3.9%	42,761	513	1.2%
2001	326,253	18,457	6.0%	7,491	293	4.1%	43,553	792	1.9%
2002	326,076	(177)	-0.1%	7,657	166	2.2%	42,585	(968)	-2.2%
2003	342,227	16,151	5.0%	7,902	245	3.2%	43,309	724	1.7%
2004	349,408	7,181	2.1%	8,105	203	2.6%	43,110	(199)	-0.5%
2005	355,141	5,732	1.6%	8,342	237	2.9%	42,573	(537)	-1.3%
2005 @	110,526			8,249			13,398		
2006 @	114,394	3,868	3.5%	8,543	294	3.6%	13,390	(8)	-0.1%

* Formerly called Schedules L-1, H-2, C and P-1, which have been combined.
** Includes refolio adjustment of 935 mwh.
@ April year-to-date

Maui Electric Company, Inc.

SCHEDULE H - COMMERCIAL COOKING, AIR CONDITIONING, HEATING, AND REFRIGERATION SERVICE ACTUAL & FORECAST SALES (MWH) & SALES GROWTH % MAUI DIVISION



										Forecast	
Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
MWh Sales	26,261	23,966	23,569	23,843	23,612	22,430	23,051	23,184	22,260	21,159	21,075
Customers	285	276	265	251	241	240	239	236	233	233	233
Growth %	-1.1%	-8.7%	-1.7%	1.2%	-1.0%	-5.0%	2.8%	0.6%	-4.0%	-4.9%	-0.4%

Maui Electric Company, Ltd.
Maui Division

BILLED DATA

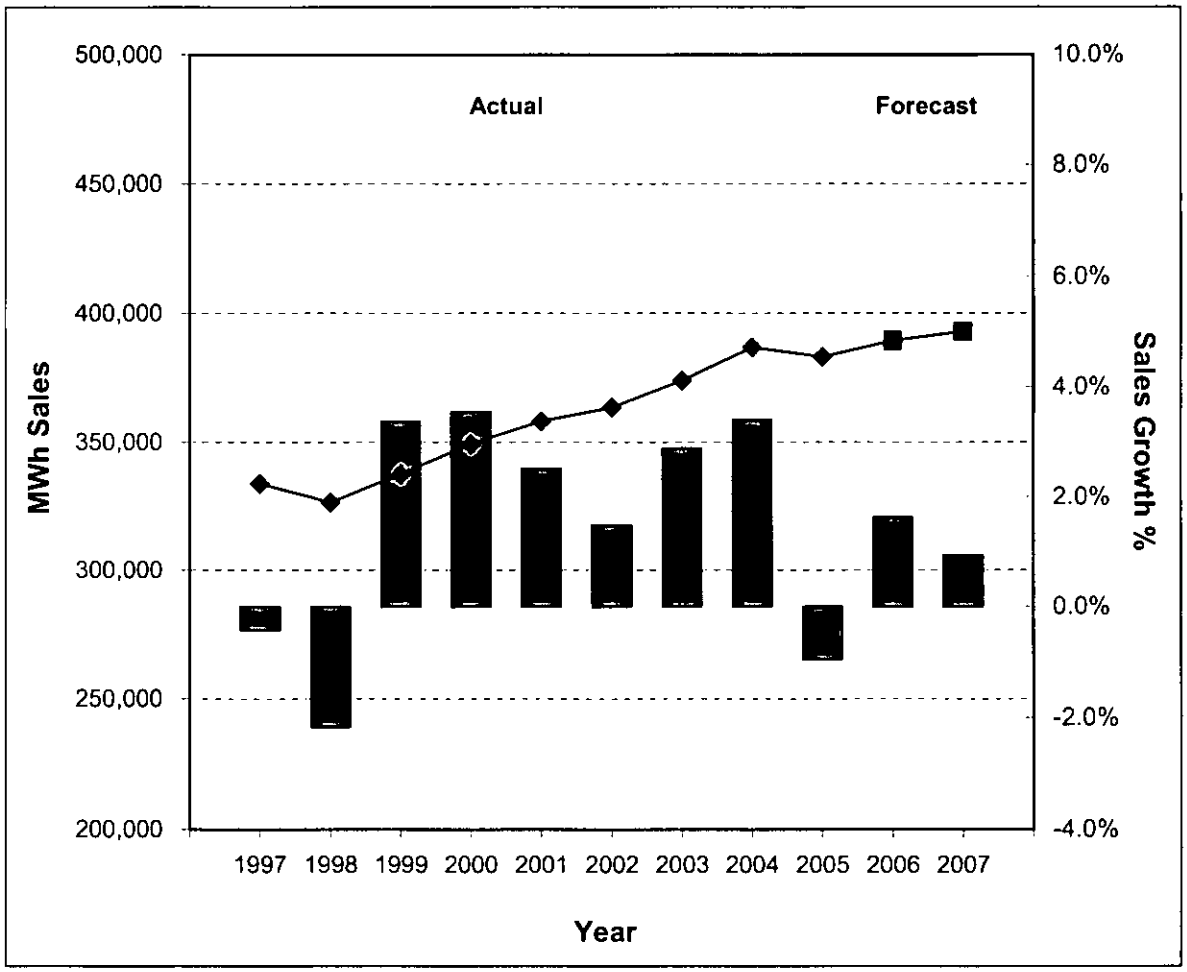
SCHEDULE H : COMMERCIAL COOKING, AIR CONDITIONING, HEATING & REFRIGERATION SERVICE

Year	Billed Sales			Average Customers			Use / Average Customer		
	Mwh	Chg	% Chg	No.	Chg	% Chg	Kwh	Chg	% Chg
1975 *	5,223			196			26,648		
1976	6,036	813	15.6%	187	(9)	-4.6%	32,278	5,630	21.1%
1977	7,553	1,517	25.1%	187	0	0.0%	40,390	8,112	25.1%
1978	8,772	1,219	16.1%	196	9	4.8%	44,755	4,365	10.8%
1979	9,869	1,097	12.5%	216	20	10.2%	45,690	935	2.1%
1980	11,477	1,608	16.3%	230	14	6.5%	49,900	4,210	9.2%
1981	12,852	1,375	12.0%	235	5	2.2%	54,689	4,789	9.6%
1982	14,068	1,216	9.5%	250	15	6.4%	56,272	1,583	2.9%
1983	14,900	832	5.9%	258	8	3.2%	57,752	1,480	2.6%
1984	15,830	930	6.2%	256	(2)	-0.8%	61,836	4,084	7.1%
1985	16,246	416	2.6%	259	3	1.2%	62,726	890	1.4%
1986 **	19,656	3,410	21.0%	268	9	3.5%	73,343	10,617	16.9%
1987	21,399	1,743	8.9%	287	19	7.1%	74,561	1,218	1.7%
1988	23,309	1,910	8.9%	294	7	2.4%	79,282	4,721	6.3%
1989	23,625	316	1.4%	296	2	0.7%	79,814	532	0.7%
1990	24,717	1,092	4.6%	296	0	0.0%	83,503	3,689	4.6%
1991	25,485	768	3.1%	306	10	3.4%	83,284	(219)	-0.3%
1992	26,525	1,040	4.1%	317	11	3.6%	83,675	391	0.5%
1993	26,619	94	0.4%	317	0	0.0%	83,972	297	0.4%
1994	26,629	10	0.0%	314	(3)	-1.0%	84,806	834	1.0%
1995	26,659	30	0.1%	306	(8)	-2.6%	87,120	2,314	2.7%
1996	26,565	(93)	-0.4%	290	(16)	-5.3%	91,683	4,563	5.2%
1997	26,261	(304)	-1.2%	285	(5)	-1.6%	92,062	379	0.4%
1998	23,966	(2,295)	-8.7%	276	(9)	-3.2%	86,834	(5,228)	-5.7%
1999	23,569	(397)	-1.7%	265	(11)	-4.0%	88,939	2,105	2.4%
2000	23,843	275	1.2%	251	(14)	-5.3%	94,994	6,055	6.8%
2001	23,612	(231)	-1.0%	241	(10)	-4.0%	97,976	2,982	3.1%
2002	22,430	(1,182)	-5.0%	240	(1)	-0.4%	93,457	(4,519)	-4.6%
2003	23,051	621	2.8%	239	(1)	-0.4%	96,447	2,990	3.2%
2004	23,184	133	0.6%	236	(3)	-1.3%	98,235	1,788	1.9%
2005	22,260	(923)	-4.0%	233	(3)	-1.3%	95,537	(2,698)	-2.8%
2005 @	6,653			234			28,431		
2006 @	6,523	(130)	-2.0%	230	(4)	-1.7%	28,362	(69)	-0.2%

* Formerly called Schedule H-1.
** Includes refolio adjustment of 38 mwh.
@ April year-to-date

Maui Electric Company, Inc.

SCHEDULE P - LARGE POWER SERVICE
ACTUAL & FORECAST SALES (MWH) & SALES GROWTH %
MAUI DIVISION



										Forecast	
Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
MWh Sales	333,654	######	######	######	######	######	######	######	######	######	######
Customers	107	106	107	109	113	116	118	117	117	120	121
Growth %	-0.4%	-2.2%	3.4%	3.5%	2.5%	1.5%	2.9%	3.4%	-0.9%	1.6%	0.9%

Maui Electric Company, Ltd.
Maui Division

BILLED DATA

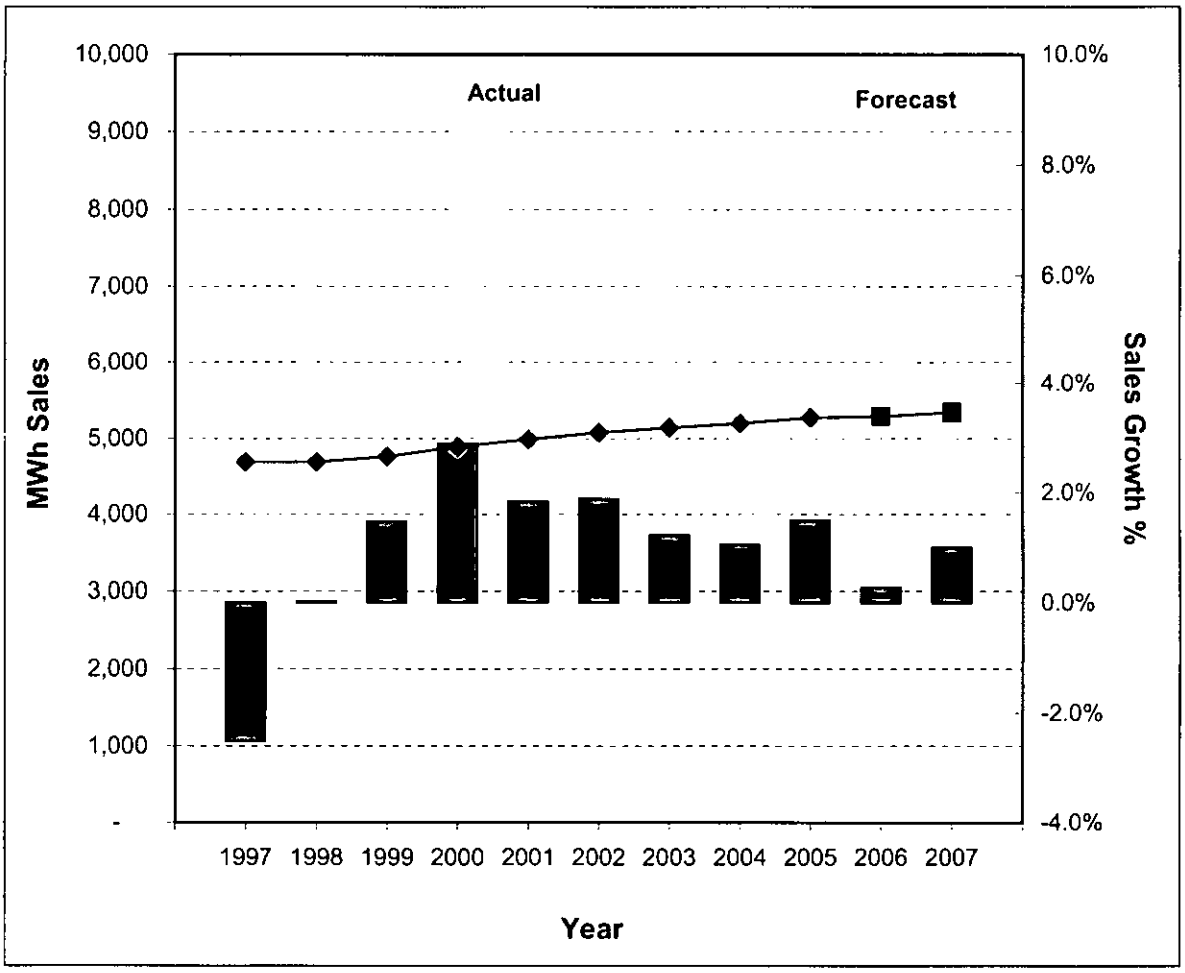
SCHEDULE P : LARGE POWER SERVICE

Year	Billed Sales			Average Customers			Use / Average Customer		
	Mwh	Chg	% Chg	No.	Chg	% Chg	Kwh	Chg	% Chg
1975 *	78,278			54			1,449,593		
1976	87,143	8,865	11.3%	35	(19)	-35.2%	2,489,800	1,040,207	71.8%
1977	103,361	16,218	18.6%	44	9	25.7%	2,349,114	(140,686)	-5.7%
1978	110,367	7,006	6.8%	47	3	6.8%	2,348,234	(880)	0.0%
1979	119,005	8,638	7.8%	51	4	8.5%	2,333,431	(14,803)	-0.6%
1980	139,110	20,105	16.9%	53	2	3.9%	2,624,717	291,286	12.5%
1981	150,456	11,346	8.2%	55	2	3.8%	2,735,564	110,847	4.2%
1982	163,429	12,973	8.6%	60	5	9.1%	2,723,817	(11,747)	-0.4%
1983	167,586	4,157	2.5%	63	3	5.0%	2,660,095	(63,722)	-2.3%
1984	186,909	19,323	11.5%	70	7	11.1%	2,670,129	10,034	0.4%
1985	182,578	(4,331)	-2.3%	72	2	2.9%	2,535,806	(134,323)	-5.0%
1986 **	197,168	14,590	8.0%	71	(1)	-1.4%	2,777,014	241,208	9.5%
1987	200,781	3,613	1.8%	71	0	0.0%	2,827,901	50,887	1.8%
1988	218,048	17,267	8.6%	72	1	1.4%	3,028,444	200,543	7.1%
1989	218,846	798	0.4%	73	1	1.4%	2,997,890	(30,554)	-1.0%
1990	234,593	15,747	7.2%	78	5	6.9%	3,007,603	9,713	0.3%
1991	252,471	17,878	7.6%	80	2	2.6%	3,155,888	148,285	4.9%
1992	287,670	35,199	13.9%	88	8	10.0%	3,268,977	113,089	3.6%
1993	298,642	10,972	3.8%	93	5	5.7%	3,211,204	(57,773)	-1.8%
1994	309,483	10,841	3.6%	98	5	5.4%	3,157,990	(53,214)	-1.7%
1995	327,180	17,697	5.7%	103	5	5.1%	3,176,506	18,516	0.6%
1996	335,085	7,905	2.4%	104	1	1.3%	3,211,679	35,173	1.1%
1997	333,654	(1,431)	-0.4%	107	2	2.2%	3,130,449	(81,230)	-2.5%
1998	326,436	(7,218)	-2.2%	106	(1)	-0.6%	3,079,585	(50,864)	-1.6%
1999	337,466	11,030	3.4%	107	1	0.9%	3,153,889	74,304	2.4%
2000	349,445	11,979	3.6%	109	2	1.9%	3,205,921	52,032	1.7%
2001	358,205	8,759	2.5%	113	4	3.7%	3,169,953	(35,968)	-1.1%
2002	363,511	5,306	1.5%	116	3	2.7%	3,133,711	(36,242)	-1.1%
2003	374,011	10,500	2.9%	118	2	1.7%	3,169,585	35,874	1.1%
2004	386,731	12,720	3.4%	117	(1)	-0.9%	3,305,396	135,811	4.3%
2005	383,086	(3,646)	-0.9%	117	0	0.0%	3,274,236	(31,160)	-0.9%
2005 @	120,342			116			1,037,430		
2006 @	122,672	2,330	1.9%	119	3	2.6%	1,030,855	(6,575)	-0.6%

* Formerly called Schedule P-4.
** Includes refolio adjustment of 4966 mwh.
@ April year-to-date

Maui Electric Company, Inc.

SCHEDULE F - STREET LIGHTING
ACTUAL & FORECAST SALES (MWH) & SALES GROWTH %
MAUI DIVISION



										Forecast	
Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
MWh Sales	4,688	4,689	4,758	4,896	4,986	5,079	5,141	5,196	5,273	5,287	5,340
Customers	131	132	132	137	142	144	149	150	158	166	169
Growth %	-2.5%	0.0%	1.5%	2.9%	1.8%	1.9%	1.2%	1.1%	1.5%	0.3%	1.0%

Maui Electric Company, Ltd.
Maui Division

BILLED DATA

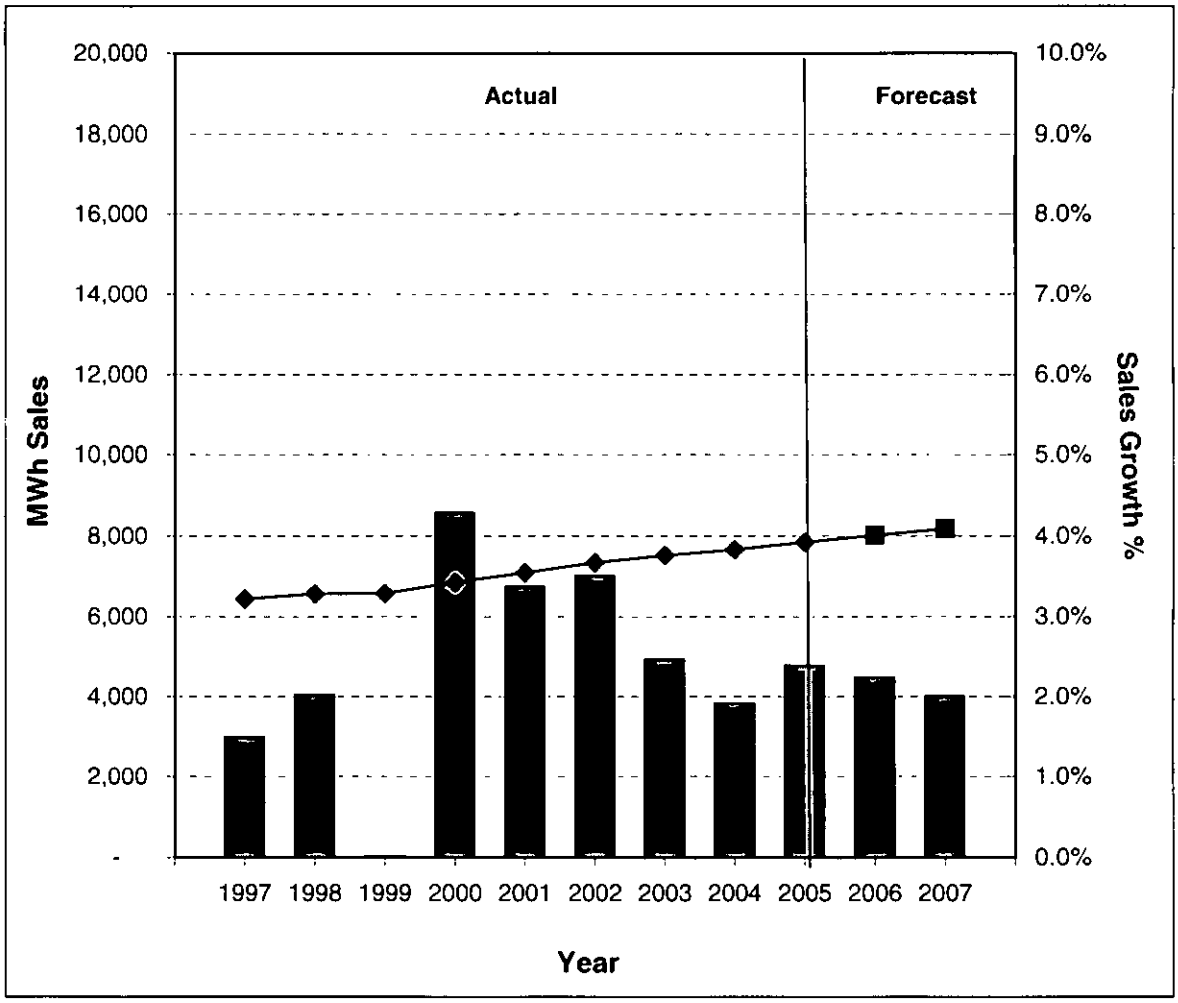
SCHEDULE F : STREET LIGHTING

Year	Billed Sales			Average Customers			Use / Average Customer		
	Mwh	Chg	% Chg	No.	Chg	% Chg	Kwh	Chg	% Chg
1975 *	3,253			345			9,429		
1976	3,410	157	4.8%	354	9	2.6%	9,633	204	2.2%
1977	3,505	95	2.8%	358	4	1.1%	9,791	158	1.6%
1978	3,690	185	5.3%	361	3	0.8%	10,222	431	4.4%
1979	3,634	(56)	-1.5%	361	0	0.0%	10,066	(156)	-1.5%
1980	3,606	(28)	-0.8%	362	1	0.3%	9,961	(105)	-1.0%
1981	3,815	209	5.8%	369	7	1.9%	10,339	378	3.8%
1982	4,083	268	7.0%	370	1	0.3%	11,035	696	6.7%
1983	3,993	(90)	-2.2%	370	0	0.0%	10,792	(243)	-2.2%
1984	3,925	(68)	-1.7%	371	1	0.3%	10,580	(212)	-2.0%
1985	3,901	(24)	-0.6%	371	0	0.0%	10,515	(65)	-0.6%
1986 **	4,027	126	3.2%	373	2	0.5%	10,796	281	2.7%
1987	4,115	88	2.2%	375	2	0.5%	10,973	177	1.6%
1988	4,204	89	2.2%	374	(1)	-0.3%	11,241	268	2.4%
1989	4,139	(65)	-1.6%	373	(1)	-0.3%	11,097	(144)	-1.3%
1990	4,205	66	1.6%	367	(6)	-1.6%	11,458	361	3.3%
1991	4,325	120	2.9%	367	0	0.0%	11,785	327	2.9%
1992	4,472	147	3.4%	367	0	0.0%	12,185	400	3.4%
1993	4,532	60	1.3%	368	1	0.3%	12,315	130	1.1%
1994	4,631	99	2.2%	368	0	0.0%	12,584	269	2.2%
1995	4,799	168	3.6%	368	0	0.0%	13,040	456	3.6%
1996 #	4,808	10	0.2%	124	(244)	-66.3%	38,726	25,686	197.0%
1997	4,688	(120)	-2.5%	131	7	5.4%	35,833	(2,893)	-7.5%
1998	4,689	1	0.0%	132	1	0.9%	35,523	(310)	-0.9%
1999	4,758	69	1.5%	132	0	0.0%	36,044	521	1.5%
2000	4,896	138	2.9%	137	5	3.8%	35,737	(307)	-0.9%
2001	4,986	90	1.8%	142	5	3.7%	35,110	(627)	-1.8%
2002	5,079	94	1.9%	144	2	1.4%	35,273	163	0.5%
2003	5,141	62	1.2%	149	5	3.5%	34,506	(767)	-2.2%
2004	5,196	54	1.1%	150	1	0.7%	34,637	131	0.4%
2005	5,273	77	1.5%	158	8	5.3%	33,373	(1,264)	-3.7%
2005 @	1,756			155			11,345		
2006 @	1,780	24	1.4%	166	11	7.3%	10,720	(625)	-5.5%

* Formerly called Schedule SL.
** Includes refolio adjustment of 4 mwh.
\# Change in source of customer count.
@ April year-to-date

Maui Electric Company, Inc.

SCHEDULE R - RESIDENTIAL SERVICE
ACTUAL & FORECAST SALES (MWH) & SALES GROWTH %
LANAI DIVISION



										Forecast	
Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
MWh Sales	6,446	6,576	6,577	6,859	7,091	7,339	7,520	7,664	7,847	8,022	8,183
Customers	1,176	1,195	1,221	1,262	1,303	1,313	1,314	1,332	1,342	1,357	1,372
Growth %	1.5%	2.0%	0.0%	4.3%	3.4%	3.5%	2.5%	1.9%	2.4%	2.2%	2.0%

Maui Electric Company, Ltd.
Lanai Division

BILLED DATA

SCHEDULE R : RESIDENTIAL SERVICE

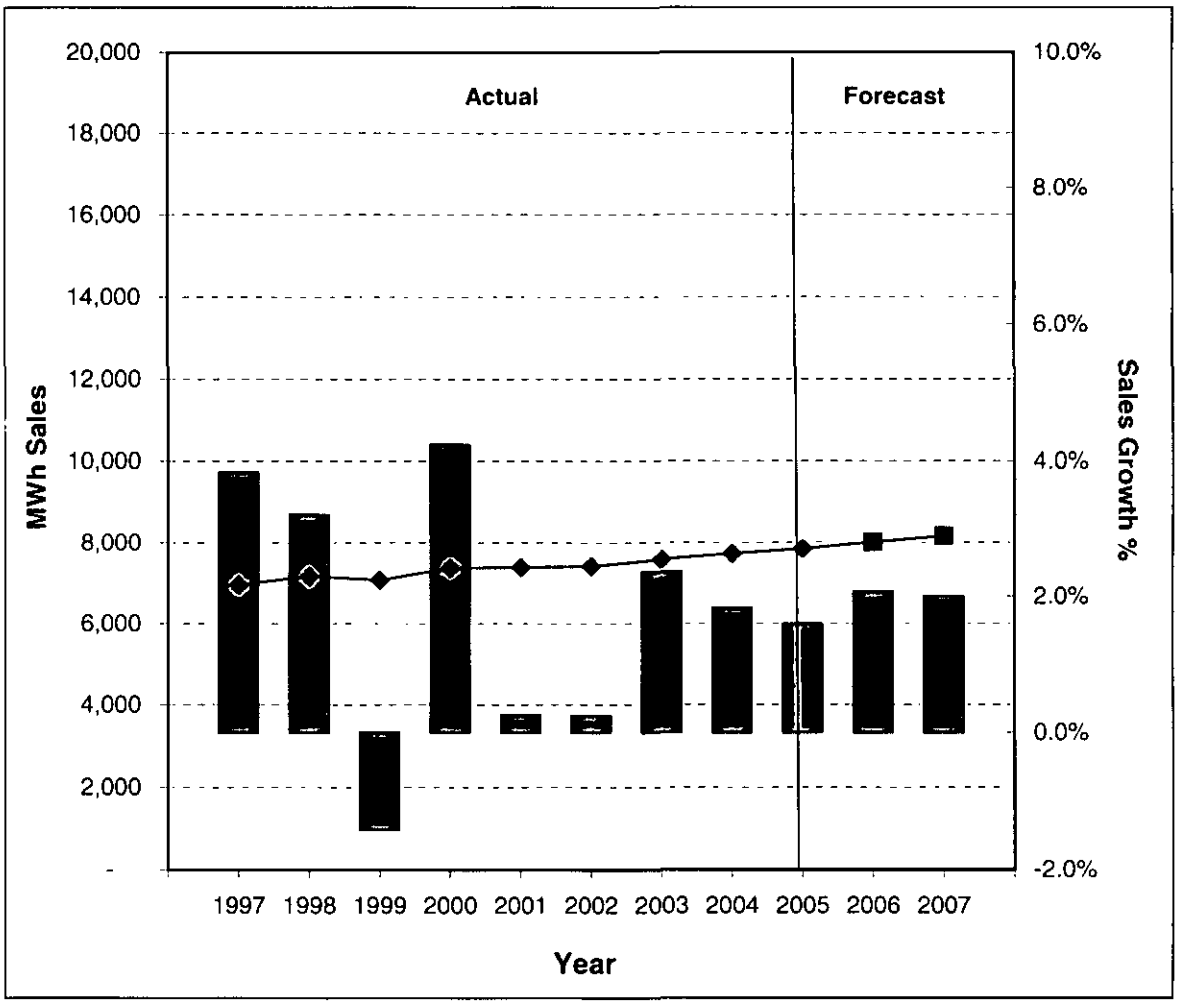
	Billed Sales			Average Customers			Use / Average Customer		
Year	Kwh	Chg	% Chg	No.	Chg	% Chg	Kwh	Chg	% Chg
1975 *	3,554,991			668			5,322		
1976	3,628,732	73,741	2.1%	677	9	1.4%	5,360	38	0.7%
1977	3,629,816	1,084	0.0%	679	2	0.3%	5,346	(14)	-0.3%
1978	3,575,617	(54,199)	-1.5%	677	(2)	-0.3%	5,282	(64)	-1.2%
1979	3,600,854	25,237	0.7%	680	3	0.4%	5,295	13	0.3%
1980	3,565,079	(35,775)	-1.0%	686	6	0.9%	5,197	(98)	-1.9%
1981	3,555,554	(9,525)	-0.3%	706	20	2.9%	5,036	(161)	-3.1%
1982	3,502,761	(52,793)	-1.5%	714	8	1.1%	4,906	(130)	-2.6%
1983	3,431,718	(71,043)	-2.0%	718	4	0.6%	4,780	(126)	-2.6%
1984	3,433,138	1,420	0.0%	732	14	2.0%	4,690	(90)	-1.9%
1985	3,382,006	(51,132)	-1.5%	750	18	2.5%	4,509	(181)	-3.9%
1986	3,463,744	81,738	2.4%	756	6	0.8%	4,582	73	1.6%
1987	3,541,223	77,479	2.2%	764	8	1.1%	4,635	53	1.2%
1988	3,720,422	179,199	5.1%	770	6	0.8%	4,832	197	4.3%
1989	4,072,459	352,037	9.5%	849	79	10.3%	4,797	(35)	-0.7%
1990	4,651,663	579,204	14.2%	909	60	7.1%	5,117	320	6.7%
1991	4,935,368	283,705	6.1%	972	63	6.9%	5,078	(39)	-0.8%
1992	5,338,053	402,685	8.2%	1,035	63	6.5%	5,158	80	1.6%
1993	5,878,343	540,290	10.1%	1,110	75	7.3%	5,296	138	2.7%
1994	5,985,484	107,141	1.8%	1,114	4	0.4%	5,373	77	1.5%
1995	6,121,152	135,668	2.3%	1,137	23	2.1%	5,384	11	0.2%
1996	6,351,061	229,909	3.8%	1,173	36	3.2%	5,414	30	0.6%
1997	6,446,231	95,170	1.5%	1,176	3	0.2%	5,482	68	1.3%
1998	6,576,195	129,964	2.0%	1,195	19	1.6%	5,503	21	0.4%
1999	6,577,297	1,102	0.0%	1,221	26	2.2%	5,387	(116)	-2.1%
2000	6,859,323	282,026	4.3%	1,262	41	3.4%	5,435	48	0.9%
2001	7,090,709	231,386	3.4%	1,303	41	3.3%	5,442	7	0.1%
2002	7,339,483	248,774	3.5%	1,313	10	0.8%	5,590	148	2.7%
2003	7,520,118	180,635	2.5%	1,314	1	0.1%	5,723	133	2.4%
2004	7,664,206	144,088	1.9%	1,332	18	1.4%	5,754	31	0.5%
2005	7,846,797	182,591	2.4%	1,342	10	0.8%	5,847	93	1.6%
2005 @	2,646,001			1,336			1,981		
2006 @	2,703,360	57,359	2.2%	1,360	24	1.8%	1,988	7	0.4%
5 year average (2001-2005):			2.7%			1.2%			1.5%
10 year average (1996-2005):			2.5%			1.7%			0.8%

* Formerly called Schedule D.

@ April year-to-date

Maui Electric Company, Inc.

SCHEDULE G/J - GENERAL SERVICE
ACTUAL & FORECAST SALES (MWH) & SALES GROWTH %
LANAI DIVISION



										Forecast	
Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
MWh Sales	6,947	7,171	7,069	7,369	7,388	7,406	7,581	7,719	7,842	8,004	8,164
Customers	160	170	175	188	192	196	197	198	204	214	224
Growth %	3.8%	3.2%	-1.4%	4.2%	0.3%	0.2%	2.4%	1.8%	1.6%	2.1%	2.0%

Maui Electric Company, Ltd.
Lanai Division

BILLED DATA

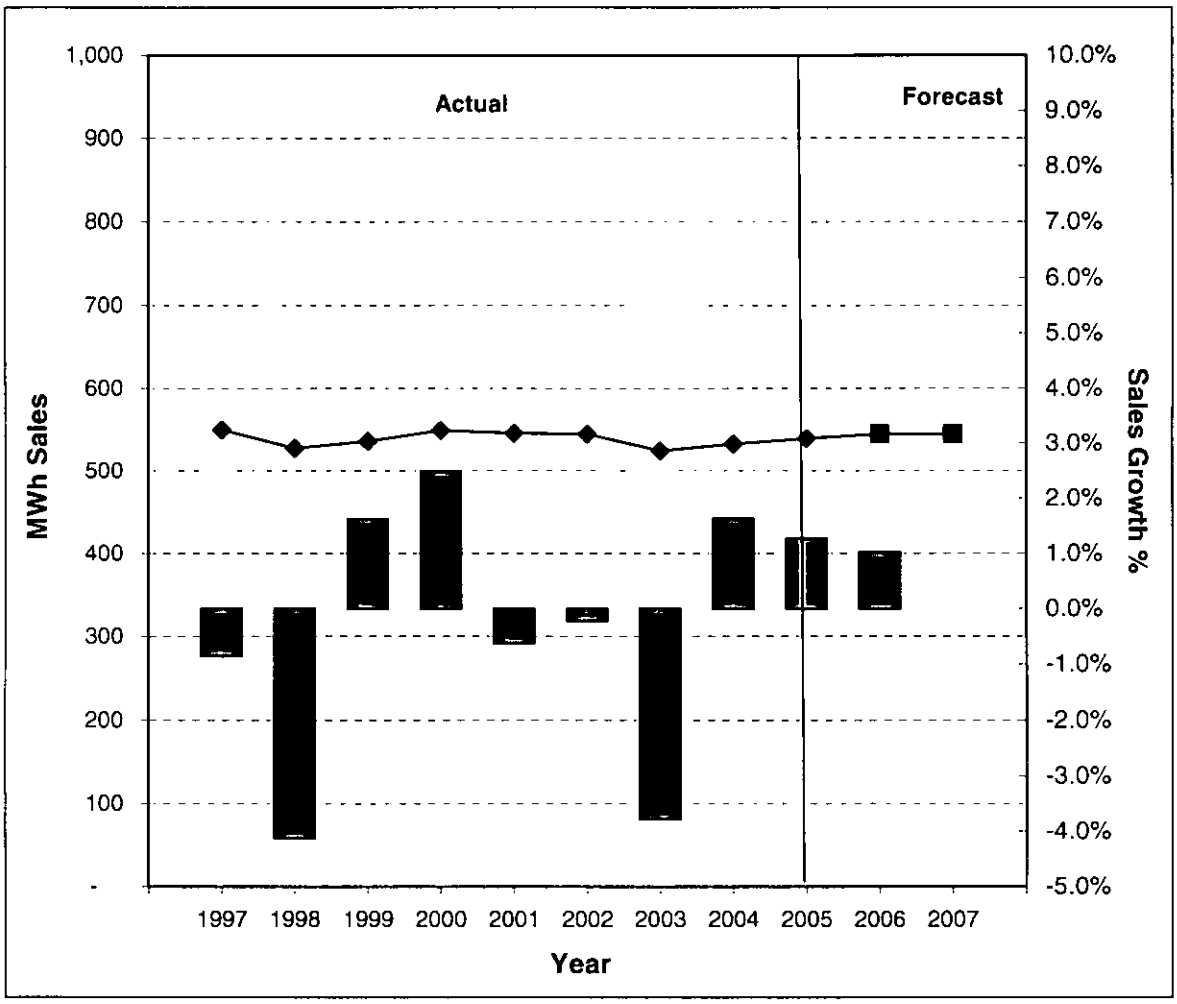
SCHEDULE G/J : GENERAL SERVICE

Year	Billed Sales			Average Customers			Use / Average Customer		
	Kwh	Chg	% Chg	No.	Chg	% Chg	Kwh	Chg	% Chg
1975 *	1,502,440			128			11,738		
1976	1,580,241	77,801	5.2%	124	(4)	-3.1%	12,744	1,006	8.6%
1977	1,775,333	195,092	12.4%	123	(1)	-0.8%	14,434	1,690	13.3%
1978	1,816,538	41,205	2.3%	126	3	2.4%	14,417	(17)	-0.1%
1979	1,797,636	(18,902)	-1.0%	125	(1)	-0.8%	14,381	(36)	-0.3%
1980	1,848,697	51,061	2.8%	126	1	0.8%	14,672	291	2.0%
1981	1,740,673	(108,024)	-5.8%	118	(8)	-6.4%	14,751	79	0.5%
1982	1,713,154	(27,519)	-1.6%	120	2	1.7%	14,276	(475)	-3.2%
1983	1,698,342	(14,812)	-0.9%	123	3	2.5%	13,808	(468)	-3.3%
1984	1,557,932	(140,410)	-8.3%	109	(14)	-11.4%	14,293	485	3.5%
1985	1,427,826	(130,106)	-8.4%	98	(11)	-10.1%	14,570	277	1.9%
1986	1,502,077	74,251	5.2%	97	(1)	-1.0%	15,485	915	6.3%
1987	1,505,928	3,851	0.3%	97	0	0.0%	15,525	40	0.3%
1988	2,065,761	559,833	37.2%	97	0	0.0%	21,297	5,772	37.2%
1989	2,659,655	593,894	28.8%	105	8	8.3%	25,330	4,033	18.9%
1990	3,520,966	861,311	32.4%	111	6	5.7%	31,720	6,390	25.2%
1991	5,694,162	2,173,196	61.7%	126	15	13.5%	45,192	13,472	42.5%
1992	4,466,985	(1,227,177)	-21.6%	130	4	3.2%	34,361	(10,831)	-24.0%
1993	4,484,319	17,334	0.4%	127	(3)	-2.3%	35,310	949	2.8%
1994	6,002,104	1,517,785	33.9%	135	8	6.3%	44,460	9,150	25.9%
1995	6,547,154	545,050	9.1%	146	11	8.2%	44,844	384	0.9%
1996	6,691,202	144,048	2.2%	152	6	4.0%	44,069	(775)	-1.7%
1997	6,947,493	256,291	3.8%	160	8	5.4%	43,422	(647)	-1.5%
1998	7,170,643	223,150	3.2%	170	10	6.3%	42,180	(1,242)	-2.9%
1999	7,069,276	(101,367)	-1.4%	175	5	2.9%	40,396	(1,784)	-4.2%
2000	7,369,129	299,853	4.2%	188	13	7.4%	39,197	(1,199)	-3.0%
2001	7,387,635	18,506	0.3%	192	4	2.1%	38,477	(720)	-1.8%
2002	7,405,813	18,178	0.3%	196	4	2.1%	37,785	(692)	-1.8%
2003	7,580,897	175,084	2.4%	197	1	0.5%	38,482	697	1.8%
2004	7,719,161	138,264	1.8%	198	1	0.5%	38,986	504	1.3%
2005	7,842,381	123,220	1.6%	204	6	3.0%	38,443	(543)	-1.4%
2005 @	2,476,310			203			12,184		
2006 @	2,540,170	63,860	2.6%	216	13	6.3%	11,760	(424)	-3.5%

* Formerly called Schedules L-1, H-2, P-1 and P-4, which have been combined.
@ April year-to-date

Maui Electric Company, Inc.

SCHEDULE H - COMMERCIAL COOKING, AIR CONDITIONING, HEATING, AND REFRIGERATION SERVICE ACTUAL & FORECAST SALES (MWH) & SALES GROWTH % LANAI DIVISION



										Forecast	
Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
MWh Sales	550	528	536	549	546	545	524	533	540	545	545
Customers	5	5	5	5	6	5	4	4	4	4	4
Growth %	-0.9%	-4.1%	1.6%	2.5%	-0.6%	-0.2%	-3.8%	1.6%	1.3%	1.0%	0.0%

Maui Electric Company, Ltd.
Lanai Division

BILLED DATA

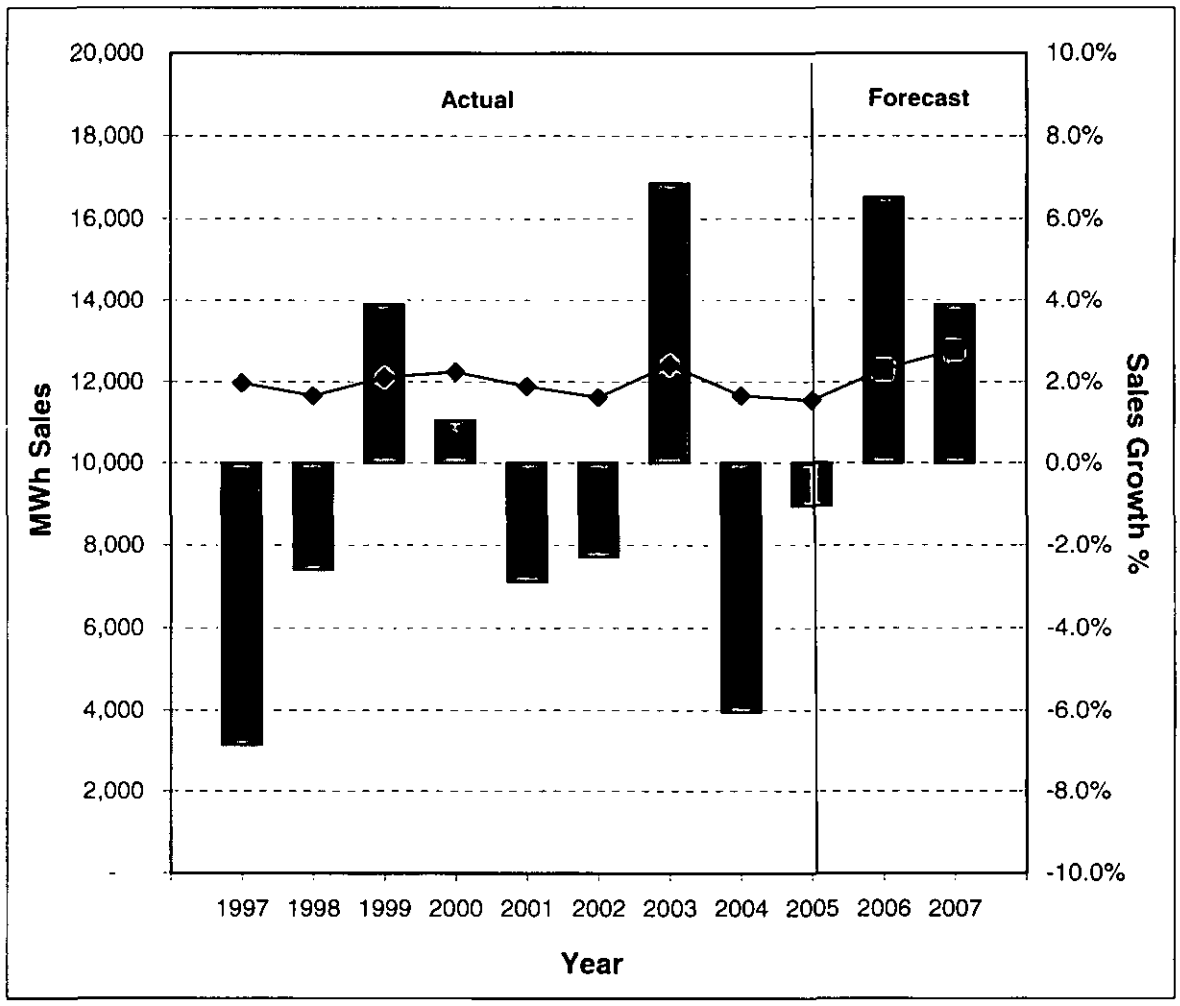
SCHEDULE H : COMMERCIAL COOKING, AIR CONDITIONING, HEATING, & REFRIGERATION SERVICE

	Billed Sales			Average Customers			Use / Average Customer		
Year	Kwh	Chg	% Chg	No.	Chg	% Chg	Kwh	Chg	% Chg
1975 *	518,569			41			12,648		
1976	543,116	24,547	4.7%	42	1	2.4%	12,931	283	2.2%
1977	563,281	20,165	3.7%	40	(2)	-4.8%	14,082	1,151	8.9%
1978	577,480	14,199	2.5%	38	(2)	-5.0%	15,197	1,115	7.9%
1979	606,620	29,140	5.1%	38	0	0.0%	15,964	767	5.1%
1980	634,047	27,427	4.5%	37	(1)	-2.6%	17,136	1,172	7.3%
1981	650,406	16,359	2.6%	32	(5)	-13.5%	20,325	3,189	18.6%
1982	631,206	(19,200)	-3.0%	30	(2)	-6.3%	21,040	715	3.5%
1983	638,607	7,401	1.2%	32	2	6.7%	19,956	(1,084)	-5.2%
1984	609,578	(29,029)	-4.6%	27	(5)	-15.6%	22,577	2,621	13.1%
1985	588,201	(21,377)	-3.5%	21	(6)	-22.2%	28,010	5,433	24.1%
1986	589,897	1,696	0.3%	19	(2)	-9.5%	31,047	3,037	10.8%
1987	621,292	31,395	5.3%	18	(1)	-5.3%	34,516	3,469	11.2%
1988	663,415	42,123	6.8%	19	1	5.6%	34,917	401	1.2%
1989	636,483	(26,932)	-4.1%	17	(2)	-10.5%	37,440	2,523	7.2%
1990	600,556	(35,927)	-5.6%	16	(1)	-5.9%	37,535	95	0.3%
1991	598,579	(1,977)	-0.3%	15	(1)	-6.3%	39,905	2,370	6.3%
1992	616,772	18,193	3.0%	15	0	0.0%	41,118	1,213	3.0%
1993	553,992	(62,780)	-10.2%	14	(1)	-6.7%	39,571	(1,547)	-3.8%
1994	523,418	(30,574)	-5.5%	14	0	0.0%	37,387	(2,184)	-5.5%
1995	475,364	(48,054)	-9.2%	13	(1)	-7.1%	36,566	(821)	-2.2%
1996	554,926	79,562	16.7%	9	(5)	-34.6%	65,285	28,719	78.5%
1997	550,209	(4,717)	-0.9%	5	(4)	-41.2%	110,042	44,757	68.6%
1998	527,542	(22,667)	-4.1%	5	0	0.0%	105,508	(4,534)	-4.1%
1999	536,108	8,566	1.6%	5	0	0.0%	107,222	1,714	1.6%
2000	549,444	13,336	2.5%	5	0	0.0%	109,889	2,667	2.5%
2001	546,033	(3,411)	-0.6%	6	1	20.0%	91,006	(18,883)	-17.2%
2002	544,825	(1,208)	-0.2%	5	(1)	-16.7%	108,965	17,959	19.7%
2003	524,230	(20,595)	-3.8%	4	(1)	-20.0%	131,058	22,093	20.3%
2004	532,757	8,527	1.6%	4	0	0.0%	133,189	2,131	1.6%
2005	539,516	6,759	1.3%	4	0	0.0%	134,879	1,690	1.3%
2004 @	172,820			4			43,205		
2005 @	174,628	1,808	1.1%	4	0	0.0%	43,657	452	1.1%

* Formerly called Schedule H-1.
@ April year-to-date

Maui Electric Company, Inc.

SCHEDULE P - LARGE POWER SERVICE
ACTUAL & FORECAST SALES (MWH) & SALES GROWTH %
LANAI DIVISION



										Forecast	
Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
MWh Sales	11,970	11,659	12,114	12,241	11,890	11,618	12,416	11,665	11,544	12,296	12,774
Customers	3	3	3	3	3	3	3	3	3	3	3
Growth %	-6.8%	-2.6%	3.9%	1.1%	-2.9%	-2.3%	6.9%	-6.0%	-1.0%	6.5%	3.9%

Maui Electric Company, Ltd.
Lanai Division

BILLED DATA

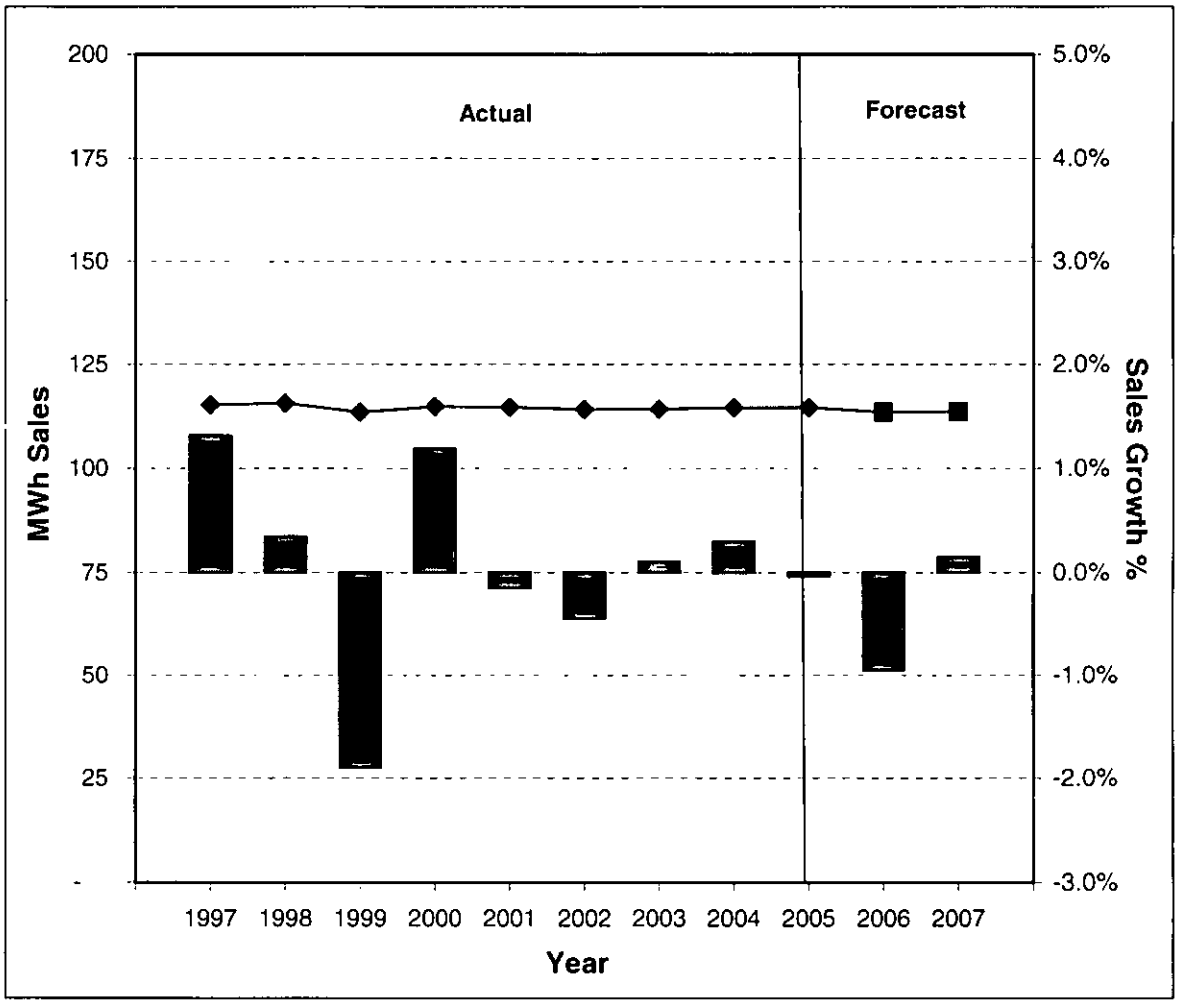
SCHEDULE P : LARGE POWER SERVICE

Year		Billed Sales			Average Customers			Use / Average Customer		
		Kwh	Chg	% Chg	No.	Chg	% Chg	Kwh	Chg	% Chg
1975										
1976										
1977										
1978										
1979										
1980										
1981										
1982										
1983										
1984										
1985										
1986										
1987										
1988	*	1,925,500			1			1,925,500		
1989		4,469,600	2,544,100	132.1%	1	0	0.0%	4,469,600	2,544,100	132.1%
1990		6,496,600	2,027,000	45.4%	2	1	100.0%	3,248,300	(1,221,300)	-27.3%
1991		8,466,200	1,969,600	30.3%	2	0	0.0%	4,233,100	984,800	30.3%
1992		12,280,300	3,814,100	45.1%	3	1	50.0%	4,093,433	(139,667)	-3.3%
1993		12,732,000	451,700	3.7%	3	0	0.0%	4,244,000	150,567	3.7%
1994		13,544,400	812,400	6.4%	3	0	0.0%	4,514,800	270,800	6.4%
1995		12,721,600	(822,800)	-6.1%	3	0	0.0%	4,240,533	(274,267)	-6.1%
1996		12,847,400	125,800	1.0%	3	0	0.0%	4,282,467	41,934	1.0%
1997		11,969,600	(877,800)	-6.8%	3	0	0.0%	3,989,867	(292,600)	-6.8%
1998		11,658,600	(311,000)	-2.6%	3	0	0.0%	3,886,200	(103,667)	-2.6%
1999		12,113,600	455,000	3.9%	3	0	0.0%	4,037,867	151,667	3.9%
2000		12,241,200	127,600	1.1%	3	0	0.0%	4,080,400	42,533	1.1%
2001		11,889,600	(351,600)	-2.9%	3	0	0.0%	3,963,200	(117,200)	-2.9%
2002		11,618,400	(271,200)	-2.3%	3	0	0.0%	3,872,800	(90,400)	-2.3%
2003		12,415,600	797,200	6.9%	3	0	0.0%	4,138,533	265,733	6.9%
2004		11,665,000	(750,600)	-6.1%	3	0	0.0%	3,888,333	(250,200)	-6.1%
2005		11,543,600	(121,400)	-1.0%	3	0	0.0%	3,847,867	(40,466)	-1.0%
2005	@	3,624,200			3			1,208,067		
2006	@	4,048,400	424,200	11.7%	3	0	0.0%	1,349,467	141,400	11.7%

* Dole Company pumps came on line as Schedule "P" from September, 1988.
@ April year-to-date

Maui Electric Company, Inc.

SCHEDULE F - STREET LIGHTING
ACTUAL & FORECAST SALES (MWH) & SALES GROWTH %
LANAI DIVISION



										Forecast	
Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
MWh Sales	115	116	114	115	115	114	114	115	115	114	114
Customers	4	4	4	3	3	3	3	3	3	3	3
Growth %	1.3%	0.3%	-1.9%	1.2%	-0.1%	-0.4%	0.1%	0.3%	0.0%	-0.9%	0.2%

Maui Electric Company, Ltd.
Lanai Division

BILLED DATA

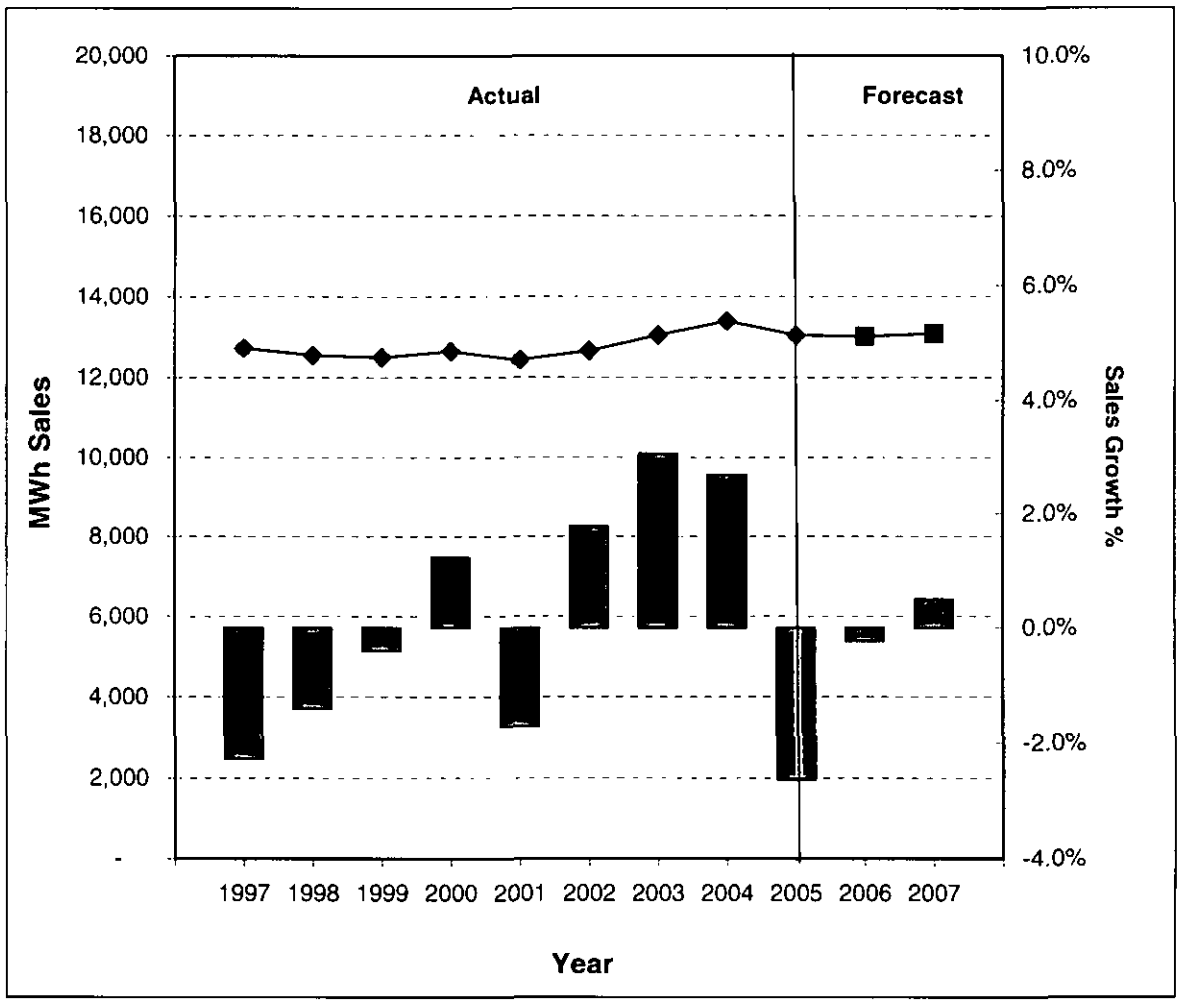
SCHEDULE F : STREET LIGHTING

Year	Billed Sales			Average Customers			Use / Average Customer		
	Kwh	Chg	% Chg	No.	Chg	% Chg	Kwh	Chg	% Chg
1975 *	49,991			6			8,332		
1976	62,310	12,319	24.6%	6	0	0.0%	10,385	2,053	24.6%
1977	83,069	20,759	33.3%	6	0	0.0%	13,845	3,460	33.3%
1978	87,312	4,243	5.1%	6	0	0.0%	14,552	707	5.1%
1979	89,262	1,950	2.2%	6	0	0.0%	14,877	325	2.2%
1980	93,956	4,694	5.3%	6	0	0.0%	15,659	782	5.3%
1981	101,811	7,855	8.4%	6	0	0.0%	16,969	1,310	8.4%
1982	100,361	(1,450)	-1.4%	6	0	0.0%	16,727	(242)	-1.4%
1983	98,810	(1,551)	-1.6%	6	0	0.0%	16,468	(259)	-1.6%
1984	100,306	1,496	1.5%	6	0	0.0%	16,718	250	1.5%
1985	108,665	8,359	8.3%	6	0	0.0%	18,111	1,393	8.3%
1986	98,613	(10,052)	-9.3%	6	0	0.0%	16,436	(1,675)	-9.3%
1987	96,429	(2,184)	-2.2%	5	(1)	-16.7%	19,286	2,850	17.3%
1988	96,159	(270)	-0.3%	4	(1)	-20.0%	24,040	4,754	24.7%
1989	108,690	12,531	13.0%	6	2	50.0%	18,115	(5,925)	-24.7%
1990	128,125	19,435	17.9%	8	2	33.3%	16,016	(2,099)	-11.6%
1991	114,304	(13,821)	-10.8%	8	0	0.0%	14,288	(1,728)	-10.8%
1992	114,505	201	0.2%	7	(1)	-12.5%	16,358	2,070	14.5%
1993	136,843	22,338	19.5%	6	(1)	-14.3%	22,807	6,449	39.4%
1994	125,526	(11,317)	-8.3%	6	0	0.0%	20,921	(1,886)	-8.3%
1995	125,357	(169)	-0.1%	6	0	0.0%	20,893	(28)	-0.1%
1996	113,859	(11,498)	-9.2%	4	(2)	-29.2%	26,790	5,897	28.2%
1997	115,356	1,497	1.3%	4	0	-5.9%	28,839	2,049	7.7%
1998	115,756	400	0.4%	4	0	0.0%	28,939	100	0.4%
1999	113,566	(2,190)	-1.9%	4	0	0.0%	28,392	(547)	-1.9%
2000	114,918	1,352	1.2%	3	(1)	-25.0%	38,306	9,914	34.9%
2001	114,746	(172)	-0.2%	3	0	0.0%	38,249	(57)	-0.2%
2002	114,237	(509)	-0.4%	3	0	0.0%	38,079	(170)	-0.4%
2003	114,353	116	0.1%	3	0	0.0%	38,118	39	0.1%
2004	114,695	342	0.3%	3	0	0.0%	38,232	114	0.3%
2005	114,652	(43)	0.0%	3	0	0.0%	38,217	(15)	0.0%
2005 @	38,251			3			12,750		
2006 @	38,064	(187)	-0.5%	3	0	0.0%	12,688	(62)	-0.5%

* Formerly called Schedule SL.
@ April year-to-date

Maui Electric Company, Inc.

SCHEDULE R - RESIDENTIAL SERVICE
ACTUAL & FORECAST SALES (MWH) & SALES GROWTH %
MOLOKAI DIVISION



										Forecast	
Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
MWh Sales	12,722	12,544	12,494	12,648	12,432	12,652	13,041	13,392	13,042	13,012	13,077
Customers	2,340	2,331	2,357	2,355	2,361	2,400	2,442	2,457	2,481	2,521	2,546
Growth %	-2.3%	-1.4%	-0.4%	1.2%	-1.7%	1.8%	3.1%	2.7%	-2.6%	-0.2%	0.5%

Maui Electric Company, Ltd.
Molokai Division

BILLED DATA

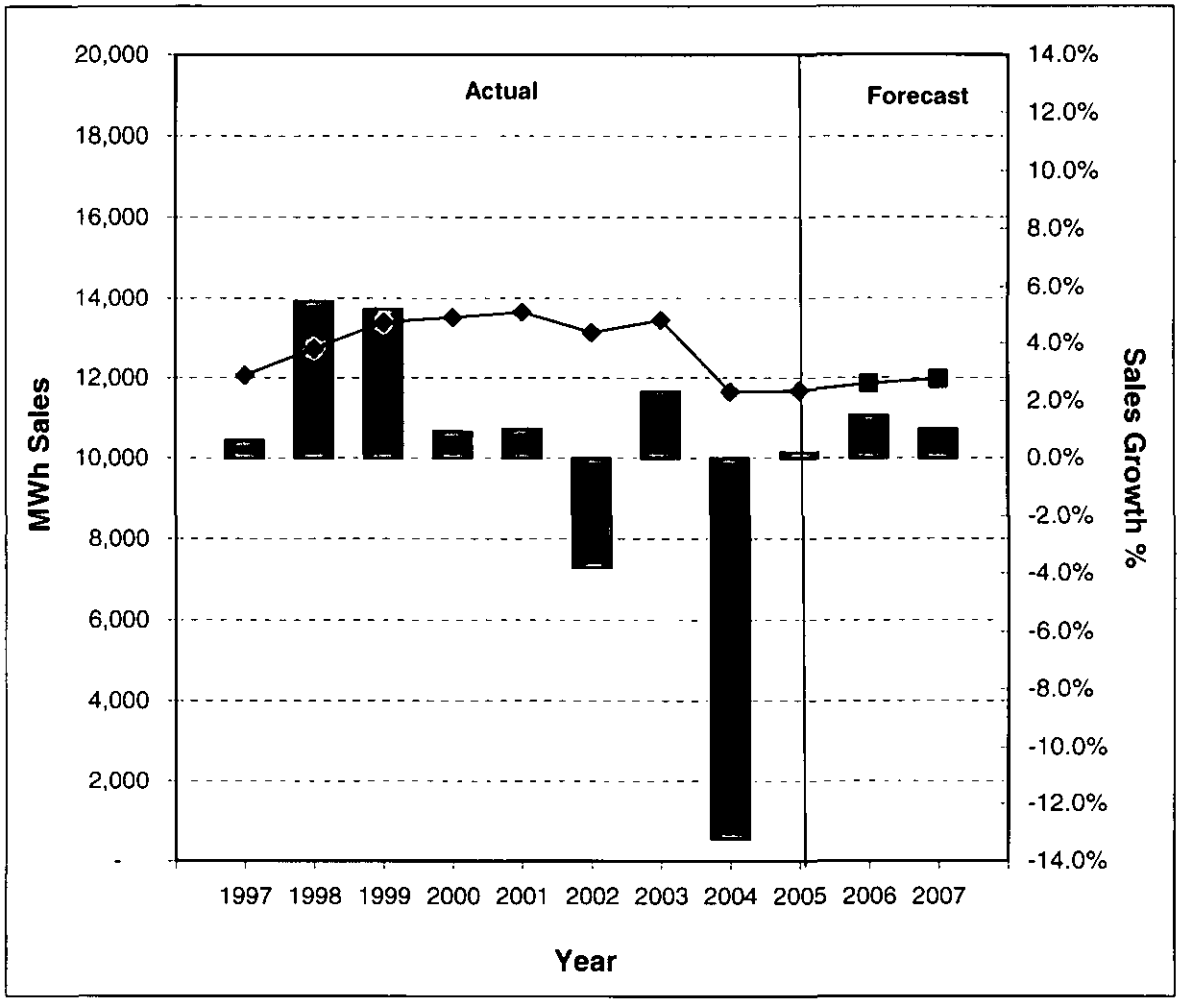
SCHEDULE R : RESIDENTIAL SERVICE

Year	Billed Sales			Average Customers			Use / Average Customer		
	Mwh	Chg	% Chg	No.	Chg	% Chg	Kwh	Chg	% Chg
1975									
1976									
1977									
1978									
1979									
1980	10,332			1,838			5,621		
1981	10,232	(99)	-1.0%	1,866	28	1.5%	5,484	(137)	-2.4%
1982	10,010	(223)	-2.2%	1,921	55	3.0%	5,211	(273)	-5.0%
1983	9,346	(664)	-6.6%	1,946	25	1.3%	4,803	(408)	-7.8%
1984	9,512	166	1.8%	2,004	58	3.0%	4,747	(56)	-1.2%
1985	9,778	266	2.8%	2,057	53	2.6%	4,753	6	0.1%
1986	10,187	409	4.2%	2,080	23	1.1%	4,898	145	3.1%
1987	10,594	407	4.0%	2,113	33	1.6%	5,014	116	2.4%
1988	10,756	162	1.5%	2,150	37	1.8%	5,003	(11)	-0.2%
1989	11,048	292	2.7%	2,164	14	0.7%	5,105	102	2.0%
1990	11,420	372	3.4%	2,194	30	1.4%	5,205	100	2.0%
1991	11,605	184	1.6%	2,218	24	1.1%	5,232	27	0.5%
1992	12,017	413	3.6%	2,269	51	2.3%	5,296	64	1.2%
1993	12,199	182	1.5%	2,275	6	0.3%	5,362	66	1.3%
1994	12,500	301	2.5%	2,307	32	1.4%	5,418	56	1.0%
1995	12,734	234	1.9%	2,310	3	0.1%	5,512	94	1.7%
1996	13,016	282	2.2%	2,323	13	0.6%	5,604	92	1.7%
1997	12,722	(295)	-2.3%	2,340	17	0.7%	5,438	(166)	-3.0%
1998	12,544	(178)	-1.4%	2,331	(9)	-0.4%	5,381	(57)	-1.1%
1999	12,494	(50)	-0.4%	2,357	26	1.1%	5,301	(80)	-1.5%
2000	12,648	154	1.2%	2,355	(2)	-0.1%	5,371	70	1.3%
2001	12,432	(216)	-1.7%	2,361	6	0.3%	5,265	(106)	-2.0%
2002	12,652	220	1.8%	2,400	39	1.7%	5,272	7	0.1%
2003	13,041	388	3.1%	2,442	42	1.8%	5,340	68	1.3%
2004	13,392	352	2.7%	2,457	15	0.6%	5,451	111	2.1%
2005	13,042	(351)	-2.6%	2,481	24	1.0%	5,257	(194)	-3.6%
2005 @	4,432			2,473			1,792		
2006 @	4,282	(150)	-3.4%	2,511	39	1.6%	1,705	(87)	-4.9%

Note: Data from 1975 through 1979 not available.
@ May year-to-date.

Maui Electric Company, Inc.

SCHEDULE G/J - GENERAL SERVICE
ACTUAL & FORECAST SALES (MWH) & SALES GROWTH %
MOLOKAI DIVISION



										Forecast	
Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
MWh Sales	12,061	12,725	13,389	13,512	13,651	13,132	13,440	11,662	11,685	11,860	11,979
Customers	454	471	493	498	496	493	493	492	510	530	540
Growth %	0.6%	5.5%	5.2%	0.9%	1.0%	-3.8%	2.3%	-13.2%	0.2%	1.5%	1.0%

Maui Electric Company, Ltd.
Molokai Division

BILLED DATA

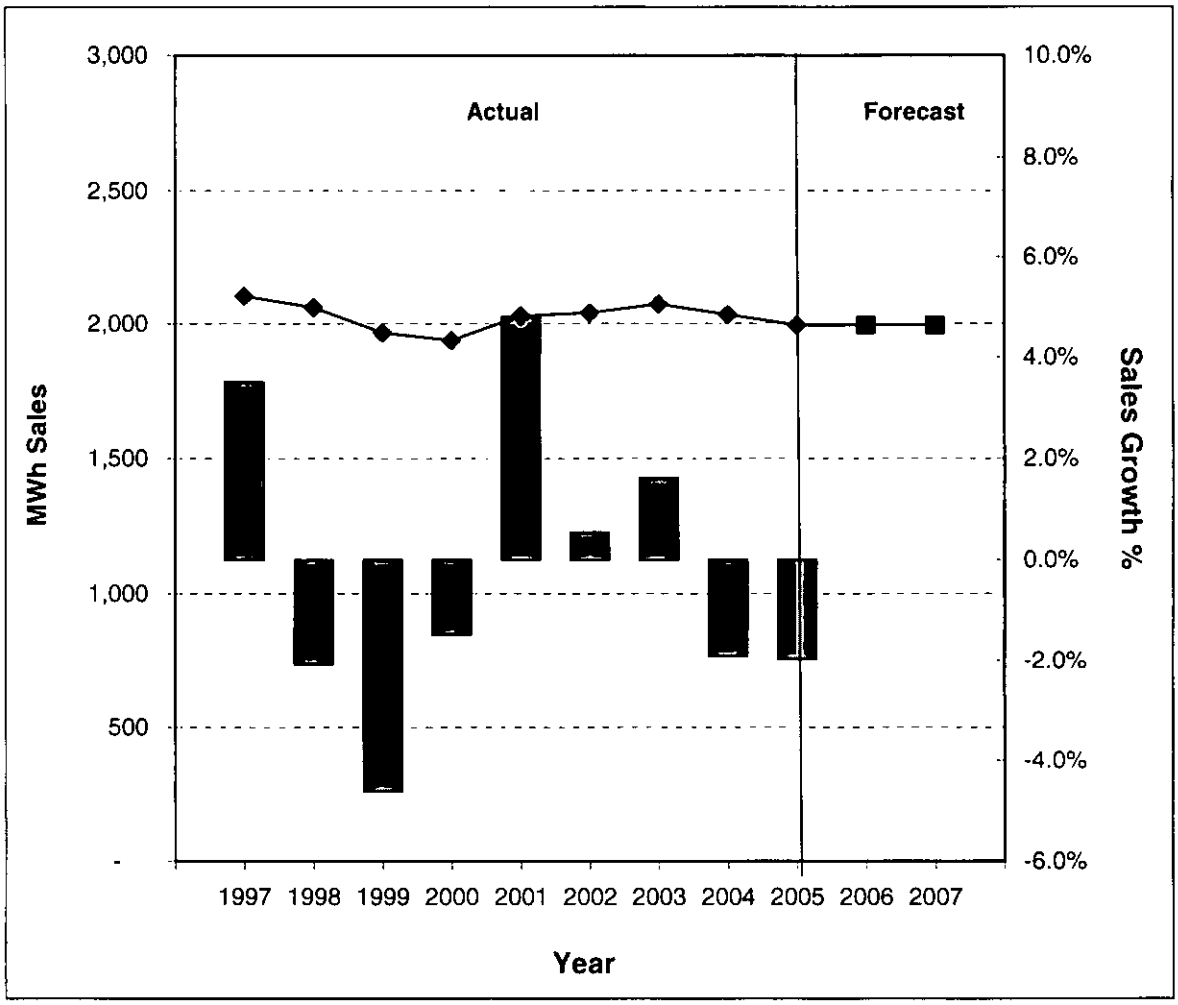
SCHEDULE G/J : GENERAL SERVICE

Year	Billed Sales			Average Customers			Use / Average Customer		
	Mwh	Chg	% Chg	No.	Chg	% Chg	Kwh	Chg	% Chg
1975									
1976									
1977									
1978									
1979									
1980	9,354			358			26,128		
1981	9,560	207	2.2%	371	13	3.6%	25,769	(359)	-1.4%
1982	9,768	207	2.2%	374	3	0.8%	26,117	348	1.4%
1983	9,798	30	0.3%	381	7	1.9%	25,716	(401)	-1.5%
1984	10,627	829	8.5%	382	1	0.3%	27,820	2,104	8.2%
1985	9,919	(709)	-6.7%	404	22	5.8%	24,551	(3,269)	-11.8%
1986	10,429	510	5.1%	411	7	1.7%	25,374	823	3.4%
1987	10,487	58	0.6%	412	1	0.2%	25,454	80	0.3%
1988	10,721	234	2.2%	421	9	2.2%	25,466	12	0.1%
1989	10,693	(28)	-0.3%	428	7	1.7%	24,985	(481)	-1.9%
1990	11,294	600	5.6%	436	8	1.9%	25,903	918	3.7%
1991	11,928	634	5.6%	440	4	0.9%	27,108	1,205	4.7%
1992	12,546	619	5.2%	439	(1)	-0.2%	28,579	1,471	5.4%
1993	12,756	210	1.7%	440	1	0.2%	28,991	412	1.4%
1994	13,799	1,043	8.2%	446	6	1.4%	30,939	1,948	6.7%
1995	12,925	(874)	-6.3%	454	8	1.8%	28,468	(2,471)	-8.0%
1996	11,987	(937)	-7.3%	445	(9)	-2.0%	26,943	(1,525)	-5.4%
1997	12,061	74	0.6%	454	9	2.0%	26,576	(367)	-1.4%
1998	12,725	664	5.5%	471	17	3.8%	27,017	441	1.7%
1999	13,389	664	5.2%	493	22	4.7%	27,163	146	0.5%
2000	13,512	123	0.9%	498	5	1.0%	27,132	(31)	-0.1%
2001	13,651	139	1.0%	496	(2)	-0.4%	27,522	390	1.4%
2002	13,132	(518)	-3.8%	493	(3)	-0.6%	26,638	(884)	-3.2%
2003	13,440	307	2.3%	493	0	0.0%	27,262	624	2.3%
2004	11,662	(1,778)	-13.2%	492	(1)	-0.2%	23,702	(3,560)	-13.1%
2005	11,685	23	0.2%	510	18	3.7%	22,911	(791)	-3.3%
2005 @	3,685			505			7,293		
2006 @	3,751	66	1.8%	521	16	3.1%	7,199	(94)	-1.3%

Note: Data from 1975 through 1979 not available.
@ May year-to-date.

Maui Electric Company, Inc.

SCHEDULE H - COMMERCIAL COOKING, AIR CONDITIONING, HEATING, AND REFRIGERATION SERVICE ACTUAL & FORECAST SALES (MWH) & SALES GROWTH % MOLOKAI DIVISION



										Forecast	
Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
MWh Sales	2,104	2,061	1,966	1,937	2,030	2,041	2,074	2,034	1,994	1,994	1,994
Customers	30	30	29	30	30	31	31	31	32	32	32
Growth %	3.5%	-2.1%	-4.6%	-1.5%	4.8%	0.5%	1.6%	-1.9%	-2.0%	0.0%	0.0%

Maui Electric Company, Ltd.
Molokai Division

BILLED DATA

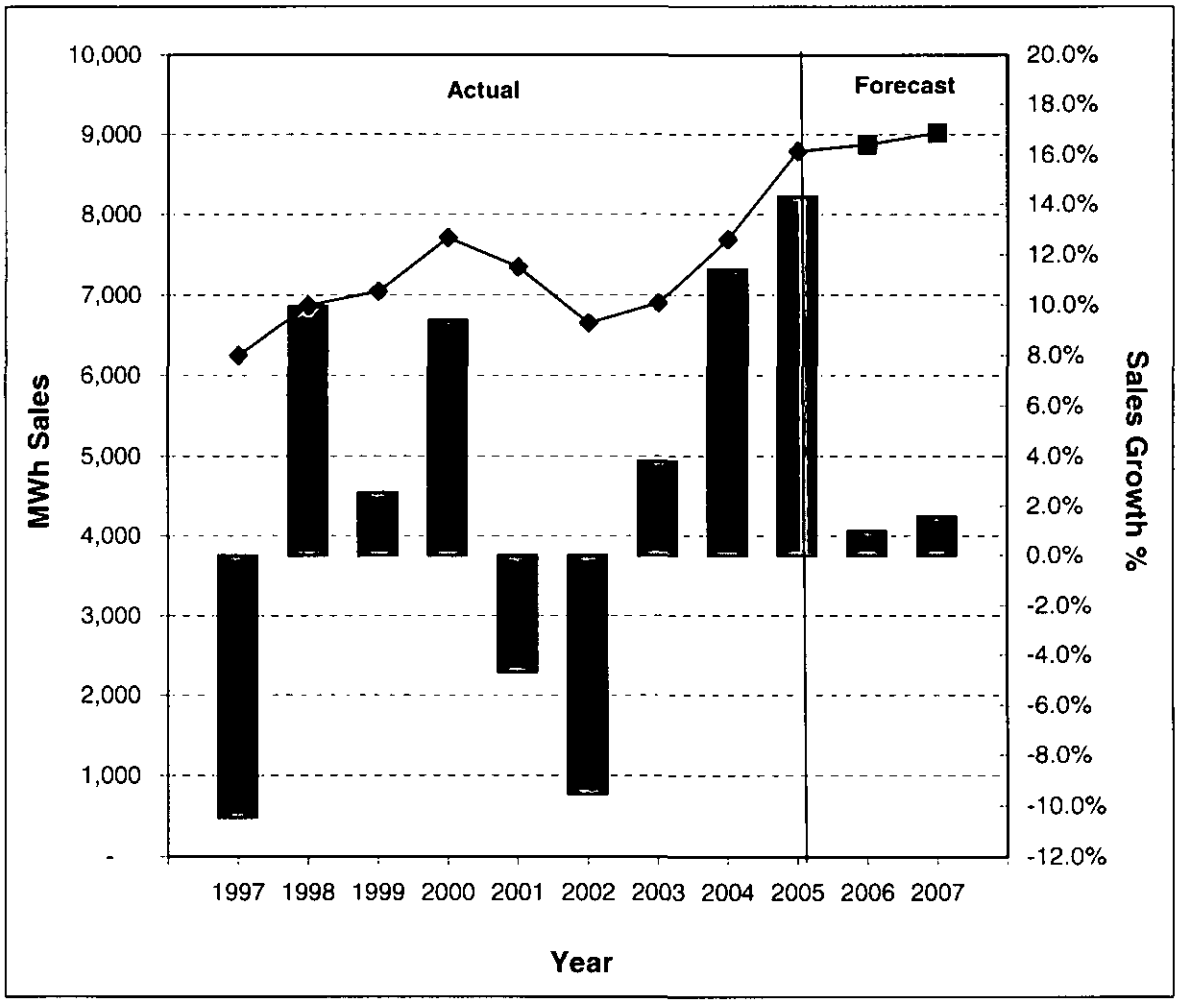
SCHEDULE H : COMMERCIAL COOKING, AIR CONDITIONING, HEATING, & REFRIGERATION SERVICE

	Billed Sales			Average Customers			Use / Average Customer		
Year	Mwh	Chg	% Chg	No.	Chg	% Chg	Kwh	Chg	% Chg
1975									
1976									
1977									
1978									
1979									
1980	1,321			42			31,451		
1981	1,372	51	3.9%	39	(3)	-7.1%	35,183	3,732	11.9%
1982	1,298	(74)	-5.4%	36	(3)	-7.7%	36,068	885	2.5%
1983	1,333	34	2.6%	33	(3)	-8.3%	40,382	4,314	12.0%
1984	1,437	104	7.8%	34	1	3.0%	42,264	1,882	4.7%
1985	1,394	(43)	-3.0%	33	(1)	-2.9%	42,253	(11)	0.0%
1986	1,438	44	3.1%	32	(1)	-3.0%	44,940	2,687	6.4%
1987	1,417	(21)	-1.5%	35	3	9.4%	40,493	(4,447)	-9.9%
1988	1,711	294	20.8%	35	0	0.0%	48,900	8,407	20.8%
1989	1,758	47	2.7%	35	0	0.0%	50,238	1,338	2.7%
1990	1,812	54	3.1%	37	2	5.7%	48,981	(1,257)	-2.5%
1991	1,758	(54)	-3.0%	36	(1)	-2.7%	48,829	(152)	-0.3%
1992	1,794	36	2.1%	33	(3)	-8.3%	54,362	5,533	11.3%
1993	1,646	(148)	-8.3%	30	(3)	-9.1%	54,867	505	0.9%
1994	1,701	55	3.3%	30	0	0.0%	56,700	1,833	3.3%
1995	1,912	211	12.4%	30	0	0.0%	63,728	7,028	12.4%
1996	2,033	121	6.3%	30	0	-1.4%	68,725	4,997	7.8%
1997	2,104	71	3.5%	30	0	-0.3%	71,336	2,611	3.8%
1998	2,061	(43)	-2.1%	30	1	1.7%	68,700	(2,636)	-3.7%
1999	1,966	(95)	-4.6%	29	(1)	-3.3%	67,789	(911)	-1.3%
2000	1,937	(29)	-1.5%	30	1	3.5%	64,569	(3,220)	-4.8%
2001	2,030	93	4.8%	30	0	0.0%	67,665	3,096	4.8%
2002	2,041	11	0.5%	31	1	3.3%	65,837	(1,828)	-2.7%
2003	2,074	33	1.6%	31	0	0.0%	66,892	1,055	1.6%
2004	2,034	(40)	-1.9%	31	0	0.0%	65,616	(1,276)	-1.9%
2005	1,994	(40)	-2.0%	32	1	3.2%	62,320	(3,296)	-5.0%
2005 @	597			31			19,253		
2006 @	562	(35)	-5.9%	32	1	3.2%	17,559	(1,694)	-8.8%

Note: Data from 1975 through 1979 not available.
@ May year-to-date.

Maui Electric Company, Inc.

SCHEDULE P - LARGE POWER SERVICE
ACTUAL & FORECAST SALES (MWH) & SALES GROWTH %
MOLOKAI DIVISION



										Forecast	
Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
MWh Sales	6,249	6,872	7,048	7,711	7,349	6,649	6,902	7,691	8,793	8,880	9,019
Customers	12	12	12	12	13	13	12	16	16	14	14
Growth %	-10.4%	10.0%	2.6%	9.4%	-4.7%	-9.5%	3.8%	11.4%	14.3%	1.0%	1.6%

Maui Electric Company, Ltd.
Molokai Division

BILLED DATA

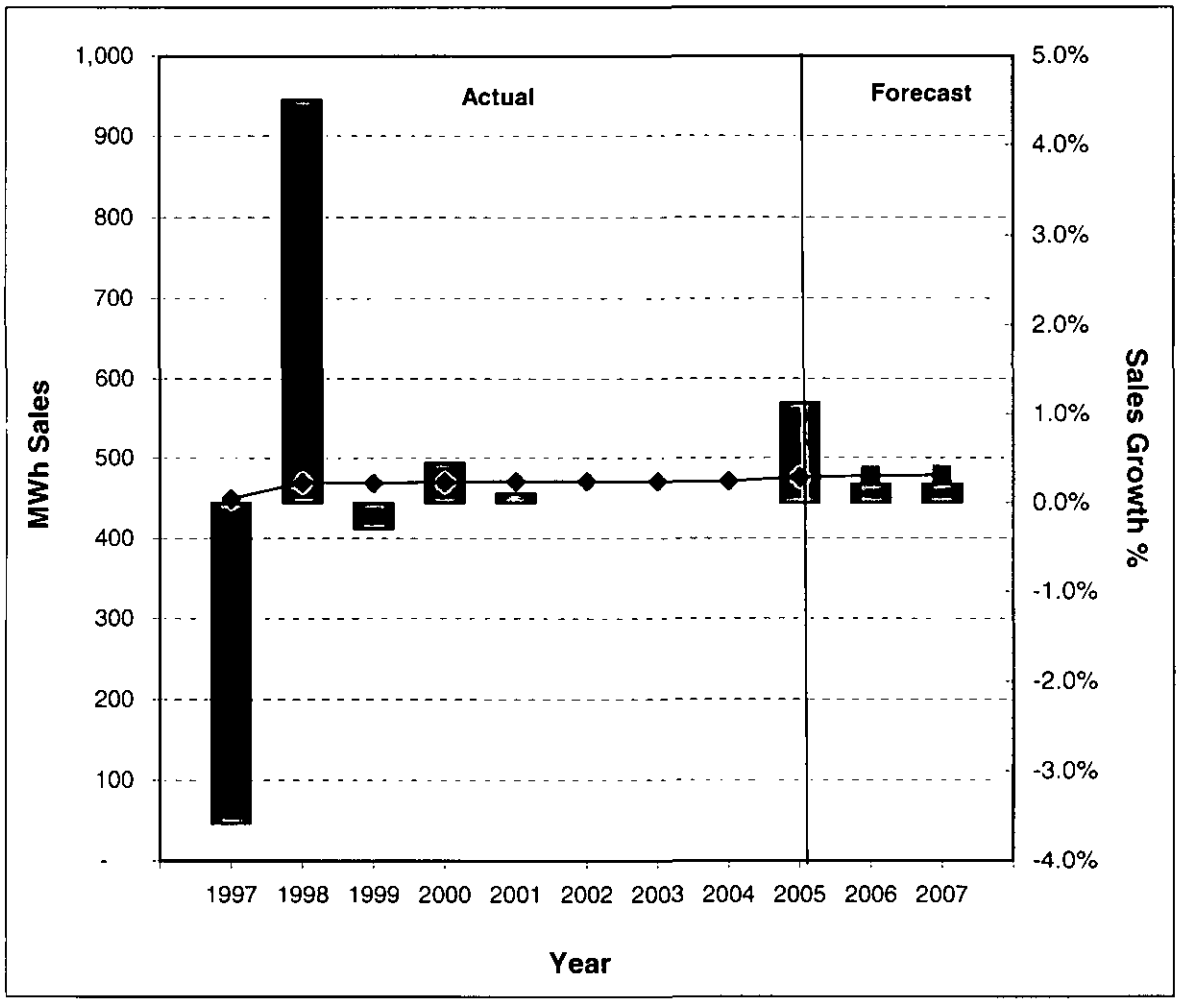
SCHEDULE P : LARGE POWER SERVICE

Year	Billed Sales			Average Customers			Use / Average Customer		
	Mwh	Chg	% Chg	No.	Chg	% Chg	Kwh	Chg	% Chg
1975									
1976									
1977									
1978									
1979									
1980	1,289			3			429,600		
1981	1,755	467	36.2%	4	1	33.3%	438,857	438,857	2.2%
1982	1,777	21	1.2%	4	0	0.0%	444,140	5,283	1.2%
1983	2,165	388	21.9%	6	2	50.0%	360,833	355,550	-18.8%
1984	2,253	88	4.0%	8	2	33.3%	281,569	(73,981)	-22.0%
1985	3,032	780	34.6%	9	1	12.5%	336,913	410,894	19.7%
1986	2,784	(248)	-8.2%	8	(1)	-11.1%	348,029	(62,865)	3.3%
1987	2,437	(347)	-12.5%	8	0	0.0%	304,669	367,534	-12.5%
1988	2,613	175	7.2%	8	0	0.0%	326,574	(40,960)	7.2%
1989	2,359	(254)	-9.7%	8	0	0.0%	294,880	335,840	-9.7%
1990	2,652	293	12.4%	9	1	12.5%	294,634	(41,206)	-0.1%
1991	2,700	49	1.8%	10	1	11.1%	270,029	311,235	-8.4%
1992	2,913	213	7.9%	10	0	0.0%	291,307	(19,928)	7.9%
1993	3,783	870	29.9%	11	1	10.0%	343,909	363,837	18.1%
1994	4,278	495	13.1%	10	(1)	-9.1%	427,800	63,963	24.4%
1995	5,847	1,569	36.7%	9	(1)	-10.0%	649,651	585,688	51.9%
1996	6,978	1,131	19.3%	12	3	33.3%	581,480	(4,208)	-10.5%
1997	6,249	(729)	-10.4%	12	0	0.0%	520,750	524,958	-10.4%
1998	6,872	623	10.0%	12	0	0.0%	572,667	47,709	10.0%
1999	7,048	176	2.6%	12	0	0.0%	587,302	539,593	2.6%
2000	7,711	663	9.4%	12	0	0.0%	642,542	102,949	9.4%
2001	7,349	(361)	-4.7%	13	1	8.3%	565,334	462,385	-12.0%
2002	6,649	(701)	-9.5%	13	0	0.0%	511,434	49,049	-9.5%
2003	6,902	253	3.8%	12	(1)	-7.7%	575,143	526,094	12.5%
2004	7,691	789	11.4%	16	4	33.3%	480,682	(45,412)	-16.4%
2005	8,793	1,102	14.3%	16	0	0.0%	549,537	594,949	14.3%
2005	2,584			16			159,001		
2006	2,587	3	0.1%	14	14	-13.9%	184,781	184,781	16.2%

Note: Data from 1975 through 1979 not available.
@ May year-to-date.

Maui Electric Company, Inc.

SCHEDULE F - STREET LIGHTING
ACTUAL & FORECAST SALES (MWH) & SALES GROWTH %
MOLOKAI DIVISION



										Forecast	
Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
MWh Sales	450	470	469	471	471	471	471	471	477	478	479
Customers	10	10	10	9	9	9	9	9	9	9	9
Growth %	-3.6%	4.5%	-0.3%	0.4%	0.1%	0.0%	0.0%	0.0%	1.1%	0.2%	0.2%

Maui Electric Company, Ltd.
Molokai Division

BILLED DATA

SCHEDULE F : STREET LIGHTING

Year	Billed Sales			Average Customers			Use / Average Customer		
	Mwh	Chg	% Chg	No.	Chg	% Chg	Kwh	Chg	% Chg
1975									
1976									
1977									
1978									
1979									
1980	397			6			66,227		
1981	399	2	0.5%	6	0	0.0%	66,572	345	0.5%
1982	400	1	0.2%	6	0	0.0%	66,732	160	0.2%
1983	416	16	3.9%	6	0	0.0%	69,329	2,597	3.9%
1984	418	2	0.6%	6	0	0.0%	69,716	387	0.6%
1985	422	3	0.8%	6	0	0.0%	70,285	569	0.8%
1986	433	12	2.7%	6	0	0.0%	72,213	1,928	2.7%
1987	454	20	4.7%	7	1	16.7%	64,817	(7,396)	-10.2%
1988	461	7	1.6%	8	1	14.3%	57,594	(7,223)	-11.1%
1989	464	3	0.7%	8	0	0.0%	57,993	399	0.7%
1990	456	(8)	-1.7%	9	1	12.5%	50,657	(7,336)	-12.7%
1991	453	(3)	-0.7%	9	0	0.0%	50,299	(358)	-0.7%
1992	457	4	0.9%	9	0	0.0%	50,730	431	0.9%
1993	459	2	0.5%	9	0	0.0%	51,000	270	0.5%
1994	454	(5)	-1.1%	9	0	0.0%	50,444	(556)	-1.1%
1995	463	9	2.1%	10	1	11.1%	46,339	(4,105)	-8.1%
1996	466	3	0.7%	10	0	0.0%	46,644	305	0.7%
1997	450	(17)	-3.6%	10	0	0.0%	44,974	(1,670)	-3.6%
1998	470	20	4.5%	10	0	0.0%	47,000	2,026	4.5%
1999	469	(1)	-0.3%	10	0	0.0%	46,866	(134)	-0.3%
2000	471	2	0.5%	9	(1)	-10.0%	52,305	5,439	11.6%
2001	471	0	0.1%	9	0	0.0%	52,360	55	0.1%
2002	471	0	0.0%	9	0	0.0%	52,360	0	0.0%
2003	471	0	0.0%	9	0	0.0%	52,360	0	0.0%
2004	471	0	0.0%	9	0	0.0%	52,360	0	0.0%
2005	477	5	1.1%	9	0	0.0%	52,949	589	1.1%
2005 @	157			9			17,453		
2006 @	161	4	2.3%	9	0	0.0%	17,846	393	2.3%

Note: Data from 1975 through 1979 not available.
@ May year-to-date.

Maui CHP Forecast - Small CHP Market
Annual Ramped Impacts

	3rd Party				Peak kW w/ T&D Loss [3]
			Impact on		
	Systems	kW	Cust kW [1]	Cust MWh [2]	6.150%
2005	0	0	0	0	0
2006	0	0	0	0	0
2007	2	1,000	-910	-4,675	-970
2008	2	1,600	-2,366	-16,250	-2,521
2009	2	1,600	-3,822	-27,406	-4,072
2010	2	800	-4,550	-37,219	-4,848
2011	2	750	-5,233	-45,840	-5,576
2012	2	750	-5,915	-51,818	-6,303
2013	2	750	-6,598	-57,801	-7,030
2014	1	750	-7,280	-63,772	-7,757
2015	1	500	-7,735	-67,759	-8,242
2016	1	500	-8,190	-71,744	-8,727
2017	1	500	-8,645	-75,730	-9,212
2018	1	500	-9,100	-79,716	-9,696
2019	1	500	-9,555	-83,702	-10,181
2020	1	500	-10,010	-87,688	-10,666
2021	1	500	-10,465	-91,673	-11,151
2022	1	500	-10,920	-95,659	-11,636
2023	1	500	-11,375	-99,645	-12,120
2024	1	500	-11,830	-103,631	-12,605
2025	1	500	-12,285	-107,617	-13,090

Note: Availability for 3rd party at 91.0%

[1] Sales Level. Cumulative 3rd party CHP kW.

[2] Sales calculated using 8,760 hours

[3] Net-to-system Level. Cust kW ÷ (1 - Loss Factor).

Source: MECO IRP-3

MAUI ELECTRIC COMPANY, LIMITED - MAUI DIVISION
COMPARISON OF BILLED SALES TO FORECAST
2002 - 2006

Line		2002	2003	2004	2005	2006	Average
1	Billed	1,095,684	1,142,924	1,182,968	1,186,662	1,199,494	1,161,546
2	Forecast	1,082,257	1,119,970	1,160,795	1,219,054	1,194,578	1,155,331
3	Difference	(13,427)	(22,954)	(22,173)	32,392	(4,916)	
4	% Difference	-1.2%	-2.0%	-1.9%	2.7%	-0.4%	

MAUI ELECTRIC COMPANY, LIMITED - LANAI DIVISION
COMPARISON OF BILLED SALES TO FORECAST
2002 - 2006

Line		2002	2003	2004	2005	2006	Average
1	Billed	27,022.8	28,155.2	27,695.8	27,886.9	28,611.5	27,874.4
2	Forecast	27,179.4	26,657.2	28,120.1	28,127.0	28,980.6	27,812.8
3	Difference	156.6	(1,498.0)	424.3	240.1	369.0	(61.6)
4	% Difference	0.6%	-5.3%	1.5%	0.9%	1.3%	-0.2%

MAUI ELECTRIC COMPANY, LIMITED - MOLOKAI DIVISION
COMPARISON OF BILLED SALES TO FORECAST
2002 - 2006

Line		2002	2003	2004	2005	2006	Average
1	Billed	34,945	35,927	35,250	35,990	35,187	35,460
2	Forecast	36,774	35,078	36,356	36,422	36,224	36,171
3	Difference	1,829	(849)	1,106	432	1,037	711
4	% Difference	5.2%	-2.4%	3.1%	1.2%	2.9%	2.0%

MAUI ELECTRIC COMPANY, LIMITED - MAUI DIVISION
COMPARISON OF ACTUAL AVERAGE NUMBER OF CUSTOMERS TO FORECAST
2002 - 2006

Line		2002	2003	2004	2005	2006	Average
1	Actual	54,945	56,144	57,300	58,498	59,704	57,318
2	Forecast	54,771	55,946	57,123	58,430	59,634	57,181
3	Difference	(174)	(198)	(177)	(68)	(70)	(137)
4	% Difference	-0.3%	-0.4%	-0.3%	-0.1%	-0.1%	-0.2%

MAUI ELECTRIC COMPANY, LIMITED - LANAI DIVISION
COMPARISON OF ACTUAL AVERAGE NUMBER OF CUSTOMERS TO FORECAST
2002 - 2006

Line		2002	2003	2004	2005	2006	Average
1	Actual	1,520	1,521	1,540	1,556	1,600	1,547
2	Forecast	1,549	1,585	1,564	1,557	1,581	1,567
3	Difference	29	64	24	1	(19)	20
4	% Difference	1.9%	4.2%	1.6%	0.1%	-1.2%	1.3%

MAUI ELECTRIC COMPANY, LIMITED - MOLOKAI DIVISION
COMPARISON OF ACTUAL AVERAGE NUMBER OF CUSTOMERS TO FORECAST
2002 - 2006

Line		2002	2003	2004	2005	2006	Average
1	Actual	2,946	2,987	3,005	3,048	3,094	3,016
2	Forecast	2,931	2,948	3,002	3,052	3,106	3,008
3	Difference	(15)	(39)	(3)	4	12	(8)
4	% Difference	-0.5%	-1.3%	-0.1%	0.1%	0.4%	-0.3%

MECO T-3
DOCKET NO. 2006-0387

TESTIMONY OF
PETER C. YOUNG

DIRECTOR, PRICING DIVISION
ENERGY SERVICES DEPARTMENT
HAWAIIAN ELECTRIC COMPANY, INC.

Subject: Electric Revenues

INTRODUCTION

Q. Please state your name and business address.

A. My name is Peter C. Young and my business address is 220 South King Street, Suite 1201, Honolulu, Hawaii, 96813.

Q. By whom are you employed and in what capacity?

A. I am employed by the Hawaiian Electric Company, Inc. as the Director of the Pricing Division of the Energy Services Department. My experience and background are listed in MECO-300.

Q. What is your area of responsibility in this proceeding?

A. My testimony in MECO T-3 will cover the estimates of electric revenues for Maui Electric Company, Limited (MECO) Consolidated, and the Maui, Lanai and Molokai divisions at present rates and proposed rates for the 2007 test year. I also sponsor the cost of service and rate design testimony in MECO T-18.

Q. Will the other operating revenues be addressed by other Company witnesses?

A. Yes. Ms. Sharon Suzuki will address the test year 2007 estimates for other operating revenues, including non-sales electric utility charges and miscellaneous other operating revenues in MECO T-7.

ESTIMATES OF TEST-YEAR REVENUES

Q. What are the estimated electric sales revenues for MECO Consolidated under present and proposed rates for the 2007 test year?

A. The estimated revenues for MECO Consolidated at present and proposed rates for the 2007 test year are $355,773,300 and $374,527,200, respectively. The estimated revenue at proposed rates represents an increase of $18,753,900 or 5.27% over the estimated revenue at present rates. A summary of the revenue estimates for the 2007 test year at present rates and proposed rates, by division is

shown in MECO-301.

Q. What are the estimated electric sales revenues for Maui Division under present and proposed rates for the 2007 test year?

A. The estimated revenues for Maui Division at present and proposed rates for the 2007 test year are $333,075,200 and $350,632,500, respectively. The estimated revenue at proposed rates for Maui Division represents an increase of $17,557,300 or 5.27% over the estimated revenue at present rates. A summary of the 2007 test year revenue estimates for Maui Division at present rates and proposed rates, by rate class is shown in MECO-302.

Q. What are the estimated electric sales revenues for Lanai Division under present and proposed rates for the 2007 test year?

A. The estimated revenues for Lanai Division at present and proposed rates for the 2007 test year are $10,066,700 and $10,597,400, respectively. The estimated revenue at proposed rates for Lanai Division represents an increase of $530,700 or 5.27% over the estimated revenue at present rates. A summary of the 2007 test year revenue estimates for Lanai Division at present rates and proposed rates, by rate class is shown in MECO-303.

Q. What are the estimated electric sales revenues for Molokai Division under present and proposed rates for the 2007 test year?

A. The estimated revenues for Molokai Division at present and proposed rates for the 2007 test year are $12,631,400 and $13,297,300, respectively. The estimated revenue at proposed rates for Molokai Division represents an increase of $665,900 or 5.27% over the estimated revenue at present rates. A summary of the 2007 test year revenue estimates for Molokai Division at present rates and proposed rates, by rate class is shown in MECO-304.

DERIVATION OF ELECTRIC SALES REVENUES

Q. What are included in the estimates of electric sales revenue for each rate class?

A. The estimates of the electric sales revenues for each rate class include the revenues from the base electric charges as well as the revenues from the Firm Capacity Surcharge Adjustment (at Maui Division only), and the Energy Cost Adjustment Clause. The base electric charges are comprised of the customer, demand, energy and minimum charges, the power factor adjustment, service voltage adjustment, and other adjustments as provided in each rate and rate rider schedule.

Calculations for the determination of the 2007 test year electric sales revenues for Maui, Lanai and Molokai by rate schedule at present and proposed rates are provided in MECO-WP-302, MECO-WP-303 and MECO-WP-304, respectively.

Q. How are the revenues from the base charges for each rate class determined?

A. The determination of the electric sales revenues for each class is based on the same method used in previous dockets by the Company. It is based on the following data:

1) 2007 test year sales forecasts for each rate class;
2) 2007 test year forecasts of number of customers for each rate class;
3) recorded billing loads by subgroups and rate blocks within each rate class; and
4) 2007 test year forecasts of rate rider adjustments.

The revenues from base electric charges are derived by simulating the billing procedure for each rate class using the following steps:

1) The 2007 test year forecasts of sales and number of customers are

allocated into subgroups and rate blocks within each rate class, based on recorded billing data. The allocation of the 2007 test year sales by rate blocks, as in Schedule J's energy rate blocks and in Schedule P's demand rate and energy rate blocks, is based on the Ogive method, using recorded billing data for the 12-month period from January 2005 to December 2005.

2) The sales and number of customers allocated to each subgroup and rate block are multiplied by the corresponding unit charges, and then summed to derive the base electric sales revenues for each rate class.

3) For customers who are on rate riders (such as Rider M, Rider T), electric sales revenues are calculated for each customer at their regular class rates and at their rate rider rates. The differences are included as rider adjustments to the base electric revenues of their respective rate classes.

Q. Are there any changes to the method of determining the base revenues for test year 2007?

A. Yes. The determination of billing demand for Schedule J is proposed to be changed, as I discuss in MECO T-18. The estimate of Schedule J revenues at proposed rates for Maui, Lanai and Molokai includes adjustments to the estimates of billed kWb to reflect the proposed change. This change in Schedule J billing demand was proposed in HECO's test year 2005 rate case in Docket 04-0113 and in HELCO's test year 2006 rate case in Docket 05-0315.

Q. How were these adjustments to Schedule J's billing demand calculated?

A. Schedule J customer actual monthly billing data for the year 2005 were re-calculated to derive the adjusted kWb based on the proposed determination of

Schedule J kWb. The percentage increase in kWb between the adjusted kWb based on the proposed determination of Schedule kWb and the actual monthly kWb for 2005 was calculated. The test year forecast Schedule J billing kWb at proposed rates was calculated by applying this percentage increase in kWb to the test year Schedule J billing kWb at present rates. These calculations are illustrated in MECO-WP-302, MECO-WP-303, and MECO-WP-304.

Q. Are there any additional changes to the method of determining the base revenues for test year 2007?

A. Yes, MECO is proposing to modify the flat rate energy charge of Schedule R, residential service, to a tiered, inclining block rate design to lessen the rate impact on low usage customers and to encourage energy conservation. This rate design modification is discussed further in my MECO T-18 testimony.

Q. What customers are reflected in the rate rider adjustments?

A. The rate rider adjustments include estimates of rider adjustments from existing rider customers only. Existing Maui Division rider customers have rate rider adjustments, including Rider M and Rider T on Schedules J and P. Existing Molokai Division rider customers have rate rider adjustments including Rider M and Rider T on Schedule P. Lanai Division does not have any current rider customers.

Q. What is the Firm Capacity Surcharge Adjustment?

A. The Firm Capacity Surcharge Adjustment is based on refunding the firm capacity cost plus associated revenue taxes resulting from the termination of the Power Exchange and Standby Agreement with Pioneer Mill Company, Limited .

Q. How is the estimate of revenues from the Firm Capacity Surcharge Adjustment determined?

A. The estimate of revenues from the Firm Capacity Surcharge Adjustment is derived by multiplying the base electric sales revenues by the Firm Capacity Surcharge Adjustment percentage factor. The estimated Firm Capacity Surcharge Adjustment percentage factor at present rates is -0.0769% as shown in MECO-305. The Firm Capacity Surcharge Adjustment percentage factor at proposed rates is 0.000%, as the reduction in firm capacity payment is reflected in test year expense and therefore in proposed base rates.

Q. How is the Firm Capacity Surcharge Adjustment percentage factor determined?

A. The Firm Capacity Surcharge Adjustment percentage factor at present rates is estimated by taking the estimated adjustment to the purchased capacity payment to Pioneer Mills Company, plus associated revenue taxes, and dividing by the estimated base electric sales revenues for test year 2007.

Q. How is the estimate of revenues from the Energy Cost Adjustment Clause determined?

A. The estimate of revenues from the Energy Cost Adjustment Clause is derived by multiplying the 2007 test year sales by the Energy Cost Adjustment Factor. The Energy Cost Adjustment Factor at present rates for Maui Division is 13.9540 cents per kWh and 0.000 cents per kWh at proposed rates. The Energy Cost Adjustment Factor at present rates for Lanai Division is 13.9130 cents per kWh and 0.000 cents per kWh at proposed rates. The Energy Cost Adjustment Factor at present rates for Molokai Division is 15.7740 cents per kWh and 0.000 cents per kWh at proposed rates. The derivation of the Energy Cost Adjustment Factor for present and proposed rates is discussed by Mr. Hee in MECO T-19.

SUMMARY

Q. Please summarize your testimony.

A. For total MECO, estimates of electric revenues at present rates and proposed rates for the 2007 test year are $355,773,300 and $374,527,200, respectively, which represents a proposed increase of $18,753,900 or 5.27% over revenues at present rates. The Maui Division's estimates of revenues at present and proposed rates for test year 2007 are $333,075,200 and $350,632,500, respectively, which represents an increase of $17,557,300 or 5.27%. The Lanai Division's estimates of revenues at present and proposed rates for test year 2007 are $10,066,700 and $10,597,400, respectively, which represents an increase of $530,700 or 5.27%. The Molokai's Division estimates of revenues at present and proposed rates are $12,631,400 and $13,297,300, respectively, which represents an increase of $665,900 or 5.27%.

The determination of the 2007 test year electric revenues is based on the same methodology used and approved by the Commission in previous dockets, with two modifications as discussed in my testimony.

Q. Does this conclude your testimony?

A. Yes, this concludes my direct testimony.

PETER C. YOUNG

BACKGROUND AND EXPERIENCE

BUSINESS ADDRESS:	Hawaiian Electric Company P.O. Box 2750 Honolulu, Hawaii 96840
CURRENT POSITION:	Director, Pricing Division, Energy Services Department
YEARS OF SERVICE:	18 Years
OTHER EXPERIENCE:	Financial Analyst, Pacific Resources, Inc. Corporate Analyst, Pentagram, Inc.
EDUCATION:	MBA (Finance), University of Washington BA (Economics, Political Science), Claremont McKenna College, Claremont, CA
OTHER TESTIMONY:	Docket No. 2006-0386 - Electric Sales Revenue; Cost of Service and Rate Design (HECO) Docket No. 05-0315 - Electric Sales Revenue; Cost of Service and Rate Design (HELCO) Docket No. 05-0146 – Residential Rate Reduction Program; Revenue Requirements and Customer Impact (HECO) Docket No. 05-0145 – Revenue Requirements and Customer Impact (HECO) Docket No. 04-0113 - Electric Sales Revenue; Cost of Service and Rate Design (HECO) Docket No. 99-0207 - Electric Sales Revenue; Cost of Service and Rate Design (HELCO) Docket No. 97-0346 - Electric Sales Revenue; Cost of Service and Rate Design (MECO) Docket No. 7766 - Rate Base (HECO) Docket No. 7764 - Rate Base (HELCO) Docket No. 7700 - Rate Base (HECO)

MAUI ELECTRIC COMPANY, LTD.- MECO CONSOLIDATED
TEST YEAR 2007
SUMMARY OF ELECTRIC SALES REVENUES AT PRESENT AND PROPOSED RATES

Division	At Present Rates ($000s)	At Proposed Rates ($000s)	PROPOSED INCREASE Amount ($000s)	PROPOSED INCREASE Percent (%)
Maui	$333,075.2	$350,632.5	$17,557.3	5.27%
Lanai	$10,066.7	$10,597.4	$530.7	5.27%
Molokai	$12,631.4	$13,297.3	$665.9	5.27%
Total Sales Revenue	$355,773.3	$374,527.2	$18,753.9	5.27%

Ref: MECO-302, MECO-303, MECO-304

MAUI ELECTRIC COMPANY, LTD.- MAUI DIVISION
TEST YEAR 2007
SUMMARY OF ELECTRIC SALES REVENUES AT PRESENT AND PROPOSED RATES

Rate Class	At Present Rates ($000s)	At Proposed Rates ($000s)	PROPOSED INCREASE Amount ($000s)	PROPOSED INCREASE Percent (%)
Schedule R	$121,916.2	$128,342.8	$6,426.6	5.27%
Schedule G	$29,812.9	$31,384.4	$1,571.5	5.27%
Schedule J	$75,029.6	$78,984.6	$3,955.0	5.27%
Schedule H	$5,909.6	$6,221.1	$311.5	5.27%
Schedule P	$98,985.7	$104,203.5	$5,217.8	5.27%
Schedule F	$1,421.2	$1,496.1	$74.9	5.27%
Total Sales Revenue	$333,075.2	$350,632.5	$17,557.3	5.27%

Ref: MECO-WP-302

MAUI ELECTRIC COMPANY, LTD.- LANAI DIVISION
TEST YEAR 2007
SUMMARY OF ELECTRIC SALES REVENUES AT PRESENT AND PROPOSED RATES

Rate Class	At Present Rates ($000s)	At Proposed Rates ($000s)	PROPOSED INCREASE Amount ($000s)	PROPOSED INCREASE Percent (%)
Schedule R	$2,731.6	$2,875.6	$144.0	5.27%
Schedule G	$725.2	$763.4	$38.2	5.27%
Schedule J	$2,253.8	$2,372.6	$118.8	5.27%
Schedule H	$180.5	$190.0	$9.5	5.26%
Schedule P	$4,138.7	$4,357.0	$218.3	5.27%
Schedule F	$36.9	$38.8	$1.9	5.15%
Total Sales Revenue	$10,066.7	$10,597.4	$530.7	5.27%

Ref: MECO-WP-303

MAUI ELECTRIC COMPANY, LTD.- MOLOKAI DIVISION
TEST YEAR 2007
SUMMARY OF ELECTRIC SALES REVENUES AT PRESENT AND PROPOSED RATES

Rate Class	At Present Rates ($000s)	At Proposed Rates ($000s)	PROPOSED INCREASE Amount ($000s)	PROPOSED INCREASE Percent (%)
Schedule R	$4,556.7	$4,796.9	$240.2	5.27%
Schedule G	$1,703.7	$1,793.5	$89.8	5.27%
Schedule J	$2,831.8	$2,981.1	$149.3	5.27%
Schedule H	$643.4	$677.3	$33.9	5.27%
Schedule P	$2,734.9	$2,879.1	$144.2	5.27%
Schedule F	$160.9	$169.4	$8.5	5.28%
Total Sales Revenue	$12,631.4	$13,297.3	$665.9	5.27%

Ref: MECO-WP-304

MAUI ELECTRIC COMPANY, LTD. - MAUI DIVISION
DOCKET NO. 2006-0387
2007 TEST YEAR

DERIVATION OF FIRM CAPACITY SURCHARGE
FOR CALCULATION OF ELECTRIC REVENUES
AT PRESENT RATES

L1	Purchased Capacity Payment to PMCO not incurred, $/Yr ($000)	-$115
L2	Revenue Tax Factor	1.0975
L3 = L1 * L2	Amount to be Refunded to Customers ($000)	-$126
L4	Base Electric Revenues @ Present Rates, TY2007 ($000)	$163,949
L5 = L3 ÷ L4	Rate Adjustment @ Present Rates, TY 2007	-0.0769%

MECO T-4
DOCKET NO. 2006-0387

TESTIMONY OF
ROSS H. SAKUDA, P.E.

DIRECTOR
GENERATION PLANNING DIVISION
SYSTEM PLANNING DEPARTMENT
HAWAIIAN ELECTRIC COMPANY, INC.

Subject: Generating Systems,
Fuel Expense,
Fuel-Related Expense,
Purchased Energy,
Generation Efficiency Factor (Heat Rate), and
Fuel Inventory

INTRODUCTION

Q. Please state your name and business address.

A. My name is Ross Sakuda and my business address is 820 Ward Avenue, Honolulu, Hawaii.

Q. By whom are you employed and in what capacity?

A. I am employed by Hawaiian Electric Company, Inc. ("HECO"), and I am the Director of the Generation Planning Division in the System Planning Department. I am submitting testimony on behalf of Maui Electric Company, Limited. ("MECO"). MECO-400 provides my educational background and work experience.

Q. What will your testimony cover?

A. My testimony will cover the following areas for MECO's Maui Division, Molokai Division and Lanai Division:

1) generating system as it relates to the determination of test year fuel expense, fuel-related expense, purchased energy, generation efficiency factor and fuel inventory,
2) test year fuel expense,
3) fuel-related expense,
4) purchased energy,
5) generation efficiency factor (heat rate), and
6) fuel inventory.

Q. How is your testimony structured?

A. Because my testimony covers the aforementioned six areas for three Divisions (Maui, Molokai and Lanai Divisions), I have divided my testimony into the following sections:

1) The first section provides an OVERVIEW of the test year 2007 estimates for fuel expense, fuel-related expense, purchased energy, generation efficiency factor (heat rate), and fuel inventory for all three islands.

2) The second section provides a summary of MECO'S GENERATING SYSTEM covering all three islands.

3) The third section provides a FUEL EXPENSE SUMMARY covering all three islands and includes fuel oil expense and fuel-related expense.

4) The fourth section covers the MAUI DIVISION regarding fuel expense, fuel-related expense, purchased energy, generation efficiency factor (heat rate), and fuel inventory.

5) The fifth section covers the MOLOKAI DIVISION regarding fuel expense, fuel-related expense, generation efficiency factor (heat rate), and fuel inventory. The Molokai Division does not purchase any energy from Independent Power Producers.

6) The sixth section covers the LANAI DIVISION on fuel expense, fuel-related expense, generation efficiency factor (heat rate), and fuel inventory. The Lanai Division does not purchase any energy from Independent Power Producers.

7) The seventh and final section provides a summary of my testimony.

OVERVIEW

Q. What are MECO's proposed normalized 2007 test year estimates for the items in your area of responsibility?

A. MECO's proposed normalized test year estimates in my area of responsibility are:

Test Year 2007		Units
1) Fuel Expense		
a) Maui Division	167,036,687	$
b) Molokai Division	7,252,659	$

	c) Lanai Division	6,175,255	$
	Total	180,464,600	$
2)	Fuel Price		
	a) Maui Industrial Fuel Oil	59.6359	$/bbl
	b) Maui Diesel Fuel	104.8621	$/bbl
	c) Maui Biodiesel	109.2000	$/bbl
	d) Hana Diesel Fuel	115.8105	$/bbl
	e) Molokai Diesel Fuel	107.3613	$/bbl
	f) Lanai Diesel Fuel	114.8311	$/bbl
3)	Purchased Energy Forecast – Maui Division		
	a) Hawaiian Commercial & Sugar	90.415	GWh
	b) Kaheawa Wind Power, LLC	122.882	GWh
	c) Makila Hydro	0.876	GWh
	Total Maui Division	214.173	GWh
4)	Generation Efficiency Factor (Sales Heat Rate)		
	a) Maui Division, Industrial Fuel Oil	0.015310	MBtu/kWh
	b) Maui Division, Maalaea Diesel Oil	0.009460	MBtu/kWh
	c) Maui Division, Hana Diesel Oil	0.012005	MBtu/kWh
	d) Molokai Division	0.010823	MBtu/kWh
	e) Lanai Division	0.010577	MBtu/kWh
5)	Fuel Inventory		
	a) Maui Division	14,628,834	$
	b) Molokai Division	632,339	$
	c) Lanai Division	549,917	$
	Total	15,811,090	$

MECO'S GENERATING SYSTEM

Maui Division

Q. Please describe the current generating system for the Maui Division as it relates to the determination of test year fuel expense, fuel-related expense, purchased energy, generation efficiency factor and fuel inventory.

A. In the test year, the Maui Division expects to have 250.0 MW-net of firm generating capacity (reserve rating), which includes but is not limited to (1) 56.78 MW-net from Dual Train Combined Cycle No. 2 (which includes M18, which was placed into commercial operation on October 27, 2006), (2) 16 MW of

capacity from HC&S (reserve rating), and (3) 2 MW-net from two Hana distributed generation units, which will be converted to firm capacity in 2007. A summary of the Maui Division's total firm generating capacity is provided in MECO-501, page 1. In the test year, MECO's generating capacity for the island of Maui will be sufficiently large to meet all reasonably expected demands for service and provide reasonable reserves for emergencies.

Q. MECO, along with HECO and HELCO (collectively, the HECO Utilities) submitted an application to the Commission in Docket No. 03-0366 for approval of a Combined Heat and Power ("CHP") Program. Is CHP fuel consumption included in your estimate of fuel expense?

A. No, it is not. The HECO Utilities have since withdrawn their application for approval of the CHP program. In January 2007, the Commission approved the withdrawal of the application. MECO does not foresee that it will be installing any CHP on Maui in the test year. Therefore, CHP fuel consumption is not included in MECO's estimate of fuel expense.

Q. How does MECO's generating system affect the determination of fuel expense, fuel related expense, and fuel inventory in this proceeding?

A. MECO's generating system affects the determination of fuel expense, fuel related expense, and fuel inventory for the Test Year 2007 in several ways:

1) About 16.6% of total net-to-system energy will be supplied by IPPs in the test year. I have estimated the amount of purchased energy in my production simulation and workpapers, which I will discuss later in my testimony. Mr. Michael Ribao covers purchased power expenses in MECO T-5.

2) The production simulation reflects the operation of the Kaheawa Wind Power, LLC ("KWP") wind farm in the test year. The production

simulation reflects a higher amount of regulating reserve needed on the system to help offset the fluctuating outputs of the wind farm. I will explain the amount of regulating reserve assumed in the production simulation later in my testimony. Mr. Ribao describes "regulating reserve" in MECO T-5.

3) M18 was placed into service on October 27, 2006. The production simulation used to determine fuel expense reflects the operation of the second dual train combined cycle at the Maalaea power plant (M17, M19 and M18). Half of the dual train combined cycle is run in baseload mode, and the other half is run in cycling mode for the entire the test year. Prior to the installation of M18, units M17 and M19 operated in peaking or cycling mode.

4) The determination of fuel expense includes the fuel used by the Hana DG units, which were placed into operation in 2001.

5) The greater amount of IPP generation impacts Maui Division's average fuel consumption. This, in turn, along with other factors, impacts the amount of fuel inventory that the Maui Division needs to carry. I will discuss MECO's proposed fuel inventory later in my testimony.

Molokai Division

Q. Please describe the current generating system for the Molokai Division as it relates to the determination of test year fuel expense, fuel-related expense, purchased energy, generation efficiency factor and fuel inventory.

A. The Molokai generating system consists of nine diesel engines and one combustion turbine. The total system effective gross rating is 12,010 kW, as shown in MECO-501, page 3. In the test year, MECO's generating capacity for the island of Molokai will be sufficiently large to meet all reasonably expected demands for service and provide reasonable reserves for emergencies.

Q. Have there been any significant changes to Molokai Division's generating system since MECO's Test Year 1999 rate case that would be relevant to the determination of fuel expense, fuel related expenses and fuel inventory for the Molokai Division in the instant docket?

A. No, there have not been any significant changes.

Lanai Division

Q. Please describe the current generating system for the Lanai Division as it relates to the determination of test year fuel expense, fuel-related expense, purchased energy, generation efficiency factor and fuel inventory.

A. The Lanai generating system consists of eight diesel engines and the total system effective gross rating is 9,400 kW, as shown in MECO-501, page 2. In the test year, MECO's generating capacity for the island of Lanai will be sufficiently large to meet all reasonably expected demands for service and provide reasonable reserves for emergencies.

Q. Have there any been any significant changes to Lanai Division's generating system since MECO's Test Year 1999 rate case that would be relevant to the determination of fuel expense, fuel related expenses and fuel inventory for the Lanai Division in the instant docket?

A. No, there have not been any significant changes. No new firm generating capacity has been added.

Q. Please briefly summarize the above section of your testimony.

A. The generating system on Maui has changed significantly since MECO's last rate case in the 1998-1999 timeframe. Units M19 and M18 were added to the system in 2000 and 2006, respectively, and the combined cycle unit consisting of M17, M19 and M18 began operating in baseload mode in 2006. Two 1 MW diesel-fired DG units were installed in Hana to improve reliability in that area. A 30

MW windfarm and a 500 kW run-of-river hydro unit now provide energy to the Maui grid on an-as-available basis and displace a large amount of oil consumption. This large amount of as-available energy makes it necessary for MECO to carry a much higher level of regulating reserve as compared to when there was no as-available energy production on the grid. MECO's test year estimates for fuel oil expense, fuel related expense, generation efficiency and fuel inventory all reflect these changes to the Maui system.

The Molokai and Lanai generating systems have not changed significantly since MECO's previous rate case.

MECO FUEL EXPENSE SUMMARY

Q. What is the normalized test year estimates of fuel expense for the Maui, Molokai and Lanai Divisions?

A. Fuel expense includes fuel oil expense and fuel-related expense. The test year normalized estimates of total fuel expense for the Maui, Molokai and Lanai Divisions are as follows:

	Fuel Oil Expense	Fuel Related Expense	Total Fuel Expense	Reference
Maui	$ 166,525,273	$511,414	$167,036,687	MECO-401
Lanai	$ 6,172,590	2,665	$ 6,175,254	MECO-401
Molokai	$ 7,247,158	$ 5,500	$ 7,252,659	MECO-401
Total	$179,945,022	$519,578	$180,464,600	MECO-401

This expense represents the cost of fuel required by MECO to produce the energy required above purchased power to meet the projected needs of MECO's customers.

MAUI DIVISION

FUEL OIL EXPENSE

Q. What are the primary determinants of fuel oil expense?

A. Fuel price and projected fuel consumption (i.e., the quantity of fuel needed to produce the required energy) are the two primary determinants of fuel expense.

Q. What types of fuel oil does the Maui Division use?

A. The Maui Division uses Industrial Fuel Oil ("IFO") in the steam units at the Kahului Generating Station, diesel fuel in its diesel engines and combustion turbines at its Maalaea Generating Station, biodiesel in certain diesel engines at its Maalaea Generating Station, and diesel fuel in its diesel engines at its Hana substation site. I will cover Maui Division's use of biodiesel later in my testimony.

Q. What costs are included in IFO and diesel fuel oil expense for the Maui Division?

A. The costs embedded in the price of IFO and diesel fuel includes the following:

1) Fuel
2) Ocean Transport Freight Expense
3) Wharfage/Dockage Fee
4) Terminaling Fee
5) Land Transportation Expense

See MECO-WP-402, page 2.

Q. What is Ocean Transport Freight Expense?

A. Ocean transport freight expense is the ocean shipping expense to deliver the fuel from Barbers Point Harbor, Oahu to Kahului, Maui. It is a per unit cost for both IFO and diesel.

Q. What is the Wharfage/Dockage Fee?

A. Wharfage/dockage fees are per unit State of Hawaii Department of Transportation costs for ports of cargo loading and discharge. Chain of custody for Maui fuels is transferred upon cargo loading at Barbers Point, Oahu, and therefore, MECO is responsible for paying wharfage/dockage fees.

Q. What is the Terminaling Fee?

A. Terminaling fees are per unit costs for the receipt of diesel from MECO's inter-island barge carrier, use of tank storage at Kahului terminal, and distribution to tanker trucks. Terminaling fees are estimated and adjusted according to Shell terminal and Chevron terminal tiered rates and actual amounts transferred.

Q. What is Land Transportation Expense?

A. Land transportation expenses are per unit costs for diesel transport by road tanker to each relevant plant.

Q. Are land transportation expenses included in the fuel price for the generating units at the Hana substation site?

A. The diesel fuel for the two diesel generators at the Hana substation is purchased from Maui Oil Company and transported by truck to the Hana site. The price of the fuel includes the cost to transport the fuel to the site.

<u>Fuel Prices</u>

Q. What are the test year fuel prices for the Maui Division?

A. Maui Division's test year prices for its generating units are as follows:

- $59.6359 for Kahului IFO,
- $104.8621 for Maalaea diesel fuel,
- $109.2000 for biodiesel, and
- $115.8105 for Hana diesel fuel.

All prices are per barrel as shown in MECO-402.

Q. How were these prices determined?

A. For test year 2007, the fuel prices for IFO and Maalaea diesel fuel are the latest available contract prices at the time this testimony was being prepared, which were the actual fuel prices effective on September 1, 2006. The price for biodiesel is based on a contract price negotiated between MECO and Pacific Biodiesel in

2004. The fuel price for the two 1 MW distributed generators at Hana is based on the latest available actual invoice price as of September 19, 2006.

Q. What are the contract prices for the IFO used at the Kahului Generating Station based on?

A. The IFO base price is based on the terms of MECO's existing inter-island fuel supply contracts with Chevron Products Company and Tesoro Hawaii Corporation. Both of the pre-existing fuel supply contracts, each of which provides for the purchase of IFO and diesel fuel, were extended and revised by amendments executed on April 12, 2004 and March 29, 2004, respectively. These fuel supply contract amendments were approved by the Commission in Decision and Order No. 21523 issued on December 30, 2004, in Docket No. 04-0129 and were effective on January 1, 2005. The price of IFO is based on the average daily market price of Los Angeles Bunker C Fuel Oil as reported in Platt's Oilgram Bunkerwire. Taxes, ocean transportation, and wharfage costs are added to this price to determine the delivered-to-plant price. The base price of IFO effective for the following month is based on the average of a defined set of previous market prices reported for dates of publication between the 21st day of the second preceding month and the 20th day of the preceding month.

Q. What are the contract prices for the diesel fuel used at the Maalaea Generating Station based on?

A. The price of diesel fuel is based on the average daily market price of West Coast Pipeline, Los Angeles California Low Sulfur No. 2 Diesel as reported in Platt's Oilgram Price Report. Expenses associated with the purchase of fuel, such as taxes, ocean and land transportation, petroleum terminaling, and wharfage costs are added to this price to determine the delivered-to-plant price. The base price of diesel fuel effective for the following month is based on the average of a defined

set of previous market prices reported for dates of publication between the 21st day of the second preceding month and the 20th day of the preceding month.

Q. Will MECO purchase IFO and diesel fuel from both suppliers?

A. Yes, MECO projects that it will purchase IFO and diesel from both suppliers. The Company has weighted the IFO and diesel prices by the volumes expected to be purchased through each supplier during the test year. The resulting weighted fuel prices are shown in MECO-402.

Fuel Consumption (Maui Division)

Q. What is the estimated test year fuel consumption for the Maui Division?

A. The estimated total test year fuel consumption for the Maui Division is 1,803,217 barrels. An estimated 499,157 barrels of IFO will be burned in MECO's steam generators at Kahului. MECO's combustion turbines and diesel engines at Maalaea will burn an estimated 1,301,713 barrels of diesel fuel. At estimated 2,193 barrels of biodiesel will be consumed in the Mitsubishi diesel engines at Maalaea. MECO's Hana distributed generators will burn an estimated 154 barrels of diesel fuel. (See MECO-404.)

Q. How is Maui Division's test year fuel consumption determined?

A. Maui Division's fuel consumption in the test year is determined through the use of a computer production simulation model (with the exception of the Hana distributed generators). The model, P-MONTH, is a production simulation program supplied by the P Plus Corporation ("PPC"). This model simulates the chronological, hour-by-hour operation of Maui's generation system by dispatching (mathematically allocating) the forecasted hourly kilowatt load among the generating units in operation. Unit commitment and dispatch levels are based on (1) fuel cost, (2) transmission loss (or "penalty") factors, and (3) transmission system requirements. The load is dispatched by the model such that the overall

fuel expense of the system is minimized (i.e., "economic dispatch") within the constraints of the system, such as air permit limitations. The model calculates the fuel consumed using the unit dispatch described above, based on the load carried by a unit and the unit's efficiency characteristics. The total fuel consumed is the summation of each unit's hourly fuel consumption. The simulation's results are then adjusted using two different calibration factors (1.017 for IFO and 1.016 for diesel), which I will explain later in my testimony.

Fuel consumption for the two 1 MW Hana DG units is determined outside of the P-MONTH model using the projected run hours and average heat rate of the units. (See MECO-WP-404, pages 1 and 2.) The generation from the Hana DG units is represented through a "transaction file," which essentially reduces the load that must be served by the central station and IPP generating units.

Q. Is this the same production simulation model MECO has used in preceding rate cases?

A. Yes. This model was used in the previous MECO Test Year 1999 Rate Case in Docket No. 97-0346. The P-MONTH production simulation model was also used in the HELCO Test Year 1999 Rate Case (Docket No. 97-0420), the HELCO Test Year 2000 Rate Case (Docket No. 99-0207), the HECO Test Year 2005 Rate Case (Docket No. 04-0113), and the HECO Test Year 2007 Rate Case (Docket No. 2006-0386). PPC has dedicated staff to maintain and update the P-MONTH program. As a result, the program algorithms used in this model are consistent with current industry standards. The technique the model used in preceding rate cases was probabilistic where in this docket the technique the model uses is Monte Carlo, which I will explain later in my testimony.

Q. What generating facilities are subject to MECO's dispatch control?

A. MECO has dispatch control over its generating units at Kahului and Maalaea.

Q. What generating facilities are not subject to MECO's dispatch control?

A. MECO does not have dispatch control over HC&S's generating facility, from which MECO purchases firm capacity and energy pursuant to a Power Purchase Agreement ("PPA") approved by the Commission. The output from the HC&S facility is "scheduled" during on-peak and off-peak periods, i.e., the output of HC&S is set at predetermined levels and does not change appreciably over the course of a day because their operations are centered around sugar mill operations with the electricity generated as a byproduct of their operations.

MECO also does not have dispatch control over the Kaheawa windfarm and the Makila Hydro run-of-river hydroelectric facility as these facilities provide energy to MECO on an as-available basis.

MECO also does not plan to place the Hana generating units on automatic generation control as these units are intended to be operated only under certain conditions, such as when the transmission line to Hana is out of service or for testing of the units. It is expected that the Hana units will operate for about 80 hours and produce 80 MWh of energy in the test year. It is estimated based on operating experience that each unit will operate for five days in the test year at 8 hours per day to provide power to the Hana area during planned or forced outages of the transmission line that feeds the Hana area as well as for testing of the Hana units.

Q. How are dispatchable generating units dispatched by the production simulation model to determine the estimated energy to be produced by MECO's generating units?

A. The MECO units are dispatched on the basis of economic dispatch, subject to any applicable generation or system constraints. The energy to be purchased from HC&S is not dispatchable and was based on the dispatch provisions of its PPA.

HC&S is assumed to be at 12 MW during all of the on-peak hours, and at 8 MW during all of the off-peak hours (with adjustments for planned outages and the forced outage rate, which I will explain later in this testimony).

Q. What are the key inputs to the P-MONTH production simulation model?

A. The key inputs to the production simulation model, when applied to the Maui Division system, are as follows:

1) energy and hourly load to be served by Maui Division system,
2) energy and hourly load to be served by firm fixed dispatch and non-firm purchased power producers,
3) load carrying capability of each MECO and firm power producer generating unit,
4) efficiency characteristics of each MECO generating unit,
5) variable O&M costs,
6) calculated penalty factors,
7) operating constraints such as must-run units, or air permit limitations, and operating considerations such as regulating reserve,
8) overhaul maintenance schedules for the generating units,
9) estimated forced outage and maintenance outage rates for MECO and HC&S units,
10) prices for fuels used by the MECO generating units, as earlier discussed.

<u>Energy and Hourly Load to be Served by the Maui Division System</u>

Q. How is the energy to be served by the system determined?

A. The total net system input, or total net energy required by the system, is determined based on the forecasted estimates for sales, no charge energy, and system losses for the test year. For the 2007 test year, total net system input (sales

plus no charge energy plus losses) is estimated to be 1,291.4 GWh. (See MECO-403, line 5.)

Q. What was the source of the test year sales?

A. Test year sales of 1,212,919 MWh were obtained from Ms. Ide in MECO T-2. See MECO-201, page 2.

Q. How is the no charge energy for the test year determined?

A. No charge energy is based on a five-year (2001-2005) average. (See MECO-WP-403, page 2.) The no charge energy for the test year is 1,662 MWh as shown in MECO-403, line 2.

Q. How are the system losses for the test year determined?

A. System losses are calculated by HECO's Transmission Planning Division based on the generating units on the system, their locations, and the load of the units at the annual peak. A load flow analysis is performed to estimate annual system losses. Refer to MECO-WP-403, page 3 for the actual calculation of the estimated system losses. The system losses for the test year are 76.8 GWh as shown in MECO-403, line 4.

Q. When the calculation of losses was performed, were any changes to the transmission system assumed to occur in the test year such that they would affect the results of the loss calculation?

A. No significant changes to the transmission system were assumed to occur in the test year.

Q. How is the system's hourly load determined?

A. The hourly load on the MECO system is based on the actual 2005 hourly load adjusted for the annual sales forecast, which is provided by Ms. Joanne Ide in MECO T-2, and for the no charge energy and system losses.

Q. How is the system's hourly load adjusted for no charge energy and system losses?

A. No charge energy and system losses are added to the sales to derive the total net-to-system energy as shown in MECO-403, line 5. This total net-to-system energy is used to estimate hourly loads based on historical load patterns.

Energy and Hourly Load to be Served by Hana DG Units

Q. What is the amount of energy production from the Hana DG units in the test year?

A. The amount of energy production from the units in the test year is 80 MWh.

Q. How is the amount of energy production by the Hana DG units determined?

A. The amount of energy production of the Hana DG units in the test year is based on how it is projected the units will be operated for testing and transmission line outages. It is estimated based on operating experience that each unit will operate for five days in the test year at 8 hours per day to provide power to the Hana area during planned or forced outages of the transmission line that feeds the Hana area as well as for testing of the Hana units.

Q. How is the output of the Hana DG units modeled?

A. The output of the Hana DG units is modeled using a transaction file. A transaction file represents an amount of energy that is provided to the system per hour by a generating resource.

Energy and Hourly Load to be Served by Purchased Power Producers

HC&S

Q. What was the estimated HC&S purchased energy for the test year 2007.

A. The estimated energy from HC&S is 90,415 MWh, with 62,095 MWh on-peak and 28,320 MWh off-peak. (See MECO-WP-404, page 99).

Q. How is the estimated amount of energy to be purchased from HC&S in test year 2007 determined?

A. The estimated amount of energy to be purchased from HC&S in test year 2007 is based on a combination of the current PPA provisions and historical data. The

test year estimate of "regular energy" to be purchased is based on 12 MW output during the 14-hour on-peak period (7:00 am to 9:00 pm) and 8 MW output during the 10-hour off-peak period (9:00 pm to 7:00 am). Under the MECO-HC&S PPA, HC&S is obligated to provide to MECO on an annual basis 12 MW of firm capacity for 8,037 hours and 8 MW of firm capacity for 437 hours. Typically, MECO calls for 12 MW during the on-peak period and 8 MW during the off-peak period. "Optional Additional Capacity" and "Supplemental Scheduled Power" are estimated using two year historical monthly average purchases during the 2004-2005 period. (See MECO-WP-404, page 99)

Q. How much "Optional Additional Energy" is HC&S expected to provide to MECO in the test year 2007?

A. HC&S is expected to provide 2,675 MWh of Optional Additional Energy On-Peak, as shown in MECO-404, page 99.

Q. What is "Optional Additional Capacity"?

A. Under the MECO-HC&S PPA, HC&S may provide Optional Additional Capacity to MECO, if HC&S can offer such additional capacity, provided MECO agrees, and at least seven calendar days' advance notice is given. The additional capacity is for such duration and for such number of hours as may be agreed upon by HC&S and MECO. When MECO requests and HC&S delivers Optional Additional Capacity, the energy delivered is referred to as "Optional Additional Energy."

Q. How much "Supplemental Scheduled Power" is HC&S expected to provide to MECO in the test year 2007?

A. HC&S is expected to provide 148 MWh of Supplemental Scheduled Power On-Peak, as shown in MECO-WP-404, page 99.

Q. What is "Supplemental Scheduled Power"?

A. Under the MECO-HC&S PPA, HC&S must provide Supplemental Scheduled Power to meet MECO's anticipated emergency power shortages, but only to the extent that HC&S is able to do so without impairing its operations or deviating from good engineering and operating practices. Whenever MECO requests Supplemental Scheduled Power, it must take or pay for a minimum of three hours.

Q. What allowance was made for planned outages of HC&S in estimating the amount of energy to be purchased from HC&S in the test year?

A. HC&S's energy production was adjusted in the month of January 2007 to account for their scheduled 262-hour annual maintenance shutdown period. Their outage is scheduled for January 6 through January 16, 2007. In addition, HC&S is scheduled to reduce their on-peak capacity from 12 MW to 8 MW on January 30, February 21, February 22 and February 23, 2007. According to the MECO-HC&S PPA, HC&S has the right to designate a period or periods totaling a maximum of 437 hours per contract year during which firm capacity will be 8 MW's. HC&S informed MECO that they will be exercising this right on the dates mentioned.

Q. How is the hourly load served by HC&S determined?

A. The on-peak and off-peak hourly loads served by HC&S are determined separately by month. Each monthly on-peak and off-peak estimated purchased energy amount is the summation of the estimated monthly regular energy plus the estimated optional additional capacity plus the monthly supplemental scheduled power.

<u>KWP</u>

Q. What is the estimated amount of energy to be purchased from KWP in the test year?

A. The estimated amount of energy to be purchased from KWP in the test year is 122,882 MWh as shown in MECO-WP-404, page 100.

Q. How is the estimated amount of energy to be purchased from KWP in the test year determined?

A. The total amount of energy to be purchased from KWP in the test year was based on an estimate of annual energy production from the windfarm as provided by KWP in 2004 during negotiations between MECO and KWP on the MECO-KWP PPA. KWP went into commercial operation on June 9, 2006. For the period June 9 to December 31, 2006, KWP delivered 56,629,416 kWh to MECO.

Q. Why was KWP's forecast used?

A. At the time the production simulation was performed in October 2006, there was only a limited amount of KWP operating data from the full wind farm. While the KWP facility went into commercial operation in June 2006, the operation of their 20 1.5 MW wind turbines was phased in gradually. In addition, during the period June to October 2006, the wind farm was undergoing a "shake-out" test period. Therefore, the actual operating data available did not reflect normal operation of the entire wind farm. Furthermore, wind farm output can vary considerably from month to month and year to year and therefore it was difficult to determine whether the small amount of actual operating data was representative of long-term operation. Hence, KWP's forecast data were used.

Q. How is the hourly output of the KWP windfarm determined?

A. The hourly output of the KWP windfarm was determined from information provided by KWP in 2004 during negotiations between MECO and KWP on the MECO-KWP PPA. KWP provided an estimate of the hourly output of the windfarm for each of the 24 hours in one typical day for each month. This 24-hour energy production profile was repeated for each day of the respective month.

Each of the 12 months had a different energy production profile. These data were used to create a "transaction file" in P-MONTH to represent the hourly output of the KWP windfarm.

In actuality, the output of the KWP windfarm will vary from second to second, minute to minute and hour to hour. The P-MONTH model does not have the capability to model this second to second and minute to minute variability. In addition, at this time MECO does not have sufficient data to determine the accuracy of the modeled hourly output of the windfarm (i.e., there is not sufficient actual hourly output data available).

Makila Hydro

Q. What is the estimated amount of energy to be purchased from Makila Hydro in the test year?

A. The estimated amount of energy to be purchased from Makila Hydro in the test year is 876 MWh as shown in MECO-WP-404, page 101.

Q. How is the estimated amount of energy to be purchased from Makila Hydro in the test year determined?

A. The unit has a rating of 500 kW. The estimate for the amount of energy to be purchased from Makila Hydro in the test year was based on a 20% capacity factor for the unit. The 20% capacity factor was based on data collected from the facility since it began commercial operation on September 22, 2006. It was the only data on the facility's production available at the time the production simulation was performed.

Q. How is the hourly load to be served by Makila Hydro determined?

A. As noted above, the estimate for the amount of energy to be purchased from Makila Hydro in the test year was based on a 20% capacity factor for the unit. The hourly load to be served by Makila Hydro was modeled at a constant level of

100 kW for all 8,760 hours in the year using a transaction file in P-MONTH. In actuality, the as-available output from the unit will vary from minute to minute, hour to hour and day to day. At this time, MECO has only a very limited amount of actual operating data from the facility. Makila Hydro delivered to MECO 14,010 kWh and 29,851 kWh in September and October 2006, respectively. They were connected to the MECO grid for 206 hours in September 2006 and for 259 hours in October 2006. The estimated capacity factor was determined from the total kWh delivered in September and October (43,861 kWh) and the total hours connected to the grid (465 hours) during this period. The total potential generation during this period was 465 hours x 500 kW = 232,500 kWh. The capacity factor was estimated at (43,861 / 232,500) ≈ 20% or 100 kW. Makila did not deliver any energy to MECO in November and December because their facility sustained damage during the October 15, 2006 earthquake. According to Makila, they are expected to be back in service sometime during the first quarter of 2007.

Load Carrying Capability of the Maui Division Units

Q. What is the "load carrying capability" of each MECO generating unit?

A. The "load carrying capability" of each unit is the ability to generate electricity to supply the load from a unit's minimum rating to its normal top load rating ("NTL"). In general, the normal top load rating is the maximum load the unit can sustain continuously. A list of MECO and non-utility generating units and their load carrying capabilities is provided in MECO-WP-404, page 85.

Q. What is the status of M13?

A. M13, a 12.34 MW (net) diesel engine, experienced a major forced outage on December 9, 2005. The unit suffered extensive damage to the engine crankshaft, frame and cylinder blocks. The manufacturer, Mitsubishi Heavy Industries, Ltd.,

assessed the damage and indicated that repairs would take approximately 18 months. Replacement parts are currently being manufactured. The unit is currently out of commission and is expected to be placed back into service in mid-2007.

Q. How was M13 modeled in the test year production simulation?

A. M13 was modeled as being operational for the entire test year in order to estimate operation over a "normal" year.

Q. What Normal Top Load ratings were used for MECO's two combined cycle units in the production simulation?

A. NTL ratings of 53.5 MW were used for MECO's two combined cycle units, M14-M15-M16 and M17-M18-M19 for the purposes of the production simulation in this proceeding. This is lower than the NTL rating used for capacity planning purposes. The higher NTL rating used for capacity planning purposes reflects the continuous output that can be achieved using a higher firing temperature in the combustion turbines, if needed to meet system demand. Over time, however, the higher firing temperature will result in higher maintenance costs. Therefore, while the higher firing temperature can be used to achieve a higher output (and defer the need for additional generating capacity), MECO's normal practice has been to utilize a lower firing temperature to reduce maintenance costs. This normally used lower firing temperature results in a lower NTL rating.

<u>Efficiency Characteristics of MECO Generating Units</u>

Q. What are a generating unit's "efficiency characteristics"?

A. The "efficiency characteristics" of a generating unit are the relationship between fuel input to the unit and the electrical output of the unit. This relationship can be expressed as a second-order equation in the form of:

$$\text{Fuel input} = A + (B \times \text{Load}) + (C \times \text{Load}^2)$$

where Load is the operating level in MW. The values for A, B, and C are the "heat rate constants" for the generating unit and are sometimes referred to as the "ABC coefficients."

Q. How were the MECO unit efficiency characteristics determined?

A. The unit efficiency characteristics for the MECO generating units were developed from test data and the manufacturer's unit data provided by MECO Power Supply. The fuel consumption rates at various output levels have been measured, and the "heat rate constants" of the units were determined by fitting a curve of fuel consumption versus output level through the test data points accumulated over five years of testing. The "heat rate constants" determined are used as inputs in the production simulation model. The heat rate constants are shown in MECO-WP-404, page 89.

Variable O&M Costs

Q. What are variable O&M costs?

A. Variable O&M costs are those non-fuel and non-labor operations and maintenance costs that vary as a function of hours that a generating unit is operated or as a function of the amount of energy produced. For example, purified water must be injected into the combustion turbines to reduce the emission of nitrogen oxides. The rate at which the water is injected into the combustion turbines is generally proportional to the output of the combustion turbines. Therefore, the cost of producing the purified water on site is treated as a variable O&M cost. Another example is the material costs incurred to overhaul the diesel engines or combustion turbines. The intervals at which the overhauls must be performed depends on the number of hours the units operate, regardless of how much energy the units produced. These overhaul costs are treated as variable O&M costs.

Q. What variable O&M costs were used in the production simulation?

A. The variable O&M costs used in the production simulation are shown in MECO-WP-404, page 90.

Q. How were these variable O&M costs determined?

A. There were determined by analyzing actual variable O&M costs incurred over a five-year period. The variable O&M costs consisted of chemical costs (for water treatment), emission fees, lube oil costs and non-labor overhaul costs (materials and outside services). Variable costs are also separated based on run hour (lube oil and overhauls) or energy production (chemicals and emission fees) dependence.

Penalty Factors

Q. What are penalty factors?

A. There are two types of penalty factors used in the production simulation: (1) commitment penalty factors and (2) dispatch penalty factors. Penalty factors are used to adjust the order in which generating units are committed or started up (commitment penalty factors) and the order in which generating units are dispatched (dispatch penalty factors). The latter are used to account for transmission system losses between the generator and the load. For example, consider two identical generating units A and B, with Unit B being much more distant than Unit A from the system load at a point C. In order for Unit B alone to satisfy a given amount of demand at Point C, it would have to generate more energy than Unit A alone would have to produce to serve that same demand. This is because a greater amount of energy would be lost in traveling from Unit B to C than would be lost in traveling from Unit A to C. Therefore, it would cost more to serve demand at C with Unit B than it would with Unit A.

Under economic dispatch, the demand at C would be satisfied partially by Unit A and the remainder satisfied by Unit B. If Units A and B were equidistant

from the demand at C, the demand would be shared equally between Unit A and Unit B, and each unit would be assigned a penalty factor equal to 1.0. However, since Unit B is more distant from the demand at C, it is more economical for more of the demand to be served by Unit A than by Unit B. Therefore, Unit B would be assigned a penalty factor greater than 1.0, where the actual value would be dependent upon the relative amount of losses between B and C and A and C. The penalty factor provides a means to account for the losses between the generators and the demand so that the demand can be allocated most economically between the generators.

Q. What commitment penalty factors were used in the production simulation?

A. The commitment penalty factors used in the production simulation are shown in MECO-WP-404, page 88.

Q. How were these commitment penalty factors determined?

A. The commitment penalty factors were determined such that the production simulation model committed the generating units in the same order that MECO Power Supply plans to commit the generating units in the test year.

<u>Generating Unit Operating Constraints</u>

Q. Are any of Maui's generating units subject to operating constraints that would be relevant to the production simulation for the test year?

A. Yes, Maalaea Units 5 and 7 ("M5" and "M7," respectively) and Maalaea Units X1 and X2 are subject to operating constraints related to their air permits. The limitations are based on the cumulative nitrogen oxide emissions of the diesel engine generators, M5 and M7, and the combustion turbine generators, M17 and M19 in any rolling twelve (12) month period. Since emission rates vary between the four units and are dependent on fuel consumption and run hours, the total emissions require constant monitoring. Unit operation is adjusted accordingly to

ensure emission constraints are not violated. The air permits for X1 and X2 limit the operating hours on the units to no more than 4,380 per unit in any rolling twelve (12) month period. The fuel consumption for Maalaea Units 10 and 11 cannot exceed 1,592 gallons per hour of diesel fuel on a daily and annual average basis.

Q. How will these limitations affect operation of these units in the test year, and how is this reflected in the production simulation for the test year?

A. In order not to exceed these permit limits, the commitment order of these units is adjusted in actual practice and in the test year production simulation. For example, M5 and M7 are placed lower in the commitment order that they otherwise would be without the permit limits. When these units are lower in the commitment order, they will accumulate fewer operating hours and will not exceed their operating hour limits.

Q. Are any of Maui's generating units subject to operating constraints related to any equipment problems?

A. No, none of the generating units were subject to operating constraints related to any equipment problems in the test year production simulation.

Regulating Reserve

Q. What is "regulating reserve"?

A. Mr. Michael Ribao describes "regulating reserve" in MECO T-5. In essence, regulating reserve is that amount of generating capacity that is on line but not serving load and is intended to keep supply and demand in balance at all times by providing additional generating output, when needed, to match minute-by-minute increases in system demand, and by decreasing generating output, when needed, to match minute-by-minute decreases in system demand.

Q. What amount of regulating reserve was used in the production simulation in the test year?

A. The production simulation used 15 MW of regulating reserve, as shown in MECO-WP-404, page 23.

Q. What was this amount of regulating reserve based on?

A. Mr. Michael Ribao explains the basis for this amount of regulating reserve in MECO T-5.

Overhaul Maintenance Schedules

Q. What is the source of the test year 2007 overhaul maintenance schedule?

A. MECO Power Supply developed the normalized overhaul maintenance schedule for the test year as shown in MECO-WP-404, page 84. The normalized test year overhaul maintenance schedule is discussed further by Mr. Ribao in MECO T-5.

Q. What is the source of the calibration year overhaul maintenance schedule?

A. The maintenance schedule for the calibration year uses the actual maintenance overhaul days for 2005.

Forced Outages and Maintenance Outages

Q. What are forced outage rates?

A. Forced outage rates are used as a measure of the percentage of time a generating unit is unavailable due to an expected problem. For example, if a generating unit must be shut down immediately due to an unexpected problem and it is not available for service for 100 hours (due to the time it takes to correct the problem) and it actually operates for 900 hours during the year, then it has a forced outage rate of (100 forced outage hours) / (900 service hours + 100 forced outage hours) = 10%.

Q. What are the sources of the 2007 test year forced outage rates for MECO's generating units and the HC&S unit?

A. The forced outage rates for the 2007 test year for MECO's generating units were determined using a five-year average over the 2001-2005 period, as shown in MECO-WP-404, page 91.

Q. What are maintenance outage rates?

A. Maintenance outage rates are the rates of outages other than forced outages or planned overhauls. Generally, an outage is labeled as a maintenance outage when a unit must be repaired for issues other than those scheduled ahead of time through the overhaul schedule, but does not need to come off-line right away (definition of a forced outage). (See also Mr. Ribao's testimony in MECO T-5.) Maintenance outage rates in P-MONTH are calculated using the maintenance outage hours or days (not including planned overhauls) divided by the possible service hours or days (8760 hours or 365 days).

Q. What are the sources of the test year maintenance outage rates for MECO's generating units and the HC&S unit?

A. The maintenance outage rates for the MECO generating units are based on a five-year average by unit type. (See MECO-WP-404, page 92.)

Q. How are maintenance outage rates allocated in P-MONTH?

A. Maintenance outage rates are allocated using a load levelization algorithm, AUTOMNT, that is a part of the P-MONTH program. The AUTOMNT algorithm schedules outages in increments of seven days. For example, the maintenance outage rate input for the test year for Kahului 1 and 2 is 1.10%. (See MECO-WP-404, page 92.) This is equal to 365 days x 1.10% or 4.02 days. AUTOMNT will round this to the nearest seven day (one week) increment. Therefore, AUTOMNT will round this to a 1 week outage.

Q. What is the source of the calibration year forced and maintenance outage rates for the MECO system?

A. Forced and maintenance outage rates for the calibration year are based on actual forced and maintenance outage rates by unit in 2005.

Q. How were MECO's generating units modeled in the production simulation?

A. I discuss modeling of the dual train combined cycle units as well as modeling of MECO's other generating units in the following sections.

Modeling of the Two Dual Train Combined Cycle Units

Q. How are the two dual train combined cycle units (Maalaea 14, 15 and 16, and Maalaea 17, 18 and 19) modeled in the test year?

A. The dual train combined cycle units are modeled as two halves of the dual train for both M14, 15, and 16 and M17, 18, and 19. In other words, each dual train combined cycle is modeled as if it is two single train combined cycle units, with each having one-half the capacity of the dual train combined cycle. For M17, 18, and 19, one-half is modeled as a baseload unit and the other half is modeled as a cycling unit to match how the units are actually operated. Each half was modeled as an individual thermal unit. M14, 15, and 16 was also modeled as two individual thermal units, but both halves were modeled baseloaded because that is how the units are actually operated.

Modeled Dispatch of the Generating Units in the Test Year

Q. Were all of MECO's generating units economically dispatched by the production simulation model in the test year?

A. No, they were not. Not all MECO generating units can be controlled by the Automatic Generation Control ("AGC") system. The production simulation for the test year reflected how MECO plans to dispatch the generating units in the test year.

Q. Which generating units does MECO plan to dispatch using the AGC in the test year?

A. MECO plans to dispatch Maalaea Units 4 to 7, Maalaea Units 10 to 13 and the two dual train combined cycle units (Maalaea Units 14, 15 and 16 and Maalaea Units 17, 18 and 19) using the AGC in the test year. MECO's other generating units, including Kahului Units 1 to 4, Maalaea Units 1 to 3, Maalaea Units X1 and X2, and Maalaea Units 8 and 9, will be dispatched by direct operator control in the test year. The Hana DG units will not be controlled by the AGC and will be operated only when needed to meet the energy needs of the Hana area.

Results of the Production Simulation

Q. What are the results of the test year production simulation?

A. The unadjusted results of the test year production simulation (net MWh) can be seen in MECO-WP-404, page 1 (net MWh).

Q. Are the results of the MECO production simulation checked against actual historical operations?

A. Yes. For Test Year 2007, the results of the MECO production simulation are calibrated against data for actual operations for the January through December 2005 period. This is the most recent available historical data for a full calendar year at the time the production simulation was developed for the test year. Historical data including load data, overhaul schedules, forced and maintenance outages, fuel prices, and unit efficiency characteristics are input into the production simulation model. The model is run in manner to simulate how the system was actually run in the historical year. The model results are compared to the historical recorded data on a monthly and annual basis.

The differences between the heat rates from the calibration production simulation described above and from actual operations are due to "real-world" conditions which cannot be completely duplicated by a production simulation.

Q. How are these differences incorporated into the determination of the test year's fuel consumption?

A. The differences are accounted for in the test year fuel consumption by applying calibration factors to the production simulation's output, as shown on MECO-WP-404, page 2. The derivation of the calibration factors for the test year, based on recorded January through December 2005 data, is shown in MECO-WP-404, page 54.

Calibration Factor

Q. What is a "calibration factor"?

A. A "calibration factor" is a constant number that can be greater than, equal to, or less than 1.00, although it is normally greater than one. The test year fuel consumption (in Btus) determined by the production simulation is multiplied by this factor.

Q. What is the purpose of the calibration factor?

A. The purpose of the calibration factor is to adjust the fuel consumption determined by the production simulation for actual operating conditions that cannot be completely duplicated by the computer model.

Q. How is a calibration factor determined?

A. A calibration factor is determined by trying to reproduce the output of the utility production system for a recorded year, called a "calibration year," and finding the ratio between the computer model outputs and recorded amounts.

Q. Please identify the actual operating conditions that cannot be completely duplicated by the computer model.

A. The actual operating conditions that cannot be completely duplicated by the computer model include, but are not limited to, the following:

a) temporary unit deratings;

b) changes in unit commitment;

c) unpredictable nature of intermittent, as-available resources;

d) actual system conditions;

e) penalty factors updated every 15-minutes;

f) actual system load; and

g) steam turbine and combustion turbine performance.

Each of these factors is discussed in detail in my rebuttal testimony in Docket No. 99-0207, HELCO Test Year 2000 rate case, HELCO RT-4, page 17, line 15, to page 30, line 8.

Q. In which previous dockets has the Commission accepted use of a calibration factor?

A. The Commission accepted results of production simulations that used calibration factors in the following HECO, HELCO and MECO rate cases:

1) Docket No. 7700, HECO Test Year 1994

2) Docket No. 7766, HECO Test Year 1995

3) Docket No. 94-0140, HELCO Test Year 1996

4) Docket No. 94-0345, MECO Test Year 1996

5) Docket No. 96-0040, MECO Test Year 1997

6) Docket No. 97-0346, MECO Test Year 1999

7) Docket No. 99-0207, HELCO Test Year 2000

8) Docket No. 04-0113, HECO Test Year 2005

Q. What is the calibration factor that MECO is using in this proceeding to determine the test year fuel consumption for the Maui Division?

A. MECO is proposing the use of two calibration factors – one for IFO consumption and one for diesel fuel consumption.

Q. Did MECO use two calibration factors in its previous Test Year 1999 rate case?

A. No, MECO used a single, system-wide calibration factor in its previous Test Year 1999 rate case. In MECO's Test Year 1997 rate case (Docket No. 96-0040), the Consumer Advocate introduced the single, system-wide calibration factor method. The single, system-wide calibration factor method was used in MECO's Test Year 1999 rate case (Docket No. 97-0346) as well as in HELCO's Test Year 2000 rate case (Docket No. 99-0207).

Q. Why is MECO proposing the use of two calibration factors in this proceeding?

A. MECO is proposing the use of two calibration factors in this proceeding because the use of two calibration factors, one for each fuel type, improves the "transparency" of the results, i.e., it is more apparent where the difference between modeled and actual results is occurring. In addition, this is also consistent with the method used in the both the HECO Test Year 2007 (Docket No. 2006-0386) and HELCO Test Year 2006 (Docket No. 05-0315) rate case proposals.

Q. Did MECO determine single, system-wide calibration factors using both the probabilistic and Monte Carlo techniques to compare the results?

A. Yes, it did. MECO determined a single, system calibration factor of 1.016 using the probabilistic technique and a factor of 1.016 using the Monte Carlo technique.

Q. Why did MECO use the Monte Carlo technique to compare with the probabilistic technique?

A. MECO used the Monte Carlo technique to compare with the probabilistic technique because the Monte Carlo technique typically produces modeled results for peaking units (such as MECO's small diesel engines) which better match actual operating results. This can be important when there is a significant amount of wind generation because the peaking units typically must offset the fluctuating output of the wind units. Therefore, the output of the peaking units become highly

variable. Under the particular set of circumstances in the calibration year (2005), there was no difference in the calibration factor derived by using the Monte Carlo technique and the probabilistic technique. This is most likely due to the fact that there was no wind generation on the system in 2005.

Q. What calibration factors did MECO determine for the two different fuels – IFO and diesel fuel – using the Monte Carlo technique?

A. MECO determined calibration factors of 1.017 for IFO and 1.016 for diesel fuel.

Q. Please briefly describe how the calibration year was modeled to derive the calibration factor.

A. The calibration factor is determined by trying to reproduce the output of the utility production system for the calibration year, which in this proceeding is 2005. Therefore, the production simulation for the calibration year tries to replicate the decisions made by planners, operators and the AGC system in committing and dispatching units and in accounting for planned or forced outages. Please refer to the testimony of Mr. Ribao in MECO T-5 on how the generating units were committed and dispatched in the calibration year.

Q. What was the commitment order of the generating units as modeled in the calibration year?

A. The actual commitment order of the generating units in the calibration year varied from day to day depending on several factors, including but not limited to temporary problems (such as overheating) on the units or the desire to equalize operating hours on the generating units to equalize maintenance cycles, as explained by Mr. Ribao in HECO T-5. The P-MONTH production simulation model determines generating unit commitment orders only once per month. The commitment orders determined by P-MONTH in the calibration year is shown in MECO-WP-404, page 88.

Q. How was the dispatch of the generating units modeled in the calibration year?

A. As explained by Mr. Ribao in MECO T-5, Kahului Units 1 to 4, Maalaea Units 1 to 3, Maalaea Units X1 and X2, and Maalaea Units 14, 15 and 16 (in combined cycle mode) were dispatched by direct operator control and Maalaea Units 4 to 7, Maalaea Units 10 to 13, and Maalaea Units 14 and 16 and Maalaea 17 and 19 (when in simple cycle mode) were dispatched primarily by the AGC in 2005. For those units that were dispatched primarily by the AGC, the model was allowed to dispatch the units according to the economic dispatch algorithm within the model that reflects the same dispatch algorithm within the AGC. Also, those units that were dispatched by the AGC used modeled dispatch according to fuel costs only. Please refer to the testimony of Mr. Ribao in MECO T-5 regarding the actual dispatch of the units.

Biodiesel Expense

Q. What is MECO's estimate for biodiesel expense in the test year?

A. MECO's estimate for biodiesel expense in the test year is $239,460, as shown in MECO-404. This expense is included in Maui Division's overall fuel oil expense.

Q. How was this estimate derived?

A. The test year biodiesel expense is calculated by multiplying the projected number of start-up/shut-down cycles (as determined by the production simulation) by the average biodiesel cost per cycle. The biodiesel cost per cycle is based on the biodiesel contract price, which was $2.60 per gallon or $109.20 per barrel, in effect at the time the production simulation was performed. (See MECO-WP-408, page 6 and MECO-WP-402, respectively.) On November 28, 2006, Amendment No. 1 was made to the biodiesel contract, increasing the price to $2.70 per gallon or $113.40 per barrel, effective on that date. This increased cost is not reflected in the biodiesel fuel expense.

Q. What is biodiesel?

A. The biodiesel that MECO uses is a liquid fuel oil that is derived from processed cooking oil. The biodiesel that MECO uses does not contain ethanol. Pacific Biodiesel processes and supplies biodiesel to MECO. While biodiesel can be a blend of biodiesel and other fuel oils, MECO uses only pure (100%) biodiesel (B100).

Q. What does MECO use biodiesel for?

A. As Mr. Ribao states in MECO T-5, MECO uses biodiesel in its Maalaea Units 12 and 13 to promote more complete combustion resulting in reduced opacity levels. This oxygenated fuel is used during start-up and shut-down sequences.

FUEL-RELATED EXPENSE (MAUI DIVISION)

Q. What is the total fuel-related expense for the 2007 test year for the Maui Division?

A. Estimated 2007 fuel-related expense for the Maui Division is $511,414, as shown on MECO-405.

Q. What costs are included in the test year forecast of fuel-related expenses?

A. Fuel-related expenses include:

1) Fuel additive expense,
2) Ignition startup expense (propane and diesel) and related fuel handling expense,
3) Petroleum inspection expense, and
4) Ocean cargo insurance expense.

Fuel Additive Expense

Q. Which Maui Division generating units utilize a fuel additive?

A. All of the steam units at Kahului utilize a fuel additive.

Q. What fuel additive is used by the Kahului generating units?

A. In the test year, the units at Kahului will be using a calcium nitrate fuel additive "LO-1" that will be supplied by the AXXO company.

Q. Why does MECO use a fuel additive?

A. MECO uses a fuel additive to reduce particulate matter emissions from the Kahului units, all of which use IFO.

Q. What is MECO's estimate of its test year fuel additive expense?

A. The test year fuel additive expense is $155,692, as shown on MECO-405. The fuel additive is injected directly into the fuel system or boiler via metering pumps and is indexed in proportion to fuel flow. Since the Kahului Units 3 and 4 are baseloaded, and the Kahului Units 1 and 2 cycle daily similar to historical operation, MECO used the 2005 actual fuel additive expense that was escalated to the test year 2007 by the forecast Gross Domestic Product Implicit Price Deflator. (See MECO-WP-405, page 2.)

<u>Ignition Startup Expense (Propane and Diesel) and Related Fuel Handling Expense</u>

Q. What is the ignition startup expense and fuel handling expense for the test year?

A. The ignition startup expense and fuel handling expenses for the test year is $26,100 as shown in MECO-405.

Q. What are ignition startup expense and fuel handling expenses?

A. Ignition startup expense and fuel handling expenses cover the cost of fuel unloading supervision and management at Kahului Harbor, routine maintenance of the Kahului fuel unloading and delivery facilities, security services, propane costs and black start unit diesel fuel costs.

Q. What is this estimate based on?

A. It is based on a five-year (2001-2005) average of these costs. Please refer to MECO-WP-405, page 1.

Petroleum Inspection Expense

Q. What is the Maui Division's test year petroleum inspection expense?

A. The test year petroleum inspection expense is $134,300, as shown on MECO-405, line 3. The estimated test year amount for petroleum inspection expense is based on the actual 2005 expense, escalated to the test year 2007 by the forecasted Gross Domestic Product Implicit Price Deflator. See MECO-WP-405, page 2.

Q. What is petroleum inspection expense?

A. Petroleum inspection expense is the cost for a third party, Petrospect, Inc., to inspect each bargeload of fuel shipped to MECO and to direct the dock side barge discharge operations. The use of an independent third-party petroleum inspection service to measure the change in storage tank heights and product temperature for the determination of the volume of IFO and diesel fuel purchased in bulk by MECO from Chevron and Tesoro is a long-term requirement and stipulated provision of the terms of MECO's fuel supply contracts with each of the respective parties, as approved by the Commission in Docket No. 04-0129. The selection of the particular petroleum inspection service vendor is a joint decision between MECO and Tesoro or Chevron, and the charge of the petroleum inspector is accordingly shared on an equal basis between the companies.

Ocean Cargo Insurance Expense

Q. What is the test year ocean cargo insurance expense?

A. The test year ocean cargo insurance expense is $195,365, as shown on MECO-405.

Q. What is ocean cargo insurance?

A. Ocean cargo insurance is first party property insurance against all risks of physical loss or damage for the value of the fuel while the fuel is in transit over the ocean. It does not include liability coverage. The insurance is applied to these fuels

because MECO takes title to the fuels at the point of loading on Oahu. The insurance does not apply to fuels purchased by MECO on Maui (such as biodiesel). Please refer to MECO-WP-405, page 3.

Q. How was the estimate derived?

A. The insurance rate for fuel oil and bulk shipments in effect at the time the production simulation was performed and exhibits and workpapers were produced was 0.1175% of the value of the fuel transported. The value of the fuel transported to Maui is the IFO and diesel fuel expense as I described earlier in my testimony. The rate was reduced in December 2006 to 0.10%. This reduced rate is not reflected in the calculation of ocean cargo insurance expense in the exhibits and workpapers.

GENERATION EFFICIENCY (MAUI DIVISION)

Q. What is the test year net generation heat rate for the Maui Division?

A. The test year net heat rate for the Maui Division is 10,001 Btu/kWh, as shown in MECO-406, line 11. The test year net heat rate for MECO steam units is 14,380 Btu/kWh, shown in MECO-406, line 13. The test year net heat rate for MECO diesel-fueled units, including the Maalaea diesel engines, and the combined cycle units is 8,885 Btu/kWh as shown in MECO-406, line 15, and the heat rate for the Hana DG, is 11,275 Btu/kWh, shown in MECO-406, line 17.

Q. What is a "net heat rate"?

A. The net heat rate is a measure of generation efficiency. It is the heat content of the fuel consumed (in Btus) per net kWh generated. That is, for MECO in the test year, an estimated 10,001 Btus of fuel heat are required for the MECO units, on average, to produce one kWh of energy.

Q. How does the test year net heat rate compare to historical performance?

A. As shown in MECO-407, the estimated test year Maui net system heat rate is 4.9 percent, or 515 Btu/kWh, lower than actual 2005. A lower heat rate is an improvement in generation efficiency.

Q. Why is the test year heat rate expected to be lower than the actual 2005 Maui net system heat rate?

A. The primary reason the test year heat rate is lower than the actual 2005 Maui net system heat rate is due to the addition of M18 and the associated conversion of M17 and M19 to combined cycle and the operation of half the combined cycle in baseload duty and the other half in cycling duty. The combined cycle units are the most efficient units on Maui. Their operation displaces generation from the less efficient units, and the result is an overall improvement (decrease) in net system heat rate.

Q. How does the test year net heat rate affect ratemaking in this proceeding?

A. The net heat rate directly affects the "sales heat rate". The sales heat rate is calculated in a similar manner as the net heat rate, except the sales heat rate is the heat content of the fuel consumed per kWh of sales. The sales heat rate in the form of a Generation Efficiency Factor is used in the Energy Cost Adjustment Clause to translate the base generation cost in cents per MBtu to the weighted base generation cost in cents per kWh of sales.

For MECO, the sales heat rate is computed by dividing the test year fuel consumption (in MBtus) by the proportion of sales provided by MECO generation (in kilowatt-hours). The resultant Generation Efficiency Factor for steam units is 0.015310 MBtu/kWh, shown in MECO-406, line 19. The resultant Generation Efficiency Factor for the Maalaea diesel-fueled units is 0.009460 MBtu/kWh, shown in MECO-406, line 20. The Hana DG Generation Efficiency Factor is 0.012005 as shown in MECO-406, line 21. The resultant Generation Efficiency

Factor for central station units is 0.010648 MBtu/kWh. This is derived from a total of 10,772,727 MBtu of central station fuel consumption (3,144,689 MBtu from IFO generation plus 7,628,038 MBtu from Maalaea diesel generation, both values from MECO-WP-406, page 1) divided by 1,011.7 GWh of sales from MECO central station generation (205.4 GWh sales from IFO generation as shown on MECO-WP-406, page 1, plus 806.3 GWh sales from Maalaea diesel generation as shown on MECO-WP-406, page 2). The Energy Cost Adjustment Clause is discussed by Mr. Peter Young in MECO T-3.

FUEL INVENTORY (MAUI DIVISION)

Q. What is the test year fuel inventory for the Maui Division?

A. The test year fuel inventory is $14,628,834 for the Maui Division, as shown on MECO-408. This is based on fuel inventories of 53,248 barrels of IFO, with a value of $3,175,519; 109,097 barrels of central station diesel fuel with a value of $11,440,113; and 114 barrels of diesel fuel, with a value of $13,202, for the Hana DG, as shown in MECO-408, pages 2 to 4. The power plant at Kahului uses IFO, and the power plant at Maalaea uses diesel fuel. The Hana DGs use diesel fuel. (See MECO-408.)

Q. What is the objective of having an adequate fuel inventory?

A. The objective of having an adequate inventory of fuel is to maintain an uninterrupted flow of fuel to the generating units given projected fuel consumption and delivery rates and reasonably expected variations in those rates.

Q. What factors were considered in determining the appropriate fuel inventory amounts for MECO?

A. The factors considered included:

1) the fuel delivery process, including the volume and frequency of fuel deliveries;

2) the average rate at which fuel will be consumed; and

3) the fuel infrastructure, including the amount of fuel storage available.

Determination of Appropriate Amount of Fuel Inventory

Q. What fuel inventory level is MECO using to determine the quantity of fuel, in barrels, in inventory?

A. For diesel fuel, MECO is using a 30-day inventory level based on the level approved in MECO's last rate case, or a diesel fuel inventory of 109,097 barrels based on 3,567 barrels per day average consumption and 30 days of storage, plus 2,094 barrels of dead storage. See MECO-408, page 3. For IFO, MECO is using a 37-day inventory level, or 53,248 barrels based on 1,368 barrels per day average consumption and 37 days of storage, plus 2,649 barrels of dead storage. See MECO-408, page 2.

Q. What is the present level of fuel inventory included in MECO's rate base for the Maui Division?

A. In MECO's last rate case, Docket No. 97-0346 (1999 Test Year), the Commission approved a 30-day supply of IFO and diesel fuel inventory based on a 10-day average fuel delivery.

Q. Why is MECO proposing a 37-day IFO inventory level?

A. MECO is proposing a 37-day IFO inventory level because MECO has experienced greater uncertainty in the scheduling of fuel deliveries in recent years and this greater uncertainty is expected to continue in the coming years. This affects the IFO inventory more than the diesel fuel inventory because MECO has storage options at the Chevron and Shell terminals for diesel fuel but has no other storage options for IFO.

Q. Please explain the uncertainties regarding the scheduling of fuel deliveries.

A. The uncertainties generally fall into three areas:

1) competition for dock space at the Kahului Harbor;

2) competition for dock space at the Barbers Point Harbor; and

3) limited barge schedules for fuel deliveries to Maui and the Big Island.

Q. Please explain the competition for dock space at the Kahului Harbor.

A. With the increasing amount of cruise ship and other ship traffic at Kahului Harbor (where IFO is delivered), the availability of dock space has become more constrained and it has become increasingly difficult to schedule fuel barge deliveries at the harbor. For example, Pier 1A, which can accommodate fully-loaded fuel barges, is now used for the NCL cruise ships for six out of seven days of the week. In addition, the pier is otherwise frequently occupied by other cruise ships not in year-round routine inter-island service. Therefore, there is at most only one day of the week (Sunday) when a fully-loaded fuel barge can dock at Pier 1A. And even then, there is competition for that space with other barges for use of that pier on that one remaining day. As an alternative, the fuel barge can dock at Pier 3B. However, that pier has a shallower draft (the inter-island fuel barge Noa's full draft is approximately 17.5 ft full loaded, while the vessel is limited to an arrival draft below 15 ft. at Pier 3B) so the fuel barge must carry less fuel when using that pier. Normally, the fuel barge can carry a total of about 62,000 barrels of diesel fuel and IFO. At Pier 3B, the cargo must be reduced by about 10,000 barrels. In a typical month of approximately three voyages, assuming that 2 of the typical 3 voyages will be destined for Pier 3B, 2 x 10,000 bbls/voyage = 20,000 bbls of cargo carrying capacity cannot be utilized. If 50% represents fuel oil cargo displaced and 50% diesel fuel displaced, the resulting 10,000 bbls of fuel oil cargo displaced represents approximately seven days of MECO's typical IFO consumption, at a burn rate of 1,368 bbls/day, as shown on MECO-408, page 2.

In the future, the availability of Pier 1A for fuel deliveries may become even more constrained as cruise ship traffic continues to increase and as harbor pier availability is further squeezed by the start-up of the inter-island "Superferry".

Q. Please explain the competition for dock space at the Barbers Point Harbor.

A. There is also competition for pier space at the Barbers Point Harbor where the fuel is loaded onto the barge. The voyage from Barbers Point to Kahului Harbor takes about three-fourths of a day, depending upon weather and ocean conditions. It takes about one-half day to discharge the fuel into fuel storage tanks in Kahului. The return voyage to Barbers Point takes about one-half day. Therefore, the round-trip time is about two-and-three-fourths to three days. These durations must be taken into account when scheduling the loading of the barge at Barbers Point and unloading of the barge in Kahului.

Q. Please explain how limited barge schedules for fuel deliveries to Maui and the Big Island impact fuel deliveries.

A. There is a single fuel barge that delivers fuel to both Maui and the Big Island on alternating trips. The length of time needed for each voyage limits the schedules for delivering fuel to each island.

Q. Please explain the fuel delivery process, the voyage durations and barge carrying capacity in more detail.

A. First, let me explain the process for delivering fuel to Maui and the Big Island. This will help one understand how limited barge schedules impact fuel deliveries to Maui.

<u>Fuel Delivery Process</u>

Q. Please briefly describe the process in which IFO and diesel fuel are delivered to Maui.

A. A single barge, named the "Noa", is used to deliver IFO and diesel to both MECO and HELCO. This barge carries both IFO and diesel fuel. IFO and diesel fuel from Chevron or Tesoro are loaded onto the barge at the Barbers Point Harbor on Oahu. The barge routinely delivers IFO and diesel fuel to MECO and HELCO on alternating trips. Occasionally, the barge to HELCO discharges a parcel of diesel for MECO in Kahului on its return run.

Q. How much fuel can be carried by the Noa on a single voyage to MECO?

A. The Noa can carry approximately 25,000 barrels of IFO and 42,000 barrels of diesel fuel on a single voyage.

Q. How often does the barge travel to MECO?

A. The barge travels to MECO every 7 to 10 days. Preparing and loading the barge with fuel at Barbers Point takes about one day. The voyage from Barbers Point to Kahului Harbor takes about three-fourths of a day, depending upon weather and ocean conditions. It takes about one-half day to discharge the fuel into fuel storage tanks in Kahului. The return voyage to Barbers Point takes about one-half day. Therefore, the round-trip time is about two-and-three-fourths to three days.

The subsequent voyage to HELCO takes about one day to prepare and load the barge with fuel. The trip to Hilo Harbor takes about one-and-one-half days. Discharging the fuel takes about one-half day. The return voyage from Hilo Harbor to Barbers Point takes about one day. Therefore, the round-trip time is about four days.

There is usually one day of rest between trips to Maui and Hawaii. Therefore, the cycle time between trips is about nine days but may be as long as 11 days, depending on weather and ocean conditions, the availability of pier space, and the loading and unloading rates. If the barge must be taken out of service for maintenance, the cycle may be as long as 19 days.

Therefore, given that the fuel barge alternates voyages between Maui and the Big Island, the scheduling of deliveries is further complicated. Any delays that occur on Maui could affect the timeliness of deliveries to the Big Island and vice verse.

The increasing competition for pier space for vessels discharging and loading passengers and cargo requires that pier reservations and their resulting implied voyage schedules be obtained from Hawaii DOT/Harbors (Harbor Master's office in Kahului) ever farther in advance – now routinely three to four months in advance. This reduces the Utility's ability to optimize shipments and scheduling frequency as planning requires a greater portion of the barge's capacity be left unutilized as a contingency against an unexpected increase in the consumption of a particular type of fuel because of a change in the maintenance outage of a MECO generating unit or reduction in generation by a firm power or as-available IPP which would require additional output by the Utility's own units accordingly. When changes become necessary due to unforeseen circumstances, it can be extremely difficult to reschedule voyages and docking times, and this could affect fuel inventories.

Because of these challenges, it has been necessary for MECO to carry a higher inventory of IFO so that a reliable supply of fuel can be maintained even during scheduling upsets.

Q. How did MECO arrive at the 37-day level of inventory?

A. Because of the uncertainties regarding the scheduling of fuel deliveries as explained above, MECO manages its fuel inventory to be able to maintain a reliable fuel supply to its generating units. The IFO inventory that MECO carried over the past five years reflects MECO's actions to manage its fuel inventory in

response to the uncertainty. Therefore, MECO used a five-year average of recorded IFO inventory. See MECO-409.

Q. Why isn't MECO proposing a higher number of days of inventory for diesel fuel?

A. There are other users of diesel fuel on Maui other than MECO. As I explained earlier in my testimony in the section "Fuel Infrastructure," MECO's diesel fuel is pumped from the fuel barge into fuel storage tanks owned by Shell Oil Company or Chevron. MECO's diesel fuel may be commingled with Chevron's diesel fuel. If necessary in a contingency situation, MECO could purchase diesel fuel from Tesoro or Chevron on Maui and MECO in its fuel supply contracts with its two oil suppliers has provisions to receive diesel directly from their respective inter-island barges. These direct deliveries would be on a space-available basis, however. MECO would not have the same option for IFO because MECO is the only user of IFO on Maui and the barge NOA employed by MECO (and HELCO) is the only IFO carrying barge in inter-island service. (The barges in inter-island service for Chevron and Tesoro do not transport IFO.) MECO's five-year average of recorded diesel fuel inventory is about 30 days.

Fuel Consumption Rates

Q. What are the estimated average fuel consumption rates in the test year?

A. The estimated average fuel consumption rates in the test year are 1,368 barrels per day for IFO and 3,567 barrels per day for diesel fuel, as shown in MECO-WP-408, page 5. These rates were used to determine the fuel inventory amounts for Maui.

Fuel Infrastructure

Q. Once the barge arrives in Kahului, to where is the fuel delivered?

A. The diesel is pumped from the barge to either a Shell Oil Company or Chevron owned fuel terminal at Kahului Harbor. These fuel terminals consist of fuel

storage tanks, fuel pumps and truck loading facilities. MECO's fuel stored at the Chevron terminal is commingled with other parties' diesel of similar specification.

Diesel fuel is loaded onto trucks for transportation to MECO's Maalaea Generating Station. The trucks pump the fuel into storage tanks at the plant.

The IFO is pumped via MECO-owned pipelines from the barge at Kahului Harbor to fuel tanks at MECO's Kahului Generation Station.

Q. How much storage capacity is available for MECO's IFO at the Kahului Power Plant?

A. The total amount of MECO-owned IFO storage capacity is 83,916 barrels. Of this amount, 81,267 barrels is usable storage and 2,649 barrels is considered "dead storage". See MECO-WP-408, page 1.

Q. How much storage capacity is available for MECO's diesel fuel?

A. The total amount of MECO-owned diesel storage capacity is 95,986 barrels. Of this amount, 93,892 barrels is usable storage and 2,094 barrels is considered "dead storage". The approximate working amount of diesel fuel storage at the Shell Oil Company terminal is about 55,000 barrels. MECO uses Shell's storage tank, but does not have an exclusive right to use the capacity of Shell's or Chevron's diesel storage tanks, and must commingle MECO's diesel fuel with diesel fuel of similar quality with Shell or Chevron and other of its customers. See MECO-WP-408, page 1. The 109,097 barrels of MECO diesel inventory is stored in the diesel fuel tanks at the Maalaea Generating Station and in Shell's diesel storage tank at their Kahului fuel terminal. The 109,097 barrels represents an annual average and is not the highest amount stored after a delivery.

Q. What is "dead storage"?

A. Dead storage (also referred to as the "heel") is that portion of the tank's contents that cannot be withdrawn from the tank. Please refer to MECO-WP-408, page 4.

Q. How is the amount of dead storage determined?

A. The amount of dead storage is a function of the tank design, with the primary determinants being the design and elevation of the outlet piping and the design of the tank bottom. Generally, the outlet pipe protrudes a few feet into the tank then has a 90 degree elbow facing downward. The entrance to this outlet pipe is generally about 12 inches to 18 inches above the tank floor. This spacing prevents water and sediment, which collects at the tank bottom, from being drawn out of the tank through the outlet pipe. (There is a separate bottom drain pipe to drain the water and sediment out of the tank.) Once the oil in the tank declines to a level at or below the level of the outlet pipe, oil can no longer be drawn from the tank. The other determinant of the dead storage volume is the shape of the bottom. Many of the tanks are "crowned," where the center of the tank floor is much higher than the edges. This crown helps to minimize the amount of dead storage and also allows water and sediment to gravitate toward the outer section of the tank bottom to where the bottom drain is situated. Other tanks slope to the center. These tanks sometimes have a sump in the middle to allow for drainage from the center.

Q. Has dead storage been accepted by the Commission in previous MECO rate cases?

A. Yes, dead storage was accepted by the Commission in MECO's Test Year 1999 Rate Case (Docket No. 97-0346)

MOLOKAI DIVISION

FUEL OIL EXPENSE

Q. What is the fuel oil expense for the Molokai Division for test year 2007?

A. The fuel oil expense for the Molokai Division for test year 2007 is $7,247,200, as shown on MECO-401.

Fuel Prices

Q. What is the test year fuel price for the Molokai Division?

A. Molokai Division's test year fuel price is $107.3613 per barrel for diesel fuel, as shown on MECO-402.

Q. How was this price determined?

A. The fuel price for Palaau diesel fuel is the latest available contract price at the time this testimony was being prepared, effective on September 1, 2006. The fuel contract was approved by the Commission in Docket No. 04-0129, Decision and Order No. 21523, dated December 30, 2004.

Q. What costs are included in fuel oil price for the Molokai Division?

A. The costs embedded in the price of the fuels includes the following:

1) Fuel oil
2) Terminaling Fee
3) Land Transportation Expense

Terminaling fees and land transportation expenses are per unit costs for diesel received by MECO under a combined terminaling/trucking contract. See MECO-WP-402, page 3. The land transportation fee is included and embedded in the storage cost shown in the work paper.

Q. Were the terminaling fee and land transportation expense included in fuel expense in MECO's last rate case?

A. Yes, the terminaling fee and the land transportation expense were included in the previous MECO Test Year 1999 Rate Case (Docket No. 97-0346).

Fuel Consumption

Q. What is the estimated test year fuel consumption for the Molokai Division?

A. An estimated 67,503 barrels of diesel fuel will be burned in Molokai Division's Palaau Generating Station in test year 2007, as shown in MECO-404.

Q. How is Molokai Division's fuel consumption determined?

A. The fuel consumption in the test year for the Molokai Division is derived by multiplying the estimated system gross heat rate of 9,527 Btu/kWh by the gross generation required to serve the load (41,520.4 MWh), and converting that fuel consumption into barrels (5.86 MBtu/bbl). (See MECO-WP-404, page 97.)

Q. Is this the same methodology used in MECO's previous rate case?

A. Yes, the same methodology was used in the previous MECO Test Year 1999 Rate Case (Docket No. 97-0346).

Q. How was the test year system gross heat rate determined?

A. The system gross heat rate was determined from a five-year (2001-2005) average. (See MECO-WP-404, page 98.)

Q. Does the Molokai Division purchase any energy from IPPs?

A. No, the Molokai Division does not purchase any energy from IPPs.

FUEL-RELATED EXPENSE (MOLOKAI DIVISION)

Q. What is the fuel-related expense for the 2007 test year for the Molokai Division?

A. The test year 2007 fuel-related expense for the Molokai Division is $5,500 for petroleum inspection, as shown on MECO-405. This test year 2007 expense was determined by escalating the actual 2005 expense of $5,246 to 2007 by the forecast Gross Domestic Product Implicit Price Deflator (2.79% for 2006 and 1.99% for 2007), as shown on MECO-WP-405, page 6.

GENERATION EFFICIENCY (MOLOKAI DIVISION)

Q. What is the test year gross generation heat rate for the Molokai Division?

A. The test year gross heat rate for the Molokai Division is 9,840 Btu/kWh, shown in MECO-406, line 11. This is based on a five-year (2001-2005) average, as shown in MECO-407.

Q. In its previous rate case, did MECO use a five-year average to determine the gross heat rate to use for the test year?

A. No. In its previous rate case, MECO used a most-recent 12-month period heat rate in its direct testimony and a most-recent calendar year heat rate in its rebuttal testimony.

Q. Why did MECO use a five-year average for the test year gross heat rate in this proceeding?

A. MECO used a five-year average of the gross heat rate in this proceeding because this method generally captured at least one overhaul cycle on each generating unit. Had MECO used the most recent calendar year (2005) recorded gross heat rate, the test year heat rate would have been higher (9,974 Btu/kWh versus 9,840 Btu/kWh).

FUEL INVENTORY (MOLOKAI DIVISION)

Q. What is the test year estimate of fuel inventory for the Molokai Division?

A. The estimated test year fuel inventory is $632,339. This is based on a 30 day fuel inventory of 5,890 barrels of diesel fuel, and a fuel price of $107.3613 per barrel, as shown in MECO-408, page 6.

Q. How was the inventory quantity and value determined?

A. The inventory quantity was determined by estimating the average fuel consumption rate over the test year (i.e., taking the total fuel consumption in the test year and dividing that value by 365 days) then multiplying that average fuel consumption rate by 30 days. The value of the inventory was determined by multiplying the 30-day quantity, plus 342 barrels of dead storage, by the delivered cost of the fuel. See MECO- 408, page 6.

Fuel Delivery Process

Q. Please briefly describe the process in which diesel fuel is delivered to Molokai.

A. Diesel fuel is loaded onto a fuel barge, the "HILO BAY" that has an approximate capacity of 60,000 barrels. This barge is owned by Hawaiian Interisland Towing, Inc. ("HITI") at Barbers Point on Oahu. The fuel barge is towed by HITI to Kaunakakai Harbor on Molokai generally every 28 days.

Fuel Infrastructure

Q. Once the barge arrives in Kaunakakai, to where is the fuel delivered?

A. The diesel fuel is pumped from the barge into diesel fuel storage tanks located at the harbor. The tanks are owned by Island Petroleum Company, which operates the only petroleum terminaling facility on the island. MECO takes ownership of the diesel fuel when it is delivered into the diesel fuel storage tanks. MECO's diesel fuel is commingled with other parties' diesel fuel in the Island Petroleum Company storage tanks. From the Island Petroleum Company storage tanks, the diesel fuel is transported by truck, under a contract between MECO and Island Petroleum Company, to MECO's Palaau Generating Station. The diesel fuel is then pumped into either one of two diesel fuel storage tanks at the Palaau Generating Station.

Q. How much diesel fuel storage capacity is available at the Palaau Generating Station?

A. There is approximately 5,919 barrels of diesel fuel storage at the Palaau Generating Station, of which 342 barrels is "dead storage." This provides enough storage for 30 days of inventory. See MECO- WP-408, page 3.

Q. How much diesel fuel storage capacity is available to MECO in Island Petroleum Company storage tanks?

A. There is approximately 9,200 barrels of diesel fuel storage available to MECO in Island Petroleum Company storage tanks.

Q. Where will MECO's 5,890 barrels of diesel fuel inventory be stored?

A. MECO's diesel fuel inventory will be stored in a combination of MECO's diesel fuel storage tanks at the Palaau Generating Station and Island Petroleum Company diesel fuel storage tanks. Actual fuel inventory is highest when fuel is delivered and lowest prior to fuel deliveries.

Determination of Fuel Inventory

Q. What is the present level of fuel inventory included in MECO's rate base for the Molokai Division?

A. The present level of inventory included in MECO's rate base for the Molokai Division is based on 30 days of inventory.

Q. Was the 30-day inventory level used by MECO and approved by the Commission in MECO's last rate case (Test Year 1999 in Docket No. 97-0346)?

A. Yes, the 30-day level was approved by the Commission in their Decision and Order No. 16922, dated April 6, 1999.

Q. What amount of diesel fuel inventory has the Molokai Division carried historically?

A. The Molokai Division carried an annual average of between 7,473 and 8,835 barrels of diesel fuel in inventory over the last five years. This equated to between 41 and 50 days of inventory at the average daily burn rate (i.e., excluding dead storage). (See MECO-409, page 3.)

LANAI DIVISION

FUEL OIL EXPENSE

Q. What is the test year 2007 fuel expense for the Lanai Division?

A. The test year 2007 fuel expense is $6,172,590 based on 53,754 barrels of diesel fuel and a fuel price of $114.8331 per barrel as shown in MECO-404.

Q. What costs are included in fuel oil expense for the Lanai Division?

A. Lanai's fuel expense is the contracted delivered-to-plant cost of diesel from the Lanai Oil Company, inclusive of all transportation and distribution expenses.

Fuel Price

Q. What is the test year fuel price for the Lanai Division?

A. Lanai Division's test year fuel price is $114.8311 per barrel for diesel fuel.

Q. How was this price determined?

A. For test year 2007, the fuel price for Miki Basin diesel fuel is the latest available contract price at the time this testimony was being prepared, actual fuel prices effective on September 1, 2006. The fuel contract was approved by the Commission in Docket No. 99-0196, Decision and Order No. 17574, dated March 1, 2000.

Fuel Consumption

Q. What is the estimated test year fuel consumption for the Lanai Division?

A. An estimated 53,754 barrels of diesel fuel will be burned in Lanai Division's Miki Basin Generating Station, as shown in MECO-404.

Q. How is Lanai Division's fuel consumption determined?

A. The fuel consumption in the test year for the Lanai Division is derived by multiplying the system gross heat rate of 9,721 Btu/kWh by the gross generation of 32,403.7 MWh required to cover the load, and converting that fuel consumption into barrels (5.86 MBtu/bbl). (See MECO-WP-404, page 94.).

Q. How was the test year system gross heat rate determined?

A. The system heat rate of 9,721 Btu/kWh was determined from a five-year (2001-2005) average. (See MECO-WP-404, page 95.)

Q. Is this the same methodology used in MECO's previous rate case?

A. Yes, this methodology was used in the previous MECO Test Year 1999 Rate Case (Docket 97-0346).

Q. Does the Lanai Division purchase any energy from IPPs?

A. No, the Lanai Division does not purchase any energy from IPPs.

FUEL-RELATED EXPENSE (LANAI DIVISION)

Q. What is the fuel-related expense for the 2007 test year for the Lanai Division?

A. The test year 2007 fuel-related expense for the Lanai Division is $2,664, for petroleum inspection expense, as shown on MECO-WP-405, page 5. This test year 2007 expense was determined by escalating the actual 2005 expense of $2,542 to 2007 by the forecast Gross Domestic Product Implicit Price Deflator, as shown on MECO-WP-405, page 5.

Q. What costs are included in the test year forecast of fuel-related expenses?

A. Fuel-related expenses include petroleum inspection expense.

GENERATION EFFICIENCY (LANAI DIVISION)

Q. What is the test year gross generation heat rate for the Lanai Division?

A. The test year gross heat rate for the Lanai Division is 10,034 Btu/kWh, shown in MECO-407, line 4. This is based on a five-year (2001-2005) average.

Q. In its previous rate case, did MECO use a five-year average to determine the gross heat rate to use for the test year?

A. No. In its previous rate case, MECO used a most-recent 12-month period heat rate in its direct testimony and a most-recent calendar year heat rate in its rebuttal testimony.

Q. Why did MECO use a five-year average for the test year gross heat rate in this proceeding?

A. MECO used a five-year average of the gross heat rate in this proceeding because this method generally captured at least one overhaul cycle on each generating unit. In addition, one of the Lanai generating units experienced an extended forced outage in 2005. This led to a relatively high gross heat rate in 2005. Therefore, a

five-year average gross heat rate would better represent test year operations. Had MECO used the most recent calendar year (2005) recorded gross heat rate, the test year heat rate would have been higher (10,288 Btu/kWh versus 10,034 Btu/kWh).

FUEL INVENTORY (LANAI DIVISION)

Q. What is the test year estimate of fuel inventory for the Lanai Division?

A. The estimated test year fuel inventory is $549,917, based on 4,789 barrels of diesel fuel, at $114.8311 per barrel, as shown on MECO-408, page 5.

Q. How was the inventory quantity and value determined?

A. The inventory quantity was determined by estimating the average fuel consumption rate over the test year (i.e., taking the total fuel consumption in the test year and dividing that value by 365 days) then multiplying that average fuel consumption rate by 30 days and adding 371 barrels of dead storage. The value of the inventory was determined by multiplying the 30-day quantity plus 371 barrels of dead storage by the delivered cost of the fuel. See MECO -408, page 5.

Fuel Delivery Process

Q. From where does MECO obtain diesel fuel for the Miki Basin Generating Station?

A. MECO purchases its diesel fuel from the Lanai Oil Company, which delivers the fuel to MECO's storage tanks at the Miki Basin Generating Station. Lanai Oil Company loads diesel into its small barge, "TARA," which has a capacity of approximately 3,100 barrels, on Oahu from Chevron. The barge is towed to Kaumalapau Harbor, Lanai where Lanai Oil Company operates the only petroleum terminal facility on the island. Lanai Oil Company trucks the diesel to Miki Basin Generating Station where MECO takes title to the fuel. MECO's purchased fuel is commingled with diesel used by Lanai's other consumers.

Fuel Infrastructure

Q. How much diesel fuel storage capacity is available at the Miki Basin Generating Station?

A. There is approximately 5,919 barrels of diesel fuel storage at the Miki Basin Generating Station, of which 371 barrels is "dead storage." See MECO-WP-408, page 2.

Determination of Appropriate Amount of Fuel Inventory

Q. What is the present level of fuel inventory included in MECO's rate base for the Lanai Division?

A. The present level of inventory included in MECO's rate case for the Lanai Division is based on 30 days of storage.

Q. Was the 30-day inventory level used in MECO's last rate case (Test Year 1999 in Docket No. 97-0346)?

A. Yes, the 30-day inventory level was used in MECO's last rate case and approved by the Commission in Decision and Order No. 16922, dated April 6, 1999.

Q. What amount of diesel fuel inventory has the Lanai Division carried historically?

A. The Lanai Division carried between 3,070 and 5,089 barrels of diesel fuel in inventory over the last five years. (See MECO-409, page 2.)

SUMMARY

Q. Please summarize your testimony.

A. The testimony presented supports the reasonableness of the following values for the 2007 test year:

Test Year 2007		Units
1) Fuel Expense		
a) Maui Division	167,036,687	$
b) Molokai Division	7,252,659	$
c) Lanai Division	6,175,255	$
Total	180,464,600	$

2)	Fuel Price		
	a) *Maui Industrial Fuel Oil*	59.6359	$/bbl
	b) Maui Diesel Fuel	104.8621	$/bbl
	c) Maui Biodiesel	109.2000	$/bbl
	d) Hana Diesel Fuel	115.8105	$/bbl
	e) Molokai Diesel Fuel	107.3613	$/bbl
	f) Lanai Diesel Fuel	114.8311	$/bbl
3)	Purchased Energy Forecast – Maui Division		
	a) HC&S	90.415	GWh
	b) Kaheawa Wind Power, LLC	122.882	GWh
	c) Makila Hydro	0.876	GWh
	Total Maui Division	214.173	GWh
4)	Generation Efficiency Factor (Sales Heat Rate)		
	a) Maui Division, Industrial Fuel Oil	0.015310	MBtu/kWh
	b) Maui Division, Maalaea Diesel Oil	0.009460	MBtu/kWh
	c) Maui Division, Hana Diesel Oil	0.012005	MBtu/kWh
	d) Molokai Division	0.010823	MBtu/kWh
	e) Lanai Division	0.010577	MBtu/kWh
5)	Fuel Inventory		
	a) Maui Division	14,628,834	$
	b) Molokai Division	632,339	$
	c) Lanai Division	549,917	$
	Total	15,811,090	$

The above items were determined by detailed analyses and methodologies, are consistent with historical values considering known and expected conditions, and are consistent with all items in this case as they relate to each other.

Q. Does this conclude your testimony?

A. Yes, it does.

Hawaiian Electric Company, Inc.

Ross H. Sakuda, P.E.

EDUCATIONAL BACKGROUND AND EXPERIENCE

Business Address:	Hawaiian Electric Company, Inc. 820 Ward Avenue P. O. Box 2750 Honolulu, HI 96840
Position:	Director, Generation Planning System Planning Department
Education:	Bachelor of Science in Mechanical Engineering University of Hawaii, 1978
Other Qualifications:	Registered Professional Engineer Hawaii Mechanical Branch – 1983
Experience:	<u>HAWAIIAN ELECTRIC COMPANY, INC.</u>

April 2000 to Present
Director, Generation Planning
System Planning Department

November 1999 – March 2000
Project Manager
Power Supply Planning & Engineering Department

August 1995 – October 1999
Senior Planning Engineer
Power Supply Planning & Engineering Department

1993 – July 1995
Senior Mechanical Engineer
Power Supply Planning & Engineering Department

Experience (cont'd):

1990 – 1992
Project Manager
Engineering Department

October 1983 – 1989
Mechanical Engineer
Engineering Department

November 1979 – September 1983
Mechanical Designer
Engineering Department

NAKASHIMA ASSOCIATES
April 1979 – October 1979
Mechanical Designer

Other Curriculum:

Corporate Training Course
Zenger-Miller Supervision Course
Utility Finance and Accounting Course

Previous Testimony:

Hawaiian Electric Company, Inc.
Request for Approval of Rate Increase
Test Year 2007
Docket No. 2006-0386

Hawaiian Electric Company, Inc.
Campbell Industrial Park Generation Station
and Transmission Additions Project
Docket No. 05-0145

HECO/HELCO/MECO
PUC Proceeding to Investigate Competitive Bidding
for New Generation in Hawaii
Docket No. 03-0372

Hawaiian Electric Company, Inc.
Request for Approval of Rate Increase
Test Year 2005
Docket No. 04-0113

Previous Testimony (cont'd):

HECO/HELCO/MECO
PUC Proceeding to Investigate Distributed Generation
Docket No. 03-0371

Hawaii Electric Light Company, Inc.
Apollo Energy Corporation Petition
Docket No. 00-0135

Hawaii Electric Light Company, Inc.
Request for Approval of Rate Increase
Test Year 2000
Docket No. 99-0207

Hawaiian Electric Company, Inc.
Waiau Water Agreements
Docket No. 7277

Maui Electric Company, Limited

TEST YEAR 2007 FUEL EXPENSE
Direct Testimony

Line		Test Year 2007 ($000)
1	**Total Fuel Oil Expense**	
2	Maui	166,525.3
3	Lanai	6,172.6
4	Molokai	7,247.2
5	Total	179,945.0
6	**Total Fuel Related Expense**	
7	Maui	511.4
8	Lanai	2.7
9	Molokai	5.5
10	Total	519.6
11	**Total Fuel Expenses**	
12	Maui	167,036.7
13	Lanai	6,175.3
14	Molokai	7,252.7
15	**Total**	180,464.6

Reference:
Lines 2-4: MECO-404
Lines 7-9: MECO-405

NOTE: TOTALS MAY NOT ADD EXACTLY DUE TO ROUNDING

Maui Electric Company, Limited

TEST YEAR 2007 FUEL OIL PRICES

Direct Testimony

Line		Delivered-to-plant Weighted Fuel Price ($/BBL)
	Maui Division	
1	Kahului (IFO)	59.6359
2	Maalaea (Diesel)	104.8621
3	Maalaea (Biodiesel)	109.2000
4	Hana (Diesel)	115.8105
	Lanai Division	
5	Miki Basin (Diesel)	114.8311
	Molokai Division	
6	Paalau (Diesel)	107.3613

Reference:
MECO-WP-402, page 1

NOTE: TOTALS MAY NOT ADD EXACTLY DUE TO ROUNDING

Maui Electric Company, Limited

TEST YEAR 2007 NET GENERATION
Direct Testimony

(Maui Division)

Line		(A) Energy (MWh)	(B) Percent of Net System Input
1	Test Year Sales	1,212,929	
2	+ No Charge (@ 1662 MWh)	1,662	
3	Sales + No Charge	1,214,591	
4	+ Losses (@ 5.95%)	76,840	
5	Net-To-System Input	1,291,431	100.00%
6	- Purchase Power	214,173	16.58%
7	Net MECO	1,077,258	83.42%

Reference:
Line 1: MECO-201, page 2
Line 2: MECO-WP-403, page 1
Line 4: MECO-WP-403, page 3
Line 6: MECO-WP-404, pages 99-101

NOTE: TOTALS MAY NOT ADD EXACTLY DUE TO ROUNDING

Maui Electric Company, Limited

TEST YEAR 2007 FUEL OIL EXPENSE SUMMARY
Direct Testimony

Line	Division	(A) Fuel Consumption (BBLs)	(B) Fuel Prices ($/BBL)	(C) = (A) x (B) Fuel Expense ($000)
	Maui			
1	Kahului (IFO)	499,157	59.6359	29,767.7
2	Maalaea (Diesel)	1,301,713	104.8621	136,500.3
3	Maalaea (Biodiesel)	2,193	109.2000	239.5
4	Hana	154	115.8105	17.8
5	Total Maui	1,803,217		166,525.3
6	**Lanai**	53,754	114.8311	6,172.6
7	**Molokai**	67,503	107.3613	7,247.2
8	**TOTAL MECO**	1,924,473		179,945.0

Reference:
Lines 1-4: MECO-WP-404, page 4
Line 6: MECO-WP-404, page 94
Line 7: MECO-WP-404, page 97

NOTE: TOTALS MAY NOT ADD EXACTLY DUE TO ROUNDING

Maui Electric Company, Limited

TEST YEAR 2007 FUEL RELATED EXPENSES
($000)
Direct Testimony

Line		Dollars ($000)
	Maui Division	
1	Ignition Start Up and Fuel Handling Expenses	26.1
2	Fuel Additives Expenses	155.7
3	Petroleum Inspection Expenses	134.3
4	Ocean Cargo Insurance	195.4
5	Total Maui Division	511.4
	Lanai Division	
6	Petroleum Inspection Expenses	2.7
	Molokai Division	
7	Petroleum Inspection Expenses	5.5
8	Total	519.6

Reference:
Line 1: MECO-WP-405, page 1
Line 2: MECO-WP-405, page 2
Line 3: MECO-WP-405, page 2
Line 4: MECO-WP-405, page 3
Line 6: MECO-WP-405, page 5
Line 7: MECO-WP-405, page 6

NOTE: TOTALS MAY NOT ADD EXACTLY DUE TO ROUNDING

Maui Electric Company, Limited

TEST YEAR 2007 FUEL EFFICIENCY
Direct Testimony

Line			Maui	Lanai	Molokai
1	Cental Station Generated Energy	(Net GWH)	1,077.3	31.4	40.2
2	IFO Generated Energy	(Net GWH)	218.7		
3	Diesel Generated Energy	(Net GWH)	858.6	31.4	40.2
4	Test Year Sales	(GWH)	1,212.9	29.8	36.5
5	Total Central Station Fuel Consumed	(000 BBLs)	1,801	53.8	67.5
6		(000 MBTUs)	10,774	315.0	395.6
7	IFO Fuel Consumed	(000 BBLs)	499		
8		(000 MBTUs)	3,145		
9	Diesel Fuel Consumed	(000 BBLs)	1,302	53.8	67.5
10		(000 MBTUs)	7,629	315.0	395.6
11	Total Central Station Net Heat Rate	(BTU / Net KWH)	10,001	10,034	9,840
12		(Net KWH / BBL)	598	584	596
13	IFO Net Heat Rate	(BTU / Net KWH)	14,380		
14		(Net KWH / BBL)	438		
15	Maalaea Diesel Net Heat Rate	(BTU / Net KWH)	8,885		
16		(Net KWH / BBL)	660		
17	Hana Diesel Net Heat Rate	(BTU / Net KWH)	11,275		
18		(Net KWH / BBL)	519		
19	IFO Sales Heat Rate	(MBTU / KWH Sales)	0.015310		
20	Diesel Sales Heat Rate	(MBTU / KWH Sales)	0.009460	0.010577	0.010823
21	Diesel Sales Heat Rate (Hana)	(MBTU / KWH Sales)	0.012005		

Reference
Lines 1 - 16: Maui Division, MECO-WP-404, page 2
Lines 1 - 10: Lanai Division, MECO-WP-404, page 93
Lines 1 - 10: Molokai Division, MECO-WP-404, page 96
Lines 11, 20 Lanai Division, MECO-WP-406, page 4
Lines 11, 20 Molokai Division, MECO-WP-406, page 5
Line 13: Maui Division, MECO-WP-406, page 1
Line 15: Maui Division, MECO-WP-406, page 2

NOTE: TOTALS MAY NOT ADD EXACTLY DUE TO ROUNDING

Maui Electric Company, Limited

HISTORICAL FUEL EFFICIENCY
Direct Testimony
(Maui Division)

Line		(A) 2001	(B) 2002	(C) 2003	(D) 2004	(E) 2005	(F) Test Year 2007	(G) TY vs. 2005 Diff	(H) TY vs. 2005 %
Maui Division									
1	Maui Net Heat Rate (BTU / KWH)	10,578	10,404	10,434	10,441	10,516	10,001	-515	-4.9
2	IFO Net Heat Rate (BTU / KWH)	14,398	14,059	14,440	14,539	14,598	14,380	-218	-1.5
3	Diesel Net Heat Rate (BTU / KWH)	9,594	9,379	9,441	9,450	9,544	8,885	-659	-6.9
Lanai Division									
4	Diesel Net Heat Rate (BTU / KWH)	10,085	9,897	9,874	10,025	10,288	10,034	-254	-2.5
Molokai Division									
5	Diesel Net Heat Rate (BTU / KWH)	9,737	9,684	9,803	10,004	9,974	9,840	-134	-1.3

Reference:
Columns A - E: Maui Division, MECO-WP-407, page 1
Columns A - E: Lanai Division, MECO-WP-407, page 2
Columns A - E: Molokai Division, MECO-WP-407, page 2
Column F: MECO-406
Column G: Column F - Column E
Column H: Column G ÷ Column E

NOTE: TOTALS MAY NOT ADD EXACTLY DUE TO ROUNDING

Maui Electric Company, Limited

DERIVATION OF FUEL INVENTORY
TEST YEAR 2007
Direct Testimony

Line		(A) Fuel Inventory (BBLs)		(B) Fuel Inventory ($)
	Maui			
1	Industrial Fuel Oil Inventory	53,248	$	3,175,519
2	Diesel Fuel Inventory			
	Maalaea	109,097	$	11,440,113
	Hana	114	$	13,202
3	Total Maui	162,459	$	14,628,834
4	**Lanai**	4,789	$	549,917
5	**Molokai**	5,890	$	632,339
6	**TOTAL MECO**	173,138	$	15,811,090

Reference:
Line 1: MECO-408, page 2
Line 2: MECO-408, page 3-4
Line 4: MECO-408, page 5
Line 5: MECO-408, page 6

NOTE: TOTALS MAY NOT ADD EXACTLY DUE TO ROUNDING

Maui Electric Company, Limited

DERIVATION OF INDUSTRIAL FUEL OIL INVENTORY
TEST YEAR 2007
Direct Testimony

(Maui Division)

Line			Test Year 2007	
1	Test Year Industrial Fuel Burn Rate		1,368	BBL / Day
2	37 Day Inventory (Line 1 x 37 Days)		50,599	BBLs
3	+ Dead Storage		2,649	BBLs
4	Total Industrial Fuel Oil BBL Inventory (Line 2 + Line 3)		53,248	BBLs
5	Fuel Price	$	59.6359	/ BBL
6	Industrial Fuel Oil Inventory (Line 4 x Line 5)	$	3,175,519	

Reference:
Line 1: MECO-WP-408, page 5
Line 2: MECO-409, page 1
Line 3: MECO-WP-408, page 1
Line 5: MECO-402, page 1

NOTE: TOTALS MAY NOT ADD EXACTLY DUE TO ROUNDING

Maui Electric Company, Limited

DERIVATION OF DIESEL FUEL INVENTORY
TEST YEAR 2007
Direct Testimony

(Maui Division)

Line		Test Year 2007	
1	Test Year Diesel Burn Rate	3,567	BBL / Day
2	30 Day Inventory (Line 1 x 30 Days)	107,003	BBLs
3	+ Dead Storage	2,094	BBLs
4	Total Diesel Fuel BBL Inventory (Line 2 + Line 3)	109,097	BBLs
5	Fuel Price	$ 104.8621	/ BBL
6	Diesel Fuel Inventory (Line 4 x Line 5)	$ 11,440,113	

Reference:
Line 1: MECO-WP-408, page 5
Line 3: MECO-WP-408, page 1
Line 5: MECO-WP-402, page 1

NOTE: TOTALS MAY NOT ADD EXACTLY DUE TO ROUNDING

Maui Electric Company, Limited

DERIVATION OF DIESEL FUEL INVENTORY - HANA
TEST YEAR 2007
Direct Testimony

(Maui Division)

Line		Test Year 2007	
1	5-year End Of Month Average Inventory	114	BBLs
2	Fuel Price	115.8105	/ BBL
3	Diesel Fuel Inventory (Line 1 x Line 2)	$ 13,202	

Reference:
Line 1: MECO-WP-408, page 8
Line 2: MECO-WP-402, page 1

NOTE: TOTALS MAY NOT ADD EXACTLY DUE TO ROUNDING

Maui Electric Company, Limited

DERIVATION OF DIESEL FUEL INVENTORY
TEST YEAR 2007
Direct Testimony

(Lanai Division)

Line		Test Year 2007	
1	Test Year Diesel Burn Rate	147	BBL / Day
2	30 Day Inventory (Line 1 x 30 Days)	4,418	BBLs
3	+ Dead Storage	371	BBLs
4	Total Diesel Fuel BBL Inventory (Line 2 + Line 3)	4,789	BBLs
5	Fuel Price	$ 114.8311	/ BBL
6	Diesel Fuel Inventory (Line 4 x Line 5)	$ 549,917	

Reference:
Line 1: MECO-WP-408, page 9
Line 3: MECO-WP-408, page 2
Line 5: MECO-402, page 1

NOTE: TOTALS MAY NOT ADD EXACTLY DUE TO ROUNDING

Maui Electric Company, Limited

DERIVATION OF DIESEL FUEL INVENTORY
TEST YEAR 2007
Direct Testimony

(Molokai Division)

Line		Test Year 2007	
1	Test Year Diesel Burn Rate	185	BBL / Day
2	30 Day Inventory (Line 1 x 30 Days)	5,548	BBLs
3	+ Dead Storage	342	BBLs
4	Total Diesel Fuel BBL Inventory (Line 2 + Line 3)	5,890	BBLs
5	Fuel Price	$ 107.3613	/ BBL
6	Diesel Fuel Inventory (Line 4 x Line 5)	$ 632,339	

Reference:
Line 1: MECO-WP-408, page 10
Line 3: MECO-WP-408, page 3
Line 5: MECO-402, page 1

NOTE: TOTALS MAY NOT ADD EXACTLY DUE TO ROUNDING

Maui Electric Company, Limited

HISTORICAL AVERAGE FUEL INVENTORY
(Barrels)
Direct Testimony

(Maui Division)

Line		(A) 2001	(B) 2002	(C) 2003	(D) 2004	(E) 2005	(F) Test Year 2007	(G) TY vs. 2005 Diff	(H) TY vs. 2005 %
	Industrial Fuel Oil								
1	Avg Inventory	53,508	54,231	50,819	52,341	54,008	53,248	-760	-1.4
2	Avg Daily Burn Rate	1,390	1,445	1,414	1,433	1,423	1,368		
3	Avg No. of Days of Supply	38	38	36	37	38	37		
	Diesel Fuel [1]								
4	Avg Inventory	112,988	112,137	111,093	113,233	119,835	107,117	-12,719	-10.6
5	Avg Daily Burn Rate	3,863	3,697	4,008	4,143	4,199	3,567		
6	Avg No. of Days	29	30	28	27	29	30		

Reference:
Line 1: Average of recorded month-ending inventories
Line 2: Average of recorded annual consumption divided by 365 days
Line 3: Line 1 ÷ Line 2
Line 4: Average of recorded month-ending inventories
Line 5: Average of recorded annual consumption divided by 365 days
Line 6: Line 4 ÷ Line 6
Column G: Column F - Column E
Column H: Column G ÷ Column E

Note:
1. Diesel fuel averages include Hana diesel inventory starting from 2003

NOTE: TOTALS MAY NOT ADD EXACTLY DUE TO ROUNDING

Maui Electric Company, Limited

HISTORICAL AVERAGE FUEL INVENTORY
(Barrels)
Direct Testimony

(Lanai Division)

Line		(A) 2001	(B) 2002	(C) 2003	(D) 2004	(E) 2005	(F) Test Year 2007	(G) TY vs. 2005 Diff	(H) TY vs. 2005 %
	Diesel Fuel								
1	Avg Inventory	5,089	5,038	3,213	4,241	3,070	4,418	1,348	43.9
2	Avg Daily Burn Rate	134	132	137	137	141	147		
3	Avg No. of Days	38	38	24	31	22	30		

Reference:
Line 1: Average of recorded month-ending inventories
Line 2: Average of recorded annual consumption divided by 365 days
Line 3: Line 1 ÷ Line 2
Column G: Column F - Column E
Column H: Column G ÷ Column E

NOTE: TOTALS MAY NOT ADD EXACTLY DUE TO ROUNDING

Maui Electric Company, Limited

HISTORICAL AVERAGE FUEL INVENTORY
(Barrels)
Direct Testimony

(Molokai Division)

Line		(A) 2001	(B) 2002	(C) 2003	(D) 2004	(E) 2005	(F) Test Year 2007	(G) TY vs. 2005 Diff	(H) TY vs. 2005 %
	Diesel Fuel								
1	Avg Inventory	8,835	8,167	7,473	8,255	7,643	5,548	-2,095	-27.4
2	Avg Daily Burn Rate	178	174	182	182	184	185		
3	Avg No. of Days	50	47	41	45	42	30		

Reference:
Line 1: Average of recorded month-ending inventories
Line 2: Average of recorded annual consumption divided by 365 days
Line 3: Line 1 ÷ Line 2
Column G: Column F - Column E
Column H: Column G ÷ Column E

NOTE: TOTALS MAY NOT ADD EXACTLY DUE TO ROUNDING

MECO T-5
DOCKET NO. 2006-0387

TESTIMONY OF
MICHAEL P. RIBAO

MANAGER
POWER SUPPLY DEPARTMENT
MAUI ELECTRIC COMPANY, LIMITED

Subjects:

Generation System,
Production Operation & Maintenance Expense,
Purchased Power Expense,
Production Materials Inventory, and
Power Supply Department Staffing

INTRODUCTION

Q. Please state your name and business address.

A. My name is Michael P. Ribao. My business address is 200 Hobron Avenue, Kahului, Maui, Hawaii.

Q. By whom are you employed and in what capacity?

A. I am employed by Maui Electric Company, Limited ("MECO") as the Manager of the Power Supply Department. My educational background and work experience are listed in MECO-500.

Q. What are your areas of responsibility in this proceeding?

A. My testimony will address MECO's operation and maintenance ("O&M") expense for the production block of accounts, covering the following areas for each of MECO's three island divisions:

1) description of MECO's Generation System,
2) production O&M expense (other than fuel),
3) purchased power expense,
4) production materials inventory, and
5) Power Supply Department staffing.

Q. What are the test year estimates for production O&M expense, purchased power expense and production materials inventory?

A. MECO's normalized 2007 test year estimate for production O&M expense (other than fuel and purchased power expense) is $21,014,800; broken down as follows:

Maui Division	$18,741,800
Lanai Division	$1,094,400
Molokai Division	$1,178,600
TOTAL	$21,014,800

(See MECO-502).

Q. What are the test year estimates for purchased power?

A. The 2007 test year expense estimate for purchased power for the Maui Division is $33,981,663 (See MECO-507). There is no purchased power expense for the Lanai and Molokai Divisions.

Q. What is the test year estimate for production materials inventory?

A. The 2007 MECO consolidated test year estimate of the average production materials inventory is $8,494,879; broken down as follows:

Maui Division	$8,325,740
Lanai Division	$126,509
Molokai Division	$42,630
TOTAL	$8,494,879

(See MECO-508).

GENERATION SYSTEM

Q. Are you familiar with MECO's generating units and associated production facilities?

A. Yes. As the Manager of Power Supply, I am involved in all aspects of the generating units and production facilities, used to provide electric utility service for customers on Maui, Lanai, and Molokai.

Maui Division

Q. What is included in the Maui Division's generation system for test year 2007?

A. MECO's Maui Division currently operates 25 generating units at two power plants: the Maalaea Power Plant and the Kahului Power Plant, as shown in MECO-501.

The Maalaea Power Plant has 15 diesel engine generators and two dual-train combined cycle units (each consisting of two combustion turbines ("CTs") and a heat recovery steam turbine) providing a total reserve capability of 212.1 MW.

The Kahului Power Plant has four steam units with a total reserve capability of 37.60 MW.

MECO's Hana Substation 41 has two 1.0 MW generating units (discussed further later in this section).

Additionally, MECO purchases up to 16.0 MW of firm capacity from Hawaiian Commercial & Sugar Company ("HC&S"). The Maui Division's total firm capacity is 267.7 MW (see MECO-501, page 1).

Q. What changes have been made to the Maui Division's generating capacity since MECO's last rate case (1999 test year)?

A. Since 1999, MECO has completed the installation of Dual-Train Combined Cycle Unit Number Two ("DTCC #2") at the Maalaea Power Plant. M17, a 20 MW (nominal) simple cycle combustion turbine, the first phase of a three phase project, went into commercial operation in December 1998. M19, the second 20 MW (nominal) simple cycle combustion turbine (phase two) went into commercial operation in September 2000. The M18 project (phase three) consisted of two heat recovery steam generators and one 18 MW (nominal) steam turbine (called Maalaea 18 or "M18") and went into commercial operation in October 2006.

Q. What operational impacts did the completion of the M18 project have on the system?

A. Prior to the completion of M18, units M17 and M19 were limited to simple cycle operation and were used primarily in peaking and cycling mode. With M18 in

service, the dual train operates in combined cycle, with half of the dual train run in baseload mode and the other half run in cycling mode.

Q. Why were M17 and M19 switched from peaking/cycling operation to base loaded/cycling with the addition of M18?

A. M18 produces power from the heat generated by the exhaust gases from M17 and M19 and burns no additional fuel. The efficiency of units M17 and M19 operating in combined cycle (with M18) is significantly better than in simple cycle (without M18). For this reason it now makes sense to base load a portion of these units.

Q. What other changes were made to the Maui Division's generating system?

A. In April 2001, MECO installed two 1.0 MW diesel generating units (HN1 and HN2) at our Hana Substation 41. These units were relocated from MECO's Lanai City Plant after closure of the plant in 2000.

Q. Why did MECO relocate HN1 and HN2 to Hana?

A. Prior to relocating the units, the Hana community was served by a single radial transmission line that crossed miles of difficult terrain. Time to repair the hard-to-access line faults was excessive and resulted in sustained outages in the area. HN1 and HN2 units were installed as standby backup for these transmission line outages and scheduled maintenance.

Q. Are the Hana units HN1 and HN2 included in the Maui Division's reserve capability?

A. Yes. In 2007, MECO plans to complete a communication and controls project which will allow the Hana units to be operated as true Distributed Generation units, so they are included as MECO owned generating capacity for the test year.

Q. Are there any other events that affect the Maui Division's capability in the test year?

A. Yes. M13, a 12.5 MW (nominal) diesel engine located at Maalaea Power Plant, experienced a major forced outage on December 9, 2005. The unit suffered extensive damage to the engine crankshaft, frame and cylinder blocks. Experts from the manufacturer, Mitsubishi Heavy Industries, Ltd., assessed the damage and indicated that repairs would take approximately 18 months. Replacement parts are currently being manufactured. The unit is presently out of commission and is expected to be back in service in mid-2007, at the same 12.5 MW normal top-load rating as prior to the repair.

Q. How is M13 treated in the 2007 test year?

A. Production O&M includes M13 on an annualized basis in the test year 2007.

Q. What was the commitment and dispatch order of the Maui Division generating units in the 2005 calendar year?

A. The commitment order of the generating units in the 2005 calendar year varied from day to day depended on several factors, including but not limited to temporary problems (planned and unplanned maintenance, derations, abnormalities, etc.) with the units and associated ancillary equipment. The desire to equalize operating hours on the generating units to maximize maintenance cycle efficiency also played a role. Operating parameter information and Maalaea MW status charts were used to dispatch units by direct operator and Automatic Generation Control (AGC). Kahului Units 1 to 4, Maalaea Units 1 to 3, Maalaea Units X1 and X2, and Maalaea Units 14, 15 and 16 (in combined cycle mode) were dispatched by direct operator control and Maalaea Units 4 to 7, Maalaea Units 10 to 13, and Maalaea Units 14 and 16 and Maalaea 17 and 19 (when in simple cycle mode) were dispatched primarily by the AGC in 2005.

Q. Why is the 2005 calendar year commitment and dispatch order significant to the 2007 test year?

A. The 2005 calendar year is the most recent historical data available at the time the production simulation model was run by Generation Planning, and therefore was used as a "calibration year". Please refer to Mr. Sakuda's T-4 testimony for a detailed explanation of "calibration year" and its use in the production simulation model.

Q. Does the Maui Division buy energy from any 'as-available' purchase power producers?

A. Yes. The Maui Division has two 'as-available' purchase power agreements; one with Kaheawa Wind Power, LLC ("KWP") and one with Makila Hydro LLC ("Makila").

Q. Please describe the KWP wind farm.

A. KWP consists of twenty General Electric 1.5 MW wind turbines with a total generating capacity of 30 MWs of as-available energy and began delivering energy to MECO on June 9, 2006.

Q. Please describe the Makila hydro electric plant.

A. The Makila hydro electric plant consists of one Allis-Chalmers 500 KW hydro-electric generator formerly owned and operated by Pioneer Mill Company, and began delivering energy to MECO on September 22, 2006.

Q. How has the addition of these two 'as-available' purchase power producers affected the operation and maintenance of MECO's generating units in the Maui Division?

A. KWP and Makila are both 'as-available' power producers, which means they provide unscheduled power to the grid when and if they are able.

From a maintenance standpoint, MECO can not depend or rely on this power when planning outages, shutdowns, or overhauls.

Similarly, from an operations standpoint, MECO can not count on power from either of these producers to meet the island's power demands. MECO must however, make every reasonable effort (within good engineering/operating practices) to accommodate and accept all the power that KWP and Makila are able to supply to the grid.

Q. Given that KWP can provide up to 30 MW of power to the grid, what provisions must MECO make to accommodate this level of intermittent power?

A. Because wind power is both unscheduled and variable, MECO's generating system must be prepared to meet the entire system demand at all times. In addition, to maintain system frequency stability, MECO must continuously increase and decrease its generation output to counter KWP's energy level fluctuations caused by changes in wind speed and direction.

Q. How does MECO counter the variations in output from the wind farm?

A. To minimize system instability risks and load shedding events, MECO's generating units must 1) be operated with sufficient "regulating reserve" and 2) be diligently maintained such that the electronic and mechanical generation governor control systems are able to accurately regulate the units output to counter the wind farm's fluctuation.

Q. What is "regulating reserve"?

A. Regulating reserve refers to unloaded generation which is synchronized and ready to serve additional demand. Sufficient regulating reserve allows for immediate increase in output to compensate for the largest anticipated down swings in the wind farm's variable output, as well as loss of generation at HC&S and in MECO's own units. Because the wind farm's output also increases unpredictably, MECO's units must be operated at loads that can be decreased immediately without incident.

Q. How much additional regulating reserve has MECO incorporated as a result of KWP coming on line?

A. Prior to KWP coming on line MECO's average regulating reserve was approximately 4 to 6 MW. With KWP on line, MECO attempts to maintain regulating reserve of approximately 7 MW plus an amount equal to half of what the wind farm is providing to the system.

Q. How was regulating reserve modeled in the production simulation program discussed by Mr. Ross Sakuda in MECO T-4?

A. As Mr. Sakuda testifies, the production simulation program used a constant value of 15 MW for regulating reserve.

Q. How was this level of regulating reserve arrived at?

A. KWP's average monthly capacity factor estimate is 46.7% which equates to an average output of 14 MW (30 x 0.467). Given the variability factor of the wind, MECO decided to use 8 MW as an average level of regulating reserve required to cover KWP. 8 MW plus the 7 MW of base regulating reserve results in 15 MW of total regulating reserve.

Q. What effect does operating with additional regulating reserve have on MECO's generating units?

A. Operating with additional regulating reserve typically results in 1) an overall increase in engine running hours (because more units are operating) and 2) less efficient heat rates (because generating units are necessarily operated at loads outside of their most efficient range).

Q. What effect does the additional output adjustments (caused by the wind farm) have on MECO's generating units?

A. The frequency controls on MECO's units will cause the units to ramp up or down to counter the wind farm's variable output. In addition to the wear and tear on

the mechanical control devices to make these adjustments, the units also lose efficiency similar to an automobile constantly varying its speed.

Q. Does MECO continue to purchase power from Pioneer Mill Company, Limited?

A. No. Pioneer Mill Company closed its business in 2000 and consequently, their Power Exchange and Standby Agreement was terminated.

Lanai Division

Q. What is included in the Lanai Division's generation system for test year 2007?

A. The Lanai Division consists of one power plant at Miki Basin. The Miki Basin Power Plant has eight diesel generating units with a total firm capacity of 9,400 KW (see MECO-501, page 2).

Q. What changes have been made to the Lanai Division's generating capacity since MECO's last rate case (1999 test year)?

A. The only change to MECO's generating assets on Lanai since 1999 was the relocation of former units L7 and L8 to MECO's Substation 41 in Hana Maui and the closure of the Lanai City Power Plant.

Q. Does the Lanai Division purchase energy from any purchased power producers?

A. No.

Molokai Division

Q. What is included in the Molokai Division's generation system for test year 2007?

A. The Molokai Division consists of one power plant at Palaau. The Palaau Power Plant has nine diesel units and one combustion turbine. Its total firm capacity is 12,010 KW (See MECO-501, page 3).

Q. What changes have been made to the Molokai Division's generating capacity since MECO's last rate case (1999 test year)?

A. In January 2003 the output ratings of Palaau Unit 1 and Unit 2 were each reduced from 1,290 KW to 1,250 KW. Also, at the same time, the firm capacity credit from the peaking units (1,2,3,4,5,6) was increased from 2,260 KW to 3,190 KW.

Q. Does the Molokai Division purchase energy from any purchased power producers?

A. No.

PRODUCTION O&M EXPENSE

Q. What is MECO's test year 2007 production O&M expense estimate (excluding fuel and purchased power)?

A. MECO's normalized test year 2007 estimate for production O&M expense is $21,014,800. Of this total, $9,674,200 is for production operation expense and $11,340,700 is for production maintenance expense.

The Maui Division 2007 normalized test year O&M expense estimate is $18,741,800; $8,314,500 for production operation expense and $10,427,300 for production maintenance expense.

The Lanai Division 2007 normalized test year O&M expense estimate is $1,094,400; $664,500 for production operation expense and $429,900 for production maintenance expense.

The Molokai Division 2007 normalized test year O&M expense estimate is $1,178,600; $695,100 for production operation expense and $483,500 for production maintenance expense. Please refer to MECO-502.

Q. What is included in production O&M expense?

A. Production O&M expense includes the costs incurred to operate and maintain MECO's generation system and associated support facilities for the Maui, Lanai and Molokai Divisions. The normalized test year O&M expense estimate was developed directly from MECO's 2007 Operating Budget.

Q. What does the 2007 Operating Budget represent?

A. The 2007 Operating Budget represents the funds required to operate and maintain MECO's production facilities in the 2007 calendar year (See MECO-WP-502).

Q. How is the 2007 Operating Budget used to determine MECO's normalized test year production O&M expense estimate?

A. The Operating Budget is adjusted to develop the normalized test year estimate, which reflects a "normal" or average year's expenses for the period which the rates approved in this proceeding will be in effect. More detailed discussion of how the production O&M test year expense estimate was developed follows later in this testimony for each of the three divisions in MECO's service area.

Q. What types of adjustments were made to the 2007 Operating Budget to derive the 2007 test year estimate for production O&M expense?

A. Two types of adjustments were made:

1) budget adjustments, and

2) normalization adjustments.

Q. What are budget adjustments?

A. Budget adjustments are made primarily to 1) correct errors, 2) update the budget for better estimates, and 3) reclassify certain costs from one account to another account.

Q. What are normalization adjustments?

A. Normalization adjustments are intended to make the test year estimates reflect results of operations more representative of a normal, on-going level of operations, or of the operating conditions that are expected to be in effect during the period that the rates set in this docket are expected to be in effect.

All references to the test year estimate (within this testimony and related exhibits) are a normalized test year estimate.

Q. How is this section of testimony organized?

A. The remaining testimony in this section is organized as follows:

1) production operations expense
   a. 2007 test year estimate
   b. 2007 Operating Budget
   c. budget adjustments
   d. normalization adjustments
   e. changes since recorded 2005
   f. variances (2005 vs. 2007)
2) production maintenance expense
   a. 2007 test year estimate
   b. 2007 Operating Budget
   c. budget adjustments
   d. normalization adjustments
      i) Maui Division
      ii) Lanai Division
      iii) Molokai Division
   e. changes since recorded 2005
   f. variances (2005 vs. 2007)

<u>1)a. Production Operations Expense: 2007 Test Year Estimate</u>

Q. What is the 2007 test year estimate for production operations expense?

A. The 2007 test year estimate for production operations expense is $9,674,200; $5,423,500 for labor expense and $4,250,600 for non-labor expense (see MECO-503, page 1).

Q. What is the Maui Division's 2007 test year estimate for production operation expense?

A. The Maui Division production operation expense for test year 2007 is $8,314,500; $4,582,600 for labor and $3,732,000 for non-labor expenses (see MECO-503, page 1).

Q. What is the Lanai Division's 2007 test year estimate for production operation expense?

A. The Lanai Division production operation expense estimate for test year 2007 is $664,500; $415,500 for labor and $249,000 for non-labor expense (see MECO-503, page 1).

Q. What is the Molokai Division's 2007 test year estimate for production operation expense?

A. The Molokai Division production operation test year 2007 expense estimate is $695,100; $425,500 for labor and $269,700 for non-labor expenses (see MECO-503, page 1).

Q. What costs are included in the $9,674,200 total MECO 2007 test year estimate for production operation expense?

A. The test year estimate for production operation expense includes all labor and non-labor costs required to operate MECO's steam, diesel, combustion turbine, and combined cycle generators for the Maui, Lanai, and Molokai Divisions, excluding fuel and purchased power expense. Test year fuel expense is addressed by Mr. Sakuda in MECO T-4. Purchased Power Expense is discussed later in my testimony.

1)b. Production Operations Expense: 2007 Operating Budget

Q. How was the 2007 Operating Budget for production operation labor expense prepared?

A. The 2007 Operating Budget is the forecast for operating expenses that will be incurred in 2007. The labor portion of this forecast is based upon our estimate of

work requirements. Specifically, the staffing required to operate and supervise MECO's generating facilities.

Q. Did MECO include operations labor expense related to M18 in the 2007 test year?

A. MECO anticipates operating M18 with its current staffing level, but the 2007 budget does allocate approximately $85,000 of direct labor expense for the operation of M18 (see MECO-WP-502, lines 505 and 666).

Q. What is included in production operations non-labor expense?

A. This cost category contains all consumable materials, services, and fees to operate MECO's power plants including lube oil, boiler water chemicals, demineralized water treatment, specialty lubricants, greases, gases, instrumentation supplies, water, office supplies, technical training, transportation, utility services, housekeeping services, and security. Environmental expenses are also in this category and include costs for emission fees, wastewater treatment, waste disposal, solvent recycling, emission source testing, continuous emissions monitoring systems, underground injection wells, and the services provided and administered by Hawaiian Electric Company ("HECO") in the environmental area.

Q. How was the 2007 Operating Budget for production operation non-labor expense prepared?

A. Historical costs were reviewed for reasonableness and adjusted as required to meet specific needs expected in 2007.

Q. What additional operations non-labor expenses are included for M18 in the 2007 Operating Budget?

A. The major operations non-labor expense increase brought about by the addition of M18 is a result of the additional running hours on combustion turbine units

M17 and M19 (because these units were cycling/peaking units prior to M18 and are now partially base loaded with M18). Combustion turbine Nox water is consumed proportionally to fuel, so this cost will increase with the commercial operation of M18. Source testing costs will increase because units M17 and M19 will now have to be tested in combined cycle (as well as simple cycle). The cost for M18 lube oil is also a new operations expense. Other items that will result in increased costs as a result of unit M18 coming on line include boiler water chemicals, oil filters, building roll filters, additional relay calibrations, crane inspection, and fire system testing.

1)c. Production Operations Expense: Budget Adjustments

Q. What adjustments were made to the 2007 Operating Budget for production operating expense?

A. Five budget adjustments were made to the 2007 Operating Budget; four for the Maui Division, and one for the Molokai Division.

Q. What four budget adjustments were made for the Maui Division?

A. For the Maui Division, budget adjustments were made for 1) Kahului Power Plant fuel additive (-$137.4K), 2) Maalaea Power Plant biodiesel (-$238.3K), 3) Maalaea Power Plant lube oil (+$7.2K), and 4)Maalaea Power Plant Nox water (+$21.3K). Please refer to MECO-504, page 1.

Q. Why was a -$137.4K budget adjustment made for fuel additive at the Kahului Power Plant?

A. The 2007 fuel additive expense estimate of $137.4K for Kahului Power Plant was reclassified from NARUC 500 (Production Operations) to NARUC 501 (Fuel Expense), which required a budget adjustment (see MECO-WP-504-a).

Q. Why was a -$238.3K budget adjustment made for biodiesel at the Maalaea Power Plant?

A. The 2007 biodiesel expense estimate of $238.3K for Maalaea Power Plant was reclassified from NARUC 546 (Production Operations) to NARUC 547 (Fuel Expense), which required a budget adjustment (see MECO-WP-504-c).

Q. Why was a +$7.2K budget adjustment made for lube oil at the Maalaea Power Plant?

A. The lube oil cost for steam turbine generators M15 and M18 was inadvertently left out of the 2007 operating budget; therefore requiring a budget adjustment (see MECO-WP-504-b).

Q. Why was a +$21.3K budget adjustment made for Nox water at the Maalaea Power Plant?

A. Nox water is used by combustion turbine units M14, M16, M17, and M19 at Maalaea Power Plant for Nox emission controls as required by our air permit. The amount of Nox water required is directly proportional to the amount of fuel burned. The 2007 operating budget for Nox water expense was inadvertently based upon unit M17 and M19 operating in cycling/peaking mode. With the addition of M18 in late 2006, half the dual train will run in baseload mode and the other half will run in cycling mode in the 2007 test year, which will require additional Nox water (see MECO-WP-504-d).

Q. What budget adjustment was made for the Molokai Division and why was this adjustment made?

A. A +$13.4K budget adjustment was made for lube oil expense for the Molokai Division. This budget adjustment was required because an incorrect lube oil price was used for the 2007 Operating Budget (see MECO-WP-504-e).

1)d. Production Operations Expense: Normalization Adjustments

Q. Did MECO make any normalization adjustments to the 2007 Operating Budget for production operations expense?

A. No normalization adjustments were made to arrive at the test year estimate for production operations expense (see MECO-504, page 1).

1)e. Production Operations Expense: Changes Since Recorded 2005

Q. How has MECO's production operation labor expense changed since 2005?

A. The 2007 test year operations labor estimate of $5,423,500 is close to the amount of the recorded 2005 cost of $5,394,300 (see MECO-506, page 2).

Q. What changes will MECO see in the 2007 production operations labor expense from 2005?

A. In addition to the wage increase in 2007 (discussed by Mr. Matsunaga in T-9), MECO will employ one additional person in responsibility area MGA (Renewable Energy Engineer) and MGL (Operator Helper), but will staff two less employees in MGK (See MECO-1102, page 1, included in Ms. Eileen Wachi's T-11 testimony). The wage increase is offset by less production operations labor hours budgeted for 2007 (vs. 2005 recorded), resulting in only a small increase in production operations labor expense.

Q. How does the 2007 test year estimate for production operations non-labor expense of $4,250,700 compare with the 2005 recorded amount and 2007 operating budget?

A. The test year estimate is approximately equal to the $4,259,200 recorded 2005 expense and the 2007 operating budget of $4,584,500 (see MECO-506, page 2).

Q. Why hasn't the production operations non-labor expense increased between recorded 2005 and forecasted 2007?

A. Costs for individual goods and services will be higher in 2007 but the costs associated with several operations non-labor items will decrease in 2007 (vs. 2005) including the following:

1) Maalaea Power Plant diesel engines are anticipated to operate less hours and at lower loads, which will decrease lube oil costs by approximately $205K (see MECO-WP-510, page 4, line 10).

2) Maui Division will likely incur lower emission fees.

3) Maalaea Power Plant will likely incur lower oil-related hazardous material related costs ($97K) (see MECO-WP-510, page 4, line 9).

Other production operations non-labor changes are identified in MECO-510, page 1.

Q. Why does MECO expect to see a substantial decrease in lube oil expense between 2005 recorded and forecasted 2007?

A. MECO expects to see a decrease in lube oil expense of approximately $205,000 in 2007 based on a decrease in operating hours and unit output for the Maalaea Power Plant diesel engines.

Q. Why will the Maalaea Power Plant diesels operate less hours starting in 2007?

A. Two factors contribute to less diesel operating hours at Maalaea Power Plant in 2007; the addition of the Kaheawa wind farm in June 2006 and the addition of unit M18 in October 2006.

Q. How did MECO estimate the 2007 test year lube oil expense?

A. MECO looked at historical lube oil usage and estimated engine running hours for the period that the rates in this case will be in effect. The effect that the wind farm will have on MECO's system was estimated based on our experience to-date which indicates the need for additional regulating reserve margins to accommodate fluctuations in wind power onto the grid (explained earlier in my testimony). Refer to MECO-509, page 1 for additional detail.

Q. Why will the Maui Division likely incur lower emission fees in 2007 compared to 2005?

A. Emission fees are determined by the amount of fuel burned. With M18 and KWP on line in the test year the Maui Division generators will likely burn less fuel in 2007 compared to 2005, which will result in lower emission fees (see MECO-WP-510, lines 2, 6).

Q. Why will the Maalaea Power Plant likely incur lower oil-related hazardous material related costs in the 2007 test year, compared to 2005?

A. In 2005 MECO incurred oil-related hazardous material costs related to a fuel spill that occurred in 2002. The 2007 operating budget estimate was obtained by averaging actual costs from 1999-2005, excluding the fuel spill costs. In this way the 2007 test year estimate is lower than the 2005 recorded amount for this item (see MECO-WP-510, line 9).

1)f. Production Operations Expense: Variance Explanations

Q. Has MECO evaluated variances between recorded 2005 and its 2007 forecast in detail?

A. Yes, similar to the approach taken in its last rate case, MECO is providing variance information in direct testimony to help expedite the proceeding.

Q. What did MECO use as criteria for determining which activities qualified for variance explanations herein?

A. As described by Mr. Reinhardt in MECO T-1, MECO analyzed variances of +/- 10% and > $45,000. These line items are identified by NARUC Account and Ellipse codeblock in MECO-510, with detailed explanations in MECO-WP-510.

2)a. Production Maintenance Expense: Test Year Estimate

Q. What is the test year 2007 estimate for MECO's production maintenance expense?

A. The test year 2007 estimate for production maintenance expense is $11,340,700; $3,902,400 for labor expense and $7,438,300 for non-labor expense (see MECO-503, page 2).

Q. What is the Maui Division 2007 test year estimate of production maintenance expense?

A. The Maui Division 2007 test year production maintenance expense is $10,427,300; $3,621,200 for labor and $6,806,100 for non-labor expense (see MECO-503, page 2).

Q. What is the Lanai Division 2007 test year estimate of production maintenance expense?

A. The Lanai Division 2007 test year production maintenance expense is $429,900; $155,000 for labor and $274,900 for non-labor expense (see MECO-503, page 2).

Q. What is the Molokai Division 2007 test year estimate of production maintenance expense?

A. The Molokai Division 2007 test year production maintenance expense is $483,500; $126,200 for labor and $357,200 for non-labor expense (see MECO-503, page 2).

Q. What costs are included in the MECO total $11,340,700 test year 2007 estimate for production maintenance expense?

A. The test year 2007 estimate for production maintenance expense includes all costs required to maintain MECO's steam, diesel, combustion turbine, and combined cycle generators in the Maui, Lanai, and Molokai Divisions.

Q. How was the 2007 test year estimate of production maintenance expense determined?

A. The test year estimate was developed from the 2007 Operating Budget maintenance expense. Adjustments were made so that the test year estimate

reflects our on-going, normalized maintenance expenses, as shown on MECO-503, page 2.

2)b. Production Maintenance Expense: 2007 Operating Budget

Q. How was the 2007 production maintenance labor expense forecasted?

A. Production maintenance labor expense was determined by estimating the work requirements and the staffing necessary to perform this work.

Q. What is included in the production maintenance non-labor expense?

A. Maintenance non-labor expense includes parts and materials required to maintain generating units and related systems, structures, and facilities. It also includes outside services such as contractors and engineers. The largest portion of the production maintenance non-labor expense is the cost incurred to overhaul our generating units.

Q. How are non-labor expenses related to unit overhauls forecasted?

A. Costs for the unit overhauls are forecasted using the overhaul schedule for the year and estimating the cost of outside services, parts, and materials required for the scope of the outage. Cost estimates are based on past experience, recorded data, and budgetary quotes from vendors and service providers. In the case of non-routine repairs, judgment, experience, and consultation with outside resources are used to formulate reasonable estimates.

Q. For the Maui Division, were any production maintenance labor expenses related to the M18 addition included in the 2007 test year expenses?

A. Yes, approximately $12K is included in the 2007 operating budget as direct labor expense for the maintenance of M18 (see MECO-WP-502, lines 3692, 4233, 4261, 4418).

Q. Were any production maintenance non-labor expenses related to the M18 addition included in the 2007 test year estimate?

A. Yes, the additional running hours on combustion turbine units M17 and M19 1) increases the maintenance overhaul frequency on these units, which translates to increased maintenance costs in the test year and 2) increases the consumption of Nox water which causes maintenance costs for these systems to go up (Nox water consumption is proportional to fuel consumption). The maintenance costs for the heat recovery boilers and steam turbine were also included in the 2007 test year estimate.

2)c. Production Maintenance Expense: Budget Adjustments

Q. What budget adjustments have been made to the 2007 production maintenance expense Operating Budget?

A. One budget adjustment was made to the 2007 production maintenance expense budget (related to additional Nox water required at Maalaea Power Plant with the addition of unit M18). Please refer to MECO-504, page 2, and supporting work papers for the calculation and reasons why this $23,500 adjustment was made.

2)d. Production Maintenance Expense: Normalization Adjustments

Q. What normalization adjustments have been made to the 2007 production maintenance expense Operating Budget?

A. Ten normalization adjustments were made to the 2007 production maintenance expense budget. Four of the adjustments are for the Maui Division (three related to overhauls), two adjustments are for the Lanai Division (both related to overhauls), and four adjustments are for the Molokai Division (three related to overhauls). See MECO-504, page 2 for the adjustment amounts; detailed calculations are shown on the supporting workpapers.

Q. Why were the normalization adjustments related to overhauls made (eight of the ten adjustments)?

A. The overhaul normalization adjustments were made because MECO used a normalized overhaul schedule in preparing its test year estimates.

Q. What was the overall effect of normalizing the 2007 test year overhauls for MECO's generating units?

A. The overall effect of normalizing the 2007 Operating Budget for overhaul maintenance is a reduction of the 2007 test year estimate by $3,371,809 (see MECO-505 and supporting workpapers).

Q. How did MECO develop its test year normalized overhaul frequency?

A. To develop a normalized test year overhaul frequency for the Maui Division, MECO utilized projected operating data for the years 2008, 2009, and 2010 for each unit type and used this data to derive a "normal" overhaul frequency for each of the unit types. These resultant normal overhaul frequencies were then compared with the test year operating maintenance schedule for each unit type. If the normal overhaul frequency indicated less overhauls than the operating maintenance schedule, the number of normal overhauls (or a portion thereof) above the scheduled overhaul amount was removed from the test year normalized maintenance schedule. Conversely, if the normal overhaul frequency indicated more overhauls than what was scheduled in the operating maintenance schedule, the number of scheduled overhauls (or a portion thereof) less than the normal amount was added to the test year operating maintenance schedule. This process was repeated for each specific unit type (see MECO-WP-505,pages 1,2).

Q. Why were the years 2008, 2009, and 2010 used to derive the normalized overhaul frequency for the Maui Division?

A. With the addition of the Kaheawa wind farm and unit M18 in 2006, the contributing sources of power to the Maui Division grid changed significantly. Historical operating data could not be used to predict future running hours. 2007

is also not appropriate to derive the normalized overhaul frequency for the Maui Division because unit M13 (12.5 MW diesel generator) will not be available for approximately one half of the year. 2008-2010 were the most applicable years available from which a normalized overhaul frequency for the test year can be developed.

Q. How did MECO develop its test year normalized overhaul frequencies for the Lanai and Molokai Divisions.

A. For the Lanai and Molokai Divisions, MECO used historical operating data from 2003-2005 to develop normalized overhaul frequencies. The operating conditions during 2003-2005 are representative of what MECO expects during the period that the rates determined in this docket will be in effect.

Q. Why does MECO use a normalized overhaul schedule in developing test year expenses?

A. Power generating unit overhauls occur at various intervals based on running hours and operating conditions and at different costs, depending on the type of unit and overhaul performed. For example, diesel engines require both minor and major overhauls, and combustion turbines undergo hot-section replacements and 50,000 hour overhauls. The practice of using a normalized maintenance schedule (and associated cost) for ratemaking purposes is a method employed to benefit both MECO's customers and stock holders by presenting a fair representation of on-going annual costs. Without overhaul normalization, all overhaul costs that occur in a test year would be included in rates set for future years, and likewise there would be no mechanism for fair cost recovery of maintenance costs which happen to occur outside of a rate case test year.

Q. What was the effect of normalizing the 2007 test year overhauls for MECO's generating units?

A. The 2007 overhaul maintenance Operating Budget non-labor expenses for the Maui, Lanai, and Molokai Divisions are $7,129,069 , $0, and $790,665 respectively, for a total of $7,919,734 which would have been included in the test year estimate if MECO did not normalize its overhaul expenses. MECO's normalized test year expenses for the Maui, Lanai, and Molokai divisions are $4,087,490, $174,826, and $285,609 respectively, for a total of $4,547,925. Consequently, the net effect of normalizing the 2007 Operating Budget for overhaul maintenance reduces the 2007 test year estimate by $3,371,809 (see MECO-505 and supporting workpapers).

Q. By implementing the aforementioned methodology for normalization of overhauls, is a significant portion of MECO's 2007 overhaul expense removed from the test year estimate?

A. Yes, that is correct. Consequently, since these costs have been removed from the test year estimate using the concept of overhaul frequency normalization, should the concept of overhaul frequency normalization be deemed unreasonable for whatever reason, the expenses which were removed in the normalization process should be re-included in the test year estimate when determining reasonable costs.

<u>2)d.i. Production Maintenance Expense: Normalization Adjustments - Maui Division</u>

Q. Please explain the normalization adjustments made to the Maui Division's Operating Budget to derive the test year estimate for production maintenance non-labor expense.

A. Four normalization adjustments were made to the Maui Division's production maintenance expense Operating Budget for ratemaking purposes:

1) -$12,300 KPP Steam Turbine Overhauls

2)	$44,600	MPP Structural Maintenance
3)	-$1,328,200	MPP Diesel Unit Overhauls
4)	-$1,701,100	MPP CT Unit Maintenance
	-$2,996,900	TOTAL Maui Division Production Maintenance Non-labor Normalization Adjustments

(See MECO-504, page 2.)

Q. What is the -$12,300 normalization adjustment for KPP Steam Turbine Overhauls?

A. Based upon vendor service estimates and historical costs for steam turbine overhauls, MECO included $60,000 in its 2007 maintenance budget to overhaul Kahului Unit 1 steam turbine. To determine the test year normalized expense, MECO multiplied the most recent overhaul cost (for each steam turbine) by the normalized overhaul frequency (0.167 overhauls/year) and totaled the costs. The normalized annual amount for steam turbine overhauls is $47,700 for the 2007 test year estimate. This results in a test year normalization adjustment of -$12,300 [($47,700 test year normalized overhaul cost) – ($60,000 operating budget) = -$12,300] (see MECO-WP-505, page 1).

Q. What is the $44,600 normalization adjustment for MPP Structural Maintenance?

A. This $44,600 normalization adjustment was made because the nature of this work requires periodic major expenses which vary significantly on a year-to-year basis. Please refer to MECO-WP-504-f for the detailed explanation and calculation.

Q. What is the -$1,328,200 normalization adjustment for MPP Diesel Overhauls?

A. This normalization adjustment was determined by first developing a normal overhaul frequency for each diesel unit type based on manufacturer's recommended overhaul intervals and estimated operating hours. Then a normal overhaul cost is developed using historical non-labor costs for each unit type.

Lastly, a normalized annual overhaul cost for each unit type is obtained by multiplying the unit's historical overhaul cost by the unit's overhaul frequency. The total "normalized" amount for all of the unit types was then compared to MECO's test year operating forecast; the difference is the Maalaea Power Plant diesel unit overhaul adjustment of -$1,328,200. The detailed calculation of this process can be found in MECO-WP-505, page 1.

Q. What is the -$1,701,100 normalization adjustment for MPP CT unit maintenance?

A. The process is identical to the MPP diesel overhaul normalization described above. In summary, more work is planned for 2007 than what is considered normal so a negative normalization adjustment was made. The detailed calculation is presented in MECO-WP-505, pages 1,2.

2)d.ii. Production Maintenance Expense: Normalization Adjustments - Lanai Division

Q. What normalization adjustments were made to the Lanai Division's Operating Budget to derive the Lanai Division's test year estimate for production maintenance expense?

A. Two normalization adjustments were made to the production maintenance expense Operating Budget for ratemaking purposes:

1)	$150,700	Caterpillar Unit Overhauls
2)	$24,200	EMD Unit Overhauls
	$174,900	Total Lanai Division Production Maintenance Non-labor Normalization Adjustment (See MECO-504, page 2)

Q. Why was a $150,700 normalization adjustment made for Caterpillar Unit Overhauls and a $24,200 normalization adjustment made for EMD unit overhauls?

A. Similar to the Maalaea units, an overhaul normalization calculation was performed on both the Caterpillar and EMD units to determine a normalized annual overhaul cost. The normalized annual costs were compared with the 2007 operating budget to determine the normalization adjustment. The detailed calculation can be found in MECO-WP-505, page 3.

2)d.iii. Production Maintenance Expense: Normalization Adjustments - Molokai Division

Q. What normalizations were made to the Molokai Division's Operating Budget to derive the test year estimate for production maintenance expense.

A. Four normalization adjustments were made to the Molokai Division's production maintenance expense Operating Budget for ratemaking purposes:

1)	$15,400	Structural Maintenance
2)	$29,400	Cummins Unit Overhauls
3)	-$534,500	Caterpillar Unit Overhauls
4)	$100	Combustion Turbine Unit Overhaul
	$489,700	Total Molokai Division Production Maintenance Non-labor Normalization Adjustment

(See MECO-504, page 2)

Q. Why was a $15,400 normalization adjustment made for structural maintenance?

A. This $15,400 normalization adjustment was made because the nature of this work requires periodic major expenses which vary significantly on a year-to-year basis. Please refer to MECO-WP-504-g for the detailed calculation and explanation.

Q. Why were normalization adjustments made for Cummins, Caterpillar, and Combustion Turbine unit overhauls?

A. Similar to the Maalaea and Lanai units, overhaul normalization calculations were performed on the Cummins, Caterpillar, and Combustion Turbine units to determine normalized annual overhaul costs. The normalized annual costs were compared with the 2007 operating budget to determine the normalization adjustment. The detailed calculations can be found in MECO-WP-505, page 4.

2)e. Production Maintenance Expense: Changes since recorded 2005

Q. How is MECO's production maintenance labor expense expected to change from 2005 to test year 2007?

A. MECO's production maintenance labor expense is expected to increase from $3,401,400 to $3,902,300 between 2005 and test year 2007 (see MECO-506, page 3).

Q. Why does MECO expect to see this increase in production maintenance labor expense?

A. The increase in production maintenance labor expense is a result of 1) three additional employees; a Senior Helper at Kahului Power Plant, an Electrician at Maalaea Power Plant, and an Operator Helper at Lanai Power Plant (see section on staffing later in my testimony) and 2) an increase in wages & salaries as discussed by Mr. Matsunaga in MECO T-9.

Q. How is MECO's production maintenance non-labor expense expected to change from recorded 2005?

A. MECO's production maintenance non-labor operating expense is expected to increase from $5,761,800 to $10,726,600 between recorded 2005 and budgeted 2007. The 2007 test year estimate ($7,438,300) is 29% higher than the recorded 2005 non-labor amount and 31% lower than the 2007 Operating Budget (see MECO-506, page 3.

Q. What are the major reasons for the increase between recorded 2005 and forecasted 2007 non-labor budget?

A. The large increase in production maintenance non-labor expense is because MECO will undergo several generating unit overhauls in 2007 that were not performed in 2005. Examples are Maalaea unit M16's 50,000-hour overhaul ($2.5M) and hot section change outs on Maalaea units M17 and M19 ($0.85M each). Please refer to MECO-510 for a list of the largest non-labor maintenance variances.

2)f. Production Maintenance Expense: Variance Explanations

Q. Has MECO prepared a variance analysis for production maintenance expenses, as it did for production operations expenses described earlier in this testimony?

A. Yes, these activities, descriptions and variance amounts are listed in MECO-510 with explanations provided in MECO-WP-510.

PURCHASED POWER EXPENSE

Q. What is MECO's test year purchased power expense?

A. The test year purchased power expense is $33,981,663, as shown in MECO-507. Only the Maui Division purchases power and incurs purchased power expense.

Q. What is included in the test year purchased power expense?

A. The test year purchased power expense includes the costs for purchased firm energy and capacity from HC&S, as-available energy from the KWP wind farm located in Central Maui, and Makila hydro-electric plant located in West Maui.

Purchased Energy Expense

Q. What is the purchased energy expense estimate for test year 2007?

A. The purchased energy expense for test year 2007 which includes firm and as-available energy is $32,142,566, as shown in MECO-507. The test year estimate

is comprised of purchased firm energy from HC&S, as-available energy from KWP, and as-available energy from Makila, broken down as follows:

HC&S	$17,811,697
KWP	$14,159,946
Makila	$170,923
TOTAL	$32,142,566

Q. How was the firm purchased energy expense from HC&S determined?

A. The firm purchased energy expense from HC&S was determined by multiplying the estimated test year purchased energy prices (governed by our purchase power contract) by the projected energy purchases for the test year (see MECO-WP-507-b).

Q. How was the purchased energy price for HC&S determined?

A. For HC&S, regular on-peak and off-peak purchased energy is priced at MECO's estimated avoided energy cost payment rates, unless the avoided energy cost payment rates are below HC&S's floor rates. The avoided energy cost payment rates are estimated to be above floor rates for the test year. "Supplemental scheduled energy" is priced at the same rates as regular energy. "Optional additional energy" is priced at avoided energy cost payment rates without a floor rate. The calculation of the test year avoided cost payment rates are shown in MECO-WP-1906, page 8 included in Mr. Alan Hee's T-19 testimony.

Q. How much energy will be purchased from HC&S in the test year?

A. The amount of energy to be purchased from HC&S in the test year is estimated at 90,415,000 KWHRs (See MECO-507). This estimate is based on the purchase power contract provisions and historical data. Regular energy was projected assuming 14 hours on-peak at 12 MW and 10 hours off-peak at 8 MW.

"Optional Additional Energy" and "Supplemental Scheduled Energy" was estimated by averaging the actual monthly purchases from 2004 – 2005 (see MECO-WP-507-a, page 2).

Q. Who does MECO purchase as-available energy from?

A. MECO purchases as-available energy from KWP (wind farm) and Makila (hydro).

Q. When did MECO begin purchasing as-available energy from KWP?

A. MECO began purchasing as-available energy from KWP on June 9, 2006.

Q. When did MECO begin purchasing as-available energy from Makila?

A. MECO began purchasing as-available energy from Makila on September 22, 2006.

Q. How was the as-available purchased energy expense determined?

A. The as-available purchased energy expense was determined by multiplying estimated test year purchased energy prices (governed by our purchase power contracts) by the projected as-available energy purchases for the test year, as shown in MECO-WP-507-b, pages 1,2.

Q. How was the test year purchased energy price for KWP determined?

A. KWP's payment rates for purchased energy are determined by a contractual composite formula equal to seventy percent of an annual escalating fixed cost plus thirty percent of MECO's avoided energy cost payment rates. The test year purchased energy price was determined using an estimated avoided energy cost rate in the composite formula.

Q. How was the purchased energy price for Makila determined?

A. The on-peak and off-peak purchased energy for Makila is priced at MECO's estimated avoided energy cost payment rates, per the contract agreement.

Q. How much as-available energy will MECO purchase in the test year?

A. The test year estimated amount of as-available purchased energy is 123,758,000 KWHs; 122,882,000 KWH from KWP and 876,000 KWH from Makila (see MECO-507).

Q. How was the test year amount of purchased energy from KWP determined?

A. The amount of as-available energy purchased from KWP was based on KWP's estimated plant capacity factor, which were based on wind studies performed for the location of the wind farm.

Q. How was the test year amount of purchased energy from Makila determined?

A. Without historical data on the plant's production, MECO based the test year estimate of purchased energy from Makila (876,000 KWH) on conversations with Makila, and MECO's past experience with Pioneer Mill. MECO used 100 KW as the average continuous output, 24 hours/day, 7 days/week (see MECO-WP-507-a, page 2).

Purchased Capacity Expense

Q. What is the test year estimate for purchased capacity expense?

A. The test year estimate for purchased capacity expense is $1,839,097, as shown in MECO-507.

Q. How was this expense determined?

A. Capacity payments to HC&S are based on the firm capacity payment rate of $2.87/kw/week in accordance with its contract (see MECO-WP-507-b, page 2).

PRODUCTION MATERIALS INVENTORY

Q. What is MECO's production materials inventory estimate for test year 2007?

A. MECO's 13-month average production materials inventory estimate for test year 2007 is $8,494,879 for the production materials inventory, exclusive of the lube

oil inventory, and $147,177 for lube oil inventory (see MECO-508 and MECO-509, page 2 respectively).

Q. What is the Maui Division's production materials inventory estimate for test year 2007?

A. The Maui Division production materials 13-month average inventory estimate for the test year is $8,325,740 for the production materials inventory exclusive of the lube oil inventory, and $129,252 for lube oil inventory (see MECO-508 and MECO-509, page 2, respectively). Of the $8,325,740 production materials inventory exclusive of the lube oil inventory, $7,631,279 is stocked at the Maalaea Power Plant, and $694,461 is stocked at the Kahului Power Plant (see MECO-508).

Q. What is the Lanai Division's production materials inventory estimate for test year 2007?

A. The Lanai Division production materials 13-month average inventory is $126,509 for the production materials inventory exclusive of the lube oil inventory, and $8,926 for lube oil inventory (see MECO-508 and MECO-509, page 2, respectively).

Q. What is the Molokai Division's production materials inventory estimate for test year 2007?

A. The Molokai Division production 13-month average materials inventory is $42,630 for production materials exclusive of the lube oil inventory, and $8,999 for lube oil inventory (see MECO-508 and MECO-509, page 2, respectively).

Q. What is included in the production materials inventory?

A. The production materials inventory (exclusive of lube oil) includes stock parts and materials required to maintain unit reliability and availability. Parts required

for repairs and overhauls are not available locally and require lead times of weeks to months to secure from the U.S. mainland, Canada, Europe, and Japan.

Q. How was the production materials inventory estimated for the test year 2007?

A. The production materials inventory (exclusive of lube oil) estimate for test year 2007 was based on a 13- month average of the Power Supply Department stores inventory. The production materials inventory estimate for the test year is based on parts and material required for planned unit overhauls during the test year, coupled with MECO's experience of other necessary parts and materials stocking levels and required lead times. Additionally, MECO includes certain diesel refurbished sub-assemblies as part of the inventory system to minimize down time during overhauls or when unplanned repairs are required.

Q. Were any adjustments made to the 13-month average estimates as described above?

A. No adjustments were made to MECO's test year 2007 13-month average estimate.

Q. How does the $8,494,879 test year 13-month average materials inventory estimate for MECO's Power Supply department (consolidated) compare with the 2005 recorded inventory?

A. The 2007 test year 13-month average inventory estimate is approximately $1.18M (16%) higher than the recorded 2005 inventory value of $7,313,532 (see MECO-508).

Q. Why has the consolidated inventory value increased from 2005?

A. Inventory levels remained fairly consistent at MECO's Kahului, Lanai, and Molokai Power Plants. MECO experienced an increase of approximately $1.15M in inventory value at our Maalaea Power Plant as a result of increased material costs, stocking of parts for new generating unit M18 and periphery equipment,

increased number of overhauls, aging diesel units requiring additional parts, additional inventory required because of longer lead times, and escalation (see MECO-508).

Lube Oil Inventory

Q. What levels of lube oil inventory will MECO maintain in the test year?

A. MECO's average 2007 lube oil inventory estimate is 18,702 gallons with a value of $147,177. MECO's Maui Division has set an inventory of 16,314 gallons with a value of approximately $129,252. Similarly, the Lanai Division inventory is set at 1,146 gallons valued at $8,926 and the Molokai Division inventory is at 1,242 gallons and $8,999, as shown in MECO-509, page 2.

Q. How were the 2007 lube oil inventories derived?

A. The 2007 lube oil inventory estimates are based on estimated lube oil consumption rates, vendor prices, forecasted engine operating hours and conditions, and allowances for lube oil contamination (see MECO-WP-509-b).

POWER SUPPLY DEPARTMENT STAFFING

Q. How does the Power Supply Department's 2007 staffing budget level compare to 2005?

A. The 2007 Power Supply staffing level is estimated at 123 employees, compared to 121 employees in 2005 (see MECO-1102 in Ms. Eileen Wachi's T-11 testimony).

Q. Please describe the staffing changes that account for this increase of two employees from 2005 to 2007.

A. Since 2005 the Power Supply Department added four employee positions as follows: a Renewable Energy Engineer position in responsibility area MGA (Administration), a Senior Helper position in MGB (Kahului Power Plant

Maintenance), a Maintenance Electrician in MGE (Electrical Maintenance), and an Operator Helper in MGL (Lanai Production). Three of the four positions have been filled with the Operator Helper position currently under recruitment. Responsibility area MGK (Kahului Power Plant Operations) has been reduced by two employees.

Q. Why was a Renewable Energy Engineer added to MGA (Administration)?

A. The responsibilities in the area of renewable energy have been increasing steadily for several years. MECO is presently facing a challenging mandate to meet the state's Renewable Portfolio Standard law and believes that at this time a full time employee focused on this effort is required. Our Renewable Energy Engineer is 1) responsible for long term renewable technology planning, development and implementation, 2) provides program management, project management, evaluates and demonstrates renewable energy and non-oil fossil fuel electric generation technologies, and 3) administers Renewable Energy contracts and serves as the MECO contact for renewable energy related matters.

Q. Why was a Senior Helper added to MGB (Kahului Power Plant Maintenance)?

A. The work load for MGB (Kahului Maintenance) has increased to the level where an additional employee is necessary to keep the plant maintained in a safe and reliable manner. Included in the reasons for the increased work load are the following: 1) aging plant requires more maintenance, 2) more demand on the Working Foreman to perform administrative duties leaves less time to assist with the maintenance work, 3) less sharing of maintenance personnel with Maalaea Power Plant due to increased maintenance at Maalaea, 4) new and changing regulations/procedures including DoH, EPA, HAZMAT, Safety, and Security, and 5) Hana units are beginning to require more maintenance.

Q. Why was a Maintenance Electrician added to MGE (Electrical Maintenance)?

A. The electrical maintenance group has experienced an increase in the amount of maintenance, repairs and equipment upgrades throughout the Maalaea, Kahului, Lanai and Molokai Power Plants. The installation of M18 at Maalaea Power Plant and the CHP unit at the Grand Wailea have added to the responsibilities of this group. To accomplish their increasing scope of work in a safe, reliable, and efficient manner, an additional electrician has been added.

Q. Why will an Operator Helper be added to MGL (Lanai Production)?

A. The additional Operator Helper in MGL actually fills a position that has been vacant for several years. Initially the position was replaced by an Electrician's position, but near the end of 2001 the electrician left and the opening remained unfilled. The work load on Lanai has increased to the point where maintenance personnel are forced to fill in for operations personnel, leaving maintenance issues undone. Factors contributing to the increased work load include aging of the plant and increasing regulations (environmental, safety, security). The additional Operator Helper will help decrease the overtime hours in MGL by performing various operational duties as well as maintenance tasks.

Q. Why was MGK reduced by two employees from 2005 to 2007?

A. In 2005 MGK (Kahului Power Plant Operations) averaged 23 employees compared to the normal required level of 21 employees. The temporary overstaffing situation was due to new employees being trained to replace retiring and transferring employees. In 2007 the average staffing level in MGK is expected to average 21 employees.

Q. What was the Power Supply Department's actual employee count as of the year end 2006?

A. The 2006 Power Supply Department's actual year end employee count was 118.

Q. What positions have been filled since the end of 2006?

A. Five positions were filled between the end of 2006 and February 16, 2007: three MGK Operator Helpers, one MGD Diesel Maintenance Senior Helper, and one MGD Diesel Maintenance Mechanic. There was one retirement in MGK (Turbine Switchboard Operator).

Q. As of February 16, 2007, what is the Power Supply Department's actual employee count?

A. As of February 16, 2007, the actual employee count was 122.

Q. Were there any adjustments made to the actual employee count of 122?

A. Yes. The adjusted employee count is 120.

Q. Why was an adjustment made to the actual employee count of 122?

A. An adjustment was made due to a temporary backlog of pending transfers of two employees. As noted earlier, the temporary overstaffing situation is due to new employees being trained to replace transferring employees. For purposes of the employee count discussion, the Transmission and Distribution Department has treated the Vehicle Mechanic position as being filled and the Customer Service Department has treated the Meter Reader position as being filled. With the removal of these two pending transfers from the Power Supply Department's employee count, this will result in the employee count of 120.

Q. Are there currently any vacant positions in the Power Supply Department?

A. Yes, there are three vacancies at the time of this filing, for the following positions: 1) Operator Helper in MGK (Kahului Power Plant Operations) became available in January 2007, 2) Electrical Maintenance Supervisor in MGE (Electrical Maintenance) became available in December 2006, and 3) Operator Helper in MGL (Lanai Production), a 2007 addition as described above.

Q. What is MECO doing to fill the Operator Helper vacancy in MGK?

A. The Plant Operator Selection System (POSS) written testing for the Operator Helper vacancy in MGK is currently scheduled for March 10, 2007. Following this initial screening, qualified candidates will be further evaluated through reference checks and interviews. The last phase of the hiring process includes a conditional offer, drug testing, and finally an employment offer. MECO plans to have this position filled by early May 2007.

Q. What is MECO doing to fill the Electrical Maintenance Supervisor vacancy in MGE?

A. MECO is currently interviewing prospective candidates and working with an employment agency to have this vacancy filled by early May 2007.

Q. Please describe the status of the recruitment efforts for the new Operator Helper position in MGL.

A. The recruitment tasks for this new MGL position are the same as described above for the MGK Operator Helper. The POSS testing is currently scheduled for March 9, 2007. MECO plans to have this position filled by the end of April 2007.

SUMMARY

Q. Please summarize your testimony.

A. MECO's normalized 2007 test year estimate for production O&M expense (other than fuel and purchased power expense) is $21,014,800; $18,741,800 for the Maui Division, $1,094,400 for the Lanai Division, and $1,178,600 for the Molokai Division (see MECO-502).

The 2007 test year expense for purchased power for the Maui Division and MECO consolidated is $33,981,663 (see MECO-507). There is no purchased power expense for the Lanai and Molokai Divisions. The 2007 test

year estimate of the average production materials inventory is $8,494,879; $8,325,740 for the Maui Division, $126,509 for the Lanai Division, and $42,630 for the Molokai Division (see MECO-508).

As described in my testimony, the changes in the generation profile for the Maui Division (addition of KWP's wind farm, addition of Maalaea unit M18, and the return to service of Maalaea unit M13) will have significant impact on our operation in the Power Supply Department starting in the 2007 test year.

Q. Does this conclude your testimony?

A. Yes, it does.

Maui Electric Company, Limited

MICHAEL P. RIBAO, SR.
Educational Background and Experience

Business Address:	Maui Electric Company, Limited 200 Hobron Avenue Kahului, Hawaii 96732	
Title:	Power Supply Department Manager (August 2006 - Present)	
Years of Service:	21 Years	
Previous Experience:	2003 - Aug 2006	Transmission & Distribution Department Manager
	1999 - 2003	Maalaea Power Plant Station Manager
	1991 - 1999	Molokai Production Supervisor
	1990 - 1991	Electrical Staff Engineer I
	1988 - 1990	Market Research Analyst
	1985 - 1988	Plant Operator
Education:	Bachelor of Science - Electrical Engineering Seattle University (1972-1976)	
Other Curriculum:	Utility Executive Course, 2004 University of Idaho - Corporate Utility Training Program	
Previous Testimony:	None	

Maui Electric Company, Limited

GENERATING CAPABILITIES
TEST YEAR 2007

MAUI DIVISION

UNIT	TYPE	NORMAL TOP LOAD (NTL) MW (GROSS)	RESERVE CAPABILITY MW (GROSS)	SERVICE DATE	TEST YEAR AGE
KAHULUI POWER PLANT					
K-1	Steam	5.00	5.90	1948	59
K-2	Steam	5.00	6.00	1949	58
K-3	Steam	11.50	12.70	1954	53
K-4	Steam	12.50	13.00	1966	41
	Sub-total Kahului Power Plant	34.00	37.60		
MAALAEA POWER PLANT					
X-1	Diesel	2.50	2.50	1987	20
X-2	Diesel	2.50	2.50	1987	20
M-1	Diesel	2.50	2.50	1971	36
M-2	Diesel	2.50	2.50	1972	35
M-3	Diesel	2.50	2.50	1972	35
M-4	Diesel	5.60	5.60	1973	34
M-5	Diesel	5.60	5.60	1973	34
M-6	Diesel	5.60	5.60	1975	32
M-7	Diesel	5.60	5.60	1975	32
M-8	Diesel	5.60	5.60	1977	30
M-9	Diesel	5.60	5.60	1978	29
M-10	Diesel	12.50	12.50	1979	28
M-11	Diesel	12.50	12.50	1980	27
M-12	Diesel	12.50	12.50	1988	19
M-13	Diesel	12.50	12.50	1989	18
M-14,15,16	DTCC [1]	58.00	58.00	1992 (M14)	15
		-	-	1993 (M15)	14
		-	-	1993 (M16)	14
M-17,18,19	DTCC [1]	58.00	58.00	1998 (M17)	9
		-	-	2006 (M18)	1
		-	-	2000 (M19)	7
	Sub-total Maalaea Power Plant	212.10	212.10		
HANA SUBSTATION					
H-1	Diesel	1.00	1.00	2001	6
H-2	Diesel	1.00	1.00	2001	6
	Sub-total Hana Substation	2.00	2.00		
	TOTAL MAUI ELECTRIC CO.	248.10	251.70		
	HC&S FIRM CAPACITY	12.00	16.00		
	TOTAL MAUI DIVISION	260.10 MW	267.70 MW		

[1] Dual Train Combined Cycle (Combustion Turbines with Heat Recovery Steam Turbine)

Maui Electric Company, Limited

GENERATING CAPABILITIES
TEST YEAR 2007

LANAI DIVISION

UNIT	TYPE	NORMAL TOP LOAD (NTL) KW (GROSS)	RESERVE CAPABILITY KW (GROSS)	SERVICE DATE	2007 TEST YEAR AGE
MIKI BASIN POWER PLANT (Peaking)					
LL-1	Diesel - EMD	1,000	1,000	1951	56
LL-2	Diesel - EMD	1,000	1,000	1954	53
LL-3	Diesel - EMD	1,000	1,000	1956	51
LL-4	Diesel - EMD	1,000	1,000	1956	51
LL-5	Diesel - EMD	1,000	1,000	1956	51
LL-6	Diesel - EMD	1,000	1,000	1962	45
	Total Peaking Units (1)	6,000	6,000		
MIKI BASIN POWER PLANT (Base Capacity)					
LL-7	Diesel - Caterpillar	2,200	2,200	1996	11
LL-8	Diesel - Caterpillar	2,200	2,200	1996	11
	Total Base Generation	4,400	4,400		
	Firm Capacity Credit (1)	5,000	5,000		
	TOTAL LANAI DIVISION	9,400 KW	9,400 KW		

NOTE:
(1) Miki Units 1,2,3,4,5,6 operate in peaking service. Based on an age/condition assessment performed on these units by an outside consultant, MECO includes only five of the six units towards firm capacity for the Lanai system. Please refer to MECO's Adequacy of Supply report (Attachment 1, page 5) submitted to the PUC and CA in March 2006.

Maui Electric Company, Limited

GENERATING CAPABILITIES
TEST YEAR 2007

MOLOKAI DIVISION

UNIT	TYPE	NORMAL TOP LOAD (NTL) KW (GROSS)	RESERVE CAPABILITY KW (GROSS)	SERVICE DATE	2007 TEST YEAR AGE
PALAAU POWER PLANT (Peaking)					
CAT1	Diesel-Caterpillar	1,250	1,250	1985	22
CAT2	Diesel-Caterpillar	1,250	1,250	1985	22
CUM3	Diesel-Cummins	970	970	1985	22
CUM4	Diesel-Cummins	970	970	1985	22
CUM5	Diesel-Cummins	970	970	1985	22
CUM6	Diesel-Cummins	970	970	1991	16
	Total Peaking Units (1)	6,380	6,380		
PALAAU POWER PLANT (Base Capacity)					
GT #1	CT-Solar	2,220	2,220	1982	25
UNIT7	Diesel-Caterpillar	2,200	2,200	1996	11
UNIT8	Diesel-Caterpillar	2,200	2,200	1996	11
UNIT9	Diesel-Caterpillar	2,200	2,200	1996	11
	Total Base Generation	8,820	8,820		
	Firm Capacity Credit (1)	3,190	3,190		
	TOTAL MOLOKAI DIVISION	12,010 KW	12,010 KW		

NOTE:
(1) Palaau Units 1,2,3,4,5,6 operate in peaking service. Because of the age and operating history of these units, MECO includes one Caterpillar unit and two Cummins units (1,250 + 970 + 970 = 3,190 kw) towards firm capacity for the Molokai system. Please refer to MECO's Adequacy of Supply report (Attachment 3, page 2) submitted to the PUC and CA in March 2006.

Maui Electric Company, Limited

PRODUCTION OPERATION & MAINTENANCE EXPENSE

TEST YEAR 2007 FORECAST
($ 1,000's)

Line		(A) OPERATING BUDGET	(B) BUDGET ADJUSTMENT	(C) NORMALIZATION ADJUSTMENT	(D) 2007 TEST YEAR
	MAUI DIVISION				
1	Production Operation	8,661.7	(347.2)	0.0	8,314.5
2	Production Maintenance	13,400.8	23.5	(2,996.9)	10,427.3
3	Sub-total Maui Division	22,062.5	(323.7)	(2,996.9)	18,741.8
	LANAI DIVISION				
4	Production Operation	664.5	0.0	0.0	664.5
5	Production Maintenance	255.0	0.0	174.8	429.9
6	Sub-total Lanai Division	919.5	0.0	174.8	1,094.4
	MOLOKAI DIVISION				
7	Production Operation	681.7	13.4	0.0	695.1
8	Production Maintenance	973.1	0.0	(489.7)	483.5
9	Sub-total Molokai Division	1,654.9	13.4	(489.7)	1,178.6
10	**TOTAL PRODUCTION OPERATION**	10,008.0	(333.8)	0.0	9,674.2
11	**TOTAL PRODUCTION MAINTENANCI**	14,628.9	23.5	(3,311.8)	11,340.7
12	**TOTAL MECO PRODUCTION O&M**	24,636.9	(310.3)	(3,311.8)	21,014.8

Source:
Column A: MECO-503, MECO-WP-502
Column B: MECO-504
Column C: MECO-504
Column D: Column A + Column B + Column C

Maui Electric Company, Limited

PRODUCTION OPERATION EXPENSE
LABOR AND NON-LABOR

TEST YEAR 2007 FORECAST
($1,000's)

Line		(A) OPERATING BUDGET	(B) BUDGET ADJUSTMENT	(C) NORMALIZATION ADJUSTMENT	(D) 2007 TEST YEAR
	MAUI DIVISION				
1	Labor	4,582.6	0.0	0.0	4,582.6
2	Non-Labor	4,079.2	(347.2)	0.0	3,732.0
3	Sub-total Maui Division	8,661.7	(347.2)	0.0	8,314.5
	LANAI DIVISION				
4	Labor	415.5	0.0	0.0	415.5
5	Non-Labor	249.0	0.0	0.0	249.0
6	Sub-total Lanai Division	664.5	0.0	0.0	664.5
	MOLOKAI DIVISION				
7	Labor	425.5	0.0	0.0	425.5
8	Non-Labor	256.3	13.4	0.0	269.7
9	Sub-total Molokai Division	681.7	13.4	0.0	695.1
10	**TOTAL PRODUCTION LABOR**	5,423.5	0.0	0.0	5,423.5
11	**TOTAL PRODUCTION NON-LABOR**	4,584.5	(333.8)	0.0	4,250.6
12	**TOTAL PRODUCTION OPERATION**	10,008.0	(333.8)	0.0	9,674.2

Source: Column A: MECO-506, p.2
Column B: MECO-504, p.1
Column C: MECO-504, p.1
Column D: Column A + Column B + Column C

Maui Electric Company, Limited

PRODUCTION MAINTENANCE EXPENSE
LABOR AND NON-LABOR

TEST YEAR 2007 FORECAST
($1,000's)

Line		(A) OPERATING BUDGET	(B) BUDGET ADJUSTMENT	(C) NORMALIZATION ADJUSTMENT	(D) 2007 TEST YEAR
	MAUI DIVISION				
1	Labor	3,621.2	0.0	0.0	3,621.2
2	Non-Labor	9,779.6	23.5	(2,996.9)	6,806.1
3	Sub-total Maui Division	13,400.8	23.5	(2,996.9)	10,427.3
	LANAI DIVISION				
4	Labor	155.0	0.0	0.0	155.0
5	Non-Labor	100.1	0.0	174.8	274.9
6	Sub-total Lanai Division	255.0	0.0	174.8	429.9
	MOLOKAI DIVISION				
7	Labor	126.2	0.0	0.0	126.2
8	Non-Labor	846.9	0.0	(489.7)	357.2
9	Sub-total Molokai Division	973.1	0.0	(489.7)	483.5
10	**TOTAL PRODUCTION LABOR**	3,902.4	0.0	0.0	3,902.4
11	**TOTAL PRODUCTION NON-LABOR**	10,726.6	23.5	(3,311.8)	7,438.3
12	**TOTAL PRODUCTION MAINTENAN**	14,628.9	23.5	(3,311.8)	11,340.7

Source: Column A: MECO-506, p.3
Column B: MECO-504, p.2
Column C: MECO-504, p.2
Column D: Column A + Column B + Column C

Maui Electric Company, Limited

PRODUCTION OPERATION EXPENSE
BUDGET ADJUSTMENTS AND NORMALIZATION ADJUSTMENT

TEST YEAR 2007 FORECAST
($1,000's)

Line		(A) OPERATING BUDGET	(B) BUDGET ADJUSTMENT	(C) NORMALIZATION ADJUSTMENT	(D) 2007 TEST YEAR
	MAUI DIVISION				
1	KPP non-labor fuel additive	137.4	(137.4)	0.0	0.0
2	MPP non-labor biodiesel	238.3	(238.3)	0.0	0.0
3	MPP non-labor lube oil	0.0	7.2	0.0	7.2
4	MPP non-labor CT Nox water	118.2	21.3	0.0	139.5
5	Sub-total Maui Division	493.9	(347.2)	0.0	146.7
	LANAI DIVISION				
6	Lanai non-labor environmental	0.0	0.0	0.0	0.0
7	Lanai non-labor lube oil	0.0	0.0	0.0	0.0
8	Sub-total Lanai Division	0.0	0.0	0.0	0.0
	MOLOKAI DIVISION				
9	Molokai non-labor environmental	0.0	0.0	0.0	0.0
10	Molokai non-labor lube oil	69.3	13.4	0.0	82.7
11	Sub-total Molokai Division	69.3	13.4	0.0	82.7
12	**TOTAL PRODUCTION OPERATION**	563.2	(333.8)	0.0	229.4

Source: Column A: MECO-WP-504, pp.1-2
Column B: MECO-WP-504, p.1
Column C: MECO-WP-504, p.2
Column D: Column A + Column B + Column C

Maui Electric Company, Limited

PRODUCTION MAINTENANCE EXPENSE
BUDGET ADJUSTMENTS AND NORMALIZATION ADJUSTMENT

TEST YEAR 2007 FORECAST
($1,000's)

Line		(A) OPERATING BUDGET	(B) BUDGET ADJUSTMENT	(C) NORMALIZATION ADJUSTMENT	(D) 2007 TEST YEAR
	MAUI DIVISION				
1	KPP Steam Turbine Overhauls	60.0	0.0	(12.3)	47.7
2	MPP Structural Maintanance	245.3	0.0	44.6	289.9
3	MPP Diesel Unit Overhauls	2,232.5	0.0	(1,328.2)	904.3
4	MPP CT Unit Maintenance	4,836.6	0.0	(1,701.1)	3,135.5
5	MPP non-labor CT Nox water	130.3	23.5	0.0	153.8
6	Sub-total Maui Division	7,504.6	23.5	(2,996.9)	4,531.2
	LANAI DIVISION				
7	Caterpillar Unit Overhauls	0.0	0.0	150.7	150.7
8	EMD Unit Overhauls	0.0	0.0	24.2	24.2
9	Sub-total Lanai Division	0.0	0.0	174.8	174.8
	MOLOKAI DIVISION				
10	Structural Maintenance	5.3	0.0	15.4	20.7
11	Cummins Unit Overhauls	0.0	0.0	29.4	29.4
12	Caterpillar Unit Overhauls	790.7	0.0	(534.5)	256.2
13	Combustion Turbine Unit Overhaul	0.0	0.0	0.1	0.1
14	Sub-total Molokai Division	796.0	0.0	(489.7)	306.3
15	**TOTAL PRODUCTION MAINTENAN**	8,300.6	23.5	(3,311.8)	5,012.3

Source: Column A: MECO-WP-504, pp.1-2
Column B: MECO-WP-504, p.1
Column C: MECO-WP-504, p.2
Column D: Column A + Column B + Column C

Maui Electric Company, Limited

OVERHAUL NORMALIZATION SUMMARY [1]

TEST YEAR 2007 FORECAST
($1,000's)

Line		(A) OPERATING BUDGET	(B) NORMALIZATION ADJUSTMENT	(C) (A) + (B) 2007 TEST YEAR
	MAUI DIVISION			
1	Kahului Power Plant [2]	60.0	(12.3)	47.7
2	Maalaea Power Plant	7,069.1	(3,029.3)	4,039.8
3	Sub-total Maui Division	7,129.1	(3,041.6)	4,087.5
	LANAI DIVISION			
4	Sub-total Lanai Division	0.0	174.8	174.8
	MOLOKAI DIVISION			
5	Sub-total Molokai Division	790.7	(505.1)	285.6
6	**TOTAL MECO**	7,919.7	(3,371.8)	4,547.9

Source: Line 1: MECO-WP-505, p. 1
Line 2: MECO-WP-505, p. 1
Line 4: MECO-WP-505, p. 3
Line 5: MECO-WP-505, p. 4

Note:
[1] Direct non-labor costs only
[2] Steam Turbine overhauls only

Maui Electric Company, Limited

(2001-2007)
PRODUCTION OPERATION & MAINTENANCE EXPENSE
($ 1,000's)

Line		(A) 2001 Recorded	(B) 2002 Recorded	(C) 2003 Recorded	(D) 2004 Recorded	(E) 2005 Recorded	(F) 2007 Budget	(G) 2007 Test Year Normalized
	MECO CONSOLIDATED							
1	Production Operation	8,474.2	9,596.0	9,666.2	9,174.3	9,653.5	10,008.0	9,674.2
2	Production Maintenance	9,740.2	8,568.5	8,619.1	10,088.5	9,163.2	14,628.9	11,340.7
3	Total MECO Consolidated	18,214.4	18,164.5	18,285.3	19,262.8	18,816.7	24,636.9	21,014.8
	MAUI DIVISION							
4	Production Operation	7,236.1	8,334.8	8,398.2	7,948.0	8,405.9	8,661.7	8,314.5
5	Production Maintenance	8,581.1	8,033.0	8,154.0	9,074.6	8,774.9	13,400.8	10,427.3
6	Sub-total Maui Division	15,817.1	16,367.8	16,552.2	17,022.6	17,180.8	22,062.5	18,741.8
	LANAI DIVISION							
7	Production Operation	605.7	653.6	600.2	574.8	594.3	664.5	664.5
8	Production Maintenance	667.7	197.4	319.1	297.1	242.2	255.0	429.9
9	Sub-total Lanai Division	1,273.4	851.1	919.2	871.9	836.5	919.5	1,094.4
	MOLOKAI DIVISION							
10	Production Operation	632.4	607.6	667.8	651.4	653.4	681.7	695.1
11	Production Maintenance	491.4	338.0	146.0	716.9	146.1	973.1	483.5
12	Sub-total Molokai Division	1,123.9	945.6	813.8	1,368.3	799.4	1,654.9	1,178.6

Source: MECO-WP-506, pp.2-3, 5
Column G: MECO-502

Maui Electric Company, Limited

(2001-2007)
PRODUCTION OPERATION EXPENSE - LABOR/NON-LABOR
($1,000's)

Line		(A) 2001 Recorded	(B) 2002 Recorded	(C) 2003 Recorded	(D) 2004 Recorded	(E) 2005 Recorded	(F) 2007 Budget	(G) 2007 Test Year Normalized
	MAUI DIVISION							
1	Labor	3,809.0	4,353.3	4,423.3	4,380.5	4,571.6	4,582.6	4,582.6
2	Non-Labor	3,427.1	3,981.5	3,974.9	3,567.5	3,834.3	4,079.2	3,732.0
3	*Sub-total Maui Division*	*7,236.1*	*8,334.8*	*8,398.2*	*7,948.0*	*8,405.9*	*8,661.7*	*8,314.5*
	LANAI DIVISION							
4	Labor	391.5	402.3	382.6	393.6	395.9	415.5	415.5
5	Non-Labor	214.2	251.3	217.6	181.3	198.4	249.0	249.0
6	Sub-total Lanai Division	605.7	653.6	600.2	574.8	594.3	664.5	664.5
	MOLOKAI DIVISION							
7	Labor	393.1	398.4	422.9	417.6	426.8	425.5	425.5
8	Non-Labor	239.3	209.2	244.9	233.9	226.6	256.3	269.7
9	Sub-total Molokai Division	632.4	607.6	667.8	651.4	653.4	681.7	695.1
10	**TOTAL LABOR**	4,593.7	5,154.0	5,228.7	5,191.6	5,394.3	5,423.5	5,423.5
11	**TOTAL NON-LABOR**	3,880.6	4,442.0	4,437.4	3,982.6	4,259.2	4,584.5	4,250.6
12	**TOTAL PRODUCTION OPERATION**	8,474.2	9,596.0	9,666.2	9,174.3	9,653.5	#######	9,674.2

Source: MECO-WP-506, pp.2-3
Column G: MECO-503, p.1

Maui Electric Company, Limited

(2001-2007)
PRODUCTION MAINTENANCE EXPENSE - LABOR/NON-LABOR
($1,000's)

Line		(A) 2001 Recorded	(B) 2002 Recorded	(C) 2003 Recorded	(D) 2004 Recorded	(E) 2005 Recorded	(F) 2007 Budget	(G) 2007 Test Year Normalized
	MAUI DIVISION							
1	Labor	2,871.5	2,723.6	2,911.2	3,160.3	3,200.2	3,621.2	3,621.2
2	Non-Labor	5,709.6	5,309.5	5,242.8	5,914.3	5,574.7	9,779.6	6,806.1
3	Sub-total Maui Division	8,581.1	8,033.0	8,154.0	9,074.6	8,774.9	#######	10,427.3
	LANAI DIVISION							
4	Labor	114.3	116.1	96.8	92.4	115.7	155.0	155.0
5	Non-Labor	553.3	81.4	222.2	204.6	126.5	100.1	274.9
6	Sub-total Lanai Division	667.7	197.4	319.1	297.1	242.2	255.0	429.9
	MOLOKAI DIVISION							
7	Labor	49.9	76.8	89.0	86.7	85.5	126.2	126.2
8	Non-Labor	441.6	261.2	57.0	630.2	60.5	846.9	357.2
9	Sub-total Molokai Division	491.4	338.0	146.0	716.9	146.1	973.1	483.5
10	**TOTAL LABOR**	3,035.7	2,916.5	3,097.1	3,339.4	3,401.4	######	3,902.4
11	**TOTAL NON-LABOR**	6,704.5	5,652.0	5,522.0	6,749.1	5,761.8	#######	7,438.3
12	**TOTAL PRODUCTION MAINTENAN**	9,740.2	8,568.5	8,619.1	10,088.5	9,163.2	#######	11,340.7

Source: MECO-WP-506, p.5
Column G: MECO-503, p.2

Maui Electric Company, Limited

PURCHASED POWER EXPENSE

Line		(A) KWHs	(B) ENERGY COST ($)	(C) CAPACITY COST ($)	(D) TOTAL COST ($)
	FIRM POWER				
1	2004 HC&S	94,498,100	10,119,878	1,834,116	11,953,994
2	2005 HC&S	97,083,300	14,456,543	1,846,910	16,303,453
3	2007 HC&S (fcst)	90,415,000	17,811,697	1,839,097	19,650,794
	AS-AVAILABLE POWER				
4	2007 KWP (fcst)	122,882,000	14,159,946	0	14,159,946
5	2007 Makila (fcst)	876,000	170,923	0	170,923
6	Sub-total 2007 Forecast	123,758,000	14,330,869	0	14,330,869
7	**TOTAL 2007 CONSOLIDATED**	214,173,000	32,142,566	1,839,097	33,981,663

Source: Column A: MECO-WP-507-a
Column B: MECO-WP-507-b
Column C: MECO-WP-507-b
Column D: Column B + Column C

Reference:
HC&S (Hawaiian Commercial & Sugar Co.)
KWP (Kaheawa Wind Partners)
Makila (Hydroelectric Plant)

Maui Electric Company, Limited

PRODUCTION DEPARTMENT

MATERIALS INVENTORY AT YEAR-END[1]

(Dollars)

		(A)	(B)	(C)	(D)	(E)	(F)	(G)
					(B) + (C)			(D) + (E) + (F)
Line		YEAR	KAHULUI POWER PLANT	MAALAEA POWER PLANT	MAUI DIVISION	LANAI DIVISION	MOLOKAI DIVISION	MECO CONSOLIDATEI
1	Recorded	2003	697,961	6,060,912	6,758,873	63,458	46,572	6,868,903
2	Recorded	2004	706,278	6,288,249	6,994,527	78,297	86,964	7,159,788
3	Recorded	2005	680,424	6,481,266	7,161,690	102,367	49,475	7,313,532
4	Forecast	2006	682,495	6,785,029	7,467,524	120,611	43,186	7,631,321
5	Forecast	2007	690,700	7,714,000	8,404,700	136,000	48,000	8,588,700
6	Test Year Average[2]	2007	694,461	7,631,279	8,325,740	126,509	42,630	8,494,879

Source: Column B: MECO-WP-508, p.1
Column C: MECO-WP-508, p.2
Column E: MECO-WP-508, p.3
Column F: MECO-WP-508, p.4

[1] Does not include lube oil inventory

[2] 2007 Test Year 13-month average (Dec 2006 - Dec 2007)

Maui Electric Company, Limited

LUBE OIL FORECAST

TEST YEAR 2007 FORECAST

Line		(A) **2007 TEST YEAR (Gallons)**	(B) **2007 TEST YEAR (Dollars)**
	MAUI DIVISION		
1	Super RR EW40 (Diesels)	9,000	83,418
2	MOBILGARD ADL (Diesels)	110,900	791,313
3	Mobil Jet II (CTs)	1,330	34,330
4	Mobil DTE Medium (CT-STG)	843	6,463
5	Sub-total Maui Division	122,073	915,524
	LANAI DIVISION		
6	Super RR EW40	917	8,499
7	MOBILGARD ADL	5,444	38,845
8	Sub-total Lanai Division	6,361	47,344
	MOLOKAI DIVISION		
9	Delo 400 15W40	500	4,359
10	MOBILGARD ADL	9,770	69,715
11	Sub-total Molokai Division	10,270	74,074
12	**TOTAL MECO PRODUCTION**	138,704	1,036,942

Source: MECO-WP-509-a

Maui Electric Company, Limited

MONTHLY LUBE OIL INVENTORY

TEST YEAR 2007 FORECAST

Line		(A) **2007 TEST YEAR (Gallons)**	(B) **2007 TEST YEAR (Dollars)**
	MAUI DIVISION		
1	Super RR EW40	1,250	11,586
2	MOBILGARD ADL	13,242	98,054
3	Mobil Jet II	311	8,028
4	Mobil DTE Medium	1,511	11,584
5	Sub-total Maui Division	16,314	129,252
	LANAI DIVISION		
6	Super RR EW40	351	3,253
7	MOBILGARD ADL	795	5,673
8	Sub-total Lanai Division	1,146	8,926
	MOLOKAI DIVISION		
9	Delo 400 15W40	87	758
10	MOBILGARD ADL	1,155	8,241
11	Sub-total Molokai Division	1,242	8,999
12	**TOTAL MECO PRODUCTION**	18,702	147,177

Source: MECO-WP-509-b

Maui Electric Company, Limited

PRODUCTION OPERATION & MAINTENANCE EXPENSE

Variance Report (2006 recorded vs. 2007 budget)[1]

Variance Criteria: +/- 10% and > $45K

(sorted by Acct Block, NARUC Acct., Codeblock)

Line	NARUC Acct.	Acct Block	Codeblock	2006 Recorded ($)	2007 Budget ($)	+/- ($)	+/- (%)
1	500	Prod Oper	MGA201NSTNENMGZZZZZ550	41,714	102,420	60,706	146
2	500	Prod Oper	MGA875NSTNENMGZZZZZ501	217,937	150,248	-67,689	-31
3	505	Prod Oper	MGK243NSTNENMGZZZZZ155	46,389	0	-46,389	-100
4	506	Prod Oper	MGM789MPONENMGZZZZZ150	59,118	12,751	-46,367	-78
5	546	Prod Oper	MGA201MNSNENMGZZZZZ550	36,992	99,786	62,794	170
6	546	Prod Oper	MGA875MNSNENMGZZZZZ201	41,390	213,525	172,135	416
7	546	Prod Oper	MGM877MNSNENMGZZZZZ501	161,105	33,431	-127,674	-79
8	548	Prod Oper	MGM244MNSNENMGZZZZZ155	65,906	0	-65,906	-100
9	548	Prod Oper	MGM244MNSNENMGZZZZZ201	1,325,743	875,000	-450,743	-34
10	548	Prod Oper	MGM247MNSNENMGZZZZZ201	226,006	150,000	-76,006	-34
11	511	Prod Maint	MGB265NSTNENMGZZZZZ501	314	166,360	166,046	52881
12	511	Prod Maint	MGB271NTFNENMGZZZZZ501	0	125,000	125,000	-
13	512	Prod Maint	MGA269NSTNENMGZZZZZ501	196,497	24,000	-172,497	-88
14	512	Prod Maint	MGB257N03NEM00000170150	0	52,179	52,179	-
15	512	Prod Maint	MGC257M15NEM0000047201	1,309	89,849	88,540	6764
16	512	Prod Maint	MGC257M15NEM0000047501	3,541	289,900	286,359	8087
17	512	Prod Maint	MGD257M15NEM0000047150	5,267	57,498	52,231	992
18	512	Prod Maint	MGE257M15NEM0000047150	733	50,021	49,288	6724
19	513	Prod Maint	MGB260N01NEM0000168501	0	60,000	60,000	-
20	513	Prod Maint	MGB262N03NENMGZZZZZ150	58,566	6,496	-52,070	-89
21	513	Prod Maint	MGC260M15NEM0000047501	80,730	0	-80,730	-100
22	552	Prod Maint	MGD265MNSNENMGZZZZZ150	101,037	19,498	-81,539	-81
23	552L	Prod Maint	MGL265LNSNENMGZZZZZ150	32,222	107,061	74,839	232
24	553	Prod Maint	MGC272M14NEM0000175501	-7,008	161,615	168,623	-2406
25	553	Prod Maint	MGC272M16NEM0000056501	0	2,532,060	2,532,060	-
26	553	Prod Maint	MGC272M17NEM0000356501	0	853,230	853,230	-
27	553	Prod Maint	MGC272M19NEM0000357501	0	853,230	853,230	-
28	553	Prod Maint	MGC272MS1NEM0000833501	862,160	0	-862,160	-100
29	553	Prod Maint	MGD275M03NEM0000151201	0	166,992	166,992	-
30	553	Prod Maint	MGD275M04NEM0000065150	0	223,411	223,411	-
31	553	Prod Maint	MGD275M04NEM0000065201	0	186,690	186,690	-
32	553	Prod Maint	MGD275M05NEM0000066150	0	223,411	223,411	-
33	553	Prod Maint	MGD275M05NEM0000066201		186,690	186,690	-
34	553	Prod Maint	MGD275M05NEM0000066501	0	112,650	112,650	-
35	553	Prod Maint	MGD275M06NEM0000022150	0	223,411	223,411	-
36	553	Prod Maint	MGD275M06NEM0000022201	0	186,690	186,690	-
37	553	Prod Maint	MGD275M08NEM0000067150	-260	223,411	223,671	-86027
38	553	Prod Maint	MGD275M08NEM0000067201	-11,165	149,390	160,555	-1438
39	553	Prod Maint	MGD275M08NEM0000067501	0	60,885	60,885	-
40	553	Prod Maint	MGD275M09NEM0000052150	202,004	0	-202,004	-100
41	553	Prod Maint	MGD275M09NEM0000052201	285,125	0	-285,125	-100
42	553	Prod Maint	MGD275M11NEM0000068150	283,718	0	-283,718	-100

PRODUCTION OPERATION & MAINTENANCE EXPENSE

Variance Report (2006 recorded vs. 2007 budget)[1]

Variance Criteria: +/- 10% and > $45K

(sorted by Acct Block, NARUC Acct., Codeblock)

Line	NARUC Acct.	Acct Block	Codeblock	2006 Recorded ($)	2007 Budget ($)	+/- ($)	+/- (%)
43	553	Prod Maint	MGD275M11NEM0000068201	513,268	0	-513,268	-100
44	553	Prod Maint	MGD275M11NEM0000068501	122,743	0	-122,743	-100
45	553	Prod Maint	MGD275M12NEM0000050150	6,381	296,264	289,883	4543
46	553	Prod Maint	MGD275M12NEM0000050201	51,475	451,458	399,983	777
47	553	Prod Maint	MGD275M12NEM0000050501	50,794	123,350	72,556	143
48	553	Prod Maint	MGD275M13NEM00000055201	1,186	300,000	298,814	25195
49	553	Prod Maint	MGD277M04NENMGZZZZZ501	156,461	53,496	-102,965	-66
50	553	Prod Maint	MGD277M06NENMGZZZZZ150	57,773	3,392	-54,381	-94
51	553	Prod Maint	MGD277M06NENMGZZZZZ201	33,118	84,051	50,933	154
52	553	Prod Maint	MGD277M08NENMGZZZZZ150	56,528	5,899	-50,629	-90
53	553	Prod Maint	MGD277M08NENMGZZZZZ201	56,453	0	-56,453	-100
54	553	Prod Maint	MGD277M10NENMGZZZZZ150	59,503	5,178	-54,325	-91
55	553	Prod Maint	MGD277M10NENMGZZZZZ201	68,045	0	-68,045	-100
56	553	Prod Maint	MGD277M12NENMGZZZZZ150	70,793	9,077	-61,716	-87
57	553	Prod Maint	MGD277M12NENMGZZZZZ201	56,186	176,493	120,307	214
58	553	Prod Maint	MGD277M12NENMGZZZZZ501	105,299	0	-105,299	-100
59	553	Prod Maint	MGD277M13NENMGZZZZZ150	55,826	4,821	-51,005	-91
60	553	Prod Maint	MGD277M13NENMGZZZZZ201	317,723	0	-317,723	-100
61	553	Prod Maint	MGD277M13NENMGZZZZZ501	314,518	0	-314,518	-100
62	553	Prod Maint	MGD277M13NENMGZZZZZ900	723,081	0	-723,081	-100
63	553	Prod Maint	MGE275M19NENMGZZZZZ201	67,541	5,227	-62,314	-92
64	553	Prod Maint	MGE275M08NEM0000067150	0	53,588	53,588	-
65	553	Prod Maint	MGE275M11NEM0000068150	46,358	0	-46,358	-100
66	553	Prod Maint	MGE275M12NEM0000050150	0	47,686	47,686	-
67	553	Prod Maint	MGM267MNSNENMGZZZZZ201	138,507	0	-138,507	-100
68	553L	Prod Maint	MGL275L07NEM0000032201	285,433	0	-285,433	-100
69	553L	Prod Maint	MGL275L07NEM0000032501	78,113	0	-78,113	-100
70	553L	Prod Maint	MGL275L08NEM0000033201	51,919	0	-51,919	-100
71	553L	Prod Maint	MGL275L08NEM0000033501	220,354	0	-220,354	-100
72	553L	Prod Maint	MGL277L08NEM0000033501	327,098	0	-327,098	-100
73	553M	Prod Maint	MGT275G07NEM0000156501	0	263,315	263,315	-
74	553M	Prod Maint	MGT275G08NEM0000030501	0	263,315	263,315	-
75	553M	Prod Maint	MGT275G09NEM0000031501	0	263,315	263,315	-
76	553M	Prod Maint	MGT277G07NENMGZZZZZ201	77,870	7,943	-69,927	-90
77	554	Prod Maint	MGC875MWTNENMGZZZZZ201	33,548	83,691	50,143	149

Reference: See MECO-WP-510 (Updated April 2007) for variance explanations.

[1] Original Version of this exhibit (submitted with Direct Testimony) compared 2005 Recorded with 2007 Budgeted.

MECO T-6
DOCKET NO. 2006-0387

TESTIMONY OF
ANDREW C. HERRERA

MANAGER
TRANSMISSION AND DISTRIBUTION DEPARTMENT
MAUI ELECTRIC COMPANY, LIMITED

Subject: Transmission and Distribution ("T&D") System
T&D Operation and Maintenance ("O&M") Expenses
T&D and Engineering Department Staffing
T&D Materials Inventory

INTRODUCTION

Q. Please state your name and business address.

A. My name is Andrew C. Herrera and my business address is 210 West Kamehameha Avenue, Kahului, Hawaii.

Q. By whom are you employed and in what capacity?

A. I am employed by Maui Electric Company, Limited ("MECO" or "Company") as the Manager of the Transmission and Distribution ("T&D") Department.

Q. Please summarize your educational background and professional experience that relate to your testimony in this proceeding.

A. I have been employed for approximately 20 years at MECO in various positions involving the design, construction, operation, and maintenance of the Company's T&D facilities. MECO-600 provides my educational background and work experience in greater detail.

Q. Please specify the areas that your testimony will address.

A. My testimony will cover the following areas:

- Introduction providing a discussion of the major drivers causing the increase in total T&D O&M expenses between the 2007 test year as compared to 2005 actuals
- Description of the MECO T&D system
- Summary of MECO's T&D operation and maintenance ("O&M") test year expense
- Transmission O&M test year expense
- Distribution O&M test year expense
- Reasonableness of MECO's T&D O&M test year expense
- T&D plant aging
- MECO's T&D projected utility plant growth
- MECO system reliability

- Staffing for MECO's T&D and Engineering Departments
- MECO's test year T&D materials inventory

Q. What is the 2007 test year estimates for T&D O&M expenses?

A. As shown in MECO-602, the 2007 test year estimate for T&D O&M expenses is $8,613,341, broken down as follows:

Transmission O&M Expense	$2,276,738
Distribution O&M Expense	$6,336,603
Total T&D O&M Expenses	$8,613,341

See lines 1 through 3, column D of MECO-602.

Q. How does the total T&D O&M 2007 test year estimate compare to the 2005 T&D O&M actual year end totals?

A. The 2007 test year estimate of $8,613,341 is $1,719,829 more then the total T&D O&M expense for 2005 of $6,893,512. See MECO-603 (page 2, line 12, column G).

Q. Please generally describe the reasons for the $1,719,829 difference.

A. MECO is increasing its efforts in a number of different areas to maintain and improve the quality and reliability of its T&D infrastructure. The following summarizes the major drivers:

- Vegetation Management – Compared to 2005, the Company will be increasing its efforts to keep corridors clear of vegetation that could come into contact with the Company's transmission and distribution lines and cause service outages.
- Steel Pole Maintenance and Repairs - Over the last decade MECO began using steel poles for new transmission line additions as a more durable alternative to wood poles. However, with age these first generation poles have started to corrode and will require extensive O&M inspection and maintenance expense to monitor and extend their service life.

- Inspections – MECO will be expanding its system inspection program for both overhead and underground infrastructure. With over 26,000 aging poles requiring yearly inspections, and hundreds of miles of aging underground infrastructure, inspections are increasingly critical to maintain system reliability. The inspection program is aimed at improving reliability, managing the replacement and maintenance of aging equipment, and identifying and remedying equipment that raises environmental concerns, such as oil leaking equipment.
- Improved Systems – MECO is adding new industry proven technology to keep MECO and its systems effective, current, efficient and reliable. MECO is focusing on the benefits of the Supervisory Control and Data Acquisition ("SCADA") system through programs that will expand SCADA use throughout its system to improve MECO's response to system conditions and to improve reliability. MECO's SCADA system will be a critical component to support all other system refinements. Through these systems, MECO will achieve greater efficiency and faster response to system failures.

DESCRIPTION OF THE MECO T&D SYSTEM

Q. Please provide a general description of MECO's T&D system.

A. MECO's T&D system provides electrical power to customers on the islands of Maui, Molokai, and Lanai. Electrical power enters MECO's transmission network through generator step-up transformers located at transmission switching stations at the MECO power plants, as well as through independent (i.e., third party) power producer facilities. The power is then routed through the transmission system to MECO's distribution system where the voltage is lowered and ultimately delivered to MECO's customers. The islands of Maui and Molokai have both transmission and distribution infrastructure, while Lanai only has

distribution infrastructure.

Q. Please describe the independent power producers that provide electric power to MECO's T&D system.

A. There are three independent power producers that currently provide electric power to MECO's system, all through separate power purchase agreements entered into with MECO: (1) Hawaiian Commercial & Sugar Company ("HC&S"), (2) Kaheawa Wind Power, LLC ("Kaheawa Wind"), and (3) Makila Hydro, LLC ("Makila Hydro").

Q. Please describe the independent power producer's respective facilities and the services provided to MECO's T&D system.

A. All three of the facilities generate power from renewable sources. HC&S provides power at transmission voltage to MECO at HC&S's Puunene Mill through the use of sugar cane processing byproducts, with coal serving as a backup fuel. Kaheawa Wind provides power at distribution voltage to MECO utilizing wind mills at Kaheawa Wind's facilities located above Maalaea Harbor. Makila Hydro provides power at distribution voltage from its hydroelectric facility located above Lahaina in the West Maui Mountains. Mr. Michael Ribao's testimony (MECO T-5) provides a further description of MECO's production system and details concerning power purchased from these independent power producers.

Q. Please describe in more detail MECO's transmission system on each island.

A. On the island of Maui, MECO's transmission system is comprised of an interconnected network consisting of 69 kilovolt ("kv") and 23 kv transmission lines that transport electricity from power production sources to distribution substations located throughout the island. The Maui transmission system includes 20 transmission switching stations used to control the flow of power between distribution substations. Three 69 kv overhead lines transport power to the west

side of the island (e.g., Lahaina, Kaanapali, Kapalua). These three lines are radial in design and, although each are independently capable of supplying the energy needs for the west side for short periods of time, all three lines are critical to provide reliable uninterrupted service. The east side of Maui, consisting of the Hana coast and the town of Hana, is served by a single 23 kv radial line without a redundant backup line. The remainder of Maui's population centers are served by a transmission "loop" system, designed to provide redundancy and reliability to the remainder of the system from isolated planned or unplanned interruptions of service to portions of the system. See MECO-601 for a high level diagram illustrating MECO's power delivery system on the island of Maui. MECO's transmission line infrastructure on the island of Maui includes more than 4,200 poles, most of which are wood poles. However, over the last decade MECO began using steel poles for new transmission line additions and it is currently MECO's construction standard for new transmission line construction to utilize steel poles. The use of steel poles is discussed later in my testimony. MECO's transmission system on the island of Molokai is comprised of a single 34.5 kv radial circuit that runs from the Palaau power plant to the Puunana Substation. Molokai's transmission line infrastructure includes approximately 94 wood poles. As mentioned above, MECO's infrastructure on the island of Lanai has no transmission lines.

Q. You stated above that the east side of Maui (Hana coast and the town of Hana) is served by a single 23 kv radial line without a redundant backup line. Please explain what, if any, steps MECO has taken to provide redundancy or increased reliability for this area.

A. To assist in providing reliable service, MECO has located distributive generation at MECO's Hana substation to provide backup power in the event of the loss of the 23 kv Hana transmission line.

Q. Please describe in more detail MECO's distribution system.

A. MECO's distribution system consists of a blend of overhead lines with more than 22,000 wood and steel poles and an extensive underground infrastructure comprised of primary and secondary underground cables of varying voltage and ampacity. Overhead distribution lines on Maui, Molokai, and Lanai generally serve rural areas, older service areas, and some industrial subdivisions, while underground distribution cables mainly serve subdivisions, retail locations, some industrial subdivisions, and other areas where overhead lines are undesirable or where a customer/developer has paid for the additional costs to have the electrical infrastructure installed underground.

As part of this system, 72 distribution substations, with 69 on Maui, one on Molokai, and two on Lanai, are situated near various large customer load centers on Maui, Molokai, and Lanai (e.g., towns, industrial centers, subdivisions) to allow power to be efficiently extracted from the transmission network and lowered to voltages that can be safely and efficiently distributed to MECO's customer base. These substations feed both overhead and underground distribution power lines energized at either 12.47 kv, 7.2 kv, 4.16 kv, or 2.4 kv to customer locations, where the voltage is then further reduced through the use of distribution service transformers in order to meet individual customer service requirements. There are approximately 11,708 distribution service transformers located on Maui, 671 located on Molokai, and 289 located on Lanai.

Q. Are these T&D facilities used and useful in providing utility service to MECO's customers?

A. Yes. These T&D facilities are the backbone of MECO's ability to provide essential electrical service, and their proper operation and maintenance are vital to MECO's ability to provide safe and reliable service to the community and its customers.

SUMMARY OF MECO'S T&D O&M TEST YEAR EXPENSE

Q. What is MECO's 2007 test year estimate of its T&D O&M expense?

A. MECO's test year estimate of its T&D O&M expense is $8,613,341, as shown on MECO-602 (line 3, column D).

Q. Of the total $8,613,341 expense, please provide what portions are attributable to the islands of Maui, Molokai, and Lanai, respectively.

A. As shown on MECO-602, of the total $8,613,341 test year T&D O&M expense, $7,888,117 is attributable to Maui (line 6, column D), $486,817 is attributable to Molokai (line 9, column D), and $238,407 is attributable to Lanai (line 12, column D).

Q. Of the total $8,613,341 expense, please provide what portions are attributable to transmission O&M versus distribution O&M.

A. As shown on MECO-602, of the total $8,613,341 expense, $2,276,738 is attributable to MECO's transmission O&M expense (line 1, column D) and the remaining $6,336,603 is attributable to MECO's distribution O&M expense (line 2, column D).

Q. Of the total transmission O&M expense of $2,276,738, please provide what portions are attributable to Maui, Molokai, and Lanai, respectively.

A. As shown on MECO-602, of the total transmission O&M expense of $2,276,738, Maui's transmission O&M expense accounts for $2,243,594 (line 4, column D), Molokai accounts for $33,144 (line 7, column D), and Lanai accounts for zero of this amount, as it has no transmission infrastructure (line 10, column D).

Q. Of the total distribution O&M expense of $6,336,603, please provide what portions are attributable to Maui, Molokai, and Lanai, respectively.

A. As shown on MECO-602, of the total distribution O&M expense of $6,336,603, Maui's distribution O&M expense accounts for $5,644,523 (line 5, column D), Molokai accounts for $453,673 (line 8, column D), and Lanai accounts for

$238,407 (line 11, column D).

Q. How does the 2007 test year T&D O&M expense compare to previous years?

A. Line 12 of page 2 of MECO-603 shows MECO's actual T&D O&M expenses recorded from 2001 through 2005 (columns A to E), budgeted for 2006 (column F), together with the 2007 test year estimate (column J). These amounts are also broken down separately into a total transmission O&M expense amount (MECO-603, page 1, line 9), as well as a total distribution O&M expense amount (MECO-603, page 2, line 9). These amounts are also shown on MECO-621, which includes a chart illustrating the generally upward trend in transmission O&M, distribution O&M and total T&D O&M expenses from 2001 recorded through 2005 recorded, 2006 budgeted, and for the test year 2007 estimate.

Q. Please explain in general the reasons why the 2007 T&D O&M expense is greater than the trend at which the Company's T&D expenses have generally increased on an annual basis since 2001.

A. As discussed above as well as later in my testimony, the increases are primarily caused increased vegetation management efforts, system plant aging, increased inspections, and technological changes and improvements, as well as by other factors such as increased labor cost, cost of materials, growth in the T&D utility plant, mapping expenses, and staffing changes. Variances between test year 2007 and 2005 recorded amounts of more than $45,000 and 10% are identified and explained in MECO-620 and MECO-620A.

Q. What items are included in MECO's T&D O&M expense?

A. The T&D O&M expense includes the labor and non-labor items incurred in the operation and maintenance of MECO's T&D system. These items are captured in the following NARUC series of accounts:

560-567	-	Transmission Operation Expenses
568-573	-	Transmission Maintenance Expenses

580-589 - Distribution Operation Expenses

590-598 - Distribution Maintenance Expenses

See MECO-608 for the 2007 test year amounts attributable to each of the above categories by island and in total, together with a comparison against the 2005 recorded amounts. See also MECO-603. MECO-WP-608A provides the NARUC descriptions of these accounts and a cross reference to MECO's Activity Based Management ("ABM") activity codes that are included in these NARUC accounts.

Q. How are costs by NARUC account distinguished for the islands of Maui, Molokai, and Lanai?

A. A cost incurred for Molokai is reflected by adding an "M" after the NARUC account number (e.g., 569M), a cost incurred for Lanai is reflected by adding an "L" after the NARUC account (e.g., 569L), and a cost incurred for the island of Maui does not have a letter designation following the NARUC account (e.g., 569).

Q. What are the estimated labor and non-labor amounts for the 2007 test year T&D O&M expense?

A. As shown in MECO-603, the 2007 test year T&D O&M expense for labor and non-labor for all of MECO are as follows:

Transmission Operation Labor	$305,931
Transmission Operation Non-labor	$430,606
Transmission Maintenance Labor	$468,759
Transmission Maintenance Non-labor	$1,071,442
Distribution Operation Labor	$1,744,472
Distribution Operation Non-labor	$1,420,462
Distribution Maintenance Labor	$1,129,299
Distribution Maintenance Non-labor	$2,042,370

Total T&D O&M expense $8,613,341

The above transmission O&M expenses and their labor and non-labor components are further broken down by island on MECO-604 and MECO-605. The above distribution O&M and total T&D O&M expenses and their respective labor and non-labor components are broken down by island on MECO-606 and MECO-607.

Q. Is the 2007 T&D O&M test year estimate amount accurate and reasonable?

A. Yes. The 2007 test year estimate for T&D O&M reflects the Company's best estimate of the costs to accomplish the work necessary to provide essential electrical service to the Company's customers in the test year, and is reasonable.

TRANSMISSION O&M EXPENSE ESTIMATE

Q. What is MECO's 2007 test year estimate for transmission O&M expense?

A. MECO's 2007 test year estimate for transmission O&M expense for all three islands it serves is $2,276,738, as shown on MECO-602 (line 1, column D), MECO-603 (page 1, line 9, column J) and MECO-605 (line 9, column I). Of the total $2,276,738, Maui's transmission O&M expense accounts for $2,243,594 and Molokai's transmission O&M expense accounts for the remaining $33,144, as shown on MECO-602 (column D, lines 4 and 7, respectively), MECO-604 (line 9, column J, pages 1 and 2, respectively), and MECO-605 (line 9, columns A and B, respectively). As noted above, Lanai has no transmission infrastructure.

Transmission Operation Expense Estimate

Q. What is MECO's 2007 test year estimate for transmission operation expense?

A. MECO's 2007 test year estimate for transmission operation expense for all islands is $736,537, as shown on MECO-603 (page 1, line 3, column J) and MECO-605 (line 3, column I). Of the total $736,537 amount, Maui's transmission operation expense accounts for $724,037 and Molokai's transmission operation expense accounts for the remaining $12,500, as shown on MECO-604 (line 3, column J,

pages 1 and 2, respectively) and MECO-605 (line 3, columns A and B, respectively). As noted above, Lanai has no transmission infrastructure.

Q. What items are included in transmission operation expense?

A. Transmission operation expense includes labor and non-labor costs in the test year amounts shown on lines 1 and 2 of MECO-603 (page 1, column J), MECO-604 (pages 1 and 2, column J), and MECO-605 (column I). These costs support activities such as load dispatching, transmission switching operations, transmission substation inspections and operations, communications systems operations including SCADA, and transmission line, pole, and structure inspections. See MECO-WP-602A (pages 1 and 3) and MECO-WP-602B (pages 1 and 5) for a breakdown of these costs by NARUC account number.

Q. How does the 2007 test year estimate for transmission operation expense compare to previous years?

A. MECO-603 shows MECO's transmission operation expense recorded from 2001 through 2005, budgeted for 2006, and then for the 2007 test year (line 3, columns A to E, F, and J, respectively). In addition, MECO-621 contains a chart showing a general increase in the trending of these amounts from 2001-2007. Consistent with this trending, the 2007 test year expense is higher than previous years. Throughout this testimony, I will compare the 2007 test year estimates with the latest recorded amounts, 2005, available as of the time of the preparation of this testimony. As a result, it should be noted that these comparisons cover a two-year period.

Q. How does the 2007 test year expense for transmission operation expense compare by islands with the recorded 2005 transmission operation expense for those islands?

A. For the island of Maui, as shown on MECO-608, there is a total difference of $201,276 (line 10, column G) between the recorded 2005 transmission operation

expense of $522,761 (line 10, column D) and the 2007 test year expense of $724,037 (line 10, column E). For Molokai, as also shown on MECO-608, there is a total difference of $5,033 (line 19, column G) between the recorded 2005 transmission operation expense of $7,467 (line 19, column D) and the 2007 test year expense of $12,500 (line 19, column E). As noted above, Lanai has no transmission infrastructure.

Q. Please explain these differences.

A. For Maui, the $201,276 difference results mainly from the following factors: (1) increased coverage required for inspections of transmission facilities in order to maintain system reliability and to support steel pole line inspections and repairs, (2) increased support needed to comply with the State's fairly recently mandated "One Call" program ($83,099.17, NARUC code 584) (see MECO-WP-608B, page 1, line 14), and (3) increased need for outside services to update and maintain transmission mapping ($20,000, NARUC code 588) (see MECO-WP-608B, page 2, line 2). All of the above factors are discussed in further detail later in my testimony. For Molokai, the $5,033 increase is primarily due to a lease with Molokai Ranch for a microwave communication system effective 2006 (see MECO-WP-608B, page 10).

Q. Are there other details of the differences?

A. Yes. MECO-WP-602B provides further details on the differences for transmission operations expenses as well as transmission maintenance, distribution operations and distribution maintenance expenses.

<u>Transmission Maintenance Expense Estimate</u>

Q. What is MECO's 2007 test year estimate for transmission maintenance expense?

A MECO's 2007 test year estimate for transmission maintenance expense for all islands is $1,540,201, as shown on MECO-603 (page 1, line 6, column J) and MECO-605 (line 6, column I).

Q. What is the breakdown of this amount by island?

A. Of the total $1,540,201 amount, Maui's transmission maintenance expense accounts for $1,519,557 and Molokai's transmission maintenance expense accounts for the remaining $20,644, as shown on MECO-604 (line 6, column J, pages 1 and 2, respectively) and MECO-605 (line 6, columns A and B, respectively). As noted above, Lanai has no transmission infrastructure.

Q. What items are included in transmission maintenance expense?

A. Transmission maintenance expense includes labor and non-labor costs in the amounts shown on lines 4 and 5 of MECO-603 (page 1), MECO-604 (pages 1 and 2), and MECO-605. These costs support activities such as maintenance and repairs related to transmission substation equipment and facilities, communications equipment, transmission lines and cables, and tree trimming. See MECO-WP-602A (pages 1 through 4) for a breakdown of these expenses by NARUC account number.

Q. How does the 2007 test year estimate for transmission maintenance expense compare to previous years?

A. Page 1 of MECO-603 shows MECO's transmission maintenance expense recorded from 2001 through 2005, budgeted for 2006 and for the 2007 test year (line 6, columns A to E, F, and J, respectively), and MECO-621 contains a chart showing a general increase in the trending of these amounts from 2001 to 2007. Consistent with this trending, the 2007 test year expense is higher than previous years.

Q. How does the 2007 test year expense for transmission maintenance compare with the recorded 2005 transmission maintenance expense?

A. As shown on MECO-608, there is a total difference of $413,599 (line 2, column G) between the recorded 2005 transmission maintenance expense of $1,126,602 (line 2, column D) and the 2007 test year expense of $1,540,201

(line 2, column E). Of the total $413,599 difference, Maui accounts for $405,126 of this difference and Molokai accounts for the remaining $8,473 (column G, lines 11 and 20, respectively).

Q. Please explain these differences.

A. For Maui, the $405,126 difference between the 2005 recorded and 2007 test year transmission maintenance expense results from multiple causes, including (1) the steel pole maintenance program that requires both MECO personnel ($214,404) and outside services ($150,000) (NARUC code 571) (see MECO-WP-608B, page 3, lines 16 and 17, respectively), and (2) the addition of Energy Management System (EMS) / (SCADA) historian software costs and the associated annual historical data system licensing fees totaling $123,000 (NARUC code 573) (see MECO-WP-608B, page 4, line 4). For Molokai, the $8,473 difference (see MECO-WP-608B, page 9, line 19) results primarily from increased SCADA related costs totaling $7,543 (NARUC code 573M, Activity 354) (see MECO-WP-608B, page 8, line 14).

Q. Are there other details of the differences?

A. Yes. MECO-WP-602B (pages 2, 5, and 6) provides further details on the differences for transmission maintenance expenses between the 2007 test year and 2005 actuals.

DISTRIBUTION O&M EXPENSE ESTIMATE

Q. What is MECO's 2007 test year estimate for distribution O&M expense?

A. MECO's test year estimate for distribution O&M expense for all islands serviced is $6,336,603, as shown on MECO-602 (line 2, column D), MECO-603 (page 2, line 9, column J) and MECO-607 (line 9, column I).

Q. What is the breakdown of this amount by island?

A. Of this $6,336,603 amount, Maui's distribution O&M expense accounts for $5,644,523, Molokai's distribution O&M expense accounts for $453,673, and

Lanai's distribution O&M expense accounts for the remaining $238,407, as shown on MECO-602 (column D, lines 5, 8 and 11, respectively), MECO-606 (line 9, column J, pages 1, 2 and 3, respectively), and MECO-607 (line 9, columns A, B and C, respectively).

Distribution Operation Expense Estimate

Q. What is MECO's 2007 test year estimate for distribution operation expense?

A. MECO's 2007 test year estimate for distribution operation expense for all islands is $3,164,934, as shown on MECO-603 (page 2, line 3, column J) and MECO-607 (line 3, column I).

Q. What is the breakdown of this amount by island?

A. Of this $3,164,934 amount, Maui's distribution operation expense accounts for $3,002,107, Molokai's distribution operation expense accounts for $56,882, and Lanai's distribution operation expense accounts for the remaining $105,945, as shown on MECO-606 (line 3, column J, pages 1, 2 and 3, respectively) and MECO-607 (line 3, columns A, B and C, respectively).

Q. What items are included in distribution operation expense?

A. Distribution operation expense includes labor and non-labor costs in the amounts shown on lines 1 and 2 of MECO-603 (page 2), MECO-606 (pages 1 through 3), and MECO-607. These costs support activities such as trouble dispatching and distribution switching operations, distribution substation inspections and operations, distribution line, pole and structure inspections, connecting, disconnecting and locking meters, investigating customer complaints, and testing and treating of wood distribution poles. See MECO-WP-602A (pages 2, 4, and 5) for a breakdown of these expenses by NARUC account number.

Q. How does the 2007 test year estimate for distribution operation expense compare to previous years?

A. Page 2 of MECO-603 shows MECO's distribution operation expenses from

recorded 2001 through 2005, budgeted for 2006 and for the 2007 test year (line 3, columns A to E, F and J, respectively), and MECO-621 contains a chart showing a general increase in the trending of these amounts from 2001 to 2007. Consistent with this trending, the 2007 test year estimate is higher than previous years.

Q. How does the 2007 test year estimate for distribution operation expense compare with the recorded 2005 distribution operation expense?

A. As shown on MECO-608, there is a total difference for all islands served of $625,074 (line 4, column G) between the recorded 2005 distribution operation expense of $2,539,860 (line 4, column D) and the 2007 test year expense estimate for distribution operation of $3,164,934 (line 4, column E). Of this $625,074 difference, Maui accounts for $665,075, Molokai accounts for ($45,827), and Lanai accounts for the remaining $5,826. See MECO-608 (column G, lines 13, 22 and 31, respectively).

Q. Please explain the differences.

A. The $625,074 difference between the 2005 recorded and 2007 test year distribution operation expense for all islands is driven by the following four main factors.

1. Trending increases in failures of aging plant assets.
2. Estimates of funds to support the new State mandated "One Call" system.
3. New Mapping efforts to upgrade and maintain distribution maps for all of MECO.
4. New outside services to support mapping initiatives.

MECO-WP-602B (pages 3, 4, 6, 7, and 8) provides further details on the differences for distribution operation expenses between the 2007 test year and 2005.

<u>Distribution Maintenance Expense Estimate</u>

Q. What is MECO's 2007 test year estimate for distribution maintenance expense?

A. MECO's 2007 test year estimate for distribution maintenance expense for all islands is $3,171,669 as shown on MECO-603 (page 2, line 6, column J) and MECO-607 (line 6, column I).

Q. What is the breakdown of this amount by island?

A. Of the total $3,171,669 amount, Maui's distribution maintenance expense accounts for $2,642,416, Molokai's distribution maintenance expense accounts for $396,791, and Lanai's distribution maintenance expense accounts for the remaining $132,462, as shown on MECO-606 (line 6, column J, pages 1, 2 and 3, respectively) and MECO-607 (line 6, columns A, B and C, respectively).

Q. What items are included in distribution maintenance expense?

A. Distribution maintenance expense includes labor and non-labor costs in the amounts shown on lines 4 and 5 of MECO-603 (page 2), MECO-606 (pages 1 through 3), and MECO-607. These costs support activities such as maintenance and repairs to distribution substation equipment and facilities, distribution lines and cables, and tree trimming. See MECO-WP-602A (pages 2 through 6) for a breakdown of these expenses by NARUC account number.

Q. How does the 2007 test year estimate for distribution maintenance expense compare to previous years?

A. Page 2 of MECO-603 shows MECO's distribution maintenance expense recorded from 2001 through 2005, budgeted for 2006 and for the 2007 test year (line 6, columns A to E, F and J, respectively). MECO-621 contains a chart showing a general increase in the trending of these amounts from 2001 to 2007. The 2007 test year estimate is $474,847 higher than the 2005 recorded expense, as shown on MECO-608 (line 5, column G).

Q. How does the 2007 test year estimate for distribution maintenance expense compare with the recorded 2005 distribution maintenance expense?

A. As mentioned above, there is a total difference of $474,847 between the recorded

2005 distribution maintenance expense of $2,696,822 and the 2007 test year estimate for distribution maintenance expense of $3,171,669. See MECO-608 (line 5, columns D and E, respectively). Of this $474,847 difference, Maui accounts for $318,014, Molokai accounts for $115,411, and Lanai accounts for the remaining $41,422 of this difference. See MECO-608 (column G, lines 14, 23, and 32, respectively).

Q. Please explain the differences.

A. The $474,847 difference between the 2005 recorded and 2007 test year distribution maintenance expense for all islands is mainly driven by the following factors:

1. Increased vegetation management expense, which were lower in 2005 than historical averages. The 2007 estimate is inline with historical trending. See MECO-622 and MECO-WP-622.
2. SCADA/EMS System Annual Licensing fees of $50,000. See MECO-WP-608B (page 5, line 2). This was taken over from Information Services (MWI) in May 2006 along with the transfer of the SCADA/EMS Engineer from MWI to Operations (MDR) (NARUC code 598).
3. Necessity of increasing preventive plant asset maintenance due to aging, mainly on the island of Maui. See MECO-WP-602B for a breakdown by island.

All of the above factors were generally discussed in the introduction section of my testimony above, and are also discussed in further detail later in my testimony. In addition, MECO-WP-602B (pages 4, 5, 7, 8, and 9) provides further details on the differences for distribution maintenance expenses between the 2007 test year and 2005.

REASONABLENESS OF TEST YEAR T&D O&M EXPENSE

Q. Is MECO's 2007 test year expense for T&D O&M reasonable?

A. Yes. The 2007 test year expense is reasonable because it is based on the expenses necessary to operate and maintain a reliable T&D system.

Test Year T&D O&M Expense Estimate

Q. How was the 2007 test year estimate of T&D O&M expense derived?

A. The 2007 test year estimate for T&D O&M expense is based on MECO's current O&M expense budget for 2007.

Q How is the T&D O&M budget prepared?

A. The T&D O&M budget is prepared using the MECO Pillar System. Each responsibility area ("RA") within a department determines the level of O&M work required to provide reliable electric service to MECO's customers. This level of work is based on a combination of inspection cycles, units of work, and historical trends, and is estimated by staff members with inherent knowledge of the operating and maintenance requirements for MECO's facilities and systems. Each RA then budgets labor and non-labor costs to activities as outlined in MECO's ABM manual, with each ABM activity code block corresponding to a NARUC account number for the collection of costs into proper accounts. See MECO-WP-608A for a cross reference between ABM and NARUC account numbers.

Q. Were any normalization or other adjustments to the 2007 made to the operating budget to determine the 2007 T&D O&M test year estimate?

A. Yes. Budget adjustments were necessary to correct for expenses related to abandoned projects, and for a recurring $15,000 amount in annual Transmission Outage Application (TOA) software fees and services for the Maui division starting in 2007 that were not included in the budget. See MECO-WP-602C for information on the abandoned projects. The TOA yearly fees are software maintenance fees that provide software onsite and remote trouble support as well

as custom programming adaptation to meet end user's dynamic needs.

Q. How are direct labor costs budgeted?

A. The standard unit of measurement in the T&D O&M estimate is a "man-hour". In other words, the labor requirements to complete a specific task are determined based on the estimated number of man-hours that it will take to complete that task. The man-hours are then converted to direct labor dollars by multiplying the man-hours by the applicable wage rates in the Pillar System. These wage rates utilize standard labor rates (SLR), which are compiled and determined based on existing union wage agreements and salary estimates for merit employees as discussed by Mr. Matsunaga in MECO T-9.

Q. How are direct non-labor costs budgeted?

A. Direct non-labor costs reflect estimates for materials, information system services, and outside contracts/services. These costs are budgeted in dollars and represent the non-labor requirements necessary to support the work that needs to be performed. These budgeted dollars are determined using known increases for non-labor requirements as well as estimated inflation adjustments as deemed appropriate.

Q. Does the Company's total T&D O&M expense estimate include only direct labor and direct non-labor costs?

A. No. Overhead costs, or "on-cost" charges, are also applied to direct T&D labor and non-labor expenses, but are not added to outside services. These overhead costs include related indirect expenses such as Energy Delivery Process Area (EDPA) supervision and administrative costs as well as non-productive wages. Therefore, total T&D expense is the sum of direct labor costs, direct non-labor costs and applicable overhead.

<u>Explanation of T&D O&M Increases</u>

Q. How is MECO's T&D O&M expense expected to change after 2005?

A. The total recorded T&D O&M expense was $6,893,512 in 2005 as shown on MECO-603 (page 2, line 12, column E). As shown on MECO-603 (page 2, line 12, column J), the Company projects this expense to increase over the 2-year period by $1,719,829 to $8,613,341 in the 2007 test year.

Q. Why is the T&D O&M expense for the 2007 test year expected to increase?

A. As mentioned earlier in my testimony, the 2007 test year estimate for T&D O&M expense is expected to increase due to the following factors, each of which is separately discussed in further detail below:

1) T&D plant aging.
2) Growth in the T&D utility plant.
3) System reliability improvements.
4) Major reliability initiatives.
5) Staffing increases.
6) Increases in wages and non-labor rates.

T&D PLANT AGING

Q. How are T&D O&M expenses affected by aging plant?

A. As T&D facilities age, additional time and emphasis must be placed on increased inspection and maintenance of these facilities to attempt to identify and correct any potential failures before they can cause service outages or interruptions, as well as to ensure that customer service reliability is maintained. In addition to requiring an increase in inspection and preventive maintenance requirements and resulting expenses, plant aging also is directly linked to system failures in service.

Q. Please explain the link between plant aging and system failures.

A. All materials, devices, and components utilized in MECO's electrical infrastructure are produced by manufacturers specializing in utility specific manufacturing. All products are generally sold to MECO with an estimated service life under normal operating conditions provided by the manufacturer based

on its estimate at the time of manufacture. Generally, as a plant item reaches, nears and even surpasses its estimated life, the risk and likelihood of the item and/or one of its components failing naturally increases.

Q. What has been MECO's experience with plant aging and how has it impacted MECO's O&M expense?

A. A large portion of the components in MECO's T&D infrastructure are currently in excess of the predicted estimated life span provided by the respective manufacturers. However, many of these components remain serviceable due to the preventive maintenance program implemented by MECO. MECO has an ongoing inspection process for identifying these liabilities and refurbishing or replacing them. In many cases, these refurbishments and replacements are capital projects and do not directly affect T&D O&M expenses. However, there are components of MECO's T&D infrastructure that are failing at an increasing rate that do impact and increase T&D O&M expenses.

Direct Buried Underground Cable Faults

Q. Please provide an example of MECO's plant aging that impacts O&M expenses.

A. MECO-609 provides information on the increasing age of the Company's direct buried, or underground, distribution subdivision infrastructure and its corresponding increasing failure rate. As noted on page 3 of MECO-609, MECO's system currently includes 17 subdivisions with over 80,500 feet of primary direct buried cable that are in excess of 20 years old, that have surpassed the original manufacturers' estimated life span of 15 to 20 years (depending on the manufacturer), and that have been and are currently experiencing escalating faults. As a result, these direct buried cables, both primary (high voltage distribution) and secondary (low voltage customer service), must be repaired on a more frequent basis.

Q. Explain how these direct buried cable failures have impacted O&M spending.

A. Generally, new underground direct buried cables require less maintenance and repair than their overhead counterparts. As a result, the installation of a new underground cable has generally resulted in initially lower O&M expenses being required on an annual basis than the installation of a comparable distance of overhead cable. However, the cost to repair an underground cable fault when it does occur is usually greater than an overhead fault, due to the added labor and cost intensive efforts that are required to locate, excavate and splice the underground cable fault, as further discussed below. As a result, over time, with the more frequent occurrence of cable faults due to the increasing age of the direct buried cables, the Company's resulting O&M expenses have correspondingly increased.

Q. What are the direct areas in which O&M spending is impacted as a result of direct buried cable faults?

A. Direct buried cable faults directly impact O&M spending in four main areas.

1. Clearing of Cables. This involves the process of separating the faulted cable from the system and restoring service to customers. This work starts immediately after customers call MECO Dispatch to report a power outage. MECO Dispatch dispatches Primary Trouble Men ("PTM") to the area to investigate the outage, clear the cable, and restore service to the affected customers. This is a lengthy process and can occur at any time of the day, which means that there is an approximately 55% chance that the outage will occur during non-business hours, when overtime expenses will be incurred by the Company. After a cable fault is repaired, the PTM must then return to the location and energize the repaired cable and restore the system to normal. All labor and non-labor charges related to investigating, clearing, and restoring cable faults are recorded as direct O&M expenses.

2. Fault Location. In order to repair direct buried cable, the exact location of

the fault site must be determined. This process involves a line crew utilizing industry standard fault finding equipment. The process of locating faults is a complicated process that can take anywhere from a few hours to a few days to locate the fault, depending on the type of cable involved, soil composition and terrain, and type of fault (high resistance or low resistance). All labor and non-labor charges related to this phase are also recorded as a direct O&M expense.

3. Excavation. Once a fault is located, the area must then be carefully excavated since the fault is often located in the immediate proximity of other energized infrastructure. This usually requires the cutting and removal of large sections of sidewalks, which cover the original cable trench, followed by mostly a "hand digging" process. Once the faulted cable damage is excavated, the crew then makes repairs, retests the cable, and back fills the excavation. All labor and non-labor charges for this phase are recorded as direct O&M expenses.

4. Restoration. The final step in the process is to replace the concrete sidewalks. This function is usually performed by an outside services contractor. These costs have continually increased as the cost of outside labor and concrete has increased. All of these outside service costs are recorded as O&M expenses. See page 2 of MECO-609 for typical direct buried cable fault repair labor and non-labor expenses.

Q. Has MECO added specific capital projects to address the underground failures in the subdivisions described above?

A. Yes. MECO has both completed capital projects to address these types of system failures and has more similar projects planned over the next five years. One example of a completed project is at the Kaanapali Vista Subdivision, where MECO has replaced the entire underground direct buried primary cable

infrastructure. Since this $398,615 project was completed in December 2004, no cable faults have occurred in this subdivision. Other direct buried subdivisions that MECO is studying for future projects are listed in page 3 of MECO-609.

Q. What is MECO doing to control these costs and minimize the occurrences of direct buried cable faults?

A. As mentioned above, MECO is in the process of studying the subdivisions listed in page 3 of MECO-609, to determine the need to replace all or portions of the underground direct buried cable. To assist in this process, MECO has implemented a new program to test and evaluate the condition of its direct buried infrastructure and conduit-encased infrastructure in order to prioritize and budget for cable replacement. This program is built around new technology that has only recently become available to the industry. MECO's new program, utilizing Very Low Frequency (VLF) testing combined with Tan Delta testing, will start in the first quarter of 2007 and will be an ongoing program for the foreseeable future. The cost of this program is a new O&M expense with a test year amount of $64,536 including labor and related overhead, which is captured under NARUC 594. See MECO-WP-608B (page 6, line 7). However, the replacement of the high risk cable fault infrastructure will be recorded as capital projects.

<u>Steel Pole Maintenance and Repairs</u>

Q. How else has MECO's T&D plant aging impacted O&M expense?

A. As stated earlier in my testimony, although most of MECO's approximately 4,200 poles are wood poles, over the last decade MECO began using steel poles for new transmission line additions and it is currently MECO's construction standard for new transmission line construction to utilize steel poles. MECO currently has approximately 383 steel poles on the transmission and distribution system. These steel pole assets were installed as an alternative to wood poles, as wood poles are subject to rotting, termites, and the wind. However, Hawaii's

environment of salt, high ultraviolet radiation and wind has begun to deteriorate the condition of these first generation steel pole finishes. As a result, these first generation poles have started to corrode and will require extensive O&M inspection and maintenance expense to monitor and extend their service life. For 2007, MECO has budgeted $364,404 for repairs to steel poles, of which $214,404 is for MECO labor and related overheads, with the remaining $150,000 for outside services. See MECO-WP-608B (page 3, lines 13, 16 and 17, respectively).

Q. What is the time frame and cost for repairing all of MECO's steel poles?

A. MECO is estimating the time necessary to de-energize and ground the line, to strip and refinish the pole, and then to remove grounds and re-energize the line to generally take approximately two to three days per pole and with a possible total cost to repair all the steel poles in excess of $1.3 million. See MECO-WP-608C. However, the actual time and cost to complete a pole will depend on the severity of the damage, the complexity of the pole, and the ability to remove the line from service.

Q. Will the corrosion on the steel poles identified above create any immediate safety or reliability issues for MECO?

A. Corrosion of steel poles does create a potential public safety hazard if not addressed in a timely manner. Because of this, MECO will initially focus its steel pole maintenance efforts on those poles that are in the most need of repair. In addition, MECO is increasing the scope and frequency of pole inspections to monitor the condition of these assets to assist in prioritizing their repair. In addition to extending service life, one of the goals of MECO's steel pole rehabilitation efforts is to prevent them from becoming public hazards.

Q. Considering the cost of steel pole maintenance, why has MECO chosen to use steel poles for all new transmission construction?

A. Steel poles offer many advantages over wood poles. Among these advantages is a

conservative expected life span of at least two times that of wood poles. When total wood pole costs, together with the installation cost of multiple replacements of wood poles over those of steel poles, are taken into consideration, this life expectancy advantage offsets the initial steel pole cost difference and greatly improves reliability. Another advantage of steel poles is that they are not susceptible to ground termite damage, which is a significant problem that plagues the structural integrity of wood poles in Hawaii and one that creates public safety and system reliability issues. A third advantage of steel poles over wood poles is strength. Steel poles are seldom damaged in vehicle pole accidents and they have a significantly higher wind tolerance than wood poles to withstand storms and even hurricanes. These last two benefits also greatly increase system reliability.

Q. What is MECO doing to manage the expenses due to aging plant?

A. MECO will continue to maintain its level of O&M spending, which places emphasis on its inspection programs that identify problems, and maintenance programs to correct the problems before they result in disruption of service to the Company's customers. In addition, the Company has steadily increased its capital spending in plant replacement programs to replace these aging assets.

MECO T&D UTILITY PLANT GROWTH

Q. How has MECO's T&D utility plant increased in recent years?

A. As shown on MECO-610, the amount of MECO's T&D plant was recorded at $18,791,000 in 2005 (line 3, column D), of which $2,965,000 was attributable to transmission plant (line 3, column B) and the remaining $15,826,000 of which was attributable to distribution plant (line 3, column C). The 2007 test year T&D plant is estimated to be $24,745,000 at year-end (line 1, column D), of which $4,423,000 is attributable to transmission plant (line 1, column B) and the remaining $20,322,000 of which is attributable to distribution plant (line 1, column C). This represents a total increase of $5,954,000 between end of test

year 2007 and 2005 recorded amounts, of which $1,458,000 is from transmission plant and the remaining $4,496,000 is from distribution plant.

Q. What factors contribute to the need for these increases to the T&D utility plant?

A. Increases to the T&D utility plant are the result of various capital projects, as further described in Ms. Arase's testimony (MECO T-14). These projects are initiated for a number of reasons, including the following:

- New customer service - new residential, commercial and industrial developments.
- Customer requests – e.g., line relocations, government improvement projects.
- Increase in existing customer loads.
- Reliability improvement projects.
- Support of renewable energy initiatives.
- Safety and system security.

Q. What is the impact of additional plant growth on T&D O&M expenses?

A. T&D plant additions represent new facilities that need to be operated, inspected, and maintained. The result is a need to increase staffing in the Construction Division, Maintenance Division, and System Operation Division to meet the operation and maintenance requirements of the growing T&D plant. Staffing needs and increases are addressed later in my testimony.

MECO SYSTEM RELIABILITY

Q. How does MECO track overall T&D system reliability?

A. MECO utilizes several indices that are standard within the utility industry to measure overall reliability. The primary indicators include System Average Interruption Frequency ("SAIF"), Customer Average Interruption Duration ("CAID"), System Average Interruption Duration ("SAID"), and Average Service Availability ("ASA"). See MECO-611 through MECO-614 for charts showing MECO's performance based on each of the above indicators, respectively, as

compared to the Edison Electrical Institute ("EEI") industry average from 1998 through 2005. See also MECO-615 for an explanation of these indicators.

Q. Given the age of MECO's T&D system, how does MECO's reliability compare with industry average?

A. With the exception of MECO's SAIF performance in 2004 and 2005 (MECO-611), over the eight-year period from 1998 through 2005, MECO's reliability has been comparable to or exceeded industry averages. The increasing frequency of outages in calendar years 2004 and 2005, which went from less than one per year to less than three per year per customer, are indicative of increasing outages relating to the failure of aging lines and equipment. In support of this, outages caused by equipment failure was the second leading cause of outages in 2001 and 2002, was the fourth leading cause in 2003, and was the third leading cause in 2004. Beginning in 2005, equipment failure became the leading cause of outages, which trend has continued in 2006.

Q. What were the circumstances that resulted in MECO's SAIF performance to fall below industry average in 2004 and 2005?

A. In 2004 and 2005, the primary contributors to MECO's SAIF performance falling below industry average were increases in the following outage cause categories: equipment failures, high winds, trees or branches, lightning, flashovers, and transient faults. Equipment failures contributed to 32% of the SAIF indices affecting 51,769 customers. In addition, an increased number of load shedding events due to generation losses added to these numbers.

Q. How will the reliability indices for 2006 and 2007 compare to 2005?

A. Reliability indices estimates for 2006 are expected to be slightly worse then 2005. This is due to the catastrophic failure of one of MECO's larger generators, which decreases the system's ability to handle unexpected generation loss. This has and will result in more frequent load shedding occurrences. The failed generator is not

expected to be returned to service until late 2007. However, the commissioning of generator M18 at Maalaea in November of 2006 will aid the system's ability to handle sudden generation loss and reduce load shedding incidents. This should bring 2007 reliability indices numbers back within a desirable range that exceeds national averages.

Q. With the exception of 2005 related to SAIF, how has MECO been able to maintain reliability indices that meet or exceed industry averages?

A. MECO has been able to achieve high results by making a commitment to reliability. Through proactive preventive maintenance, continuing replacement of aging equipment, increases in vegetation management, and by continuing to expand its inspections program to deal with the aging of its system, MECO has been able to maintain an overall high level of system reliability.

Major Reliability Initiatives

Q. Given the increasing scope and age of the Company's system, what actions is MECO taking to continue to maintain or improve current levels of reliability?

A. MECO is committed to maintaining similar levels of investment into system maintenance through numerous programs and initiatives. To ensure this investment is applied most effectively, an analysis of the major causes of interruptions is routinely conducted. With this information, MECO focuses and prioritizes its O&M spending on the components of its infrastructure that are in need of the highest reliability improvements for the resources allocated.

Q. What are the major causes of interruptions?

A. While the major contributors differ each year, the major contributors on a consistent basis are cable faults, equipment deterioration, and faulty equipment. Storm damage and vehicle accidents also have a high impact on reliability, but by nature they are impossible to predict or control. The key in those cases is to have the resources available to immediately respond to these events to minimize the

impact they will have on MECO's system and customers.

Q. With this information, what types of programs and initiatives has MECO implemented?

A. In addition to regular and routine maintenance efforts, MECO has implemented or is implementing several programs and initiatives to improve reliability in the following categories:

1) Cable Faults – As discussed in my testimony above, MECO is implementing a new program to test and evaluate the condition of its underground direct buried infrastructure and conduit encased infrastructure in order to prioritize and budget for cable replacement. The cost of this program is an added O&M expense, but the high risk cable fault infrastructure the program identifies will be replaced as capital projects, which will ultimately reduce O&M cost and improve system reliability. For the 2007 budget, MECO has allocated an additional 736 man-hours for this activity at an annual cost of $64,536 in NARUC code 594. See MECO-WP-608B (page 6). This activity will be a continuing process from 2007 on, with budget increases in man-hours expected in each succeeding year.

2) Equipment Deterioration – MECO will be expanding its system inspection program by adding two additional inspectors in 2007, one for overhead infrastructure and one for underground infrastructure. With over 26,000 poles requiring yearly inspections, and hundreds of miles of underground infrastructure, inspections are increasingly critical to maintain system reliability. These additional positions will allow MECO to aggressively audit the condition of its equipment and better manage inspection time intervals as plant additions increase. The inspection program is aimed at improving reliability, managing the replacement and maintenance of aging equipment, and identifying and remedying equipment that raises

environmental concerns, such as oil leaking equipment. Estimates are that the two inspectors will spend approximately two-thirds (2/3) of their time on O&M related duties, and one-third (1/3) on capital projects. Their O&M duties, mainly inspection, standby, and infrastructure locating, will be annually reoccurring. Estimated expenses for all O&M labor is 2,680 man-hours or $244,880. See MECO-WP-608B (page 11, line 8).

3) Faulty Equipment – MECO has adopted the concept of Asset Management. This strategic approach identifies system, circuit and equipment owners (Construction and Maintenance Supervisors) who can focus on their specific part of the system and place the necessary care to ensure that their responsible area(s) are able to deliver reliable service. Additionally, the use of technology, such as inspection devices, in various parts of the system helps to provide an early indication of potential problems, and automatic or remote switching capability is constantly added to the MECO system to prevent or minimize these potential problems from affecting customers. This includes automated substation relays, automated switches, and automated transformers.

Q. What else is MECO doing to improve reliability?

A. MECO is constantly adding new industry proven technology, such as the new Transmission Outage Application (TOA), and new technology based staff positions, such as the Geographical Information Specialist, to keep MECO and its systems effective, current, efficient, and reliable. MECO is focusing on the benefits of SCADA through programs that will expand SCADA use throughout its system.

Q. Please explain MECO's SCADA program.

A. MECO has committed capital resources to expand its SCADA use in order to improve MECO's response to system conditions and improve reliability. MECO's

SCADA system will be a critical component to support all other system refinements, such as to improve Automated Generation Control ("AGC") and Customer Information Systems ("CIS"). Through these systems, MECO will achieve greater efficiency and faster response to system failures.

STAFFING FOR THE T&D AND ENGINEERING DEPARTMENTS

Q. Describe the staffing levels for the T&D Department and the Engineering Department in 2001 and 2005?

A. The "average" staffing is the actual average number of employees employed by MECO over a given year. The average staffing level for the T&D Department was 101 employees in 2001 and 96 in 2005. The Engineering Department average was 28 in 2001 and 29 in 2005. See MECO-616 for a staffing comparison between 2001 through 2006 and then estimated for the 2007 test year. See also Ms. Wachi's testimony (MECO T-11) for additional information on MECO staffing details.

Q. How do the actual staffing levels at year-end 2006 compare with the budgeted amount for year-end 2006?

A. At year-end 2006, the T&D department had an actual employee count of 96, as compared to a budgeted amount of 106. At year-end 2006, the Engineering Department had an actual employee count of 29, as compared to a budgeted amount of 29. See MECO-616 for average staffing counts by year.

Q. Please describe the positions that remained unfilled at year-end 2006 as compared to the budgeted levels, and the reasons the respective positions remain unfilled.

A. For the T&D Department, the following were open positions as of year-end 2006:

1. One (1) communications vacancy (MDC): Caused by the transfer of supervisor to new department. Job posted and filled internally in 2006, which in turn created an opening for a communications technician.
2. Seven (7) Construction Department vacancies (MDK): Caused by

retirements, discharges, and promotions.

3. Two (2) dispatcher vacancies (MDR): Caused by promotions.

Q. How are staffing shortages managed?

A. The two departments were able to manage staffing level shortfalls through the use of outside contract services, deferral of projects, use of overtime, and through recruitment to backfill positions that became vacant.

Q. What are the T&D Department and Engineering Department overtime expenses in a typical year?

A. As shown on MECO-624, the five year overtime average for T&D for the period 2002 to 2006 has been approximately 27%, or $1,694,757 a year. For Engineering for the same period, the average was approximately 4%, or $76,575 a year. See E. Wachi's testimony (MECO T-11).

Q. What impacts do managing staffing shortages have on MECO's expenses and its employees?

A. Many of the actions taken to manage staffing shortages either directly or indirectly increase O&M costs, which in turn offset wage and benefit savings created by open positions. During 2004, 2005, and 2006, T&D operated with fluctuating vacancies, with overtime expenses being 20%, 16%, and 33% respectively above the five year average. Overtime also creates quality of life issues for overworked employees, which over time leads to employees becoming less efficient and less productive. See MECO-624 and MECO-WP-616A.

Q. What types of productivity improvements were implemented?

A. The Company has implemented various efforts to achieve continuous productivity improvements. Some examples of these efforts include, without limitation:

- Application of new technologies and tools that improved efficiency.
- Investing capital in infrastructure improvements, replacements, and upgrades.

Q. What are the projected average staffing levels for the 2007 test year?

A. MECO-616 summarizes the changes in the T&D Department staffing estimates and the Engineering Department staffing estimates for 2007. As noted in that exhibit, the T&D Department staffing level at year-end 2007 is estimated to be 111 in 2007, which represents an additional 5 positions, or an approximate 5% increase, from 2006 budgeted staffing levels. Engineering staffing is estimated at 31 at year-end 2007, which represents an additional 2 positions, or a 7% increase from 2006 budgeted levels.

Q. Please describe the additional 5 positions to be added to the T&D Department in 2007.

A. For the T&D department:

1. Vehicle Mechanic – position added due to the volume of work the existing vehicle mechanic is performing. The addition of this position adds approximately $201,690 to 2007 in Non-Billable Clearing Expenses. See MECO-WP-616B, page 5, line 33.
2. Environmental Specialist – position added due to the record keeping and processes mandated by various Federal, State, and local laws concerning the handling of environmental contaminants, and meeting environmental compliance regulations. The addition of this position adds approximately $85,571 to O&M operating expense and $30,854 in Non-Billable Clearing Expenses (see MECO-WP-616B, page 3, lines 69 and 64, respectively).
3. Senior Inspector – position added due to the growing demand on underground (U/G) inspection resources caused by the increase in U/G infrastructure and cable faults, as well as by the recommendation by MECO's liability insurer, AEGIS, to perform comprehensive system inspections as an integral part of a viable liability loss control program. See MECO-623 for AEGIS' recommendations/suggestions. As MECO's utility industry mutual liability

insurer, AEGIS provides loss control services that identify liability exposures and provides guidelines to limit those exposures. AEGIS' premiums are influenced by the insured's exposure and the programs and procedures implemented to lessen that exposure. AEGIS' premiums are a direct O&M expense, and meeting AEGIS' loss control guidelines is one factor in positively influencing the premium costs to MECO as well as reducing MECO's absorbed losses exposure. Implementation of AEGIS's recommendations helps MECO avoid higher premiums. In addition, the State's new "One Call" system will place additional labor demands on this resource. The addition of this position adds approximately $19,713 to O&M operating expense and $6,653 to Non-Billable Clearing Expense. See MECO-WP-616B (page 7, lines 75 and 74, respectively).

4. System Inspector – position added due to the growing demand on overhead (O/H) inspection resources caused by increase in O/H infrastructure, and again by AEGIS' insurance recommendations. In addition, the State's new "One Call" system will place additional labor demands on this resource. The addition of this position adds approximately $127,442 to O&M operating expense and $5,391 to Non-Billable Clearing Expenses. See MECO-WP-616B (page 2, lines 42 and 39, respectively).

5. Transmission and Distribution Analyst – position added due to the necessity to prepare increased documentation required by outside agencies (OSHA, HIOSHA, DOT, etc). In addition, this portion is also part of a redistribution of resources to realign MECO's base yard facilities management from the Maintenance Department to the Stores/Vehicles Department in order to better utilize the Maintenance Department high demand labor resources. The addition of this adds approximately $95,574 to Non-Billable Clearing Expenses. See MECO-WP-616B (page 4, line 35).

Q. Please describe the additional 2 positions to be added to the Engineer Department in 2007.

A. For the Engineering Department:

1. Staff Engineer – position added due to increasing plant assets and customer demands. The addition of this position adds approximately $17,436 to O&M operating expense and $71,997 to Non-Billable Clearing Expenses. See MECO-WP-616B (page 10, lines 13 and 11, respectively).
2. Customer Designer – position added due to increasing customer demand and added work load created by increased government documentation and process requirements. The addition of this position adds approximately $2,053 to O&M operating expense and $54,398 to Non-Billable Clearing Expenses. See MECO-WP-616B (page 8, lines 44 and 42, respectively).

Q. What is the status of filling these additional positions?

A. As of January 30, 2007, all of the newly created positions for 2007 have been filled. However, four of the five positions were filled by applicants within the Company and by taking these new positions, new vacancies have been created that must now be filled. The Company's Human Resources Department is actively recruiting for all open positions.

Q. As a result of the above, please describe the positions that remain open in T&D and Engineering (including as a result of the 2006 vacancies discussed above), as well as your anticipated timing of filling these positions.

A. In Engineering, the following position is currently open:

1. Engineering Analyst: New position is currently being advertised externally and should be filled in the first quarter of 2007.

In the T&D Department, the following 12 positions are currently open:

1. Two Dispatcher positions (MDR): Positions are currently being advertised externally and should be filled in the first quarter of 2007.

2. One Dispatch Supervisor (MDR): Position is currently being advertised externally should be filled by the end of the first quarter of 2007.
3. One Electrician (Electronics) (MDC): Position is currently being advertised externally and should be filled in the first quarter of 2007.
4. Six Journeyman Linemen (MDK): Positions are currently being advertised externally and should be filled in the first quarter of 2007. One of these six positions has been accepted and candidate plans to start by March 23, 2007.
5. One Senior Helper (MDK): Position posted and should be filled by end of first quarter of 2007.
6. One Vehicles/Stores Supervisor: Position advertised externally and should be filled by the end of first quarter of 2007.

See MECO-616 for average staffing counts by year.

Q. Why are the staffing level increases in the two departments necessary?

A. The increased staffing is necessary to address increased system requirements as a result of the labor demands that continuing growth and the increasing age of the utility plant creates, to meet growing customer demand, to account for the loss of technical knowledge and experience of existing staff, and to implement new projects to ensure the continued reliability of the system.

Q. Please expand on the need for two additional inspectors (i.e., senior inspector and system inspector) in the T&D Department.

A. MECO inspectors provide a valuable service as they are the primary inspectors of the T&D facilities. MECO inspectors have linemen qualifications and are all experienced in and knowledgeable of T&D facilities. They are capable of inspecting and detecting defects on T&D facilities such as transformers, cutouts, switches, cross arms, connectors, lightning arresters, insulators and fixtures. They are also qualified electrical workers that can serve as observers and escorts for unqualified workers who perform work near electrical facilities. MECO

inspectors are capable of using volt meters, amp meters, infrared cameras and underground cable locating equipment. During emergency situations, MECO inspectors can troubleshoot problems and provide information to MECO Dispatch and to crews so repairs can be made. They are qualified to use hotline tools and in work procedures to perform switching and address energized facilities. MECO inspectors also inspect underground duct systems that are built by developers and dedicated to MECO as in-kind contributions and provide monitoring and assistance to contractors constructing pole lines and underground systems. The inspectors are also able to locate infrastructure as required by the State's "One-Call" system as mandated by Act 141.

Q. How will Act 141, which established the One Call Center, impact MECO operations?

A, Act 141 (2004 Session Laws of Hawaii), codified as Chapter 269E of the Hawaii Revised Statutes, required the Commission to establish and administer a "One Call" Center by January 1, 2006. Act 141 generally requires excavators to notify and provide pertinent information to the One Call Center of any plan to excavate on either public or private property where operators are authorized to install subsurface facilities. Once notified by the One Call Center of an excavator's plan, the operator (e.g., MECO) will inform the excavator of the approximate location of its subsurface facilities at the excavation site. Although MECO has responded to requests for facility locating in the past, it expects that the number of requests for locating facilities will increase significantly over the near future since state law will mandate excavators to notify the One Call Center of their plans. In the past, excavators have often excavated without inquiring with MECO about the location of subsurface facilities.

Q. Did MECO increase its 2007 test year labor expenses to address the impacts of Act 141?

A. Yes. An additional 656 man-hours were added to the T&D Systems Operations Distribution budget for 2007 at a cost of $60,249. See MECO-WP-608B (page 1, line 17). However, the resources that are or may be required by MECO to fulfill its obligation under this Act are currently unknown since we believe excavation contractors are only now starting to understand their obligations under the Act, and we believe that at least some contractors have been slow to comply. Also, the amount of calls will be dependent on the extent of future growth and development that will occur on the island. The position primarily responsible for locating underground facilities for excavators is the inspectors. Primary Trouble Men (PTM) are also trained to locate underground facilities and can perform this function when they are not responding to trouble, installing services, responding to customer complaints, or doing switching.

Q. Will these increases in staffing discussed above reduce overtime?

A. The staffing increase will reduce, but not eliminate overtime due to the 24-hour seven-days-a-week nature of T&D's work. T&D employees have to respond to traffic accidents involving MECO infrastructure, equipment failures, outage calls, and after hour meter reconnects, all of which may occur and require MECO's immediate assistance 24 hours a day.

Q. What are the expected estimated savings in overtime expense resulting from these additional positions?

A. Quantifying estimates of potential overtime savings is difficult due to the nature of the work and the overlapping work groups that will be affected. For the additional vehicle mechanic that will be added in 2007, the overtime savings are estimated to be at least 50%, or approximately $37,444 to O&M clearing, based on 2005 actuals. This will be accomplished by utilizing a staggered overlapping shift for the two mechanics, which will eliminate the necessity for the previously single vehicle mechanic to start early or to work late. However, there will be times when

emergency work will require one or both of the mechanics to work overtime. Further savings will be realized through reduced use of contractors currently doing vehicle maintenance work for MECO. The Environmental Specialist is a new position and will reduce uncompensated labor of the supervisors and superintendent of the maintenance department. The two additional inspectors will be doing work that is currently not being done due to current staffing limitations. The additions to the Engineering Department and the Transmission and Distribution Analyst are all staff positions and as such they do not qualify for compensated overtime. The work these two positions will be responsible for will reduce uncompensated overtime of other staff engineers. Generally, we expect the amount of overtime to fall back in line with historical averages during years with full staffing levels.

WAGES AND NON-LABOR INCREASES

Q. What wage increases are included in the 2007 test year estimate?

A. The wage increases for bargaining unit employees are in accordance with the Union/Company Collective Bargaining Agreement contract negotiated in 2004 and due to be renegotiated in 2007. Wage increases for merit employees are effective in May of each year. Mr. Matsunaga discusses the wage increase assumptions for bargaining unit and merit employees in MECO T-9.

Q. What are the inflation estimates for non-labor expenses?

A. Non-labor expenses are estimated on the basis of quoted or contracted prices for materials and services. If these quoted or contracted prices were not available, the inflation increase was estimated to be at 2.5% per annum. See Mr. Matsunaga's testimony (MECO T-9) for an explanation of inflation estimates. Actual materials inflation on common materials for 2005 and 2006 has averaged approximately 11% per year. See MECO-619.

T&D MATERIALS INVENTORY

Q. How many warehouses does MECO operate to store and distribute the T&D materials inventory?

A. MECO operates three materials warehouses which are located at the following base yards:

1) Kahului Base Yard – Kahului, Maui.
2) Miki Basin Power Plant – Miki Basin, Lanai
3) Palaau Power Plant – Molokai

The Kahului Base Yard warehouse serves as the central yard and handles all of MECO's ordering, receiving, and inventorying functions. The Molokai and Lanai base yard warehouses serve as staging yards and receive their inventory from MECO's Kahului Base Yard.

Q. What was the 2004 and 2005 T&D consolidated 13 month average materials inventory?

A. The 13 month average T&D materials inventory in 2004 was $2,170,633 and the 2005 average inventory was $2,622,304, as shown on MECO-618 (page 1, line 14, columns C and D, respectively). The warehouse inventories for each individual island can also be found in MECO-618 (pages 1 through 2).

Q. What is the consolidated 2007 test year average inventory forecast?

A. The 2007 test year average inventory forecast is estimated at $3,910,857 as shown on MECO-618 (page 1, line 14, column I).

Q. How was the 2007 13-month average derived?

A. The 2007 number was derived by taking the 2006 projected 13 month averages and increasing them by the average change rate between 2003 and 2006 shown on MECO-618, column H.

Q. What is included in the T&D materials inventory?

A. The T&D materials inventory includes those items required in the day-to-day construction, operation and maintenance of the T&D system. It does not include

distribution transformers, substation transformers or major substation equipment.

Q. Why is the test year 2007 T&D materials inventory reasonable?

A. Estimates for the 2007 test year T&D materials inventory are based on the increasing cost of goods caused by inflationary pressures such as the increasing prices of commodities, increases in manufacturer labor rates, and increased shipping costs. Additionally, inventory costs are further increased due to MECO's transition from less expensive wood transmission poles to more expensive steel poles as discussed above, and the expanded use of stainless steel materials.

Q. Please provide an example of the increase in the cost of goods.

A. MECO-619 provides a list of common manufactured goods used by MECO T&D in the normal course of T&D operations. The materials chosen were from MECO's 1999 rate case exhibit (Docket No. 97-0346, MECO-611) to maintain consistency, except where that material is no longer used as part of MECO's T&D operations, and in that case a similar material substitute was utilized. MECO-619 documents an average 11% yearly increase in both 2005 and 2006, for a two year total increase of approximately 22%.

Q. Is the 2007 forecast a reasonable inventory for MECO to carry? Please explain.

A. Yes. The 2007 forecast is representative of the materials needed to maintain MECO's infrastructure and to meet the needs of ongoing customer and Company projects. Further, MECO's inventory levels are maintained at levels that allow for work to continue on customer jobs, system maintenance, and for repairs after storms or other unexpected timing events, despite supply line disruptions and fluctuating manufacturers' lead times.

SUMMARY

Q. Please summarize your testimony.

A. MECO's 2007 test year T&D O&M expense is estimated to be $8,613,341, as

shown in MECO-602 (line 3, column D), with a breakdown of $2,276,738 for transmission O&M expense (line 1, column D) and $6,336,603 for distribution O&M expense (line 2, column D). MECO's goal is to deliver reliable, cost-effective service to its customers. The costs and actions associated with achieving this goal have been highlighted in my testimony and are consistent with achieving this goal and the duty of providing essential electrical service to MECO's customers. The T&D materials inventory is forecasted at a monthly average of $3,910,857 as shown in MECO-618 (page 1, line 14, column I) and is necessary and reasonable to support MECO's obligation to provide reliable electrical service.

Q. Does this conclude your testimony?

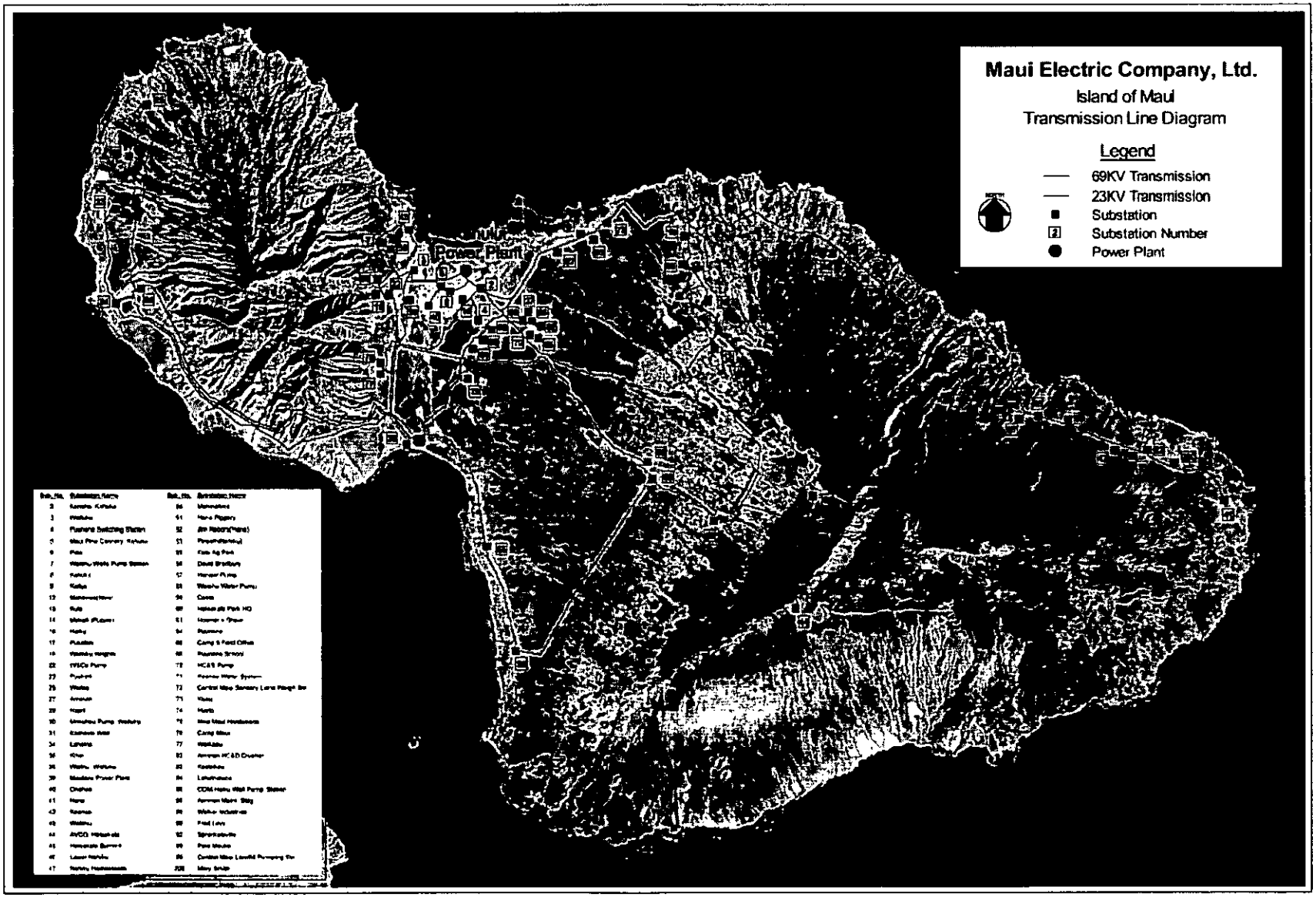
A. Yes, it does.

MAUI ELECTRIC COMPANY, LIMITED

ANDREW C. HERRERA

EDUCATIONAL BACKGROUND AND EXPERIENCE

BUSINESS ADDRESS:	Maui Electric Company, Limited 210 West Kamehameha Avenue, Kahului, HI 96732
POSITION:	Manager, Transmission and Distribution Department Maui Electric Company, Ltd. (August 2006 to present)
YEARS OF SERVICE:	Approximately 20 Years
EDUCATION:	California State University (May 1982) University of Phoenix (January 2002)
DEGREE:	Bachelor of Science in Industrial Technology, Manufacturing Industries Masters in Organizational Management
PREVIOUS POSITIONS:	Superintendent, Construction Division Maui Electric Company, Ltd. (July 2005 to August 2006)
	Supervisor, Construction Division Maui Electric Company, Ltd. (2001 to July 2005)
	Working Foreman, Construction Division Maui Electric Company, Ltd. (1995 to 2001)
	Lineman, Construction Division Maui Electric Company, Ltd. (1990 to 1995)
	Apprentice Lineman, Construction Division Maui Electric Company, Ltd. (1986 to 1990)



MECO-601
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PAGE 1 OF 1

MAUI ELECTRIC COMPANY, LIMITED

2007 TEST YEAR (TY)

TRANSMISSION AND DISTRIBUTION
OPERATIONS & MAINTENANCE EXPENSE

Line		(A) 2007 BUDGET	(B) BUD ADJ	(C) NORM	(D) 2007 TEST YEAR
	MECO				
1	Transmission O&M Expense	$ 2,270,501	$ 6,237	$ -	$ 2,276,738
2	Distribution O&M Expense	6,222,971	113,632	-	6,336,603
3	TOTAL	$ 8,493,472	$ 119,869	$ -	$ 8,613,341
	MAUI				
4	Transmission O&M Expense	$ 2,237,357	$ 6,237	$ -	$ 2,243,594
5	Distribution O&M Expense	5,545,083	99,440	-	5,644,523
6	TOTAL	$ 7,782,440	$ 105,677	$ -	$ 7,888,117
	MOLOKAI				
7	Transmission O&M Expense	$ 33,144	$ -	$ -	$ 33,144
8	Distribution O&M Expense	441,843	11,830	-	453,673
9	TOTAL	$ 474,987	$ 11,830	$ -	$ 486,817
	LANAI				
10	Transmission O&M Expense	$ -	$ -	$ -	$ -
11	Distribution O&M Expense	236,045	2,362	-	238,407
12	TOTAL	$ 236,045	$ 2,362	$ -	$ 238,407

Source
MECO-WP-602A
MECO-WP-602B
Budget Adjustments: MECO-WP-602C
Note: Differences due to rounding.

MAUI ELECTRIC COMPANY, LIMITED
Rate Case Summary Report: Labor vs. Nonlabor
MECO Consolidated Comparative
TRANSMISSION

Line			(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
			Recorded					Budget	2007 TY vs. 2005 Rec	Budget	Budget Adj	Test Year (TY)
			2001	2002	2003	2004	2005	2006	$ Diff	2007	2007	2007
	Transmission Operation											
1	B32	Labor	206,127	232,763	268,646	319,762	277,679	338,426	**28,252**	305,931		**305,931**
2	B32	Non-Labor	223,221	458,163	241,983	335,990	252,549	406,603	**178,057**	424,369	6,237	**430,606**
3	Total Transmission Oper		429,348	690,926	510,629	655,752	530,228	745,029	**206,309**	730,300	6,237	**736,537**
	Transmission Maintenance											
4	B33	Labor	285,003	295,269	305,437	325,073	439,538	485,016	**29,221**	468,759		**468,759**
5	B33	Non-Labor	311,872	220,739	779,711	915,017	687,064	1,388,947	**384,378**	1,071,442		**1,071,442**
6	Total Transmission Maint		596,875	516,008	1,085,148	1,240,090	1,126,602	1,873,963	**413,599**	1,540,201	-	**1,540,201**
	Total Transmission											
7		Labor	491,130	528,032	574,083	644,835	717,217	823,442	**57,473**	774,690	-	**774,690**
8		Non-Labor	535,093	678,902	1,021,694	1,251,007	939,613	1,795,550	**562,435**	1,495,811	6,237	**1,502,048**
9	Grand Total Transmission		1,026,223	1,206,934	1,595,777	1,895,842	1,656,830	2,618,992	**619,908**	2,270,501	6,237	**2,276,738**

Source:
MECO-WP-602A, page 6
MECO-WP-602B, page 11
Budget Adjustments: MECO-WP-602C, page 1, line 4

Note: Differences due to rounding.

MAUI ELECTRIC COMPANY, LIMITED
Rate Case Summary Report: Labor vs. Nonlabor
MECO Consolidated Comparative
DISTRIBUTION AND TOTAL T&D

Line			(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
			Recorded					Budget	2007 TY vs. 2005 Rec	Budget	Budget Adj	Test Year (TY)
			2001	2002	2003	2004	2005	2006	$ Diff	2007	2007	2007
	Distribution Operation											
1	B34	Labor	1,332,905	1,203,920	1,243,346	1,298,858	1,448,408	1,734,070	**296,064**	1,744,472		**1,744,472**
2	B34	Non-Labor	710,758	891,749	979,228	957,280	1,091,452	1,289,495	**329,010**	1,306,830	**113,632**	**1,420,462**
3	Total Distribution Operation		2,043,663	2,095,669	2,222,574	2,256,138	2,539,860	3,023,565	**625,074**	3,051,302	**113,632**	**3,164,934**
	Distribution Maintenance											
4	B35	Labor	1,005,277	910,470	902,642	1,107,804	1,032,136	900,361	**97,163**	1,129,299		**1,129,299**
5	B35	Non-Labor	1,599,037	1,503,738	1,529,529	1,659,916	1,664,686	1,791,944	**377,684**	2,042,370		**2,042,370**
6	Total Distribution Maint		2,604,314	2,414,208	2,432,171	2,767,720	2,696,822	2,692,305	**474,847**	3,171,669	-	**3,171,669**
	Total Distribution											
7		Labor	2,338,182	2,114,390	2,145,988	2,406,662	2,480,544	2,634,431	393,227	2,873,771	-	2,873,771
8		Non-Labor	2,309,795	2,395,487	2,508,757	2,617,196	2,756,138	3,081,439	706,694	3,349,200	113,632	3,462,832
9	Grand Total Distribution		4,647,977	4,509,877	4,654,745	5,023,858	5,236,682	5,715,870	1,099,921	6,222,971	113,632	6,336,603
	Total T&D											
10		**Labor**	**2,829,312**	**2,642,422**	**2,720,071**	**3,051,497**	**3,197,761**	**3,457,873**	**450,700**	**3,648,461**	-	**3,648,461**
11		**Non-Labor**	**2,844,888**	**3,074,389**	**3,530,451**	**3,868,203**	**3,695,751**	**4,876,989**	**1,269,129**	**4,845,011**	**119,869**	**4,964,880**
12	**Grand Total T&D**		**5,674,200**	**5,716,811**	**6,250,522**	**6,919,700**	**6,893,512**	**8,334,862**	**1,719,829**	**8,493,472**	**119,869**	**8,613,341**

Source:
MECO-WP-602A, page 6
MECO-WP-602B, page 11
Budget Adjustments: MECO-WP-602C, pages 1 and 2

Note: Differences due to rounding.

MAUI ELECTRIC COMPANY, LIMITED
Rate Case Summary Report: Labor vs. Nonlabor
Comparative
ISLAND OF MAUI
TRANSMISSION

Line		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
		Recorded					Budget	2007 TY vs. 2005 Rec	Budget	Budget Adj	Test Year (TY)
		2001	2002	2003	2004	2005	2006	S Diff	2007	2007	2007
	Transmission Operation										
1	Labor	206,023	232,763	267,850	313,493	274,649	332,057	**31,282**	305,931		**305,931**
2	Non-Labor	218,716	448,828	232,695	328,900	248,112	410,106	**169,994**	411,869	6,237	**418,106**
3	Total Transmission Oper	424,739	681,591	500,545	642,393	522,761	742,163	**201,276**	717,800	6,237	**724,037**
	Transmission Maintenance										
4	Labor	273,491	288,148	301,983	313,662	436,342	475,193	**22,636**	458,978		**458,978**
5	Non-Labor	303,284	213,672	772,524	895,084	678,089	1,384,261	**382,490**	1,060,579		**1,060,579**
6	Total Transmission Maint	576,775	501,820	1,074,507	1,208,746	1,114,431	1,859,454	**405,126**	1,519,557	-	**1,519,557**
	Total Transmission										
7	Labor	479,514	520,911	569,833	627,155	710,991	807,250	**53,918**	764,909	-	**764,909**
8	Non-Labor	522,000	662,500	1,005,219	1,223,984	926,201	1,794,367	**552,484**	1,472,448	6,237	**1,478,685**
9	Grand Total Transmission	1,001,514	1,183,411	1,575,052	1,851,139	1,637,192	2,601,617	**606,402**	2,237,357	6,237	**2,243,594**

Source:
MECO-WP-602A, page 7
MECO-WP-602B, page 12
Budget Adjustments (Transmission): MECO-WP-602C, page 1, line 4

Note: Differences due to rounding

MAUI ELECTRIC COMPANY, LIMITED
Rate Case Summary Report: Labor vs. Nonlabor
Comparative
ISLAND OF MOLOKAI
TRANSMISSION

		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
		Recorded					Budget	2007 TY vs. 2005 Rec	Budget	Budget Adj	Test Year (TY)
Line		2001	2002	2003	2004	**2005**	2006	$ Diff	**2007**	2007	2007
	Transmission Operation										
1	Labor	104	-	796	6,269	3,030	6,369	(3,030)	-		-
2	Non-Labor	4,505	9,335	9,288	7,090	4,437	(3,503)	8,063	12,500		12,500
3	Total Transmission Oper	4,609	9,335	10,084	13,359	7,467	2,866	5,033	12,500	-	12,500
	Transmission Maintenance										
4	Labor	11,512	7,121	3,454	11,411	3,196	9,823	6,585	9,781		9,781
5	Non-Labor	8,588	7,067	7,187	19,933	8,975	4,686	1,888	10,863		10,863
6	Total Transmission Maint	20,100	14,188	10,641	31,344	12,171	14,509	8,473	20,644	-	20,644
	Total Transmission										
7	Labor	11,616	7,121	4,250	17,680	6,226	16,192	3,555	9,781	-	9,781
8	Non-Labor	13,093	16,402	16,475	27,023	13,412	1,183	9,951	23,363	-	23,363
9	Grand Total Transmission	24,709	23,523	20,725	44,703	19,638	17,375	13,506	33,144	-	33,144

Source:
MECO-WP-602A, page 7
MECO-WP-602B, page 13

Note: Differences due to rounding

MAUI ELECTRIC COMPANY, LIMITED
Rate Case Summary Report: Labor vs. Nonlabor
Comparative
BY ISLAND
TRANSMISSION

Line		(A) Maui TY	(B) Molokai TY	(C) Lanai TY	(G) Budget 2007	(H) Budget Adj 2007	(I) Test Year (TY) 2007
	Transmission Operation						
1	Labor	305,931	-	-	305,931		305,931
2	Non-Labor	418,106	12,500	-	424,369	6,237	430,606
3	Total Transmission Oper	724,037	12,500	-	730,300	6,237	736,537
	Transmission Maintenance						
4	Labor	458,978	9,781	-	468,759		468,759
5	Non-Labor	1,060,579	10,863	-	1,071,442		1,071,442
6	Total Transmission Maint	1,519,557	20,644	-	1,540,201	-	1,540,201
	Total Transmission						
7	Labor	764,909	9,781	-	774,690	-	774,690
8	Non-Labor	1,478,685	23,363	-	1,495,811	6,237	1,502,048
9	Grand Total Transmission	2,243,594	33,144	-	2,270,501	6,237	2,276,738

Source:
MECO-WP-602A, pages 6 and 7
MECO-WP-602B, pages 11 to 13
Budget Adjustments (Transmission): MECO-WP-602C, page 1, line 4

Note: Differences due to rounding

MAUI ELECTRIC COMPANY, LIMITED
Rate Case Summary Report: Labor vs. Nonlabor
Comparative
ISLAND OF MAUI
DISTRIBUTION AND TOTAL T&D

		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
		Recorded					Budget	2007 TY vs. 2005 Rec	Budget	Budget Adj	Test Year (TY)
Line		2001	2002	2003	2004	2005	2006	$ Diff	2007	2007	2007
	Distribution Operation										
1	Labor	1,278,698	1,149,067	1,169,610	1,210,136	1,372,180	1,602,426	312,577	1,684,757		1,684,757
2	Non-Labor	668,829	820,923	884,883	806,042	964,852	1,222,381	352,498	1,217,910	99,440	1,317,350
3	Total Distribution Operation	1,947,527	1,969,990	2,054,493	2,016,178	2,337,032	2,824,807	665,075	2,902,667	99,440	3,002,107
	Distribution Maintenance										
4	Labor	843,600	757,577	745,908	1,005,192	922,977	798,514	10,261	933,238		933,238
5	Non-Labor	1,441,189	1,306,613	1,318,111	1,464,546	1,401,425	1,605,071	307,753	1,709,178		1,709,178
6	Total Distribution Maint	2,284,789	2,064,190	2,064,019	2,469,738	2,324,402	2,403,585	318,014	2,642,416	-	2,642,416
	Total Distribution										
7	Labor	2,122,298	1,906,644	1,915,518	2,215,328	2,295,157	2,400,940	322,838	2,617,995	-	2,617,995
8	Non-Labor	2,110,018	2,127,536	2,202,994	2,270,588	2,366,277	2,827,452	660,251	2,927,088	99,440	3,026,528
9	Grand Total Distribution	4,232,316	4,034,180	4,118,512	4,485,916	4,661,434	5,228,392	983,089	5,545,083	99,440	5,644,523
	Total T&D										
10	Labor	2,601,812	2,427,555	2,485,351	2,842,483	3,006,148	3,208,190	376,756	3,382,904	-	3,382,904
11	Non-Labor	2,632,018	2,790,036	3,208,213	3,494,572	3,292,478	4,621,819	1,212,735	4,399,536	105,677	4,505,213
12	Grand Total T&D	5,233,830	5,217,591	5,693,564	6,337,055	6,298,626	7,830,009	1,589,491	7,782,440	105,677	7,888,117

Source:
MECO-WP-602A, page 7
MECO-WP-602B, page 12
Budget Adjustments (Distribution): MECO-WP-602C, page 1 (line 5) and page 2 (line 1)

Note: Differences due to rounding

MAUI ELECTRIC COMPANY, LIMITED
Rate Case Summary Report: Labor vs. Nonlabor
Comparative
ISLAND OF MOLOKAI
DISTRIBUTION AND TOTAL T&D

		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
		Recorded					Budget	2007 TY vs. 2005 Rec	Budget	Budget Adj	Test Year (TY)
Line		*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*$ Diff*	*2007*	*2007*	*2007*
	Distribution Operation										
1	Labor	28,288	27,789	52,326	57,759	45,497	80,879	(19,505)	25,992		25,992
2	Non-Labor	14,296	35,701	54,432	97,755	57,212	47,667	(26,322)	19,060	11,830	30,890
3	Total Distribution Operation	42,584	63,490	106,758	155,514	102,709	128,546	(45,827)	45,052	11,830	56,882
	Distribution Maintenance										
4	Labor	101,474	103,000	102,838	47,269	70,662	50,352	64,181	134,843		134,843
5	Non-Labor	116,059	129,081	156,650	118,129	210,718	152,249	51,230	261,948		261,948
6	Total Distribution Maint	217,533	232,081	259,488	165,398	281,380	202,601	115,411	396,791	-	396,791
	Total Distribution										
7	Labor	129,762	130,789	155,164	105,028	116,159	131,231	44,676	160,835	-	160,835
8	Non-Labor	130,355	164,782	211,082	215,884	267,930	199,916	24,908	281,008	11,830	292,838
9	Grand Total Distribution	260,117	295,571	366,246	320,912	384,089	331,147	69,584	441,843	11,830	453,673
	Total T&D										
10	Labor	141,378	137,910	159,414	122,708	122,385	147,423	48,231	170,616	-	170,616
11	Non-Labor	143,448	181,184	227,557	242,907	281,342	201,099	34,859	304,371	11,830	316,201
12	Grand Total T&D	284,826	319,094	386,971	365,615	403,727	348,522	83,090	474,987	11,830	486,817

Source:
MECO-WP-602A, page 7
MECO-WP-602B, page 13
Budget Adjustments (Distribution): MECO-WP-602C, page 1, line 9

Note: Differences due to rounding

MAUI ELECTRIC COMPANY, LIMITED
Rate Case Summary Report: Labor vs. Nonlabor
Comparative
ISLAND OF LANAI
DISTRIBUTION AND TOTAL T&D

		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
		Recorded					Budget	2007 TY vs. 2005 Rec	Budget	Budget Adj	Test Year (TY)
Line		2001	2002	2003	2004	2005	2006	$ Diff	2007	2007	2007
	Distribution Operation										
1	Labor	25,919	27,064	21,410	30,963	30,731	50,765	2,992	33,723		33,723
2	Non-Labor	27,633	35,125	39,913	53,483	69,388	19,447	2,834	69,860	2,362	72,222
3	Total Distribution Operation	53,552	62,189	61,323	84,446	100,119	70,212	5,826	103,583	2,362	105,945
	Distribution Maintenance										
4	Labor	60,203	49,893	53,896	55,343	38,497	51,495	22,721	61,218		61,218
5	Non-Labor	41,789	68,044	54,768	77,241	52,543	34,624	18,701	71,244		71,244
6	Total Distribution Maint	101,992	117,937	108,664	132,584	91,040	86,119	41,422	132,462	-	132,462
	Total Distribution										
7	Labor	86,122	76,957	75,306	86,306	69,228	102,260	25,713	94,941	-	94,941
8	Non-Labor	69,422	103,169	94,681	130,724	121,931	54,071	21,535	141,104	2,362	143,466
9	Grand Total Distribution	155,544	180,126	169,987	217,030	191,159	156,331	47,248	236,045	2,362	238,407
	Total T&D										
10	Labor	86,122	76,957	75,306	86,306	69,228	102,260	25,713	94,941	-	94,941
11	Non-Labor	69,422	103,169	94,681	130,724	121,931	54,071	21,535	141,104	2,362	143,466
12	Grand Total T&D	155,544	180,126	169,987	217,030	191,159	156,331	47,248	236,045	2,362	238,407

Source:
MECO-WP-602A, page 7
MECO-WP-602B, page 13
Budget Adjustments (Distribution): MECO-WP-602C, page 1, line 2

Note: Differences due to rounding

MAUI ELECTRIC COMPANY, LIMITED
Rate Case Summary Report: Labor vs. Nonlabor
2007 TY BUDGET
BY ISLAND
DISTRIBUTION AND TOTAL T&D

Line		(A) Maui TY	(B) Molokai TY	(C) Lanai TY	(G) Budget 2007	(H) Budget Adj 2007	(I) Test Year (TY) 2007
	Distribution Operation						
1	Labor	1,684,757	25,992	33,723	1,744,472		1,744,472
2	Non-Labor	1,317,350	30,890	72,222	1,306,830	113,632	1,420,462
3	Total Distribution Operation	3,002,107	56,882	105,945	3,051,302	113,632	3,164,934
	Distribution Maintenance						
4	Labor	933,238	134,843	61,218	1,129,299		1,129,299
5	Non-Labor	1,709,178	261,948	71,244	2,042,370		2,042,370
6	Total Distribution Maint	2,642,416	396,791	132,462	3,171,669	-	3,171,669
	Total Distribution						
7	Labor	2,617,995	160,835	94,941	2,873,771	-	2,873,771
8	Non-Labor	3,026,528	292,838	143,466	3,349,200	113,632	3,462,832
9	Grand Total Distribution	5,644,523	453,673	238,407	6,222,971	113,632	6,336,603
	Total T&D						
10	Labor	3,382,904	170,616	94,941	3,648,461	-	3,648,461
11	Non-Labor	4,505,213	316,201	143,466	4,845,011	119,869	4,964,880
12	Grand Total T&D	7,888,117	486,817	238,407	8,493,472	119,869	8,613,341

Source:
MECO-WP-602A, pages 6 and 7
MECO-WP-602B, pages 11 to 13
Budget Adjustments (Distribution): MECO-WP-602C, page 1 (lines 2, 5, and 9) and page 2 (line 1)

Note: Differences due to rounding

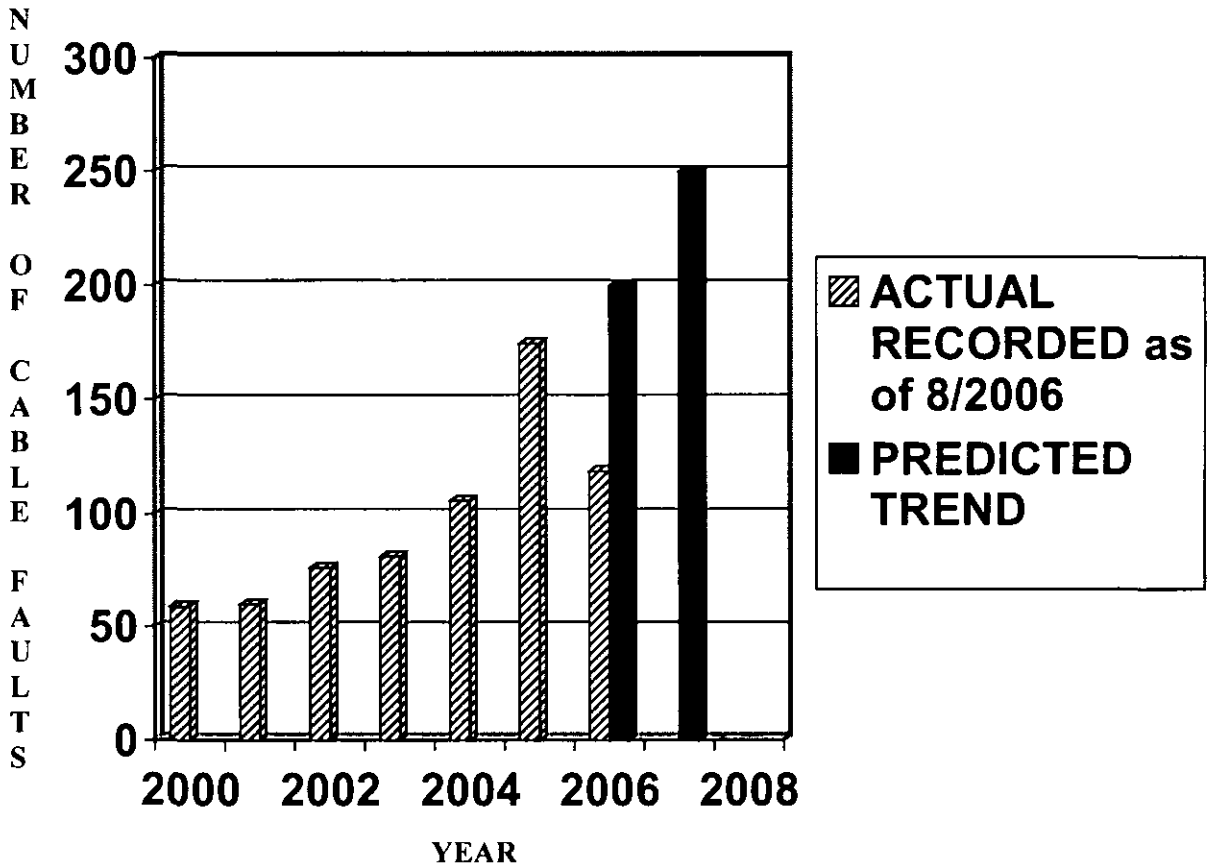
MECO 2007 Test Year Rate Case
T&D Accounts 560-598
2005 Recorded v 2007 Test Year, by account

Line	NARUC Account Number (Col. A)	Description (Col. B)	2005 Recorded (Col. D)	2007 Test Year (TY) (Col. E)	2007 TY v. 2005 Rec $ Diff (Col. G = E - D)
		MECO			
1	560-567	Transmission Operations:	530,228	736,537	206,309
2	568-573	Transmission Maintenance:	1,126,602	1,540,201	413,599
3	560-573	Total Transmission:	1,656,830	2,276,738	619,908
4	580-589	Distribution Operations:	2,539,860	3,164,934	625,074
5	590-598	Distribution Maintenance:	2,696,822	3,171,669	474,847
6	580-598	Total Distribution:	5,236,682	6,336,603	1,099,921
7	560-598	TOTAL T&D:	6,893,512	8,613,341	1,719,829
8					
9		**MAUI**			
10	560-567	Transmission Operations:	522,761	724,037	201,276
11	568-573	Transmission Maintenance:	1,114,431	1,519,557	405,126
12	560-573	Total Transmission:	1,637,192	2,243,594	606,402
13	580-589	Distribution Operations:	2,337,032	3,002,107	665,075
14	590-598	Distribution Maintenance:	2,324,402	2,642,416	318,014
15	580-598	Total Distribution:	4,661,434	5,644,523	983,089
16	560-598	TOTAL T&D:	6,298,626	7,888,117	1,589,491
17					
18		**MOLOKAI**			
19	560-567	Transmission Operations:	7,467	12,500	5,033
20	568-573	Transmission Maintenance:	12,171	20,644	8,473
21	560-573	Total Transmission:	19,638	33,144	13,506
22	580-589	Distribution Operations:	102,709	56,882	(45,827)
23	590-598	Distribution Maintenance:	281,380	396,791	115,411
24	580-598	Total Distribution:	384,089	453,673	69,584
25	560-598	TOTAL T&D:	403,727	486,817	83,090
26					
27		**LANAI**			
28	560-567	Transmission Operations:	-	-	-
29	568-573	Transmission Maintenance:	-	-	-
30	560-573	Total Transmission:	-	-	-
31	580-589	Distribution Operations:	100,119	105,945	5,826
32	590-598	Distribution Maintenance:	91,040	132,462	41,422
33	580-598	Total Distribution:	191,159	238,407	47,248
34	560-598	TOTAL T&D:	191,159	238,407	47,248

Source:
MECO-WP-602A, pages 6-7
NARUC CODES: MECO-WP-608A
2007 Differences: MECO-WP-608B

Note: Differences due to rounding.

Maui Distribution Cable Fault Trending



Data obtained from MECO Transmission and Distribution Construction Repair Orders 2000-2006.

Source: MECO-WP-609

DIRECT BURIED CABLE FAULT AVERAGE O&M REPAIR COST

Work Order Number	Date of Fault	Total Cost ($)	Outside Service Cost (feet)
TD005273	6/13/2006	$4,041.77	608.88
TD014715	6/16/2006	$4,912.81	1,186.07
TD005279	6/17/2006	$3,445.98	658.09
TD014702	6/19/2006	$3,487.03	702.03
TD014735	6/22/2006	$3,034.16	588.8
TD005295	6/22/2006	$3,034.16	588.88
TD014751	7/5/2006	$2,384.86	610.11
TD014752	7/5/2006	$2,487.25	595.06
TD005304	7/5/2006	$2,487.25	595.06
TD014780	7/12/2006	$3,684.67	604.05
TD014836	7/21/2006	$3,617.62	602.02
TD014822	7/21/2006	$4,725.48	612.34
TD014832	7/22/2006	$3,350.77	590.24
TD005347	7/25/2006	$2,883.20	1,285.78
TD014832	7/26/2006	$3,350.77	590.24
Totals		$50,927.78	10417.65

Average cable fault cost labor and non-labor other then outside service	$3,395.19
Average cable fault outside service cost	$694.51

Data from Transmission and Distribution Repair Orders and Ellipse Work Order Cost Reports. Direct Buried Cable Faults Only.

Costs do not include O&M Distribution Operations expenses related to clearing of cable, restoring cables, and writing of Hold offs.

SUBDIVISIONS WITH DIRECT BURIED CABLE WITH HIGH FAULT RATE

(Primary cable only)

AREA	PRINT	DATE INSTALLED	CABLE FOOTAGE (feet)
UYEHARA SUB'D	1-5-352	1981	1400
KAUHALE NANI	1-5-12A	12/4/1973	4750
PUKALANI TERRACE SUB'D	4-1-32A	6/3/1980	700
PUAMANA NUI SUB'D	8-1-83	11/30/1976	1000
PUAMANA NUI SUB'D	8-1-17	12/7/1967	850
PUAMANA NUI SUB'D	8-1-141	5/9/1985	70
AHOLO HOUSE LOTS	8-1-64	3/29/1974	2000
KA UA ULA	8-1-49	12/14/1971	400
KELAWEA MAUKA SUB'D	8-1-112	4/11/1975	26000
ANI STREET	2-1-260	10/5/1973	7600
12TH INCREMENT	2-1-200	7/1/1976	14850
POMAKAI	2-1-226	5/24/1973	3900
POMAKAI III	2-1-236	8/5/1974	5300
HALE LAULEA	2-1-339	10/1/1982	2390
NAPILIHAU	8-3-10	6/28/1972	2038
HALE NOHO SUB'D	8-3-79	11/4/1982	5000
KOA VENTURE SUB'D	1-1-168	5/6/1975	2300
TOTAL FOOTAGE			80548

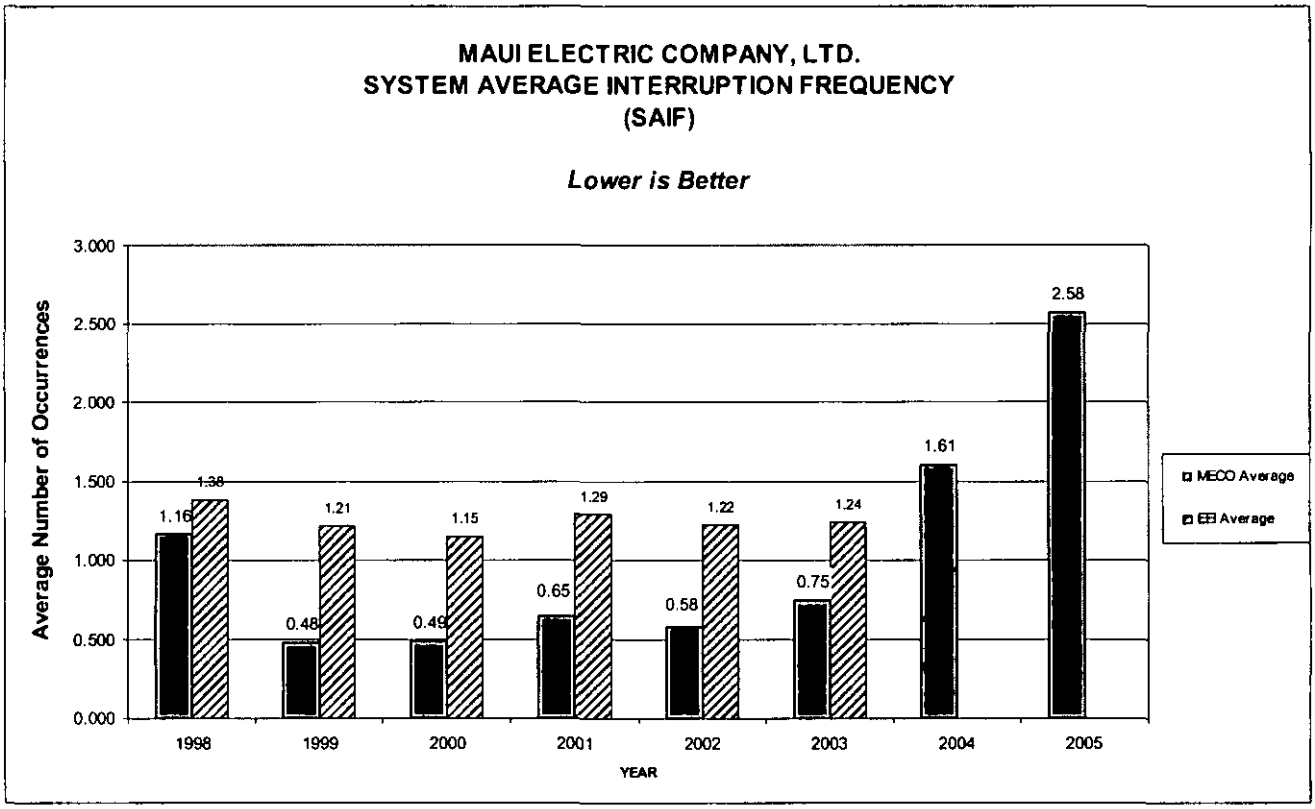
Not a complete list of all direct buried cable subdivisions.

Maui Electric Company, Limited
2007 Test Year

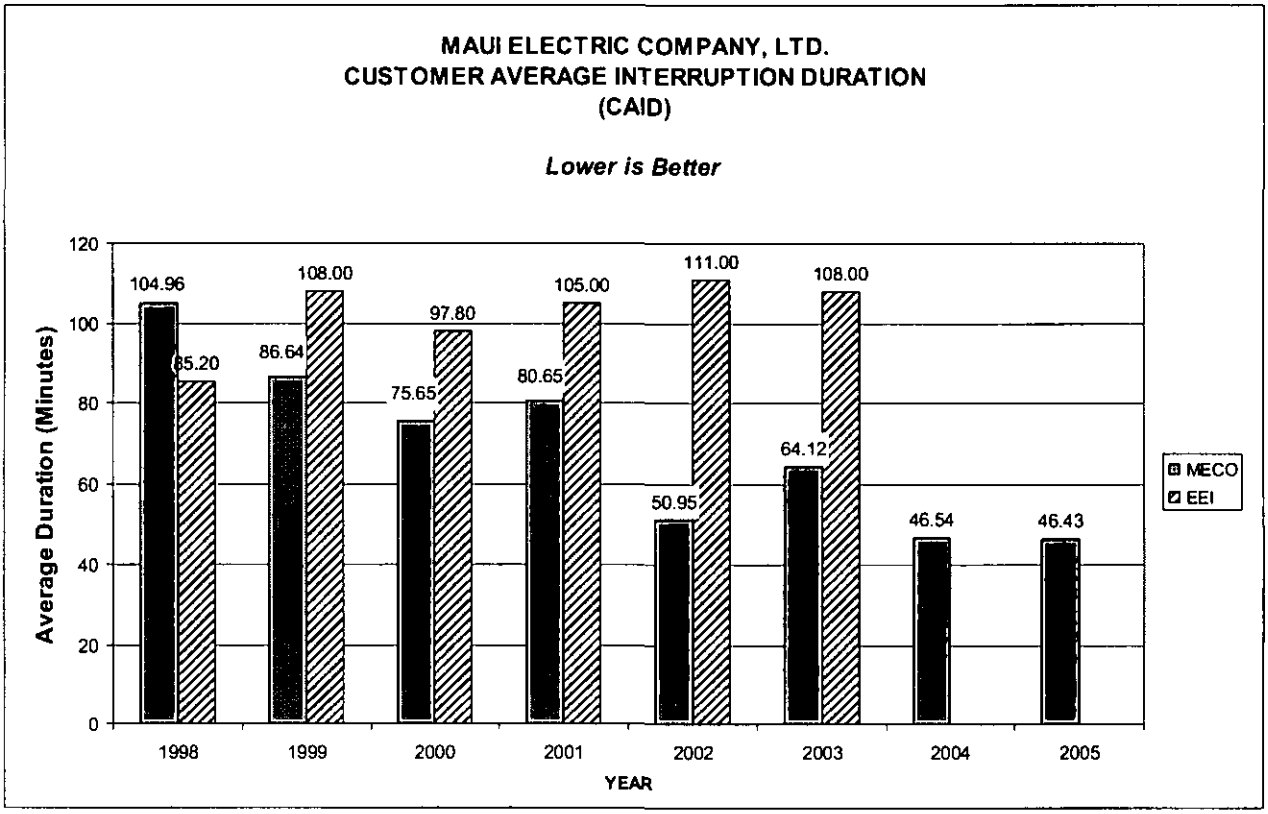
TRANSMISSION AND DISTRIBUTION UTILITY PLANT
YEAR-END TOTALS
($ Thousands)

Line	(A) Year	(B) Transmission	(C) Distribution	(D) Total	(E) Annual Increase (Decrease)
1	2007 (forecasted)	$ 4,423	$ 20,322	$ 24,745	$ 532
2	2006 (forecasted)	$ 4,213	$ 20,000	$ 24,213	$ 5,422
3	2005 (recorded)	$ 2,965	$ 15,826	$ 18,791	$ 396
4	2004 (recorded)	$ 4,396	$ 13,999	$ 18,395	$ (6,805)
5	2003 (recorded)	$ 3,388	$ 21,812	$ 25,200	$ 9,461
6	2002 (recorded)	$ 3,124	$ 12,615	$ 15,739	

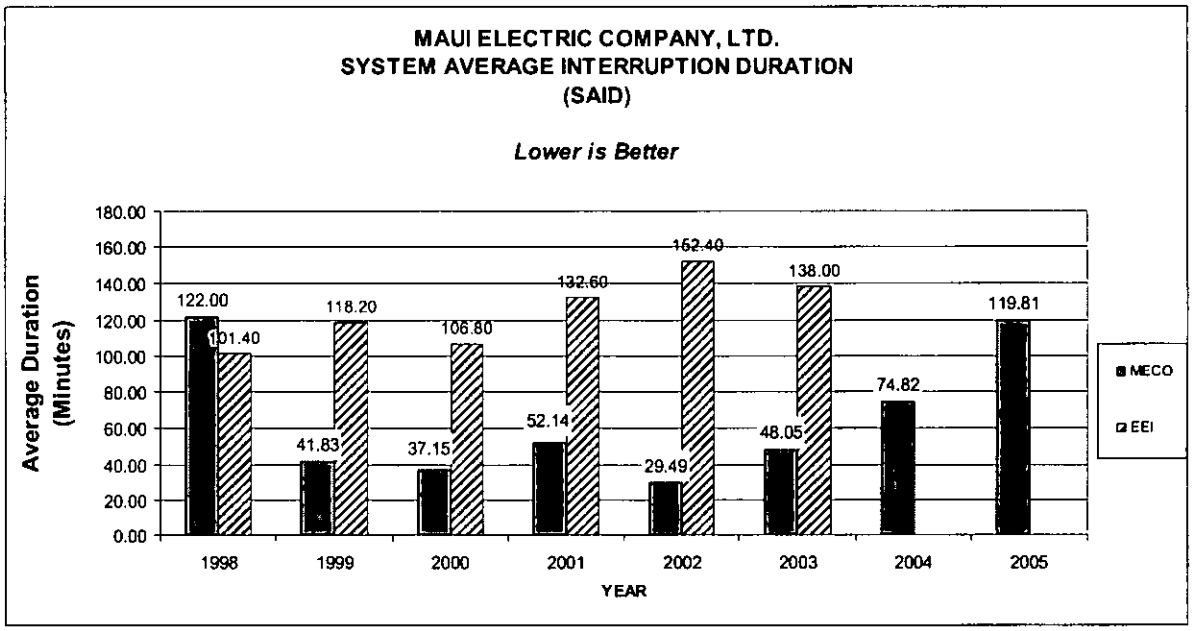
MECO SAIF REPORT 1998 to 2005



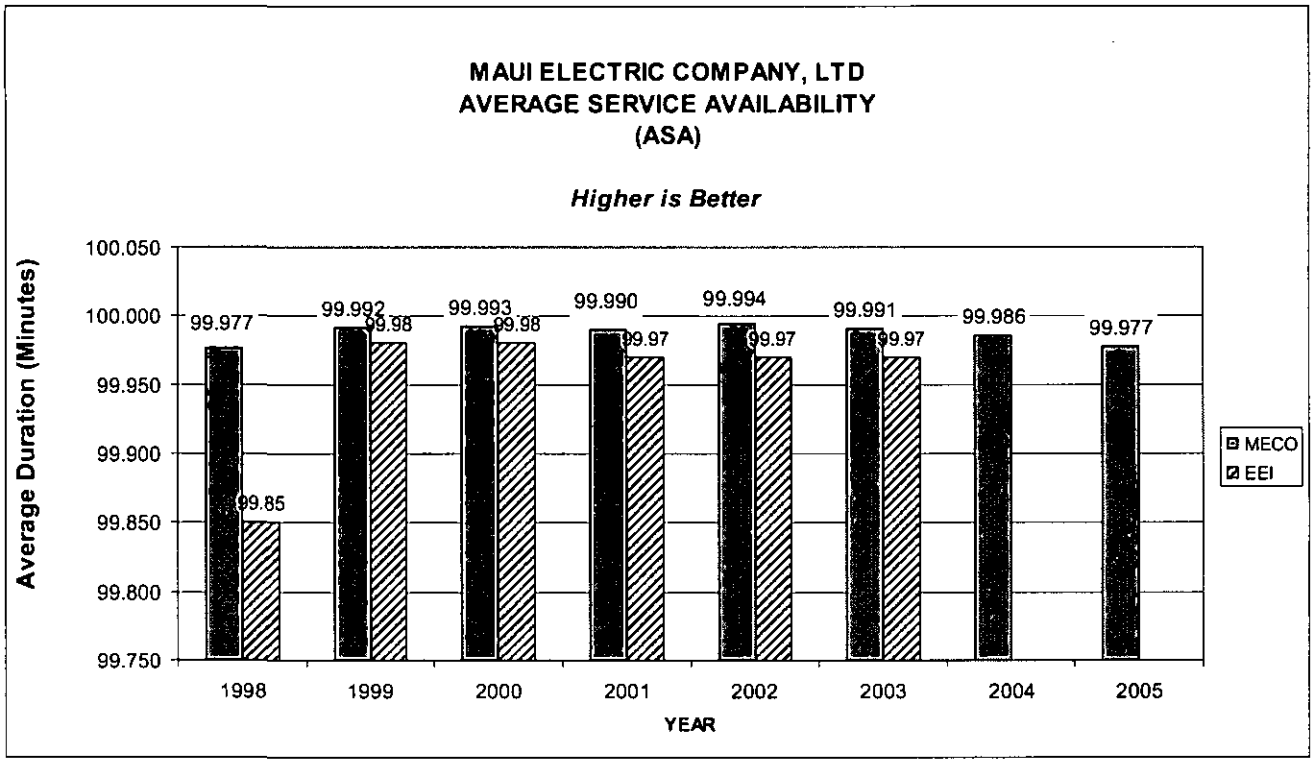
CAID Report 1998 to 2005



SAID Report 1998 to 2005



ASA Report 1998 to 2005



Maui Electric Company, Limited
2007 TEST YEAR

TRANSMISSION & DISTRIBUTION SYSTEM RELIABILITY
INDUSTRY INDICES DEFINITIONS

System Average Interruption Frequency (SAIF)

The number of customer interruptions per customer served during the year. This index indicates the average number of sustained interruptions experienced by all customers serviced on the system.

$$\text{SAIF} = \frac{\Sigma \text{ Number of Customer Interruptions Experienced During the Year}}{\text{Average Number of Customers Served During the Year}}$$

Customer Average Interruption Duration Index (CAID)

The interruption duration per customer interrupted during the year. This index indicates the average duration of an interruption for those customers affected by a sustained interruption.

$$\text{CAID} = \frac{\Sigma \text{ Duration of Interruptions X Number of Customers Affected}}{\Sigma \text{ Number of Customer Interruptions Experienced for the Year}}$$

System Average Interruption Duration Index (SAID)

The interruption duration per customer served during the year. This index indicates the average interruption time experienced by all customers serviced on the system.

$$\text{SAID} = \frac{\Sigma \text{ Duration of Interruptions X Number of Customers Affected}}{\text{Average Number of Customers Served During the Year}}$$

Average Service Availability (ASA)

Total customer hours actually served as a percentage of total customer hours possible during the year. This indicates the extent to which electrical service was available to all customers. This index has been commonly referred to as the "Index of reliability." A customer-hour is calculated by multiplying the number of customers by the number of hours in the period being analyzed.

$$\text{ASA} = \frac{\Sigma \text{ Number of Customer Hours Actually Served during the Year}}{\Sigma \text{Number of Customer Hours Possible during the Year}}$$

Staffing Employee Count 2001-2006 vs. 2006-2007 Budgeted

Line			(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)
			Recorded Average						2006 Average Budget	2006 RA vs 2007 AB Incr / (Decr)	2007 Average Budget	2006 Year-End Actual	2006 YEA vs 2007 YEB Incr / (Decr)	2007 Year-End Budget
1	Dept	RA	2001	2002	2003	2004	2005	2006	2006	(I-F)	2007	2006	(L-J)	2007
2	T&D	MDA	0	0	0	2	2	2	2	0	2	2	1*	3
3	T&D	MDC	6	6	6	6	6	6	6	0	6	5	1	6
4	T&D	MDE	9	9	9	9	9	9	9	1	10	9	1	10
5	T&D	MDK	32	31	31	32	30	31	36	5	36	29	8	37
6	T&D	MDL	3	3	3	3	3	3	3	0	3	3	0	3
7	T&D	MDM	8	7	7	5	6	7	7	0	7	7	0	7
8	T&D	MDR	25	25	23	24	25	24	25	3	27	24	3	27
9	T&D	MDS	5	5	5	5	5	5	5	1	6	5	0*	5
10	T&D	MDT	5	5	4	4	4	4	4	0	4	4	0	4
11	T&D	MDV	1	2	2	2	2	2	2	1	3	2	1	3
12	T&D	MWI	6	6	6	5	5	5	7	1	6	6	0	6
13	**Total**		**101**	**99**	**95**	**96**	**96**	**97**	**105**	**12**	**110**	**96**	**15**	**111**
14	Eng	MWA	3	3	3	3	3	3	3	0	3	3	0	3
15	Eng	MWC	2	2	2	2	2	2	2	0	2	2	0	2
16	Eng	MWL	2	2	2	2	2	2	2	0	2	2	0	2
17	Eng	MWM	1	1	1	1	1	1	1	0	1	1	0	1
18	Eng	MWP	17	17	17	17	17	17	17	1	18	17	1	18
19	Eng	MWS	3	3	4	4	4	4	4	1	5	4	1	5
20	**Total**		**28**	**28**	**29**	**28**	**29**	**29**	**29**	**2**	**31**	**29**	**2**	**31**

From MECO-WP-616A Employee Count
Impacts of New Positions: MECO-WP-616B
* T&D Budget Analyst position will fall under RA MDA instead of MDS.

Sources: MECO-1102 and MECO-WP-1102

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MAUI ELECTRIC COMPANY, LIMITED
2006 - 2007 Inventory Calculations – **Consolidated ($)**

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
	Consolidated				Forecast				Test Year
Line		2003	2004	2005	2006		AVERAGE	%	2007
1	January	1,861,453	1,970,300	2,497,995	2,890,279		2,305.00	7.7	3,677.80
2	February	2,031,440	2,002,116	2,571,557	3,004,483		2,402.40	8	3,836.40
3	March	1,896,933	2,059,750	2,591,231	2,981,098		2,382.30	8	3,794.40
4	April	1,896,933	2,006,475	2,621,129	3,103,379		2,407.00	8	3,833.30
5	May	1,813,141	2,069,437	2,685,123	3,340,765		2,477.10	8.3	3,947.30
6	June	1,842,252	2,068,801	2,734,705	3,653,466		2,574.80	8.6	4,081.60
7	July	1,916,577	2,219,613	2,744,785	3,816,971		2,674.50	8.9	4,247.20
8	August	1,912,365	2,295,182	2,712,391	3,334,441	**	2,563.60	8.6	4,072.40
9	September	1,920,272	2,263,705	2,643,883	3,246,954	**	2,518.70	8.4	3,989.20
10	October	2,058,691	2,400,193	2,629,474	3,259,348	**	2,586.90	8.6	4,124.00
11	November	1,909,614	2,400,193	2,555,373	3,166,560	**	2,507.90	8.4	3,997.00
12	December	1,918,841	2,543,620	2,558,681	3,171,337	**	2,548.10	8.5	4,067.20
13	13 Month Total	24,856,813	28,218,226	34,089,947	41,527,762				50,839.10
14	13 mo avg.	1,912,063	2,170,633	2,622,304	3,194,443				3,910.70

15 1. Data for December 2003 estimated based on average % allocation between all islands for Jan-Nov 2003.
16 2. Forecast for the months from August through December 2006 based on the actual growth
17 rate for 2006 YTD.
18 3. Used the monthly average from 2003 to 2006 (FCST) to get an average monthly profile.
19 4. Assumed the same percentage increase in the 13 month average to calculate the 2007 13 mo. Average.
20 5. Applied the monthly average profile (from note 3) to the forecast 13 mo. averages (from note 4) to
21 calculate the monthly forecast for 2007.
22 6. 2007 13 month averages for individual islands are incorrect due to defective calculations of division
23 breakdown. Consolidated 2007 averages are correct. Incorrect data will be corrected at next opportunity.

MAUI ELECTRIC COMPANY, LIMITED
2006 - 2007 Inventory Calculations – **Maui ($)**

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
	Maui				Forecast				Test Year
Line		2003	2004	2005	2006		AVERAGE	%	2007
24	January	1,730,189	1,859,384	2,340,678	2,750,557		2,170.20	7.7	3,433.7
25	February	1,905,874	1,882,434	2,412,999	2,864,078		2,266.30	8.1	3,591.1
26	March	1,773,527	1,880,117	2,430,945	2,849,249		2,233.50	8	3,537.3
27	April	1,773,527	1,837,180	2,461,848	2,951,461		2,256.00	8	3,574.2
28	May	1,684,235	1,888,099	2,539,459	3,188,026		2,325.00	8.3	3,687.0
29	June	1,718,255	1,888,684	2,500,271	3,438,917		2,386.50	8.5	3,787.8
30	July	1,803,620	2,041,025	2,515,732	3,597,999		2,489.60	8.9	3,956.6
31	August	1,797,868	2,133,480	2,489,871	3,132,295	**	2,388.40	8.5	3,790.9
32	September	1,798,211	2,067,166	2,415,375	3,038,578	**	2,329.80	8.3	3,695.0
33	October	1,920,112	2,192,594	2,484,142	3,125,088	**	2,430.50	8.7	3,859.8
34	November	1,777,839	2,192,594	2,412,930	3,035,502	**	2,354.70	8.4	3,735.8
35	December	1,793,325	2,352,658	2,417,549	3,041,313	**	2,401.20	8.6	3,811.9
36	13 Month Total	23,218,883	26,008,740	31,774,457	39,430,611				47,502.1
37	13 mo avg.	1,786,068	2,000,672	2,444,189	3,033,124				3,654.0

38 1. Data for December 2003 estimated based on average % allocation between all islands for Jan-Nov 2003.
39 2. Forecast for the months from August through December 2006 based on the actual 25.8% growth
40 rate for 2006 YTD.
41 3. Used the monthly average from 2003 to 2006 (FCST) to get an average monthly profile.
42 4. Assumed the same percentage increase in the 13 month average to calculate the 2007 13 mo. Average.
43 5. Applied the monthly average profile (from note 3) to the forecast 13 mo. averages (from note 4) to
44 calculate the monthly forecast for 2007.
45 6. 2007 13 month averages for individual islands are incorrect due to defective calculations of division
46 breakdown. Consolidated 2007 averages are correct. Incorrect data will be corrected at next opportunity.

MAUI ELECTRIC COMPANY, LIMITED
2006 - 2007 Inventory Calculations – **Molokai ($)**

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
	Molokai				**Forecast**				**Test Year**
Line		**2003**	**2004**	**2005**	**2006**		**AVERAGE**	**%**	**2007**
1	January	83,355	71,890	108,158	105,848		92.3	6.8	167.0
2	February	77,537	76,245	107,241	103,636		91.2	6.8	166.0
3	March	78,168	114,423	108,965	102,880		101.1	7.5	175.2
4	April	78,168	104,007	108,695	120,802		102.9	7.6	176.8
5	May	84,289	115,300	109,091	109,623		104.6	7.8	178.4
6	June	83,051	113,997	192,633	134,933		131.2	9.7	203.0
7	July	71,377	113,004	193,540	138,885		129.2	9.6	201.1
8	August	70,713	102,660	185,915	163,542	**	130.7	9.7	202.5
9	September	75,556	137,153	186,403	163,971	**	140.8	10.4	211.9
10	October	95,287	140,458	108,655	95,579	**	110	8.2	183.4
11	November	91,055	140,458	109,539	96,357	**	109.4	8.1	182.8
12	December	81,021	136,616	107,549	94,606	**	104.9	7.8	178.7
13	13 Month Total	1,057,810	1,447,232	1,763,000	1,538,211				2321.3
14	13 mo avg.	81,370	111,326	135,615	118,324				178.6

15 1. Data for December 2003 estimated based on average % allocation between all islands for Jan-Nov 2003.
16 2. Forecast for the months from August through December 2006 based on the actual -12.03% growth
17 rate for 2006 YTD.
18 3. Used the monthly average from 2003 to 2006 (FCST) to get an average monthly profile.
19 4. Assumed the same percentage increase in the 13 month average to calculate the 2007 13 mo. Average.
20 5. Applied the monthly average profile (from note 3) to the forecast 13 mo. averages (from note 4) to
21 calculate the monthly forecast for 2007.
22 6. 2007 13 month averages for individual islands are incorrect due to defective calculations of division
23 breakdown. Consolidated 2007 averages are correct. Incorrect data will be corrected at next opportunity.

MAUI ELECTRIC COMPANY, LIMITED
2006 - 2007 Inventory Calculations – **Lanai ($)**

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
	Lanai				**Forecast**				**Test Year**
Line		**2003**	**2004**	**2005**	**2006**		**AVERAGE**	**%**	**2007**
24	January	47,909	39,026	49,159	33,874		42.5	7.5	77.0
25	February	48,029	43,437	51,317	36,769		44.9	7.9	79.3
26	March	45,238	65,210	51,321	28,969		47.7	8.4	81.9
27	April	45,238	65,288	50,586	31,116		48.1	8.5	82.2
28	May	44,617	66,038	36,573	43,116		47.6	8.4	81.8
29	June	40,946	66,120	41,801	79,616		57.1	10	90.7
30	July	41,580	65,584	35,513	80,087		55.7	9.8	89.3
31	August	43,784	59,042	36,605	38,605	**	44.5	7.8	78.9
32	September	46,505	59,386	42,105	44,405	**	48.1	8.5	82.3
33	October	43,292	67,141	36,677	38,681	**	46.4	8.2	80.7
34	November	40,720	67,141	32,904	34,701	**	43.9	7.7	78.3
35	December	44,495	54,346	33,583	35,418	**	42	7.4	76.5
36	13 Month Total	580,121	762,254	552,490	558,939				1014.0
37	13 mo avg.	44,625	58,635	42,499	42,995				78.0

38 1. Data for December 2003 estimated based on average % allocation between all islands for Jan-Nov 2003.
39 2. Forecast for the months from August through December 2006 based on the actual 5.49% growth
40 rate for 2006 YTD.
41 3. Used the monthly average from 2003 to 2006 (FCST) to get an average monthly profile.
42 4. Assumed the same percentage increase in the 13 month average to calculate the 2007 13 mo. Average.
43 5. Applied the monthly average profile (from note 3) to the forecast 13 mo. averages (from note 4) to
44 calculate the monthly forecast for 2007.
45 6. 2007 13 month averages for individual islands are incorrect due to defective calculations of division
46 breakdown. Consolidated 2007 averages are correct. Incorrect data will be corrected at next opportunity.

RANDOM MATERIAL COST ON COMMONLY USED MATERIALS ($)

Stock #	Part #	Description	2004	2005	2006
100040	11	30' Penta Pole	105	105	119
100123	27	40' Penta Pole	413	418	524
606970	39	45' Penta Pole	602	743	725
100867	170	Crossarm, 6 Stl Pin Spl 3-1/2X4-1/2X8'	29.95	34.43	36.92
101063	524	Anchor Deadman Conrete 24"	30	37	38
606442	1118	Insulator Post Line Porcelain 27kV	19.47	19.47	21.36
143404	1164	Insulator, Susp, non-ceramic 15kV	19.8	21.6	25.79
103765	2136	Bolt Machine Galv 5/8X1/2"	0.72	0.78	0.92
104067	2176	Bolt Machine Galv 3/4X1/2"	1.4	1.58	1.56
109348	3304	Fuse link typ 200 w/slv 5A	1.34	1.84	3.76
109389	3306	Fuse link typ 200 w/slv 10A			
114827	7620	Cond XLPEICN #2-1/c AL 15kV	0.77	0.87	1.27
114843	7621	Cond XLPEICN 4/0-3/c AL 15kV	3.7	3.71	4.65
115089	7951	Cond Bare AAC 1/0 Nonspec 7 Strnd	3.18	3.65*	3.65
115105	7978	Cond Serv Drop Tpx AL #4 0-300V	0.31	0.31	0.36
115204	7985	Cond Serv Drop Tpx 1/0 0-300V	0.67	0.64	0.84
115220	7988	Cond Serv Drop Tpx 1/0 0-600V	1.18	1.43	1.51
115261	8006	Cond Bare Cu Sol #8 SD	1.79	2.06	6.44
115287	8008	Cond Bare Cu Sol #4 SD	1.79	2.06	7.95
115386	8030	Cond Tpx AL 350 MCM 600V	1.88	1.87	1.95
118406	11635	Splice, Permanent, #2 AL PEICN 15kV	16.23	15	17.4
121301	12111	Conn Split Bolt CU 350 MCM	4.28	4.65	4.75
122903	12410	Crimpit YC4C4	0.47	0.47*	0.5
125526	18138	Sw Disc Hook Operated 600A 14.4kV	151	144.72	153.86
608588	29514	Cnd PVC Sch-40 w/cplug 2"X10'	5.37	5.37	13.17
129262	29532	Cnd PVC	10.54	10.54	34.14
Totals			1425.84	1575.93	1748.75

The above dollar values were determined by looking at the same month materials were ordered for each year.

*Two items exception to the above due to no information available within the year.

Average percent change from 2004 to 2005 = 11%

Average percent change from 2005 to 2006 = 11%

Data taken from Ellipse inventory reports.

2007 TEST YEAR

T&D O&M EXPENSE VARIANCES BY ACCOUNTS
(Over $45,000 and 10%)

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
	Account	RA	Activity	Expense Element	2006 Recorded	2007 Test Year Estimate	Variance $	Variance %	
	Transmission Operations								
1	563	MDR	331	150	84,380	176,082	91,702	109%	A
2	567	MDE	926	570	-	49,200	49,200	N/A	B
	Transmission Maintenance								
3	570	MDE	348	201	337,481	178,960	(158,521)	-47%	C
4	571	MDK	344	150	8,031	102,351	94,320	1174%	D
5	571	MDK	344	501	100	150,000	149,900	149900%	E
6	571	MDR	342	501	124,242	50,000	(74,242)	-60%	F
7	573	MDR	354	501	29,769	123,000	93,231	313%	G
8	573	MWI	354	501	59,261	-	(59,261)	-100%	H

Notes:
Column I: Letter designation ties to items in MECO-620A
Differences due to rounding

MAUI ELECTRIC COMPANY, LTD.
2007 TEST YEAR

T&D O&M EXPENSE VARIANCES BY ACCOUNTS
(Over $45,000 and 10%)

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
						2007			
				Expense	2006	Test Year	Variance		
	Account	RA	Activity	Element	Recorded	Estimate	$	%	
	Distribution Operations								
1	583	MDR	461	150	242,610	333,598	90,988	38%	I
2	583	MDR	461	462	99,415	-	(99,415)	-100%	J
3	584	MDR	462	150	125,431	182,037	56,606	45%	K
4	586	MDM	465	150	239,753	346,744	106,991	45%	L
	Distribution Maintenance								
5	593	MDK	494	501	456,761	660,000	203,239	44%	M
6	593M	MDT	494	501	61,077	125,840	64,763	106%	N
7	594	MDK	478	501	45,662	105,000	59,338	130%	O
8	598	MDR	491	501	-	50,000	50,000	N/A	P

Notes:
Column I: Letter designation ties to items in MECO-620A
Differences due to rounding

MAUI ELECTRIC COMPANY, LTD.
2007 TEST YEAR VERSUS 2006 RECORDED

TRANSMISSION AND DISTRIBUTION
OPERATIONS AND MAINTENANCE EXPENSE
VARIANCES BY ACCOUNTS
(Over $45,000 and 10%)

(A) B	(C)	(D)
A	91,702	NARUC 563, MECO activity MDR331 (Operate Transmission Facilities-OH Line) Labor variance = $91,702. The variance is attributable to the following: (1) the addition of a Dispatch Supervisor in November 2006, which accounts for approximately $ 20,996 in new expenses to this activity code in 2007, (2) increase in labor rates from 2006 to 2007, which adds $8,890 to this activity code in 2007, and (3) large number of capital projects in 2006 which resulted in $60k less than projected budget for this activity code being charged in 2006; however, the 2006 budget was 3600 hours for this activity code, which is based on trending and five year average actuals for 2001-2005 of 3,743.65 hours average. See MECO-WP-620 page 1.
B	49,200	NARUC 567, MECO activity MDE926 (Manage Owned, Leased & Jointly Owned Property) Rent, Variance = $49,200. This consists of the rental fee for the property used by MECO for its Camp Maui Substation in Haiku. Since the expiration of the lease agreement with the property owners in or around 2001, MECO has not been paying rent for the use of the property pending negotiation of a new lease extension. The last rental payment was made in June, 2000 for the period of 6/2000 to 6/2001. The test year cost of $49,200 was based on an estimated rental payment of $1,000 per month (based on payments made to Haleakala Ranch for leased property). The cost projection includes the cost of monthly payments for 2007 and the possibility of making back payments for 2001 through 2006.
C	(158,521)	NARUC 570, MECO activity MDE348 (Maintain Substation Transmission Equipment) Materials, Variance = ($158,521). This budgetary item is for purchasing O&M materials relating to preventive maintenance of substation transmission equipment. The costs for materials vary year to year depending upon the type and age of equipment being maintained and the extent of maintenance required. 2006 expenses were unusually high due to extensive damage found on CT's and bushings at Sub#139 and Sub#104 which necessitated the replacement of more components then normal.
D	94,320	NARUC 571, MECO activity MDK344 (Maintain Transmission OH Line) Labor, Variance = $94,320. The variance is due to the commencement of the steel pole maintenance program, and the resulting manpower needed to provide support for steel pole corrosion removal and pole *painting based on approx. 2,400 hours DKCREW and 48 hours DKSUPV a year for travel time,* time to test and clear lines, time to ground and remove grounds for painting contractor, stand-by time, time to assist contractor, and time to document process. See MECO-WP-620 page 2.

Note: Differences due to rounding

MAUI ELECTRIC COMPANY, LTD.
2007 TEST YEAR VERSUS 2006 RECORDED

TRANSMISSION AND DISTRIBUTION
OPERATIONS AND MAINTENANCE EXPENSE
VARIANCES BY ACCOUNTS
(Over $45,000 and 10%)

E	149,900	NARUC 571, MECO activity MDK344 (Maintain Transmission OH Line) Outside Service, Variance = $149,900. This variance is also attributable to the commencement of the steel pole maintenance program and the estimated outside services costs to be incurred for this program. The outside services cost is based on $1500 - $3000 per pole. This estimate was based on a rough verbal estimate obtained from JD Painting and March Painting in 2005 due to the inability to predict the actual labor requirements until project is underway and experience is gained by contractor. 2007 updated bid price $9,145 per pole to grit blast and refinish Proposal from Endo Painting. Maximum number of poles for 2007 not to exceed $150,000. Work not started, still soliciting other qualified bids.
F	(74,242)	NARUC 571, MECO activity MDR342 (Maintain Transmission OH Line) Outside Service, Variance = ($74,242). This involves the outside services contract to maintain roads and trails. The contract services and resulting charges in 2006 were higher then normal due to extensive damage to the West Maui 69kv access roads. Also, higher then normal charges to this account due to incorrect job number used when billing. $30,000 should have been charged to MDK342, which saw charges of only $604 and was budgeted for $30,000 of Outside services to maintain transmission accesses (roads and trails).
G	93,231	NARUC 573, MECO activity MDR354 (Maintain Transmission SCADA System) Outside Service, Variance = $93,231. This involves new O/S (Outside services) funds for annual support for the newly installed and upgraded EMS system. These services are critical for continued operations and to assist in training the new SCADA/EMS engineer. This was taken over from MWI in May 2006 with the transfer of the SCADA/EMS Engineer from MWI to MDR. See Variance item H below. See also MECO T-6, CA-IR-2 Attachment 6A for support for expenses.
H	(59,261)	NARUC 573, MECO activity MWI354 (Maintain Transmission SCADA System) Outside Service, Variance = ($59,261). This was taken over from MWI in May 2006 with the transfer of the SCADA/EMS Engineer from MWI to MDR. See Variance item G above.
I	90,988	NARUC 583, MECO activity MDR461 (Operate Distribution Facilities-OH Line) Labor, Variance = $90,988. Variances due to multiple factors: $30,764 due to labor rate increase from 2006 to 2007, $30,927 due to addition of DRDSUPV position in 2007, $8,475 due to vacancies, $21,645 due to 450 hours not charged by DRFCSP due to temporary reassignment to special project. See MECO-WP-620 page 3
J	(99,415)	NARUC 583, MECO activity MDR461 (Operate Distribution Facilities-OH Line) Software, Variance = ($99,415). In 2006 a non-budgeted non-recurring Transmission Outage Application (TOA) software suite expense was added, which accounts for this unusually high 2006 expense.

Note: Differences due to rounding

MAUI ELECTRIC COMPANY, LTD.
2007 TEST YEAR VERSUS 2006 RECORDED

TRANSMISSION AND DISTRIBUTION
OPERATIONS AND MAINTENANCE EXPENSE
VARIANCES BY ACCOUNTS
(Over $45,000 and 10%)

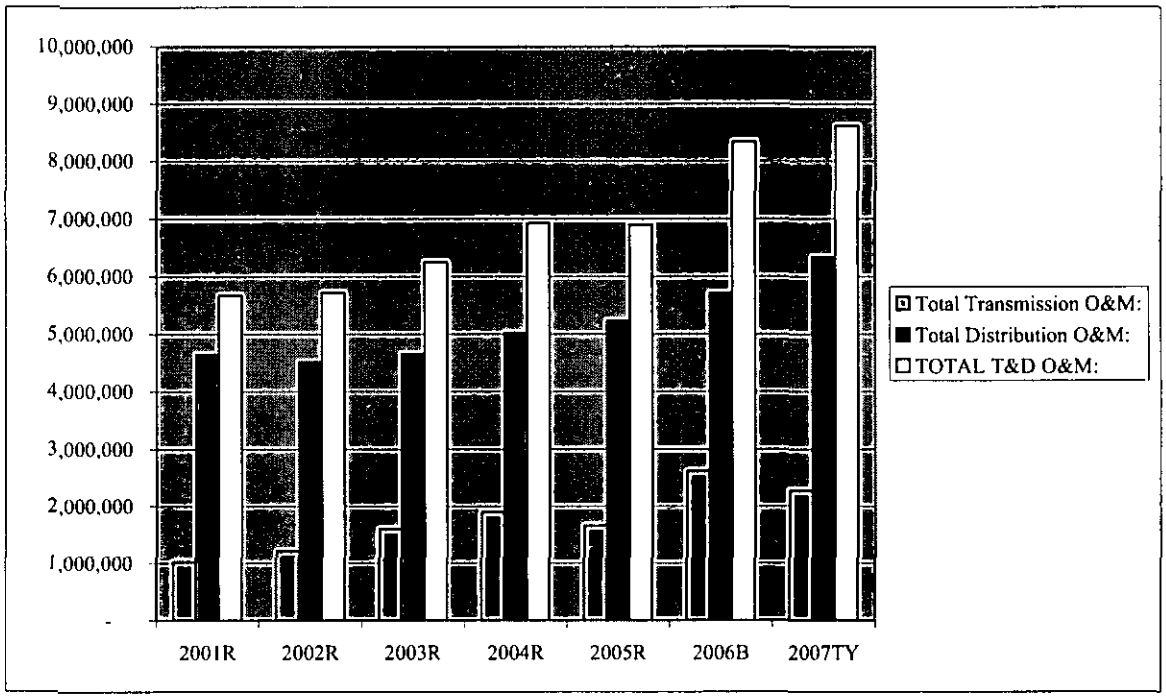
K	56,606	NARUC 584, MECO activity MDR462 (Operate Distribution Facilities - UG Line) Labor, Variance = $56,606. $12,235 due to labor rate increase, $15,497 for added DRDSUP position, and $17,838 due to vacancies. Remainder due to additional labor hours added to 2007 budget to diagnose, clear, test, trouble-shoot, and restore underground direct buried cables, see pages 22-25 of MECO T-6 for discussion on UG direct buried cables and MECO-609 for cable fault trending. Also included in this activity is labor to locate and mark electrical infrastructure under the State mandated "ONE CALL" program. The One call program was still in development stage in 2006 and expected demand had not been realized yet. See MECO-WP-620 page 4.
L	106,991	NARUC 586, MECO activity MDM465 (Inspect and test revenue meters and related equipment) Labor, Variance = $106,991. The variance is due to the following factors. Meter Shop Working Foreman position was reclassified to a merit Meter Shop Supervisor position in 2007. The primary activity code for reclassified position is MDM465. For 2007, that accounts for $70,974 or 1,800 labor hours added to this activity code. Standard labor rate change accounts for $13,888. Remainder due to vacancies and unplanned temporary shift in work from O&M to capital project to install Turtle meters in support of CIS project. See MECO-WP-620 page 5.
M	203,239	NARUC 593, MECO activity MDK494 (Perform Vegetation Management-Distribution) Outside Service, Variance = $203,239. Variance caused by historically low 2006 numbers, which are not reflective of real trending. 2007 budget for this activity code is in line with trending. See MECO-WP-622. Five year average based on actuals = $640,933. Five year average without 2005 (2004 to 2000) = $693,056. It should also be noted that the 2007 budget is actually $30,473 lower then the five year average with 2005 excluded and is reasonable in view of trending without the 2005 anomaly. In addition, 2005 and 2006 were below budget due to redirection of budget to other company O&M expenses.
N	64,763	NARUC 593M, MECO activity MDT494 (Perform Vegetation Management-Distribution Molokai) Outside Service, Variance = $64,763. Based on revised (new) two year contract with Asplundh Expert Tree Service. For 2006 Tree trimming Molokai 22 weeks 3 man bucket crew + mobilization, Lodging per PO#M32137. See MECO T-6 CA-IR-2 response Attachment 6B, page 2, item 157x and Attachment 6E, pages 54-55.
O	59,338	NARUC 594, MECO activity MDK478 (Maintain Distribution UG Lines) Outside Service, Variance = $59,338. Variance caused by the start of direct buried underground cable testing projects scheduled to start in November 2006 being pushed to 2007 due to man-power shortages. See, MECO T-6 testimony for discussion on cable faults and testing programs.
P	50,000	NARUC 598, MECO activity MDR491 (Maintain Distribution SCADA system) Outside Services, Variance = $50,000. This budgetary item consists of SCADA/EMS System (upgraded in 2005) Annual Licensing fees. See MECO T-6 CA-IR-2 response Attachment 6B, page 2, item 144x and Attachment 6E, page 48.

Note: Differences due to rounding

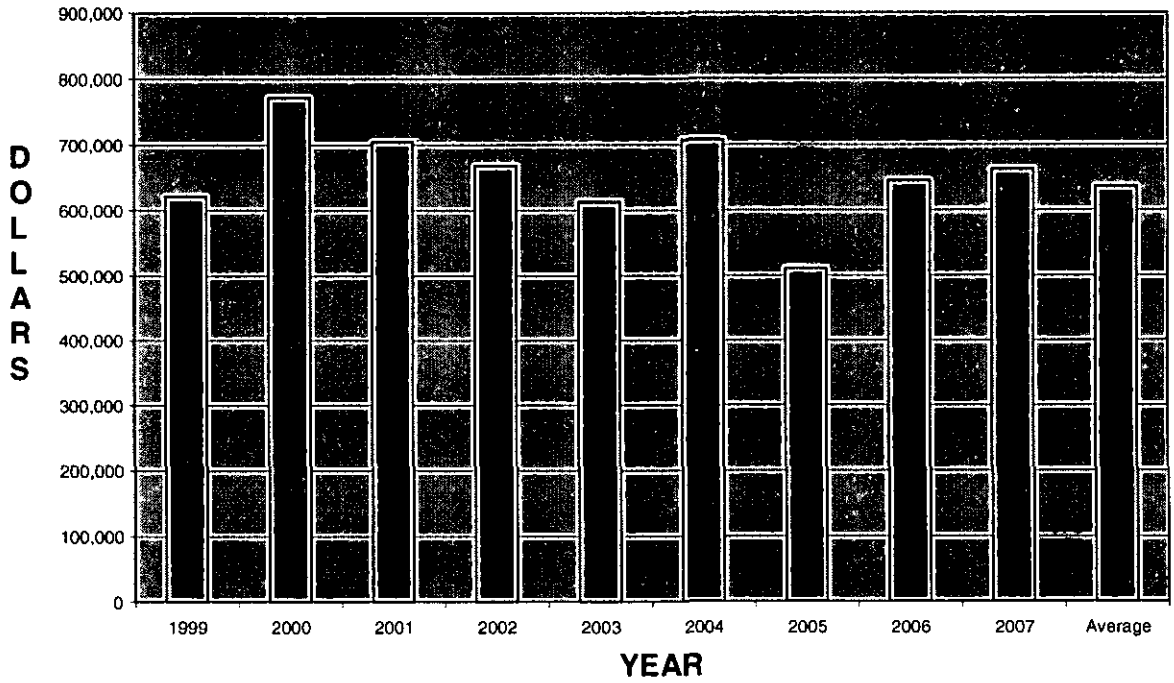
MAUI ELECTRIC COMPANY, LIMITED
Rate Case Summary Report: T&D O&M

Comparative of Recorded 2001-2005, Budgeted 2006 and Test Year (TY) 2007

Line		(A)	(B)	(C)	(D)	(E)	(F)	(G)
		Recorded					Budget	Test Year
		2001R	2002R	2003R	2004R	2005R	2006B	2007TY
1	Total Transmission O&M:	1,026,223	1,206,934	1,595,777	1,895,842	1,656,830	2,618,992	2,276,738
2	Total Distribution O&M:	4,647,977	4,509,877	4,654,745	5,023,858	5,236,682	5,715,870	6,336,603
3	TOTAL T&D O&M:	5,674,200	5,716,811	6,250,522	6,919,700	6,893,512	8,334,862	8,613,341



Maui Distribution Vegetation Management Expense Trending



NOTES:
1999 - 2005 Actuals
2006 and 2007 Estimates
Ref: MECO-WP-622

AEGIS Suggestions for MECO regarding Distribution System Inspections:

Consider the benefits of inspecting all underground padmounted equipment on a continuing cyclical basis.

Document the overhead and underground distribution inspection program by developing a written policy statement summarizing the program. This statement should indicate the reasons for the program, who is responsible for its administration, inspection cycles, items inspected and how repairs are prioritized, scheduled and completed.

Develop a list of items to be checked by inspectors performing overhead distribution inspections and underground padmounted equipment inspections and effect timely correction of identified substandard conditions, including those noted in the Field Observations Section above.

Distribution Design and Inspections

Background:

Utilities are charged with maintaining the integrity of all components of their electric system from the time of installation to removal. Regular inspection of all facilities supports proper maintenance programs and helps identify substandard conditions or deficiencies before they become serious hazards. NESC rules 214 and 313 do not specify inspection frequencies, but only "as experience has shown to be necessary." This leaves some latitude for utilities depending on their current programs, the local environment, construction practices, state and local ordinances and other considerations. In addition to the natural deterioration of line equipment and facilities, other factors that support the need for regular inspection programs are changing land conditions around and below company electric facilities, vandalism, or improper construction.

TOPIC ELEMENT	FINDINGS
Distribution Inspections	
• The company has a regular inspection program monitoring the condition of all overhead distribution facilities to ensure their safe and reliable operation. (NESC 214.A.)	2005: Yes. MECO line inspectors inspect the entire overhead distribution system on a continuing basis as needed.

	2000: YES. MECO LINE INSPECTORS INSPECT THE ENTIRE OVERHEAD DISTRIBUTION SYSTEM ON A CONTINUING BASIS. COMPANY MANAGERS ONLY LOOSELY CONTROL THIS PROGRAM. THE COMPANY RECENTLY INITIATED AN UNDERGROUND DISTRIBUTION INSPECTION PROGRAM AND PLANS TO CONTINUE THIS PROCESS UNTIL THE ENTIRE UNDERGROUND SYSTEM HAS BEEN INSPECTED.
• A written policy statement outlining the overhead inspection program is in place.	2005: No. 2000: NO.
• Overhead distribution inspection intervals are based on the requirements of the company's own facilities and its own unique operating environment.	2005: Yes. 2000: YES.
• Standard, system-wide, inspection forms are used to record the results of overhead distribution inspections.	2005: Yes. 2000: NO.
TOPIC ELEMENT	**FINDINGS**
• The company has a regular inspection program monitoring the condition of accessible underground distribution facilities to ensure their safe and reliable operation. (NESC 313.A.)	2005: Yes. 2000: YES. MECO LINE INSPECTORS INSPECT THE ENTIRE OVERHEAD DISTRIBUTION SYSTEM ON A CONTINUING BASIS. COMPANY MANAGERS ONLY LOOSELY CONTROL THIS PROGRAM. THE COMPANY RECENTLY INITIATED AN UNDERGROUND DISTRIBUTION INSPECTION PROGRAM AND PLANS TO CONTINUE THIS PROCESS UNTIL THE ENTIRE UNDERGROUND SYSTEM HAS BEEN INSPECTED.
• A written policy statement outlining the underground inspection program is in place.	2005: No. 2000: NO.
• Underground distribution inspection intervals are based on the requirements of the company's own facilities and its own unique operating environment.	2005: Yes. 2000: YES.
• Standard, system-wide, inspection forms are used to record the results of underground inspections.	2005: Yes. Forms are used for exception reporting only. 2000: NO.
• The distribution inspection program includes the	2005: Yes.

inspection of company equipment located inside customer-owned vaults and enclosures.	2000: YES.
• Employees specifically trained to recognize hazardous security and public safety conditions, as well as conditions affecting service reliability, complete inspections.	2005: Yes. Company linemen complete inspections. 2000: YES. LINE INSPECTORS WHO ARE EXPERIENCED LINEMEN COMPLETE INSPECTIONS.
• Supervisors check inspection results to insure quality and accuracy of inspections by making spot check inspections of the distribution system.	2005: Yes. 2000: YES.
• Inspection records are appropriately retained in accordance with applicable regulations and the company's record retention policy. Preferably, inspection results are computerized to facilitate trending analysis.	2005: Yes. 2000: YES.
• Record retention practices permit the retrieval of the date of last inspection, results observed and repair dates for each structure, line section, enclosure, etc.	2005: Yes. 2000: YES.

MAUI ELECTRIC COMPANY, LIMITED
OVERTIME HOURS, DOLLARS, AND PERCENT
MECO

PAID OVERTIME	2001			2002			2003			2004		
	Overtime Hours	Overtime Dollars	% Overtime	Overtime Hours	Overtime Dollars	% Overtime	Overtime Hours	Overtime Dollars	% Overtime	Overtime Hours	Overtime Dollars	% Overtime
President's Office	0	0	0%	0	0	0%	0	0	0%	0	0	0%
Accounting	17	545	0%	40	1,429	0%	57	1,959	0%	462	14,508	2%
Customer Services	542	16,552	1%	565	17,646	1%	947	31,299	2%	2,031	70,064	4%
Distribution	34,609	1,503,951	25%	14,901	685,640	11%	32,834	1,535,147	26%	41,992	2,036,166	33%
Production	32,077	1,329,128	19%	28,749	1,216,010	17%	30,217	1,295,907	18%	36,707	1,621,363	22%
Administration	188	5,646	1%	158	4,526	1%	114	3,404	1%	238	7,070	1%
Engineering	1,367	51,216	3%	23	781	0%	868	34,397	2%	2,702	102,988	6%
TOTAL COMPANY	**68,799**	**2,907,037**	**16%**	**44,437**	**1,926,032**	**11%**	**65,036**	**2,902,114**	**16%**	**84,132**	**3,852,159**	**20%**

PAID OVERTIME	2005			2006			Five year Average (2002-2006)		
	Overtime Hours	Overtime Dollars	% Overtime	Overtime Hours	Overtime Dollars	% Overtime	Overtime Hours	Overtime Dollars	% Overtime
President's Office	0	0	0%	0	0	0%	0	0	0%
Accounting	32	1,117	0%	113	4,736	1%	141	4,750	1%
Customer Services	2,133	74,434	4%	2,047	71,543	3%	1,545	52,997	3%
Distribution	40,429	1,966,873	31%	45,765	2,249,957	33%	35,184	1,694,757	27%
Production	36,010	1,617,350	21%	39,556	1,878,299	23%	34,248	1,525,786	20%
Administration	80	2,502	0%	77	2,473	0%	133	3,995	1%
Engineering	2,193	90,790	5%	3,670	153,921	8%	1,891	76,575	4%
TOTAL COMPANY	**80,877**	**3,753,065**	**19%**	**91,229**	**4,360,929**	**21%**	**73,142**	**3,358,860**	**17%**

SOURCE:
T11 MECO-1106 revised 01-12-07

MAUI ELECTRIC COMPANY, LIMITED
OVERTIME HOURS, DOLLARS, AND PERCENT
MAUI ONLY

PAID OVERTIME	2001			2002			2003			2004		
	Overtime Hours	Overtime Dollars	% Overtime	Overtime Hours	Overtime Dollars	% Overtime	Overtime Hours	Overtime Dollars	% Overtime	Overtime Hours	Overtime Dollars	% Overtime
President's Office	0	0	0%	0	0	0%	0	0	0%	0	0	0%
Accounting	17	545	0%	40	1,429	0%	57	1,959	0%	462	14,508	2%
Customer Services	524	15,947	1%	539	16,755	1%	887	28,987	2%	1,922	65,425	4%
Distribution	33,398	1,458,353	26%	13,496	629,420	11%	30,590	1,438,412	26%	39,960	1,938,063	34%
Production	29,524	1,220,225	20%	26,181	1,104,339	17%	26,817	1,148,013	18%	32,841	1,453,121	22%
Administration	188	5,646	1%	158	4,526	1%	114	3,404	1%	238	7,070	1%
Engineering	1,367	51,216	3%	23	781	0%	868	34,397	2%	2,702	102,988	6%
TOTAL COMPANY	**65,017**	**2,751,931**	**17%**	**40,437**	**1,757,250**	**10%**	**59,332**	**2,655,173**	**15%**	**78,125**	**3,581,174**	**20%**

PAID OVERTIME	2005			2006			Five year Average (2002-2006)		
	Overtime Hours	Overtime Dollars	% Overtime	Overtime Hours	Overtime Dollars	% Overtime	Overtime Hours	Overtime Dollars	% Overtime
President's Office	0	0	0%	0	0	0%	0	0	0%
Accounting	32	1,117	0%	113	4,736	1%	141	4,750	1%
Customer Services	1,967	67,095	4%	1,902	64,995	3%	1,443	48,651	3%
Distribution	38,467	1,868,565	32%	43,661	2,138,052	34%	33,235	1,602,502	27%
Production	32,495	1,463,398	21%	35,360	1,684,738	23%	30,739	1,370,722	20%
Administration	80	2,502	0%	77	2,473	0%	133	3,995	1%
Engineering	2,193	90,790	5%	3,670	153,921	8%	1,891	76,575	4%
TOTAL COMPANY	**75,233**	**3,493,467**	**19%**	**84,783**	**4,048,915**	**21%**	**67,582**	**3,107,196**	**17%**

SOURCE:
T11 MECO-1106 revised 01-12-07

MAUI ELECTRIC COMPANY, LIMITED
OVERTIME HOURS, DOLLARS, AND PERCENT
MOLOKAI ONLY

	2001			2002			2003			2004		
PAID OVERTIME	Overtime Hours	Overtime Dollars	% Overtime	Overtime Hours	Overtime Dollars	% Overtime	Overtime Hours	Overtime Dollars	% Overtime	Overtime Hours	Overtime Dollars	% Overtime
Customer Services	18	605	0%	26	891	0%	60	2,312	1%	109	4,640	3%
Distribution	525	19,617	7%	633	26,468	9%	1,056	46,894	20%	913	43,526	18%
Production	679	29,471	7%	798	35,547	8%	1,826	77,542	18%	2,097	86,414	20%
TOTAL MOLOKAI	**1,221**	**49,693**	**5%**	**1,457**	**62,907**	**7%**	**2,942**	**126,748**	**15%**	**3,119**	**134,580**	**16%**

	2005			2006			Five year Average (2002-2006)		
PAID OVERTIME	Overtime Hours	Overtime Dollars	% Overtime	Overtime Hours	Overtime Dollars	% Overtime	Overtime Hours	Overtime Dollars	% Overtime
Customer Services	167	7,339	4%	145	6,549	3%	101	4,346	2%
Distribution	720	36,276	14%	768	43,447	15%	818	39,322	15%
Production	1,887	77,722	16%	1,983	86,064	16%	1,718	72,658	16%
TOTAL MOLOKAI	**2,774**	**121,336**	**13%**	**2,896**	**136,059**	**14%**	**2,637**	**116,326**	**13%**

SOURCE:
T11 MECO-1106 revised 01-12-07

MAUI ELECTRIC COMPANY, LIMITED
OVERTIME HOURS, DOLLARS, AND PERCENT
LANAI ONLY

PAID OVERTIME	2001			2002			2003			2004		
	Overtime Hours	Overtime Dollars	% Overtime	Overtime Hours	Overtime Dollars	% Overtime	Overtime Hours	Overtime Dollars	% Overtime	Overtime Hours	Overtime Dollars	% Overtime
Distribution	687	25,981	16%	773	29,752	17%	1,189	49,842	27%	1,120	54,578	27%
Production	1,874	79,432	20%	1,770	76,123	22%	1,574	70,351	23%	1,768	81,828	26%
TOTAL LANAI	**2,561**	**105,413**	**19%**	**2,543**	**105,876**	**20%**	**2,763**	**120,193**	**25%**	**2,888**	**136,406**	**26%**

PAID OVERTIME	2005			2006			Five year Average (2002-2006)		
	Overtime Hours	Overtime Dollars	% Overtime	Overtime Hours	Overtime Dollars	% Overtime	Overtime Hours	Overtime Dollars	% Overtime
Distribution	1,242	62,032	29%	1,337	68,458	30%	1,132	52,932	26%
Production	1,629	76,230	24%	2,214	107,498	33%	1,791	82,406	26%
TOTAL LANAI	**2,871**	**138,262**	**26%**	**3,551**	**175,956**	**32%**	**2,923**	**135,338**	**26%**

SOURCE:
T11 MECO-1106 revised 01-12-07

MECO T-7
DOCKET NO. 2006-0387

TESTIMONY OF
SHARON M. SUZUKI

MANAGER
CUSTOMER SERVICE DEPARTMENT
MAUI ELECTRIC COMPANY, LIMITED

Subject: Customer Accounts Expense
Other Operating Revenues
Customer Deposits
Interest on Customer Deposits
Revenue Collection Lag Days
Customer Service Department
Workforce

INTRODUCTION

Q. Please state your name and business address.

A. My name is Sharon M. Suzuki and my business address is 210 West Kamehameha Avenue, Kahului, Hawaii.

Q. By whom are you employed and in what capacity?

A. I am employed by Maui Electric Company, Limited ("MECO" or "Company") as the Manager of the Customer Service Department.

Q. Please summarize your educational background and professional experience that relate to your testimony in this proceeding.

A. My educational background and experience are listed in MECO-700.

Q. What is your area of responsibility in this testimony?

A. My testimony will cover the Company's 2007 test year estimate of customer accounts expense for the Company's Maui, Lanai and Molokai Divisions. In addition, my testimony will cover the following related areas:

1) Other operating revenues,
2) Customer deposits and interest on customer deposits,
3) Revenue collection lag days, and
4) Customer Service Department workforce.

Q. What are the 2007 test year estimates for your area of responsibility in this testimony?

A. The 2007 test year estimate for customer accounts expense is $3,300,000 at present rates and $3,311,000 at proposed rates.

The 2007 test year estimate for other operating revenue is $1,535,000 at present rates and $1,759,000 at proposed rates.

The 2007 test year estimate for customer deposits is $3,882,000. The interest on customer deposits for the 2007 test year is $233,000.

The revenue collection lag days for the 2007 test year are 36 days.

Finally, the Customer Service Department employee count for the 2007 test year is 43.

CUSTOMER ACCOUNTS EXPENSE

Q. What is the Company's 2007 test year estimate of customer accounts expense at present rates?

A. The 2007 test year estimate of the Company's customer accounts expense at present rates is as follows:

	Test Year 2007
Maui Division	$2,978,000
Lanai Division	$145,000
Molokai Division	$177,000
MECO Consolidated	$3,300,000

See MECO-701, column A.

Q. What is the Company's 2007 test year estimate of customer accounts expense at proposed rates?

A. The Company's customer accounts expense at proposed rates is as follows:

	Test Year 2007
Maui Division	$2,987,000
Lanai Division	$146,000
Molokai Division	$178,000
MECO Consolidated	$3,311,000

See MECO-701, column B.

Q. What is the reason for the $11,000 difference in the Company's customer accounts test year expense at present rates versus proposed rates?

A. As discussed later in my testimony, the sole reason for the $11,000 difference is due to different amounts included in the allowance for uncollectible accounts because, as electric sales revenues increase due to the proposed rate increase, the corresponding amount of uncollectible dollars can be expected to increase proportionately. The other items remain the same between present and proposed rates, as shown on pages 1 and 2 of MECO-702, MECO-705 and MECO-708. As a result of the difference in rates, the test year estimate at present rates includes an allowance for uncollectible accounts of $200,000 for the Maui Division (see MECO-711, page 1, line 2, column C), $6,000 for the Lanai Division (see MECO-711, page 1, line 3, column C), and $8,000 for the Molokai Division (see MECO-711, page 1, line 4, column C), for a MECO consolidated allowance for uncollectible accounts of $214,000 (see MECO-711, page 1, line 1, column C). The test year estimate at proposed rates includes an allowance for uncollectible accounts of $209,000 for the Maui Division (see MECO-711, page 1, line 6, column C), $7,000 for the Lanai Division (see MECO-711, page 1, line 7, column C), and $9,000 for the Molokai Division (see MECO-711, page 1, line 8, column C), for a MECO total allowance for uncollectible accounts of $225,000 (see MECO-711, page 1, line 5, column C.)

Q. What is customer accounts expense?

A. Customer accounts expense are those expenses primarily related to managing and maintaining services and information related to customer account services and customer account management.

Q. What blocks of accounts are utilized to record customer accounts expense?

A. The following four (4) blocks of accounts are used to record customer accounts expense:

1) Account no. 901 - supervision,
2) Account no. 902 - meter reading,
3) Account no. 903 - customer records and collection, and
4) Account no. 904 - uncollectibles.

These accounts are consistent with the National Association of Regulatory Utility Commissioner's ("NARUC") Uniform System of Accounts ("USOA"). See MECO-WP-701, pages 1 to 4.

Q. What expenses are included in the Company's customer accounts expense?

A. The expenses included in the Company's customer accounts expense are activities implemented by the Company's Customer Service Department such as: 1) customer billing (including the cost of processing customer requests to commence, modify or terminate service) and mailing, 2) meter reading, 3) collecting and processing of payments, 4) handling customer inquiries, 5) maintaining customer records, 6) managing delinquent and uncollectible accounts, and 7) conducting field services and investigations. These activities are also described in detail in the NARUC USOA, as shown in MECO-WP-701, pages 1 to 4.

Q. How was the Company's 2007 test year customer accounts expense estimate at present rates developed?

A. The Company's 2007 test year estimate of customer accounts expense at present rates was based on the total 2007 operating budget, as adjusted for budget adjustments made for known or expected changes in the test year and/or to correct for errors that were discovered after the 2007 operating budget was finalized.

Q. Please describe how the 2007 operating budget was prepared.

A. The 2007 operating budget was prepared by the Supervisors and Manager of the Customer Service Department working closely with the Administrator of the Department. They reviewed historical data, and adjusted those numbers based on expected activities for the coming year to derive the budget estimates. The Company's overall budgeting process is described in more detail by Mr. Lyle Matsunaga in MECO T-9.

Q. Please describe the budget adjustments included in the 2007 test year estimates for customer accounts expense?

A. To derive the Company's total test year estimate, budget adjustments were specifically made for each of the divisions (Maui, Lanai, and Molokai) as reflected in MECO-702, pages 1 and 2, line 6, column B (Maui Division) ($147,000), MECO-705, pages 1 and 2, line 6, column B (Lanai Division) (-$10,000), and MECO-708, pages 1 and 2, line 6, column B (Molokai Division) (-$59,000). No normalization adjustments were made to the operating budget for each of the divisions to derive the Company's total 2007 test year estimates at present rates.

Overall, the following budget adjustments were made to the Company's customer accounts expense:

(1) For the Maui Division, reclassification of hours and related on-costs for the Customer Service Department Manager from account no. 903 - customer records and collection to account no. 901 - supervision. This adjustment resulted in an upward adjustment of $32,000 to account no. 901.

(2) updating the allocation of customer records and collection expenses from the Maui Division to the Lanai and Molokai Divisions. This adjustment resulted

in an upward adjustment $84,000 for account no. 903 for the Maui Division, which was offset by the downward adjustment of the Manager's labor and on-costs mentioned above in my testimony of -$32,000 for a net adjustment to account no. 903 for the Maui Division of $52,000. For the Lanai Division, the updated allocation of customer records and collection expenses resulted in a -$16,000 downward adjustment. For the Molokai Division, the updated allocation of customer records and collection expenses resulted in a -$67,000 downward adjustment.

(3) adjusting bad debt expense based on revenues at present rates for the Maui Division, and to apply amounts to the Lanai and Molokai Divisions. These adjustments resulted in an upward adjustment of $63,000 for the Maui Division, an upward adjustment of $6,000 for the Lanai Division, and an upward adjustment of $8,000 for the Molokai Division. See MECO-703, pages 1 and 2, column B, MECO-705, pages 1 and 2, column B, MECO-708, pages 1 and 2, column B, and MECO-WP-701, pages 21 and 22. I discuss these adjustments later in my testimony.

Q. How does the 2007 test year estimates for customer accounts expense compare with recorded expenses in 2005?

A. The 2007 test year estimate at present rates of $3,300,000 is approximately $576,000, or 21.1%, greater than the 2005 recorded customer accounts expense of approximately $2,724,000. See MECO-WP-701, page 6, line 33, columns N and O. See MECO-WP-701, page 8, line 33, columns N and O for a similar comparison between the 2007 test year estimate at proposed rates with recorded expenses in 2005. A more detailed comparison is provided in MECO-WP-701, pages 9 to 19, which lists the recorded 2005 expenses by NARUC USOA code

1 blocks and compares those amounts with the Company's 2007 operating budget.
2 Variance explanations are provided for each particular NARUC USOA code block
3 with variances of greater than $45,000 and plus or minus 10% between the 2007
4 operating budget and the 2005 recorded amounts. See MECO-WP-701, page 20.
5 Q. How does the estimated 2007 test year customer accounts expense compare to the
6 average recorded customer accounts expense in previous years from 2001 through
7 2005?
8 A. The Company's 2007 test year customer accounts expense at present rates are
9 higher by approximately $848,000, or 34.6%, when compared to the average
10 2001-2005 recorded expenses. See MECO-WP-701, page 6, line 33, columns L
11 and M. See MECO-WP-701, page 8, line 33, columns L and M for a similar
12 comparison between the 2007 test year estimate at proposed rates with recorded
13 expenses in 2005. Again, as set forth above, the sole reason for the $11,000
14 difference between the 2007 test year customer accounts expense at present vs.
15 proposed rates is due to different amounts included in the allowance for
16 uncollectible accounts.
17 Q. Please explain the reasons for the increased expenses estimated in the 2007 test
18 year as compared to prior years.
19 A. There are two (2) primary reasons for the increased expenses estimated in the
20 2007 test year.
21 First, the number of customers served by the Company continues to grow
22 each year. For example, the consolidated average number of customers for 2001
23 was 58,311, as compared to an average number of customers of 63,102 in 2005
24 and a projected average number of customers of 65,441 for the 2007 test year.
25 See Ms. Joanne Ide's testimony (MECO T-2) and MECO-WP-205, page 1, for

information on the average monthly number of customers. Each additional customer results in the addition of at least one more account, and a corresponding increase in the number of customer transactions and account management functions managed by the Customer Service Department. For example, each new customer account generally requires 12 meter reads, 12 bills and 12 payments processed each year. In addition, customers contact the Company daily to address a wide array of situations that range from specific questions concerning their bill or service to reporting outages or trouble situations. As the Company's customer base continues to grow, the volume of such transactions continues to increase, resulting in a corresponding increase in variable labor and non-labor costs. These increased costs are discussed in more detail in my testimony below under account no. 902 - meter reading and account no. 903 - customer records and collection.

Second, a more sophisticated class of customers has been created for the Company due to ongoing changes and significant advances in consumer technology and the widespread increase in the use of more costly and sensitive electronic consumer equipment and appliances, which result in increasing needs and expectations on the Company's electric service. In order to keep abreast of these evolving customer demands and expectations and to better serve its existing and prospective customers, the Company believes it must continue to evaluate and pursue new and improved initiatives, systems and tools such as the new customer information system project ("CIS project"), discussed further below. With these new initiatives, systems and tools, the Customer Service Department will require additional and/or specialized staffing and resources to meet these demands, expectations and needs. To address these increased demands, two (2) positions

were added: 1) the Supervisor, Commercial Services position, which was filled in November 2006; and 2) the Customer Information Systems Administrator position, which was filled in January 2007. Further, to properly address the changing and increasing needs and expectations of the Company's customers and customer accounts functions, the Company plans to replace this system with a new customer information system, known as the CIS project.

Q. What is the CIS project?

A. The CIS project is a planned computer information systems project that is intended to benefit the Company, Hawaiian Electric Company, Inc. ("HECO") and Hawaii Electric Light Company ("HELCO") (the Company, HECO and HELCO hereafter together referred to as the "HECO Companies"). The HECO Companies' new CIS system will: (1) allow the HECO Companies to more quickly and accurately store, maintain, and manage customer-specific information necessary to provide basic customer service functions, such as producing bills, collecting payments, establishing service, and fulfilling customer requests in the field; and (2) have substantially greater capabilities and features than its existing customer information system (known as the Automated Corporation Customer Energy Services System or ACCESS).

Q. What is the status of the CIS project?

A. By Decision and Order No. 21798, filed on May 3, 2005, in Docket No. 04-0268, the Commission approved the proposed accounting treatment requested by the HECO Companies. In particular, the HECO Companies received approval to defer certain costs related to this project, to accumulate an allowance for funds used during construction during the deferral period, to amortize the deferred costs, and to include the unamortized deferred costs in rate base. A more detailed

discussion on MECO's accounting policy with respect to the costs of computer software developed or obtained for internal use is also discussed in MECO T-9 under the heading "Computer Software Development Costs". Phase 1 of the project commenced in 2005 and was completed into 2006. Phase II was initiated and completed in 2006. The HECO Companies are currently in Phases III and IV of the project, which commenced in 2006 and are continuing into 2007. The anticipated completion, or "go-live", date is targeted for early 2008.

MAUI DIVISION

CUSTOMER ACCOUNTS EXPENSE

Q. What is the Company's 2007 test year estimate for customer accounts expense for the Maui Division?

A. The Company's 2007 test year estimate at present rates for customer accounts expense for the Maui Division is $2,978,000. See MECO-702, page 1, line 6, column D. This amount consists of $1,881,000 in labor expenses and $1,097,000 in non-labor expenses. See MECO-703, page 1, column D, lines 6 and 12, respectively. See page 2 of MECO-702 for the 2007 test year estimate at proposed rates, and page 2 of MECO-703 for a breakdown of this amount into labor and non-labor expenses.

Q. How does the Maui Division's 2007 estimated test year customer accounts expense compare with historical recorded information?

A. The Maui Division's 2007 test year estimate at present rates of $2,978,000 for customer accounts expense is approximately $636,000, or 27.2%, more than the 2005 recorded customer accounts expense of $2,342,000. See MECO-704, page 1, line 5, columns E and F, and MECO-WP-704, page 1, line 15, columns N and O. Further, the Maui Division's 2007 test year estimate for customer accounts

expense is higher by approximately $873,000, or 41.5%, when compared to the average 2001-2005 recorded expenses. See MECO-WP-704, page 1, line 15, columns L and M. See MECO-WP-704, page 2, line 15, columns N and O, and line 15, columns L and M, for a similar comparison between the 2007 test year estimate at proposed rates with recorded expenses in 2005 and average 2001-2005 recorded expenses, respectively.

Maui Division

Account no. 901 - Supervision

Q. What is the Maui Division's 2007 test year estimate for account no. 901 - supervision?

A. The Maui Division's 2007 test year estimate, at both present and proposed rates, for account no. 901 - supervision is $157,000. See MECO-702, pages 1 and 2, line 1, column D. This amount includes $135,000 for labor, and $22,000 for non-labor expenses. See MECO-703, pages 1 and 2, column D, lines 2 and 8, respectively. A budget adjustment and no normalization adjustments to the 2007 operating budget were made to the Maui Division's account no. 901 – supervision in determining the 2007 test year estimate for this account.

Q. What was the budget adjustment made to the 2007 operating budget in determining the 2007 test year estimate for this account?

A. The labor expense was increased by $23,000 and the non-labor expense was increased by $9,000. The budget adjustment is to reclassify the total labor and non-labor charges of $32,000 for the Customer Service Department Manager from account no. 903 - customer records and collections to account no. 901 - supervision. The purpose of this reclassification is to properly reflect the general direction and supervision of customer accounting and collecting activities as

directed by NARUC. See MECO-703, pages 1 and 2, lines 2 and 8, column B, and MECO-WP-701, pages 5 and 7, lines 1 through 3, column I, and MECO-WP-701, page 21, lines 1 through 14, column B.

Labor Expense

Q. How was the 2007 test year labor expense estimate for the Maui Division's account no. 901 – supervision determined?

A. The 2007 test year labor expense estimate was based on a review of historical data coupled with the Company's knowledge of activities to be performed for ongoing operations and for additional future work. See MECO-WP-702, pages 1 and 2, for details of activities that the Customer Service Department Manager and the Customer Service Department Secretary are forecasted to perform.

Q. What labor expenses are included in account no. 901 – supervision?

A. This account includes a portion of the labor expenses for the Manager and Secretary of the Customer Service Department. The Customer Service Department Manager charges approximately 45% of her labor expenses to the customer accounts based on activities actually performed. The Customer Service Department Secretary also supports the Administration Department with approximately 35% of her time. See MECO-WP-702, pages 1 and 2.

Non-labor

Q. How was the 2007 test year non-labor expense estimate for the Maui Division's account no. 901 – supervision determined?

A. The 2007 test year non-labor expense estimate was based on a review of historical data coupled with the Company's knowledge of activities to be performed for ongoing operations and for additional future work.

Q. What non-labor expenses are included in account no. 901 – supervision?

A. Included in the $22,000 non-labor estimate is $5,000 for vehicle charges, $7,000 for business meetings, including inter-island travel costs for business meetings throughout the year at HECO, $1,000 for cell phone charges, and $9,000 for on-costs. See MECO-WP-703, line 4, page 1, for non-labor costs excluding on-costs and general ledger (G/L) codes.

Comparison With 2005

Q. How does the 2007 test year expense for the Maui Division's account no. 901 – supervision compare with the recorded 2005 expense?

A. The 2007 test year estimate for the Maui Division's account no. 901 is approximately $30,000, or 23.9%, higher than the recorded 2005 expense. See MECO-WP-704, pages 1 and 2, line 3, columns N and O.

Q. Please explain the reason for this increase.

A. This increase is primarily due to a higher percentage of the Customer Service Department Manager's labor expenses forecast to this account, as partially offset by lower non-labor expenses forecast in 2007. For non-labor expenses, a one-time only moving expense of $47,000 was booked in 2005 for the Customer Service Department Manager's relocation to Maui from Honolulu.

Maui Division

Account no. 902 - Meter Reading

Q. What is the Maui Division's 2007 test year estimate for account no. 902 - meter reading?

A. The Maui Division's 2007 test year estimate, at present and proposed rates, for account no. 902 - meter reading expense is $662,000, as shown in MECO-702, pages 1 and 2, line 2, column D. This amount includes $474,000 for labor and $188,000 for non-labor expenses. See MECO-703, pages 1 and 2, column D,

lines 3 and 9, respectively. There are no budget adjustments and no normalization adjustments made to the 2007 operating budget in determining this test year amount.

Q. What expenses are included in the Maui Division's account no. 902 – meter reading?

A. This account includes labor and non-labor expenses to read customer meters and determine electric usage of customers when performed by the Company's employees engaged in reading meters.

Labor Expense

Q. How was the 2007 test year labor expense estimate determined for the Maui Division's account no. 902 – meter reading?

A. The 2007 test year expense estimate is based on a review of historical data coupled with the Company's knowledge of forecasted activities to be performed for ongoing operations (including the meter reading schedule) and for additional future work. See MECO-WP-702, pages 5 to 7 and 25, for details of activities that the meter reading positions are forecasted to perform. The labor hours forecasted for account no. 902 – metering reading, primarily activity no. 610 (read billing meters), are multiplied by the standard labor rate for positions involved in meter reading to arrive at the direct labor cost for this account. Added to the direct labor costs is the non-productive labor on-cost to arrive at the $474,000 labor expense for the 2007 test year as shown on MECO-703, pages 1 and 2, line 3, column D. Mr. Lyle Matsunaga further discusses MECO's on-cost in MECO T-9.

Q. What expenses are included in the Maui Division's account no. 902 - meter reading's labor expense of $474,000 for the 2007 test year?

A. The meter reading labor expense estimate includes the labor costs associated with the following:

1) Approximately 90% of the time for eight (8) Meter Readers,
2) Approximately 7% of the time for six (6) Field Service Representatives, who read meters on an as needed basis when any of the regular meter readers are out on vacation, sick leave or training, and perform meter rereads,
3) Approximately 4% of the time for a Supervisor to oversee the meter reading activity, and
4) Approximately 2% of the time for one (1) Primary Troubleman in the Transmission and Distribution ("T&D") Department who reads meters in the Hana area on the island of Maui.

See MECO-WP-702, pages 5 to 7 and 25.

Q. Has the number of Meter Readers changed over the past five years?

A. Yes. An additional Meter Reader was added in 2005 (to bring the total number of Meter Readers to eight) to meet the growth in workload tied to the increase in the Company's customer base and resulting number of meters to be read.

Q. How has the number of customers in the Maui Division increased over the past five years?

A. The average number of customers in the Maui Division has been growing annually at an average rate of about 1.7% over the past five years. See MECO-704, page 2, line 4, column E. The average number of customers in the Maui Division for 2001 was 53,895 and has grown to an average number of customers of 58,498 in 2005, with a projected average number of customers of 60,694 for the

2007 test year. See MECO-704, page 2, line 2. See MECO-T-2 (Ms. Joanne Ide's testimony) for a further discussion on the average number of customers.

Q. How has the increase in customers affected the Maui Division's meter reading workload?

A. The growth in customers has caused selected meter reading routes to be adjusted to balance daily workloads. Further, as mentioned earlier in my testimony, the Maui Division saw the need to increase the number of Meter Readers in 2005 to address the increased workload.

Q. Are the Meter Readers for the Maui Division incurring any overtime?

A. Yes. Meter Reader's overtime has increased over the last five years to approximately 5.5% in 2005. See MECO-704, page 3, line 8, column F. See also MECO-704, page 3, line 8, column I, which shows a projected test year overtime amount of 6.6%.

Q. Please explain this increase in overtime.

A. This increase in overtime is primarily due to the increased volume of meters installed or to be installed on Maui, the turnover in staff that has occurred recently, and a change in the meter reading schedule to prepare for a change in the function of the new Customer Information System.

Q. Has the Company looked at automating some of its meter reading to address the growing number of customers and meters to be read?

A Yes. The Company has partially implemented the Automatic Meter Reading ("AMR") Turtle project. As discussed later in my testimony, had the AMR Turtle project not been implemented, the Company would have incurred higher labor and non-labor costs and it would have taken longer to perform the meter reading.

Q. What is the AMR Turtle project?

A. This project involved the installation by the Company over a 12-month period between 2003 and 2004 of approximately 900 Hunt Technologies' automatic meter reading Turtle units (aka, TS1 system) using power line carrier technology devices. The TS1 system consists of transmitters attached to a meter, a receiver at a substation and the Turtle server, which communicates with the substation receiver on a daily basis to download meter data. Data is transmitted from the meter via the turtle unit attached to the meter through the Company's power lines.

Q. Why did MECO decide to implement the AMR Turtle project?

A. With the growth experienced and anticipated on the island of Maui and the remoteness of some of its rural areas, the Company attempted to control its meter reading costs by seeking alternate ways of conducting meter reading. Based on its research, the Company projected that the use of these AMRs would free up the time of a Primary Troubleman in the T&D Department to do other work in the Hana area. After implementing this AMR Turtle project, the Company found that:

1) The Turtle System Power Line Carrier technology works well.
2) The TS1 system is accurate and avoids having to perform rereads; better than conventional meter reading.
3) The TS1 system is relatively easy to install and operate.
4) The TS1 system allows the Company to redirect work of a Primary Troubleman in the T&D Department, particularly when the TS1 system is installed in remote areas.

In sum, the Company also found that that the use of Power Line Carrier technology such as the AMR Turtle project lowers the cost of investment by utilizing existing electric utility facilities to transmit valuable data to the Company and is viewed as an efficient and feasible solution for the Company at

this juncture, particularly due to low customer density in inaccessible and remote areas.

Q. What were the capital costs incurred for the AMR Turtle project?

A. The Company incurred capital costs of about $68,000 in the years 2003 – 2004 for the purchase and installation of the approximately 900 AMR Turtle units and related equipment. This cost included the Company's labor expenses to program and install the respective units.

Q. What are some of the benefits realized as a result of the AMR Turtle project implementation?

A. The most significant benefit was the reduction and/or redirection of labor costs for the Primary Troubleman of the T&D Department in Hana. However, offsetting some of these lower labor costs were increased costs by the Meter Readers to input the reads to the handheld system for uploading into the customer billing system. The total benefits of this AMR Turtle project will likely not be realized until the automatic meter reading is fully automated, including automatic billing, which is expected to occur sometime in the first half of 2007.

Other benefits realized or to be realized include reduction in vehicle operations and maintenance costs (particularly if implemented in remote areas where the difficult terrain often results in long driving times and excessive wear and tear to the Company's vehicles), reduced employee safety risks (particularly if implemented in areas where there are dangerous dogs and other animals located on premises and areas that are not easily accessible such as properties that have gates, fences and other unsafe obstructions and barriers), increased accuracy of reads and billings, reduced amount of rereads, an enhanced ability to detect meter

tampering, and an enhanced ability to retrieve customer daily load profile (for high bill investigations).

Q. Had the AMR Turtle project not been implemented, would the Company have had to hire more Meter Readers for Maui?

A. Yes, the Company would have had to hire more Meter Readers to maintain the customer billing requirements had the AMR Turtle Project not been implemented. In addition to higher labor costs, the Company would have incurred costs relating to increased travel distances and field visits. The meter reading required would not have been able to be performed with normal levels of scheduled overtime work.

Q. If the AMR Turtle project has resulted in the benefits referred to above, why does the Company not install the AMR Turtle units island-wide?

A. The Company determined that the AMR Turtle technology was most beneficial in remote and inaccessible areas where meter readers have difficulty in reading the meters. These areas are mostly the rural areas of the island of Maui, where road conditions are rough and average manual meter reading times are often longer due to having to go through gated properties or properties where dangerous dogs and other animals are prevalent. Full implementation of the AMR Turtle technology would not be economically feasible island-wide.

<u>Non-labor Expense</u>

Q. What is the 2007 test year non-labor expense estimate for account no. 902 – meter reading?

A. The 2007 test year non-labor expense estimate for account no. 902 – meter reading is $188,000. Included in the estimate is $136,000 for vehicle charges, $31,000 for intercompany billings for meter reader handheld and software

maintenance and support and IT costing, $6,000 for uniforms, safety and supplies, $3,000 for cellular phone charges, $3,000 for meter rings and seals, and $8,000 for on-costs. See MECO-703, pages 1 and 2, line 9, column D , and MECO-WP-703, lines 1-11, page 2.

Q. How was the 2007 test year non-labor expense estimate for the Maui Division's account no. 902 – meter reading determined?

A. The 2007 test year expense estimate for the Maui Division is based on a review of historical data coupled with the Company's knowledge of forecasted activities to be performed for ongoing operations and for additional future work.

Comparison with Recorded 2005 and Prior Years

Q. How does the 2007 test year expense for account 902 - meter reading compare with recorded 2005 expenses?

A. The 2007 test year meter reading expense estimate of $662,000 is approximately $60,000, or 10.1%, higher than the 2005 recorded expense. See MECO-WP-704, pages 1 and 2, line 6, columns N and O. This is attributed to an approximately $56,000 increase in labor expense, and an approximately $4,000 increase in non-labor expenses. See MECO-WP-704, pages 1 and 2, line 4, column N, and line 5, column N, respectively.

Q. What accounts for the $56,000 increase in labor expenses for account no. 902 - meter reading for the 2007 test year over the 2005 recorded amount?

A. The $56,000 increase is attributed primarily to the full-staffing of Meter Readers in 2007, and the higher overtime due to the increased volume of meters installed on Maui, the turnover in staff that has occurred recently, and a change in the meter reading schedule to prepare for a change in the function of the new Customer Information System.

Q. What accounts for the $4,000 increase in non-labor expenses account no. 902 - meter reading for the 2007 test year over the recorded 2005 amount?

A. A major portion of the $4,000 increase is due primarily to higher maintenance costs for the added vehicle, tools, equipment, and supplies related to the additional Meter Reader position added in 2005.

Q. How does the 2007 test year labor and non-labor expense estimates for account no. 902 – meter reading compare with recorded expenses in other periods?

A. A comparison of combined labor and non-labor expenses for account no. 902 – meter reading, based on amounts shown below and on MECO-704, pages 1 and 2, are as follows:

2001 (recorded):	$428,000
2002 (recorded):	$461,000
2003 (recorded):	$477,000
2004 (recorded):	$507,000
2005 (recorded)	$601,000
2007 (test year estimate):	$662,000

The test year 2007 estimate is approximately $167,000, or 33.7%, higher than the 2001-2005 recorded average. See MECO-WP-704, pages 1 and 2, line 6, columns L and M. As mentioned above, this increase is a result of the continued growth in the Company's customer base and the corresponding increase in labor costs tied to wage increases, the increased hours worked, and the addition of a Meter Reader position in 2005 to be able to bill customers in a timely manner.

<u>Maui Division</u>

<u>Account no. 903 - Customer Records and Collection</u>

Q. What expenses are included in the Maui Division's account no. 903 – customer records and collection?

A. This account includes labor and non-labor expenses to work on customer applications, requests, contracts, orders, credit investigations, billing and accounting, collections and complaints.

Q. What is the Maui Division's 2007 test year estimate for account no. 903 - customer records and collection expenses?

A. The Maui Division's 2007 test year estimate for account no. 903 is $1,959,000. See MECO-702, pages 1 and 2, line 3, column D. This includes $1,272,000 for labor and $687,000 for non-labor costs. See MECO-703, pages 1 and 2, column D, lines 4 and 10, respectively.

Q. Were budget adjustments made to Maui Division's account no. 903?

A. Yes, two (2) budget adjustments and no normalization adjustments were made to account no. 903 from the 2007 operating budget.

Q. What were the two (2) budget adjustments made to the 2007 operating budget in calculating the 2007 test year estimate for this account?

A. The two budget adjustments were as follows:

(1) Reclassification of the labor and on-cost charges of $32,000 for the Customer Service Department Manager from account no. 903 to account no. 901. This adjustment had a downward impact of -$32,000 to account no. 903 (-$23,000 labor and -$9,000 non-labor). See MECO-WP-701, page 21, lines 9 through 14, column B.

(2) Updating the allocation of customer records and collection expenses from the Maui Division to the Lanai and Molokai Divisions. This update is necessary because the estimate cannot be finalized until after the operating budget process is

completed. The update results in an increase to the Maui Division of $84,000. See MECO-WP-701, page 21, line 15, column B.

The net impact of the two budget adjustments is an increase of $52,000 (-$23,000 labor and +$75,000 non-labor).

Labor Expense

Q. What expenses are included in Maui Division's account no. 903 - customer records and collection's $1,272,000 labor expense for the 2007 test year?

A. The labor expense estimate of $1,272,000 represents the costs for the equivalent of 22.5 employees. See MECO-WP-715, page 1, line 15, column D. These employees include, among others: twelve (12) Clerical Staff, six (6) Field Service Representatives and Collectors (when not performing meter reading functions), and two (2) Supervisors. See lines 4 through 14 of MECO-WP-715, page 1, for a list of the employees. The Clerical Staff and Field Service Representatives and Collectors are responsible to receive and process customer applications, contracts, orders, credit investigations, billing and accounting, collections and complaints. The two (2) Supervisors are responsible to oversee the clerical and field services staff. The 2007 test year labor estimate also includes the costs of a Customer Information Systems Administrator, Customer Service Administrator, and half of the Commercial Services Supervisor. These employees are all part of the Customer Service Department and handle residential and commercial customer inquiries and requests regularly. See MECO-WP-715, page 1, and MECO-WP-702, pages 3 to 6, 8, 10 to 15, and 19 of 25. The 2007 test year labor estimate also includes costs from the Company's Engineering Department for a portion of a Planner's time to respond to customer inquiries and service requests. See MECO-WP-702, page 24.

1 Non-labor Expense

2 Q. What expenses are included in Maui Division's account no. 903 - customer
3 records and collection's $687,000 non-labor expense for the 2007 test year?

4 A. The non-labor expense in this account primarily includes:

5 1) the cost for vehicle operating expenses,
6 2) bank collection fees for customer payments made at banks and
7 savings and loans,
8 3) collection agency fees,
9 4) postage,
10 5) envelopes,
11 6) supplies,
12 7) mailing services,
13 8) payment processing and recordation,
14 9) customer records and maintenance,
15 10) customer information and billing system, and
16 11) related miscellaneous expenses (e.g., telephone charges, copier and
17 fax equipment, etc.)

18 Supporting details of the expenses described above are provided in MECO-WP-
19 703, pages 3 to 5.

20 Comparison with Recorded 2005 and Prior Years

21 Q. How does the 2007 test year estimate for Maui Division's account no. 903 -
22 customer records and collection compare to the 2005 recorded expense?

23 A. The 2007 test year estimate of $1,959,000 is approximately $520,000, or 36.2%,
24 higher than the 2005 recorded expense of $1,439,000. See MECO-WP-704,
25 pages 1 and 2, line 9, columns N and O. This increase is attributed to an

approximately $353,000 increase in labor expense and an approximately $167,000 increase in non-labor expense. See MECO-WP-704, pages 1 and 2, column N, lines 7 and 8, respectively.

Q. What accounts for the $353,000 increase in labor expense for the 2007 test year over the recorded 2005 expense?

A. The $353,000 increase in labor expense is primarily due to the following:

1) the addition of a Customer Assistance Representative in 2006,
2) the addition of a Field Services Representative in January 2007,
3) the filling of the Commercial Services Supervisor position in November 2006, and
4) additional overtime forecasted for the Customer Accounts Services Division that will be required to get the work done as new employees assume new positions.

Q. What accounts for the $167,000 increase in non-labor expense for the Maui Division's 2007 test year over the recorded 2005 expense?

A. The $167,000 increase in non-labor costs in 2007 over 2005 recorded expenses is primarily due to following:

(1) an increase in postage rates,
(2) increased employee training,
(3) higher costs tied to increased customer transactions, including customer payments and mailing services, and
(4) higher allocation of the costs for the Maui, Lanai and Molokai Divisions for account nos. 901 - supervision and 903 – customer records and collection. The allocation method is based on an estimate

of the percentage of Maui Division customers in relation to the total number of the Company's customers.

Q. How do the 2007 test year labor and non-labor expense estimates for Maui Division's account no. 903 – customer records and collection compare with recorded expenses in other periods?

A. A comparison of the combined labor and non-labor expenses by year for Maui Division's account no. 903 - customer records and collection is shown below (see MECO-704, page 1, line 3):

2001 (recorded):	$1,399,000
2002 (recorded):	$1,224,000
2003 (recorded):	$1,299,000
2004 (recorded):	$1,433,000
2005 (recorded)	$1,439,000
2007 (test year estimate):	$1,959,000

The test year 2007 estimate is approximately $600,000, or 44.2%, higher than the 2001-2005 recorded average. See MECO-WP-704, pages 1 and 2, line 9, columns L and M. This increase is a result of the continued growth in the Company's customer base and the corresponding increase in labor costs tied to wage increases, the increased hours worked, and the need to add the positions in 2006 and 2007, as mentioned above in my testimony, to be able to service customers in a timely manner.

<u>Maui Division</u>

<u>Account no. 904 - Uncollectible Accounts</u>

Q. What is the Company's 2007 test year estimate for Maui Division's account no. 904 - uncollectible accounts expense?

A. The Maui Division's 2007 test year estimate of account no. 904 is $200,000 at present rates, and $209,000 at proposed rates. See MECO-702, line 5, column D, pages 1 and 2, respectively, and MECO-711, page 1, column C, lines 2 and 6, respectively.

Q. What expenses are included in the Maui Division's account no. 904 – uncollectible accounts?

A. This account includes amounts estimated to provide for losses from uncollectible utility revenues.

Q. Was there a budget adjustment to the Maui Division's 2007 operating budget for account no. 904?

A. Yes. There was a budget adjustment to the 2007 operating budget made to account no. 904 – uncollectible accounts to arrive at the test year estimate at present rates. See MECO-WP-711, page 4, line 10, column C.

Q. What was the budget adjustment?

A. A budget adjustment of $63,000 was made to adjust bad debt expense based on revenues at present rates. See MECO-703, page 1, line 11, column B, MECO-WP-701, page 21, line 18, column B, and MECO-WP-711, page 4, line 10, column C. At the time the 2007 operating budget was finalized, the Company's electric sales revenues at present rates was not yet available. Therefore, the estimate for bad debt expense of $137,000 was based on a different estimate of the Company's electric sales revenues.

Q. Was there a normalization adjustment to the Maui Division's 2007 operating budget for account no. 904?

A. Yes. A normalization adjustment was also made to compute the test year estimate for uncollectible accounts expense at proposed rates. See MECO-WP-711, line 10, column E, page 4.

Q. Why is there a difference in uncollectible accounts expense between present and proposed rates?

A. As mentioned above, the 2007 test year estimate of uncollectibles differs between present and proposed rates because the amount is based upon the Company's electric sales revenues and the uncollectible factor. Therefore, as electric sales revenues increase due to the proposed rate increase, the corresponding amount of uncollectible dollars can be expected to increase proportionately.

Q. How was the 2007 test year estimate for account no. 904 - uncollectible accounts expense determined?

A. The Company utilized the "Percentage of Electric Sales Revenue" method, which has been accepted by the Commission in previous dockets, including the Company's last rate case. See Decision and Order No. 16922, filed on April 6, 1999, in Docket No. 97-0346.

Q. What is the "Percentage of Electric Sales Revenue" method?

A. This method calculates uncollectibles for a given period by multiplying electric sales revenues for that period by a net write-off percentage. The net write-off percentage (or factor) is determined by dividing the total net write-offs for the latest twelve months for which data is available by the 12-month ending electric sales revenue, lagged by four months by the total electric sales revenue for the same period.

Q. What percentage was used to calculate the 2007 test year uncollectibles?

A. The Company used the calendar year-end 2005 recorded net write-off factor of 0.06% (rounded from 0.0546%) to calculate uncollectibles for the 2007 test year. The 2005 factor of 0.06% is calculated by taking the adjusted twelve months ending December 2005 net write-offs of $152,831 and dividing it by the twelve months ending August 2005 electric sales revenues of $280,015,000. See MECO-WP-711, page 1, line 6, column G.

Q. How does the 0.06% compare to prior years?

A. In the past five years, the year-end uncollectible factor ranged between a high of 0.1172% in December 2001 to 0.0546% in December 2005. See MECO-WP-711, page 1, lines 1 to 5, column G. The historical uncollectible accounts expenses for the periods 2001 through 2005, as well as the year-to-date 2006 amounts, are reflected in MECO-WP-711, pages 2 to 3.

Q. What is the reason for the low of 0.0546% in December 2005?

A. The low is, in part, due to measures taken by the Company, consisting of improved and more focused collection efforts, especially in the commercial accounts, resulting in lower write-offs.

Q. What measures has the Company taken to mitigate the uncollectible expenses experienced?

A. MECO has taken the following measures to minimize uncollectible expenses.

1) <u>Recovery of bad debts</u>.

Increased recovery of bad debts was achieved through continued transfers of balances from customers' former delinquent accounts to the customers' new active accounts, collection agency and legal follow-up efforts, intensified internal follow-up, and more turnoffs of electrical service to delinquent customers.

2) Reduce commercial delinquency.

Customer Service Department credit personnel continued to emphasize delinquent balance reduction through increased customer follow-ups. Customer follow-ups included implementation of letter writing campaigns by the Customer Service Manager with follow-up by the Customer Services Supervisors and staff.

3) Targeting customers with deposit balances.

It is the Company's practice to terminate service to customers owing deposit balances outstanding for more than 20 days. Generally, these customers are most likely to relocate without paying their deposit and electric bills.

4) Targeting collection efforts on residential customers.

As shown in MECO-WP-711, page 5, line 40, column A, approximately 91% of delinquent accounts are for residential customers as of December 31, 2005. A greater emphasis has been placed on telephone contacts, field calls, and use of load limiters and termination of service for these customers.

5) Increased deposit amount for new commercial rate accounts.

It is now the Company's practice to request two months' estimated bill deposits for new commercial rate customers.

6) Closer working relationships with collection agencies and attorneys.

There has been an increased emphasis to keep the two collection agencies that follow-up on the Company's bad debt accounts competitive. The use of attorneys that are knowledgeable in

collection and bankruptcy laws has also been increased to more quickly address delinquent accounts and bankruptcies.

7) Personal and humane customer treatment.

Based on the Company's past experience, not all delinquent customers are credit risks for bad debt. The Company's Customer Service Department credit personnel continue to cooperatively work with many of its delinquent customers to attempt to reduce past due balances in a personal, trusting, and humane manner. The Company has found that these customers are more likely to pay their debts and develop good payment habits when this type of treatment is implemented.

Q. As a result of the above measures taken, what has the Company accomplished over the last several years in the way of reducing delinquency?

A. As shown in MECO-711, page 2, the uncollectible factor of 0.0546 in December 2005 is at or close to the five-year low. This is a direct result of the increased focus the Company has taken in the area of managing delinquent customer accounts.

LANAI DIVISION

CUSTOMER ACCOUNTS EXPENSE

Q. What is the Company's 2007 test year estimate for customer accounts expense for the Lanai Division?

A. The 2007 test year estimate at present rates for customer accounts expense for the Lanai Division is $145,000 as shown in MECO-705, line 6, column D, page 1. This amount consists of approximately $57,000 in labor expenses and $88,000 in non-labor expenses. See MECO-706, page 1, column D, lines 6 and 12,

respectively. See page 2 of MECO-705 for the 2007 test year estimate at proposed rates, and page 2 of MECO-706 for a breakdown of this amount into labor and non-labor expenses.

Q. How does the Lanai Division's 2007 test year customer accounts expense compare with historical recorded information?

A. The Lanai Division's 2007 test year estimate of $145,000 at present rates is approximately $6,000, or 4.0%, more than the 2005 recorded customer accounts expense of $139,000. See MECO-WP-707, page 1, line 12, columns N and O. Further, the Lanai Division's 2007 test year estimate for customer accounts expense is higher by approximately $45,000, or 44.3%, when compared to the average 2001-2005 recorded expense. See MECO-WP-707, page 1, line 12, columns L and M. See MECO-WP-707, page 2, line 12, columns N and O, and line 12, columns L and M, for a similar comparison between the 2007 test year estimate at proposed rates with recorded expenses in 2005 and average 2001-2005 recorded expenses, respectively,

<u>Lanai Division</u>

<u>Account no. 901 - Supervision</u>

Q. What is the Lanai Division's 2007 test year estimate for account no. 901 - supervision?

A. The Lanai Division's 2007 test year estimate for account no. 901 - supervision is $0. See MECO-705, pages 1 and 2, line 1.

Q. Why are no expenses estimated for the Lanai Division's account no. 901 - supervision?

A. Supervisory personnel are handled by the Maui Division. The time spent on supervision by Maui Division personnel on the Lanai Division customer account

is not large enough to offset the difficulty and impracticality of monitoring and assessing the charge. This practice is consistent with the treatment of supervisory expenses in prior MECO rate cases, including Docket Nos. 7000, 94-0345, 96-0040, and 97-0346.

Q. Were there any expenses incurred for account no. 901 from 2001 to 2005?

A. No. There were no expenses incurred for account no. 901 from 2001 to 2005 for the Lanai Division.

Account no. 902 - Meter Reading

Q. What is the Lanai Division's 2007 test year estimate for account no. 902 - meter reading?

A. The Lanai Division's 2007 test year estimate for account no. 902 is $83,000, at present and proposed rates, as shown in MECO-705, pages 1 and 2, line 2, column D. This amount includes $55,000 for labor and $28,000 for non-labor expenses. See MECO-706, pages 1 and 2, column D, lines 3 and 9, respectively. No budget adjustments nor normalization adjustments to account no. 902 – meter reading for the Lanai Division have been made to the 2007 operating budget in determining this test year estimate.

Labor Expense

Q. How was the 2007 test year labor expense estimate of $55,000 for the Lanai Division's account no. 902 – meter reading determined?

A. The 2007 test year expense estimate is based on a review of historical data coupled with the Company's knowledge of activities to be performed for ongoing operations (including the meter reading schedule) and for additional workload. See MECO-WP-702, pages 21 to 22, for details of activities that the workforce is forecasted to perform. The labor hours forecasted for account no. 902 – metering

reading, primarily activity 610 (Read Billing Meters), is multiplied by the standard labor rate for Meter Readers to arrive at the direct labor cost for this account. Added to the direct labor costs is the non-productive labor on-cost to arrive at the $55,000 labor expense for the 2007 test year. Mr. Lyle Matsunaga discusses MECO's on-cost in more detail in MECO T-9.

Q. What expenses are included in the Lanai Division's account no. 902 - meter reading's labor expense of $55,000 for the 2007 test year?

A. The meter reading labor expense estimate includes the costs associated with T&D employees on Lanai who read meters on a part-time basis. The T&D employees primarily perform tasks related to distribution line work and trouble calls.

Non-labor Expense

Q. How was the 2007 test year non-labor expense estimate of $28,000 for the Lanai Division's account no. 902 – meter reading determined?

A. The 2007 test year expense estimate for the Lanai Division is based on a review of historical data coupled with the Company's knowledge of activities to be performed for ongoing operations and for additional workload.

Q. What expenses are included in the Lanai Division's account no. 902 - meter reading's non-labor expense of $28,000 for the 2007 test year?

A. The 2007 test year non-labor expense estimate for the Lanai Division includes the Energy Delivery on costs.

Comparison with Recorded 2005 and Prior Years

Q. How does the 2007 test year expense for account no. 902 - meter reading compare with the recorded 2005 expense?

A. The 2007 test year meter reading expense estimate of $83,000 is approximately $8,000, or 11.0%, higher than the 2005 recorded expenses. See MECO-WP-707,

pages 1 and 2, line 3, columns N and O. This is primarily attributed to an increase in non-labor expenses. See MECO-WP-707, pages 1 and 2, line 2, column N.

Q. What accounts for the $8,000 increase in non-labor expense for the 2007 test year over recorded 2005 expenses?

A. The $8,000 increase is due to an increase in the Energy Delivery on-costs. See MECO-WP-701, page 11, line 104, column C.

Q. How does the 2007 test year labor and non-labor expense estimates for account no. 902 – meter reading compare with recorded expenses in other periods?

A. A comparison of combined labor and non-labor expense for account no. 902 – meter reading by year is shown below (see MECO-707, line 2):

2001 (recorded):	$31,000
2002 (recorded):	$34,000
2003 (recorded):	$37,000
2004 (recorded):	$45,000
2005 (recorded)	$75,000
2007 (test year estimate):	$83,000

The test year 2007 estimate is approximately $39,000, or 87.0%, higher than the 2001-2005 recorded average. See MECO-WP-707, pages 1 and 2, line 3, columns L and M. This increase is a result of the continued growth in the Company's customer base and the corresponding increase in labor costs tied to wage increases, and the increased hours allocated to meter reading, to be able to bill customers in a timely manner.

<u>Lanai Division</u>

<u>Account no. 903 - Customer Records And Collection</u>

Q. What is the Lanai Division's 2007 test year estimate for account no. 903 - customer records and collection expenses?

A. The Lanai Division's 2007 test year estimates for account no. 903 - customer records and collection expenses is $56,000. See MECO-705, pages 1 and 2, line 3, column D. This includes $2,000 for labor and $54,000 for non-labor costs. See MECO-706, pages 1 and 2, column D, lines 4 and 10, respectively. One budget adjustment and no normalization adjustments were made to the 2007 operating budget in determining the test year estimate.

Q. What was the budget adjustment made to the 2007 operating budget in determining the 2007 test year estimate of this account?

A. The budget adjustment was to update the allocation of customer records and collection expenses from the Maui Division to the Lanai Division. This update is necessary because the estimate cannot be finalized until after the budget process is completed. The update results in a decrease to the Lanai Division of -$16,000. See MECO-706, pages 1 and 2, line 10, column B, and MECO-WP-701, page 22, line 23, column B.

<u>Labor Expense</u>

Q. What expenses are included in Lanai Division's account no. 903 - customer records and collection's $2,000 labor expense for the 2007 test year?

A. The labor expense estimate of $2,000 primarily includes the cost for the Lanai Supervisor to perform energy bill assistance to customers on the island of Lanai. See MECO-WP-702, page 22.

<u>Non-labor Expense</u>

Q. What expenses are included in Lanai Division's account no. 903 - customer records and collection's $54,000 non-labor expense for the 2007 test year?

A. The non-labor expense in this account primarily includes an allocation of the total labor and non-labor costs for the Maui, Lanai and Molokai Divisions for account nos. 901 - supervision and 903 – customer records and collection. The allocation method is based on an estimate of the percentage of the Lanai Division customers in relation to the total number of the Company's customers. See MECO-706, pages 1 and 2, line 10, column D, and MECO-WP-703, page 5, line 55, column D, for non-labor costs excluding on-costs and G/L codes.

Comparison with Recorded 2005 and Prior Years

Q. How does the 2007 test year estimate for Lanai Division's account no. 903 customer records and collection compare to the 2005 recorded expenses?

A. The 2007 test year estimate of $56,000 is approximately $9,000, or 13.4%, lower than the 2005 recorded expense of $64,000. See MECO-WP-707, pages 1 and 2, line 6, columns N and O. This decrease is attributed to an approximately $2,000 decrease in labor expense and an approximately $7,000 decrease in non-labor expense. See MECO-WP-707, pages 1 and 2, column N, lines 4 and 5, respectively.

Q. What accounts for the $2,000 decrease in labor expense for the 2007 test year over the recorded 2005 expense?

A. The $2,000 decrease in labor expense is primarily due to less time being spent in 2007 by the Lanai Supervisor in addressing customer energy bill inquiries.

Q. What accounts for the $7,000 decrease in non-labor expense for the Lanai Division's 2007 test year over recorded 2005 expenses?

A. The $7,000 decrease is primarily due to the lower allocation from the Maui Division for the following:

(1) postage charges,

(2) employee training, and

(3) variable costs relating to customer transactions, including customer payments and mailing services.

Q. How do the 2007 test year labor and non-labor expense estimates for Lanai Division's account no. 903 – customer records and collection compare with recorded expenses in other periods?

A. A comparison of combined labor and non-labor expenses for Lanai Division's account no. 903 – customer records and collection by year is shown below (see MECO-707, line 3):

2001 (recorded):	$37,000
2002 (recorded):	$56,000
2003 (recorded):	$60,000
2004 (recorded):	$62,000
2005 (recorded)	$65,000
2007 (test year estimate):	$56,000

The test year 2007 estimate is approximately equal to the 2001-2005 recorded average. See MECO-WP-707, pages 1 and 2, line 6, columns L and M. This amount, which includes the impact of labor wage increases, represents the expected level of work based on the allocation of costs across the Maui, Lanai and Molokai divisions discussed above in my testimony.

<u>Lanai Division</u>

<u>Account no. 904 - Uncollectible Accounts</u>

Q. What is the Company's 2007 test year estimate for Lanai Division's account no. 904 - uncollectible accounts expense?

A. The Lanai Division's 2007 test year account no. 904 - uncollectible accounts expense estimate is $6,000 at present rates, and $7,000 at proposed rates. See MECO-705, line 5, column D, pages 1 and 2, respectively, and MECO-711, page 1, column C, lines 3 and 7, respectively. There was one budget adjustment made to the 2007 operating budget to arrive at the test year estimate at present rates. A normalization adjustment was made to compute the test year estimate at proposed rates. See MECO-WP-711, page 4, line 11, columns C and E, respectively.

Q. What was the budget adjustment that was made to the 2007 operating budget for this account?

A. A budget adjustment for +$6,000 was made to allocate a portion of the bad debt expense to the Lanai Division based on revenues at present rates. See MECO-705, pages 1 and 2, line 5, column B, MECO-WP-701, page 22, line 29, column B, and MECO-WP-711, page 4, line 11, column C. At the time the 2007 operating budget was finalized, the electric sales revenues at present rates were not yet available. Therefore, the estimate for bad debt expense of $137,000 was based on a different estimate of electric revenues, and was not allocated to the Lanai Division.

Q. How was the 2007 test year estimate for Lanai Division's account no. 904 - uncollectible accounts expense determined?

A. The Lanai Division's uncollectible accounts expense was determined using the "Percentage of Electric Sales Revenue" method discussed earlier in the Maui Division section of this testimony.

MOLOKAI DIVISION

CUSTOMER ACCOUNTS EXPENSE

Q. What is the Company's 2007 test year estimate for customer accounts expense for the Molokai Division?

A. The 2007 test year estimate at present rates for customer accounts expense for the Molokai Division is $177,000 as shown in MECO-708, line 6, column D, page 1. This amount consists of approximately $165,000 in labor expenses and $12,000 in non-labor expenses. See MECO-709, page 1, column D, lines 6 and 12, respectively. See page 2 of MECO-708 for the 2007 test year estimate at proposed rates, and page 2 of MECO-709 for a breakdown of this amount into labor and non-labor expenses.

Q. How does the Molokai Division's 2007 test year customer accounts expense compare with historical recorded information?

A. The Molokai Division's 2007 test year estimate of $177,000 at present rates for customer accounts expense is approximately $66,000, or 27.3%, lower than the 2005 recorded customer accounts expense of $243,000. See MECO-WP-710, page 1, line 12, columns N and O. Further, the Molokai Division's 2007 test year estimate for customer accounts expense is lower by approximately $69,000, or 28.2%, when compared to the average 2001-2005 recorded expense. See MECO-WP-710, page 1, line 12, columns L and M. See MECO-WP-710, page 2, line 12, columns N and O, and line 12, columns L and M, for a similar comparison between the 2007 test year estimate at proposed rates with recorded expenses in 2005 and average 2001-2005 recorded expenses, respectively. The decreases reflect the move of a Customer Assistance Representative position in 2002 from the Molokai Division to the Maui Division, where there is a higher volume of

activity and growth, and a lower allocation of costs from the Maui Division to the Molokai Division.

Molokai Division

Account no. 901 - Supervision

Q. What is the Molokai Division's 2007 test year estimate for account no. 901 - supervision?

A. The Molokai Division's 2007 test year estimate for account no. 901 - supervision is $0. See MECO-708, pages 1 and 2, line 1, column D.

Q. Why are no expenses estimated for the Molokai Division's account no. 901 - supervision?

A. As previously discussed, supervisory personnel for the customer service staff are located within the Maui Division. Similar to Lanai, the time spent on supervision by the Maui Division personnel on the Molokai Division customer account is not large enough to offset the difficulty and impracticality of monitoring and assessing the charge. This practice is different from the treatment of supervisory expenses for the Molokai Division in prior MECO rate cases. See Docket Nos. 7000, 94-0345, 96-0040, and 97-0346.

Q. What is the change in the treatment of supervisory expenses in the 2007 test year estimate for the Molokai Division's account no. 901 – supervision as compared to prior MECO rate cases?

A. The change in the treatment of supervisory expenses in the 2007 test year estimate for the Molokai Division is from account no. 901 - supervision ($0) to an allocation of part of the Maui Division supervisors' time to account no. 903 – customer records and collections. The change was made because the costs relate to the direct supervision of customer accounts activity.

Molokai Division

Account no. 902 - Meter Reading

Q. What is the Molokai Division's 2007 test year estimate for account no. 902 - meter reading?

A. The Molokai Division's 2007 test year estimate for account no. 902 - meter reading expense is $59,000, as shown in MECO-708, pages 1 and 2, line 2, column D. This amount includes $43,000 for labor and $16,000 for non-labor expenses. See MECO-709, pages 1 and 2, column D, lines 3 and 9, respectively. No budget adjustments nor normalization adjustments were made to the 2007 operating budget in determining this test year estimate.

Labor Expense

Q. How was the 2007 test year labor expense estimate of $43,000 for the Molokai Division's account no. 902 – meter reading determined?

A. The 2007 test year expense estimate is based on a review of historical data coupled with the Company's knowledge of forecasted activities to be performed for ongoing operations (including the meter reading schedule) and for additional future workload. See MECO-WP-702, page 16, for a detail of activities that the workforce is forecasted to perform. The labor hours forecasted for account no. 902 – metering reading, primarily activity 610 (Read Billing Meters), is multiplied by the standard labor rate for meter readers to arrive at the direct labor cost for this account. Added to the direct labor costs is the non-productive labor on-cost to arrive at the $43,000 labor expense for the 2007 test year. Mr. Lyle Matsunaga discusses MECO's on-cost in further detail in MECO T-9.

Q. What expenses are included in the Molokai Division's account no. 902 - meter reading's labor expense of $43,000 for the 2007 test year?

A. The meter reading labor expense estimate includes a major part of the costs of wages for one (1) Meter Reader/Collector. The other portion of the labor time and costs are charged to account no. 903 – customer records and collections for field collection and service start and termination activities and account no. 586 – meter expenses for meter related work.

Non-labor Expense

Q. How was the 2007 test year non-labor expense estimate of $16,000 for the Molokai Division's account no. 902 – meter reading determined?

A. The 2007 test year non-labor expense estimate for the Molokai Division is based on a review of historical data coupled with the Company's knowledge of forecasted activities to be performed for ongoing operations and for additional future work.

Q. What expenses are included in the Molokai Division's account no. 902 - meter reading's non-labor expense of $16,000 for the 2007 test year?

A. The 2007 test year meter reading non-labor expense estimate for the Molokai Division includes the cost of vehicle operation and maintenance, meter reading equipment such as meter rings and seals, hand-held meter reading device maintenance, safety items, uniforms, and data transmission costs and supplies required by the meter readers to do their jobs. See MECO-709, pages 1 and 2, line 9, column D, and MECO-WP-703, page 2, line 15, column D.

Comparison with Recorded 2005 and Prior Years

Q. How does the 2007 test year expense for account no. 902 - meter reading compare with recorded 2005 expenses?

A. The 2007 test year meter reading expense estimate of $59,000 is approximately $5,000, or 7.8%, lower than the 2005 recorded expenses. See MECO-WP-710,

pages 1 and 2, line 3, columns N and O. This is attributed to an approximately $3,000 increase in labor expenses, offset by an approximately $8,000 decrease in non-labor expenses. See MECO-WP-710, pages 1 and 2, column N, lines 1 and 2, respectively.

Q. What accounts for the $3,000 increase in labor expense for the 2007 test year over recorded 2005 expenses?

A. The $3,000 increase in labor expenses is primarily due to an expected increase in overtime hours due to a change in the meter reading schedule relating to features of the new CIS.

Q. What accounts for the $8,000 decrease in non-labor expense for the 2007 test year from recorded 2005 expenses?

A. The $8,000 decrease in non-labor expense for the 2007 test year from recorded 2005 expenses is due primarily to higher vehicle maintenance expenses incurred in 2005 because a second vehicle was provided to Molokai while the primary vehicle was being repaired.

Q. How does the 2007 test year labor and non-labor expense estimates for account no. 902 – meter reading compare with recorded expenses in other periods?

A. A comparison of combined labor and non-labor expense for account no. 902 – meter reading by year is shown below (see MECO-710, line 2):

2001 (recorded):	$32,000
2002 (recorded):	$36,000
2003 (recorded):	$46,000
2004 (recorded):	$53,000
2005 (recorded)	$64,000
2007 (test year estimate):	$59,000

The test year 2007 estimate is approximately $13,000, or 27.7%, higher than the 2001-2005 recorded average. See MECO-WP-710, pages 1 and 2, line 3, columns L and M. This increase, which includes the impact of labor wage increases, represents the expected level of work for meter reading on Molokai.

Molokai Division

Account no. 903 - Customer Records And Collection

Q. What is the Molokai Division's 2007 test year estimate for account no. 903 - customer records and collection expenses?

A. The Molokai Division's 2007 test year estimate for account no. 903 - customer records and collection expenses is $110,000. See MECO-708, pages 1 and 2, line 3, column D. This includes $122,000 for labor and -$12,000 for non-labor costs. See MECO-709, pages 1 and 2, column D, lines 4 and 10, respectively. One budget adjustment and no normalization adjustments were made to the 2007 operating budget to determine this test year estimate.

Q. What was the budget adjustment that was made to the 2007 operating budget in determining the 2007 test year estimate of this account?

A. The budget adjustment was to update the allocation of customer records and collection expenses from the Maui Division to the Molokai Division. This update is necessary because the estimate cannot be finalized until after the budget process is completed. The update results in a decrease to the Molokai Division of -$67,000. See MECO-709, pages 1 and 2, line 10, column B, and MECO-WP-701, page 22, line 26, column B.

Labor Expense

Q. What expenses are included in Molokai Division's account no. 903 - customer records and collection's $122,000 labor expense for the 2007 test year?

A. The labor expense estimate of $122,000 primarily includes two employees with three quarters (3/4) of their time charged to account no. 903 – records and collections, with the remainder of their time charged to account no. 920 - administrative and general salaries. See MECO-WP-702, pages 17 and 18. The labor expense in account no. 903 – records and collections also includes the cost of a portion of the Meter Reader/Collector's time. See MECO-WP-702, page 16. These employees are required to handle customer requests via telephone and in-person, credit investigations, billing and accounting, field collections and complaints. The Meter Reader/Collector charges most of the time to account no. 902 – meter reading.

Non-labor Expense

Q. What expenses are included in Molokai Division's account no. 903 - customer records and collection's -$12,000 non-labor expense for the 2007 test year?

A. The non-labor expense in this account primarily includes an allocation of the total labor and non-labor costs for the Maui, Lanai and Molokai Divisions for account nos. 901 - supervision and 903 – customer records and collection. The allocation method is based on an estimate of the percentage of Molokai customers in relation to the total number of MECO customers. See MECO-709, pages 1 and 2, line 10, column D, and MECO-WP-703, page 5, line 70, column D.

Comparison with Recorded 2005 and Prior Years

Q. How does the 2007 test year estimate for Molokai Division's account no. 903 compare to the 2005 recorded expenses?

A. The 2007 test year estimate of $110,000 is approximately $69,000, or 38.8%, lower than the 2005 recorded expense of $179,000. See MECO-WP-710, pages 1 and 2, line 6, columns N and O. This reflects a decrease of approximately $7,000

in labor expense, and a decrease of approximately $63,000 in non-labor expense. See MECO-WP-710, pages 1 and 2, column N, lines 4 and 5, respectively.

Q. What accounts for the $7,000 decrease in labor expense for the 2007 test year from the recorded 2005 expense?

A. The $7,000 decrease in labor expense is primarily due to a lower allocation of the Meter Reader/Collector's labor to this account with more time allocated to meter reading and field work.

Q. How does the 2007 non-labor expense for Molokai Division's account no. 903 – customer records and collection compare with the 2005 recorded expense?

A. The 2007 test year non-labor expense estimate of -$12,000 is approximately $63,000, or 123.8%, less than the recorded expense of $51,000, as shown in MECO-WP-710, pages 1 and 2, line 5, columns N and O.

Q. What accounts for the $63,000 decrease in non-labor expense for the Molokai Division's 2007 test year over recorded 2005 expenses?

A. The $63,000 decrease in non-labor costs in 2007 as compared to 2005 recorded expenses is primarily due to a lower allocation from the Maui Division for the following:

(1) postage charges,

(2) employee training, and

(3) variable costs relating to increase in customer transactions, including customer payments and mailing services.

Q. How do the 2007 test year labor and non-labor expense estimates for Molokai Division's account no. 903 – customer records and collection compare with recorded expenses in other periods?

A. A comparison of combined labor and non-labor expenses for Molokai Division's account no. 903 – customer records and collection by year is shown below (see MECO-710, line 3):

2001 (recorded):	$221,000
2002 (recorded):	$228,000
2003 (recorded):	$194,000
2004 (recorded):	$176,000
2005 (recorded)	$179,000
2007 (test year estimate):	$110,000

The test year 2007 estimate is approximately $90,000, or 45.1%, lower than the 2001-2005 recorded average. See MECO-WP-710, pages 1 and 2, line 6, columns L and M. This decrease reflects the change in allocation of customer records and collection expenses from the Maui Division to the Molokai Division.

Molokai Division

Account no. 904 - Uncollectible Accounts

Q. What is MECO's 2007 test year estimate for Molokai Division's account no. 904 - uncollectible accounts expense?

A. The Molokai Division's 2007 test year account no. 904 - uncollectible accounts expense estimate is $8,000 at present rates, and $9,000 at proposed rates. See MECO-708, line 5, column D, pages 1 and 2, respectively, and MECO-711, page 1, column C, lines 4 and 8, respectively. There was one budget adjustment to the 2007 operating budget made to account no. 904 – uncollectible accounts to arrive at the test year estimate at present rates. A normalization adjustment was made to compute the test year estimate at proposed rates. See MECO-WP-711, page 4, line 12, columns C and E, respectively.

Q. What was the budget adjustment made to the 2007 operating budget to arrive at the test year estimate for this account?

A. A budget adjustment of +$8,000 was made to allocate a portion of the bad debt expense to the Molokai Division based on revenues at present rates, as shown on MECO-709, pages 1 and 2, line 11, column B, MECO-WP-701, page 22, line 30, column B, and MECO-WP-711, page 4, line 12, column C. At the time the 2007 operating budget was finalized, the electric sales revenues at present rates for this docket were not yet available. Therefore, the estimate for bad debt expense of $137,000 was based on a different estimate of electric revenues, and was not allocated to the Molokai Division.

Q. How was the 2007 test year estimate for Molokai Division's account no. 904 - uncollectible accounts expense determined?

A. The Molokai Division's uncollectible accounts expense was determined using the "Percentage of Electric Sales Revenue" method discussed earlier in the Maui Division section of this testimony.

OTHER OPERATING REVENUES

Q. What is included in the test year estimates of "Other Operating Revenues"?

A. "Other Operating Revenues" are the sum of the following items:

1) Account no. 450 - other revenues

This includes revenues collected in accordance with MECO Tariff Rule No. 8 (specifically, field collection, returned check and late payment charges).

2) Account no. 451 - miscellaneous service revenues

This includes revenues from service establishment charges (MECO

Tariff Rule No. 7) and temporary facilities charges (MECO Tariff Rule No. 12).

3) Account no. 454 - rent from electric property

This includes rental revenues for street light fixtures, poles and transformers.

Q. What is the 2007 test year estimate of "Other Operating Revenues"?

A. The 2007 test year estimate of "Other Operating Revenues" are $1,535,000 at present rates and $1,759,000 at proposed rates, as shown in MECO-712, page 1, line 13, columns A and B, respectively. MECO-WP-712, page 1, shows the 2001-2005 recorded (columns A through E) and 2007 test year other operating revenues at present rates (column F).

Q. How are "Other Operating Revenues" estimated?

A. Each item is forecasted based on either recorded averages, historical trends adjusted for special situations or recent changes that will result in material impacts, or both. See MECO-WP-712, pages 1 to 8 for recorded historical information for each division and MECO consolidated. The sum of the divisions' totals is the Other Operating Revenues estimate for MECO consolidated, as shown in MECO-712, page 1.

Q. Is the Company proposing any changes to the method of estimating Other Operating Revenues in this proceeding?

A. No. The Company is not proposing any changes to the methods used in past rate case proceedings to estimate other operating revenues.

<u>Account no. 450 - Other Revenues</u>

Q. What is the Company's consolidated 2007 test year estimate for account no. 450 - other revenues?

A. The Company's consolidated 2007 test year estimate of account no. 450 – other revenues is $347,000 at present rates and $408,000 at proposed rates, as shown in MECO-712, page 1, line 5, columns A and B, respectively.

Q. How is account no. 450 – other revenues estimated?

A. Account no. 450 - other revenues is estimated in the following three parts:

1) field collection charge revenues,
2) returned check charge revenues*, and
3) late payment charge revenues - energy.

* The Company is proposing to change the returned check charge to returned payment charge (as discussed further below)

Q. What are field collection charges?

A. Field collection charges are fees assessed to customers for any field call to the service location necessitated by the customer's non-payment of bills or for failure otherwise to comply with the Company's tariff.

Q. What is the 2007 test year estimate of revenues from field collection charge?

A. The 2007 test year estimate for field collection charge is $38,000 at present rates and $62,000 at proposed rates, as shown in MECO-712, page 1, line 1, columns A and B, respectively.

Q. How was the field collection charge revenue estimate derived?

A. Revenues from field collections were estimated by forecasting the number of field documents worked and multiplying that number by the present charge of $15 per field call. The Company is proposing to increase the field collection charge from $15 per field call to $25 per field call in this proceeding. Therefore, revenues from the field collection charge are approximately $38,000 at present rates and

approximately $62,000 at proposed rates. See MECO-712, page 1, line 1, columns A and B, respectively.

Q. How was the increased rate of $25 per field call determined?

A. The Company estimated the labor time spent both in the field and at the office to process a field collection and multiplied such time by hourly wages including overheads to arrive at an estimated cost for the Company to appropriately process a field collection call. See MECO-WP-712, page 24.

Q. What are returned check charges?

A. Returned check charges are fees assessed to customers for payments by check for any service covered by MECO's tariff that are returned by the financial institution on which it is issued.

Q. What are the 2007 test year revenues from returned check charges?

A. The annual returned check charge revenues are $13,000 at present rates and $33,000 at proposed rates for the 2007 test year, as shown in MECO-712, page 1, line 2, columns A and B, respectively.

Q. How are returned check revenues calculated at present rates?

A. Revenues at present rates from returned check charges were calculated by multiplying the projected number of returned checks during the 2007 test year by the present charge of $15.00 per returned check.

Q. Is the Company proposing any change to the returned check charge?

A. Yes. MECO is proposing to increase the $15 returned check charge to $25, because the costs to process a returned payment have increased since last set in 1994 in Docket No. 7000. Therefore, the 2007 test year revenues for returned check charges are $13,000 at present rates and $33,000 at proposed rates. See MECO-712, page 1, line 2, columns A and B, respectively, and MECO-WP-712,

line 2, column F, pages 1 and 2, respectively. The Company is also proposing to change the name "returned check charge" to "returned payment charge".

Q. Why is the Company proposing to change the name "returned check charge" to "returned payment charge"?

A. The purpose of the name change is to reflect the different payment options (e.g., checks, credit cards, electronic payments, etc.) that are now available to customers, and to allow the Company to apply the same service charge on "returned" payments made through any of these options. This proposed change discussed above is discussed in more detail by Mr. Peter Young in MECO T-18.

Q. How was the increased rate of $25 per returned payment determined?

A. The Company estimated the labor time spent to process a returned payment and multiplied the time by hourly wages including overheads to arrive at an estimated cost for the Company. See MECO-WP-712, page 24.

Q. What is "OCARS"?

A. "OCARS" stands for the Other Corporate Accounts Receivable System. It is a subsystem of the existing Automated Corporate Customer Energy Services Systems ("ACCESS") that aids the Company in managing the non-electric accounts receivables. These receivables include: damage claims, non-posted cash, property rentals and leases, line construction, pole contact and attachments, power sales, joint facilities, temporary service, meter tampering charges, scrap and materials sales, contract services, prepaid deposits, equipment financing, notes receivables, and other receivables.

Q. What is a late payment charge for OCARS?

A. Late payment charges for OCARS are applied to any other customer account receivables (OCARS) excluding any unpaid late payment charges existing when

the unpaid account balance is calculated for billing purposes provided the billing period is not less than 20 days since the last bill. A late payment charge provision specified in a written contract shall supersede the late payment charge in MECO Tariff Rule No. 8.

Q. What are the test year revenues from late payment charges for OCARS?

A. The late payment revenues from OCARS are zero for the 2007 test year as shown in MECO-712, page 1, line 3, columns A and B.

Q. Please explain why the 2007 test year revenues for late payment charges for OCARS are zero.

A. The 2007 test year revenues are zero because the Company has not recorded such expenses historically and is expecting a similar forecast.

Q. How are late payment revenues on outstanding OCARS balances calculated?

A. At both present and proposed rates, the OCARS late payment revenues are based on current outstanding OCARS balances. A 10% per annum rate on the outstanding OCARS balance is applied to determine late payment revenues and confirmed by comparing to historical 2005 recorded revenues. Historical amounts for the period from 2001 - 2005 are zero.

Q. What is a late payment charge for Energy?

A. Late payment charges for Energy are fees applied to any unpaid balance existing when the electric service bill is calculated, provided it has been at least 20 days since the last bill was calculated.

Q. What are the test year revenues from late payment charges for Energy?

A. Late payment charge revenues from energy bill balances are $296,000 at present rates based on total billed revenue of $306,221,700, and $313,000 at proposed rates for the 2007 test year based on total billed revenue of $374,527,000, as

shown in MECO-712, page 1, line 4, columns A and B, respectively, and MECO-WP-712, line 4, column F, pages 1 and 2, respectively.

Q. How are the late payment revenues for outstanding energy bill balances calculated?

A. Late payment revenues on outstanding energy bill revenues are based on the current 0.09% percentage factor of late payment revenues received against billed revenues for the Maui Division, 0.11% for the Lanai Division, and 0.17% for the Molokai Division. The calculations of the 2007 test year late payment revenues at present and proposed rates are shown on MECO-WP-712, line 6, column C, pages 15, 16 and 17.

Account no. 451 - Miscellaneous Service Revenues

Q. What is included in account no. 451 - miscellaneous service revenues?

A. Account no. 451 - miscellaneous service revenues are comprised of revenues from the following:

1) Service establishment charges and reconnection charges,
2) Temporary facilities,
3) Revenue protection, and
4) "Other" charges.

Q. What is a service establishment charge?

A. A service establishment charge is a fee required for each establishment, supersedure, or re-establishment of electric service to any customer. This service establishment charge is in addition to the charges calculated in accordance with the applicable schedule and will be required each time an account is opened, including turn on or reconnection of electric service or a change of customer which requires a meter reading.

Q. What is a reconnection charge?

A. A reconnection charge is a fee required to reconnect electric service to any customer.

Q. What is the 2007 test year estimate of revenues at present rates from the service establishment charge and the reconnection charge?

A. Revenues at present rates from the service establishment charge and the reconnection charge are approximately $219,000 and $13,000, respectively, for a total of approximately $232,000, as shown in MECO-712, page 1, column A, lines 6 and 7, respectively.

Q. How is the 2007 test year estimate for service establishment and reconnection revenues at present rates derived?

A. Service establishment charge and reconnection charge revenues are estimated by forecasting the number of starts per year and reconnections per year, and multiplying that number by the current $15.00 service establishment charge for services provided during regular hours.

Q. Is the Company proposing any change in the service establishment charge and/or the reconnection charge?

A. Yes, to both. The Company is proposing to increase both the service establishment charge and the reconnection charge to $25 each. The Company is also proposing to increase the same day service or outside normal hours charge from $10 to $20. Therefore, revenues from service establishment and reconnection charges at proposed rates are approximately $370,000 and $25,000, respectively, for a total of approximately $395,000 at proposed rates. See MECO-712, page 1, column B, lines 6 and 7, respectively.

Q. What are revenues from temporary facilities?

A. These are revenues expected from various customer projects requiring temporary service during the construction phase, and other miscellaneous charges.

Q. What is the 2007 test year estimate for revenues from temporary facilities?

A. For the 2007 test year, at both present and proposed rates, the revenues from temporary facilities are estimated to be $74,000, as shown in MECO-712, page 1, line 8, columns A and B, and MECO-WP-712, line 8, column F, pages 1 and 2.

Q. How is the 2007 test year estimate for revenues from temporary facilities derived?

A. The 2007 test year estimate for revenues from temporary facilities was derived based on the average revenue recorded between 2001 and 2005.

Q. What are revenues from revenue protection?

A. These are revenues expected from the recovery of expenses in connection with current diversion cases, i.e., when customers by-pass the meter to receive their power. Billing for the electricity consumed is included in the appropriate electric revenue account.

Q. What is the 2007 test year estimate for revenues from revenue protection?

A. For the 2007 test year, at both present and proposed rates, the revenues from revenue protection are estimated to be $12,000, as shown in MECO-712, page 1, line 9, columns A and B, and MECO-WP-712, line 9, column F, pages 1 and 2.

Q. How is the 2007 test year estimate for revenues from revenue protection derived?

A. The 2007 test year estimate for revenues from revenue protection was derived based on the average revenue recorded between 2001 and 2005.

Q. What are "other" miscellaneous service revenues?

A. These are revenues expected from the other small, miscellaneous revenues that do not fit other categories.

Q. What is the 2007 test year estimate for these "other" revenues?

A. For the 2007 test year, at both present and proposed rates, the "other" revenues are estimated to be zero, as shown in MECO-712, page 1, line 10, columns A and B, and MECO-WP-712, line 10, column F, pages 1 and 2.

Q. How is the 2007 test year estimate for "other" revenues derived?

A. The 2007 test year estimate for "other" revenues was derived based on the average revenue recorded between 2001 and 2005.

Account no. 454 - Rent from Electric Property

Q. What does account no. 454 – rent from electric property include?

A. This account includes revenues from street light fixture, pole and transformer rentals.

Q. What is the 2007 test year amount for revenues in account no. 454 – rents from electric property?

A. Account no. 454 – rents from electric property is estimated, at both present and proposed rates, to be $870,000, as shown in MECO-712, page 1, line 12, columns A and B, and MECO-WP-712, line 12, column F, pages 1 and 2.

Q. How is the 2007 test year estimate for account no. 454 – rents from electric property derived?

A. Street light fixture, pole and transformer rental revenues are estimated based on recent income levels. The 2006 year-to-date actuals were annualized, and then an average historical 5-year growth rate of 2.0% was applied to arrive at the $870,000 test year estimate.

CUSTOMER DEPOSITS

Q. What are customer deposits?

A. These are amounts the Company collects from customers as security for their electric service. These customers are either new customers who have not

established their credit worthiness with the Company, or are past or existing customers who have failed to maintain creditworthiness with the Company.

Q. When does the Company require a deposit?

A. A customer deposit is required in cases where the applicant for service cannot establish credit by any of the other means allowed under MECO Tariff Rule No. 5, Establishment and Re-establishment of Credit. The customer deposit is held until the customer has established a record of twelve months of continuous prompt payments, has closed the account, or service has been terminated for nonpayment of the full deposit and/or electric bills

Q. Are there any changes proposed regarding customer deposits?

A. No. The Company proposes to continue with the Company's current policy, which sets the deposit at an amount equal to the maximum estimated charge for service for two consecutive months in a twelve-month period.

Q. What is the Company's estimate of customer deposits for the 2007 test year?

A. The Company's estimate of average customer deposits for the 2007 test year is $3,882,000 as shown on line 4, column A of MECO-713. The estimated average customer deposits are further broken down for each Division as follows:

	Test Year 2007
Maui Division	$3,601,000
Lanai Division	$95,000
Molokai Division	$186,000
MECO Consolidated	$3,882,000

See MECO-713, column A.

Q. How is the Company's estimate of average customer deposits for the 2007 test year derived?

A. The Company's estimate of average customer deposits for the 2007 test year is derived by first taking the 2005 recorded year end customer deposit balance and increasing it by a factor of 1.157 to estimate the year-end 2006 and year-end 2007 amounts. See MECO-WP-713, page 1, line 7, column D. The test year average customer deposit estimate of $3,882,000 is then derived by calculating the simple average of the total estimated year-end 2006 and estimated year-end 2007 customer deposit balances of $3,600,000 and $4,165,000, respectively.

Q. How is the test year estimate of average customer deposits by division derived?

A. The test year estimate of average customer deposits by division is an allocation, which is based on the percentage of the average number of customers for each division, as shown in MECO-WP-713, page 2, lines 1 to 4, column A.

Q. How was the factor of 1.157 derived?

A. The factor represents the forecasted annual growth rate in customer deposits for 2007 based on the historical 5-year average between 2001 and 2005, as shown on MECO-WP-713, page 1, line 7, column D.

Q. Does the Company pay interest on customer deposits?

A. Yes, in accordance with MECO Tariff Rule No. 6.

Q. What interest rate does MECO pay to its customers for customer deposits?

A. MECO pays 6% interest on customer deposits, in accordance with MECO Tariff Rule No. 6.

Q. What is MECO's 2007 test year estimate of interest on customer deposits?

A. MECO's test year estimate of interest on customer deposits is approximately $233,000. See MECO-713, line 4, column B.

Q. How was the 2007 test year estimate of interest on customer deposits derived?

A. The average customer deposits for the 2007 test year of $3,882,000 was multiplied by the 6% interest rate to arrive at the approximately $233,000 test year estimate for interest on customer deposits, as shown on MECO-WP-713, page 1, lines 17 to 20, column E.

REVENUE COLLECTION LAG DAYS

Q. What are revenue collection lag days?

A. Revenue collection lag days are the number of days between the provision of electric service and the receipt of payment for that service. This lag represents the average period of time over which the Company extends credit to its customers for electric service delivered.

Q. How are revenue collection lag days calculated?

A. The revenue collection lag days are calculated by adding a fixed number of days (representing the mid-point of the monthly bill) to a variable number that represents the average amount of time it takes to bill a customer and receive payment for the bill.

Q. What is the Company's estimate of revenue lag days for the 2007 test year?

A. The Company's consolidated estimate of revenue lag days for the 2007 test year is 36.0 (rounded from 35.6) days. See MECO-714, line 9, column C.

Q. In determining the test year 2007 revenue lag days, how many fixed and variable lag days were included in the calculation?

A. The fixed days for the test year is 16 and the variable days are 20, as shown on MECO-714, page 1, line 9, columns A and B, respectively.

Q. How does the 2007 test year estimate compare with the recorded revenue lag days?

A. The revenue lag days of 36 for the 2007 test year are consistent with the recorded revenue lag days over the past five years. See MECO-714, line 4, columns A to E.

Q. How does the 2007 test year estimate compare with the lag days calculation used in MECO's prior rate case in Docket No. 97-0346?

A. The revenue lag days of 36 for the 2007 test year represent a decrease to MECO's lag days calculation of 38 days used by the Commission in determining MECO's prior rate case, in Decision and Order No. 16922, filed on April 6, 1999, Docket No. 97-0346.

Q. Do you have any explanation for the decrease in revenue lag days for the 2007 test year when compared to Docket No. 97-0346?

A. As previously discussed in my testimony on uncollectibles expense, due to the continued improvement in the local economy, as well as efforts made to improve the collection of delinquent account balance, the Company has improved lag days and customer payments are made on a more timely basis. With a concerted effort to reduce receivables to existing delinquent accounts, the revenue lag days have improved over the years to a much lower level.

CUSTOMER SERVICE DEPARTMENT WORKFORCE

Q. What is the Customer Service Department's estimated employee count for the test year 2007?

A. The Customer Service Department's test year 2007 estimated employee count is 43 as shown in MECO-715, line 1, column H. Of these 43 employees, three (3) positions are dedicated to the administration and implementation of MECO's Demand-Side Management ("DSM") programs (two (2) Energy Efficiency Program Managers and a Clerk Typist III). Therefore, their labor costs are

recovered through the DSM Surcharge component of the Integrated Resource Planning Cost Recovery Provision ("IRP Clause") and not included in base rates. See MECO T-8 for more discussion on the DSM program cost recovery.

Q. How does the Customer Service Department's test year 2007 estimated employee count at year-end 2007 compare with the actual employee count at the end of 2006?

A. The test year 2007 estimated employee count of 43 for the Customer Service Department is greater than the actual employee count as of December 31, 2006 by three (3) employees.

Q. Are there any new positions that were added in the 2007 test year estimate?

A. Yes, one position was added. The Field Services Representative was added as a new position in the 2007 test year estimate. This position was added due to the increasing number of field transactions required for the growing number of customers, as mentioned earlier in my testimony and was filled in January 2007.

Q. Are there any vacancies in the Customer Service Department?

A. Yes. As of February 16, 2007, there were four (4) vacant positions in the Customer Service Department. The four vacant positions are for a Commercial Account Manager, an Administrator, a Clerk Typist I, and a Clerk Typist III.

Q. What is the status of these vacancies?

A. The Commercial Account Manager position is vacant because the employee who previously was in that position is now in the Supervisor, Commercial Services position. The Commercial Account Manager position became vacant in November 2006. Recruitment efforts for the Commercial Account Manager are on-going, and the position is expected to be filled by March 2007.

The Administrator position is a pending hire, i.e., a conditional offer was made and accepted. This position should be filled by the end of February 2007.

The Clerk Typist I position became vacant in early February 2007 as the employee who was in that position is now in a different position with MECO. Recruitment for the position is on-going and is expected to be filled by March 2007.

As previously discussed in this testimony, the Clerk Typist III position is fully charged to account no. 186 – miscellaneous deferred debits, recovered through the DSM Surcharge of the IRP Clause because it supports the DSM programs, and is not included in base rates. The position will be evaluated as part of MECO's review of the impacts of D&O 23258.

Q. Why are no adjustments being made to the test year 2007 estimate of Customer Service Department employees?

A. There are no adjustments being made to the test year 2007 estimate of Customer Service Department employees because three of the four vacant positions should be filled in the first quarter of 2007, and one vacant position is not included in base rates.

SUMMARY

Q. Please summarize your testimony.

A. The 2007 test year estimate for customer accounts expense is $3,300,000 at present rates and $3,311,000 at proposed rates. The increase in expenses is necessitated by wage rate increases, customer growth, and the need to increase customer services to meet customer needs. The Company believes that the combination of a professional, caring staff, increased productivity, strict enforcement of credit policies, and system enhancements are in the best

long-range interest of our customers.

The 2007 test year estimate for other operating revenue is $1,535,000 at present rates and $1,759,000 at proposed rates.

The 2007 test year estimate for customer deposits is $3,882,000. The interest on customer deposits for the 2007 test year is $233,000.

The revenue collection lag days for the 2007 test year are 36 days.

Finally, the Customer Service Department employee count for the 2007 test year is 43.

Q. Does this conclude your testimony?

A. Yes.

MAUI ELECTRIC COMPANY, LIMITED

SHARON M. SUZUKI

EDUCATIONAL BACKGROUND AND EXPERIENCE

BUSINESS ADDRESS:	Maui Electric Company, Limited 210 West Kamehameha Avenue Kahului, Hawaii 96732
POSITION:	Manager, Customer Service Department (2004 - Present)
PRIOR POSITIONS:	Director, Customer Account Services Customer Service Department Hawaiian Electric Company, Inc. (2002 - 2004)
	Energy Efficiency Program Manager Customer Efficiency Programs Division Energy Services Department Hawaiian Electric Company, Inc. (1996 - 2002)
	DSM Analyst Customer Efficiency Programs Division Energy Services Department Hawaiian Electric Company, Inc. (1992 - 1996)
EDUCATION:	M.B.A., Finance California State University, Fullerton, 1987
	B.A., Economics University of Michigan, 1981
OTHER CURRICULUM:	Utility Executive Course University of Idaho, 2005

MAUI ELECTRIC COMPANY, LIMITED

2007 TEST YEAR
CUSTOMER ACCOUNTS EXPENSE
($ THOUSANDS)

Line		A	B
		2007 Test Year @ Present Rates	2007 Test Year @ Proposed Rates
1	Maui Division	2,978	2,987
2	Lanai Division	145	146
3	Molokai Division	177	178
4	MECO Consolidated	3,300	3,311

SOURCE:
Line 1 Column A: MECO-702, column D, line 6, page 1 of 2.
Line 1 Column B: MECO-702, column D, line 6, page 2 of 2.
Line 2 Column A: MECO-705, column D, line 6, page 1 of 2.
Line 2 Column B: MECO-705, column D, line 6, page 2 of 2.
Line 3 Column A: MECO-708, column D, line 6, page 1 of 2.
Line 3 Column B: MECO-708, column D, line 6, page 2 of 2.

MAUI ELECTRIC COMPANY, LIMITED
MAUI DIVISION

2007 TEST YEAR
CUSTOMER ACCOUNTS EXPENSE
($ THOUSANDS)
@ PRESENT RATES

Line		A	B	C	D
		2007			
		Operating Budget	Budget Adjustments	Normalizations	Test Year Estimates
1	901 Supervision	125	32		157
2	902 Meter Reading	662	-		662
3	903 Customer Records & Collections	1,907	52		1,959
4	Subtotal	2,694	84	-	2,778
5	904 Uncollectibles	137	63		200
6	TOTAL	2,831	147	-	2,978

SOURCE:
MECO-703, page 1

MAUI ELECTRIC COMPANY, LIMITED
MAUI DIVISION

2007 TEST YEAR
CUSTOMER ACCOUNTS EXPENSE
($ THOUSANDS)
@ PROPOSED RATES

Line		A	B	C	D
		2007			
		Operating Budget	Budget Adjustments	Normalizations	Test Year Estimates
1	901 Supervision	125	32		157
2	902 Meter Reading	662	-		662
3	903 Customer Records & Collections	1,907	52		1,959
4	Subtotal	2,694	84	-	2,778
5	904 Uncollectibles	137	63	9	209
6	TOTAL	2,831	147	9	2,987

SOURCE:
MECO-703, page 2

MAUI ELECTRIC COMPANY, LIMITED
MAUI DIVISION

2007 TEST YEAR
CUSTOMER ACCOUNTS EXPENSE
BY LABOR AND NONLABOR EXPENSES
($ THOUSANDS)
@ PRESENT RATES

Line		A	B	C	D
		2007			
		Operating Budget	Budget Adjustments	Normalizations	Test Year Estimates
1	Labor				
2	901 Supervision	112	23		135
3	902 Meter Reading	474	-		474
4	903 Customer Records & Collections	1,295	(23)		1,272
5	904 Uncollectibles	-	-		-
6	Total Labor	1,881	-		1,881
7	Nonlabor				
8	901 Supervision	13	9		22
9	902 Meter Reading	188	-		188
10	903 Customer Records & Collections	612	75		687
11	904 Uncollectibles	137	63		200
12	Total Non-labor	950	147	-	1,097
13	TOTAL	2,831	147	-	2,978

SOURCE:
MECO-WP-704, Columns H-K, page 1 of 2.

Note: Differences between exhibits and workpapers are due to rounding.

MAUI ELECTRIC COMPANY, LIMITED
MAUI DIVISION

2007 TEST YEAR
CUSTOMER ACCOUNTS EXPENSE
BY LABOR AND NONLABOR EXPENSES
($ THOUSANDS)
@ PROPOSED RATES

Line		A	B	C	D
		2007			
		Operating Budget	Budget Adjustments	Normalizations	Test Year Estimates
1	Labor				
2	901 Supervision	112	23		135
3	902 Meter Reading	474	-		474
4	903 Customer Records & Collections	1,295	(23)		1,272
5	904 Uncollectibles	-	-		-
6	Total Labor	1,881	-	-	1,881
7	Nonlabor				
8	901 Supervision	13	9		22
9	902 Meter Reading	188	-		188
10	903 Customer Records & Collections	612	75		687
11	904 Uncollectibles	137	63	9	209
12	Total Non-labor	950	147	9	1,106
13	TOTAL	2,831	147	9	2,987

SOURCE:
MECO-WP-704, Columns H-K, page 2 of 2.
Column C: MECO-WP-711, Column E, Line 10, page 4 of 5.

Note: Differences between exhibits and workpapers are due to rounding.

Maui Electric Company, Limited
Maui Division

CUSTOMER ACCOUNTS EXPENSE BY ACCOUNTS
($ THOUSANDS)

		A	B	C	D	E	F	G
		<----------Recorded---------->					Test Year Estimate 2007 @ Present Rates	Test Year Estimate 2007 @ Proposed Rates
Line		2001	2002	2003	2004	2005		
1	901 Supervision	63	29	54	82	127	157	157
2	902 Meter Reading	428	461	477	507	601	662	662
3	903 Records & Coll.	1,399	1,224	1,299	1,433	1,439	1,959	1,959
4	904 Uncollectibles	252	219	205	50	175	200	209
5	Total Customer Accounts Expense	2,142	1,933	2,035	2,072	2,342	2,978	2,987

SOURCE:
MECO-WP-704

Note: Differences between exhibits and workpapers are due to rounding.

Maui Electric Company, Limited
Maui Division

CUSTOMER ACCOUNTS EXPENSE - METER READING
($ THOUSANDS)

		A	B	C	D	E	F
		<----------Recorded---------->					Test Year Estimate
Line		2001	2002	2003	2004	2005	2007
1	902 Meter Reading Total Costs	428	461	477	507	601	662
2	Average Number of Customers	53,895	54,945	56,144	57,300	58,498	60,694
3	Percent Change in Customers		1.9%	2.2%	2.1%	2.1%	3.8%
4	5-year average annual growth rate					1.7%	

SOURCE:
Line 1: MECO-WP-704, line 6, pages 1 and 2.
Line 2: MECO-WP-205, line 11, page 2.

Note: Differences between exhibits and workpapers are due to rounding.

MAUI ELECTRIC COMPANY, LIMITED

2007 TEST YEAR
CUSTOMER SERVICE DEPARTMENT OVERTIME COMPARISON
2001-2005 ANNUAL RECORDED & 2007 ANNUAL FORECAST

Line			A	B	C	D	E	F	G	H	I
			2001 Annual Recorded			2002 Annual Recorded			2003 Annual Recorded		
	RA	RA Description	Productive Hours	Overtime Hours	% OT	Productive Hours	Overtime Hours	% OT	Productive Hours	Overtime Hours	% OT
1	MCF	Field Services	12,867.6	53.5	0.4%	12,480.3	95.3	0.8%	12,480.0	180.8	1.4%
2	MCM	Meter Reading Cust Acct	14,233.8	332.5	2.3%	14,136.0	314.0	2.2%	14,536.5	475.3	3.3%
3	MCR	Service	23,072.6	118.3	0.5%	24,229.5	121.2	0.5%	24,946.3	174.4	0.7%
4	MCT	Molokai	8,321.0	18.0	0.2%	7,288.3	26.0	0.4%	6,240.0	60.0	1.0%
5	MCZ	IRP	8,175.0	19.5	0.2%	8,875.4	9.0	0.1%	10,220.0	38.1	0.4%
6	MC0	Total Dept	66,670.0	541.8	0.8%	67,009.5	565.4	0.8%	68,422.8	928.5	1.4%

			2004 Annual Recorded			2005 Annual Recorded			2007 Annual Forecast		
	RA	RA Description	Productive Hours	Overtime Hours	% OT	Productive Hours	Overtime Hours	% OT	Productive Hours	Overtime Hours	% OT
7	MCF	Field Services	12,481.0	348.0	2.8%	12,480.0	264.3	2.1%	12,712.0	184.0	1.4%
8	MCM	Meter Reading Cust Acct	14,452.5	751.2	5.2%	16,662.0	918.4	5.5%	17,880.0	1,176.0	6.6%
9	MCR	Service	24,945.8	528.3	2.1%	24,492.3	653.1	2.7%	27,676.0	2,620.0	9.5%
10	MCT	Molokai	6,240.0	109.3	1.8%	6,240.0	166.5	2.7%	6,464.0	200.0	3.1%
11	MCZ	IRP	6,637.3	72.5	1.1%	6,182.0	130.8	2.1%	2,088.0	0.0	0.0%
12	MC0	Total Dept	64,756.6	1,809.2	2.8%	66,056.3	2,133.0	3.2%	66,820.0	4,180.0	6.3%

			5-Year Recorded Total			5-Year Average		
	RA	RA Description	Productive Hours	Overtime Hours	% OT	Productive Hours	Overtime Hours	% OT
13	MCF	Field Services	62,788.9	941.8	1.5%	12,557.8	188.4	1.5%
14	MCM	Meter Reading Cust Acct	74,020.8	2,791.5	3.8%	14,804.2	558.3	3.8%
15	MCR	Service	121,686.4	1,595.1	1.3%	24,337.3	319.0	1.3%
16	MCT	Molokai	34,329.3	379.8	1.1%	6,865.9	76.0	1.1%
17	MCZ	IRP	40,089.7	269.8	0.7%	8,017.9	54.0	0.7%
18	MC0	Total Dept	332,915.0	5,978.0	1.8%	66,583.0	1,195.6	1.8%

SOURCE:
Recorded Information from DARS Department Overtime Report (659)
Forecast Information from Pillar System files

MAUI ELECTRIC COMPANY, LIMITED
LANAI DIVISION

2007 TEST YEAR
CUSTOMER ACCOUNTS EXPENSE
($ THOUSANDS)
@ PRESENT RATES

Line		A	B	C	D
		2007			
		Operating Budget	Budget Adjustments	Normalizations	Test Year Estimates
1	901 Supervision	-	-		-
2	902 Meter Reading	83	-		83
3	903 Customer Records & Collections	72	(16)		56
4	Subtotal	155	(16)		139
5	904 Uncollectibles	-	6	-	6
6	TOTAL	155	(10)	-	145

SOURCE:
MECO-706, page 1

MAUI ELECTRIC COMPANY, LIMITED
LANAI DIVISION

2007 TEST YEAR
CUSTOMER ACCOUNTS EXPENSE
($ THOUSANDS)
@ PROPOSED RATES

Line		A	B	C	D
		2007			
		Operating Budget	Budget Adjustments	Normalizations	Test Year Estimates
1	901 Supervision	-	-		-
2	902 Meter Reading	83	-		83
3	903 Customer Records & Collections	72	(16)		56
4	Subtotal	155	(16)		139
5	904 Uncollectibles	-	6	1	7
6	TOTAL	155	(10)	1	146

SOURCE:
MECO-706, page 2

MAUI ELECTRIC COMPANY, LIMITED
LANAI DIVISION

2007 TEST YEAR
CUSTOMER ACCOUNTS EXPENSE
BY LABOR AND NONLABOR EXPENSES
($ THOUSANDS)
@ PRESENT RATES

Line		A	B	C	D
		2007			
		Operating Budget	Budget Adjustments	Normalizations	Test Year Estimates
1	Labor				
2	901 Supervision	-	-		-
3	902 Meter Reading	55	-		55
4	903 Customer Records & Collections	2			2
5	904 Uncollectibles	-	-		-
6	Total Labor	57	-	-	57
7	Nonlabor				
8	901 Supervision	-	-		-
9	902 Meter Reading	28	-		28
10	903 Customer Records & Collections	70	(16)		- 54
11	904 Uncollectibles	-	6		6
12	Total Nonlabor	98	(10)	-	88
13	TOTAL	155	(10)	-	145

SOURCE:
MECO-WP-707, columns H-K, page 1 of 2.

Note: Differences between exhibits and workpapers are due to rounding.

MAUI ELECTRIC COMPANY, LIMITED
LANAI DIVISION

2007 TEST YEAR
CUSTOMER ACCOUNTS EXPENSE
BY LABOR AND NONLABOR EXPENSES
($ THOUSANDS)
@ PROPOSED RATES

Line		A	B	C	D
		2007			
		Operating Budget	Budget Adjustments	Normalizations	Test Year Estimates
1	Labor				
2	901 Supervision	-	-		-
3	902 Meter Reading	55	-		55
4	903 Customer Records & Collections	2			2
5	904 Uncollectibles	-	-		-
6	Total Labor	57	-	-	57
7	Nonlabor				
8	901 Supervision	-	-		-
9	902 Meter Reading	28	-		28
10	903 Customer Records & Collections	70	(16)		- 54
11	904 Uncollectibles	-	6	1	7
12	Total Nonlabor	98	(10)	1	89
13	TOTAL	155	(10)	1	146

SOURCE:
MECO-WP-707, columns H-K, page 2 of 2.
Column C: MECO-WP-711, Column E, Line 11, page 4 of 5.

Note: Differences between exhibits and workpapers are due to rounding.

Maui Electric Company, Limited
Lanai Division

CUSTOMER ACCOUNTS EXPENSE BY ACCOUNTS
($THOUSANDS)

Line		A	B	C	D	E	F	G
		<----------Recorded---------->					Test Year Estimate 2007 @ Present Rates	Test Year Estimate 2007 @ Proposed Rates
		2001	2002	2003	2004	2005		
1	901 Supervision	0	0	0	0	0	0	0
2	902 Meter Reading	31	34	37	45	75	83	83
3	903 Records & Coll.	37	56	60	62	65	56	56
4	904 Uncollectibles	0	0	0	0	0	6	7
5	Total Customer Accounts Expense	68	90	97	107	140	145	146

SOURCE:
MECO-WP-707

Note: Differences between exhibits and workpapers are due to rounding.

MAUI ELECTRIC COMPANY, LIMITED
MOLOKAI DIVISION

2007 TEST YEAR
CUSTOMER ACCOUNTS EXPENSE
($ THOUSANDS)
@ PRESENT RATES

Line		A	B	C	D
				2007	
		Operating Budget	Budget Adjustments	Normalizations	Test Year Estimates
1	901 Supervision	-	-	-	-
2	902 Meter Reading	59	-	-	59
3	903 Customer Records & Collections	177	(67)	-	110
4	Subtotal	236	(67)	-	169
5	904 Uncollectibles	-	8	-	8
6	TOTAL	236	(59)	-	177

SOURCE:
MECO-709, page 1

MAUI ELECTRIC COMPANY, LIMITED
MOLOKAI DIVISION

2007 TEST YEAR
CUSTOMER ACCOUNTS EXPENSE
($ THOUSANDS)
@ PROPOSED RATES

Line		A	B	C	D
		2007			
		Operating Budget	Budget Adjustments	Normalizations	Test Year Estimates
1	901 Supervision	-	-	-	-
2	902 Meter Reading	59	-	-	59
3	903 Customer Records & Collections	177	(67)	-	110
4	Subtotal	236	(67)	-	169
5	904 Uncollectibles	-	8	1	9
6	TOTAL	236	(59)	1	178

SOURCE:
MECO-709, page 2

MAUI ELECTRIC COMPANY, LIMITED
MOLOKAI DIVISION

2007 TEST YEAR
CUSTOMER ACCOUNTS EXPENSE
BY LABOR AND NONLABOR EXPENSES
($ THOUSANDS)
@ PRESENT RATES

Line		A	B	C	D
		2007			
		Operating Budget	Budget Adjustments	Normalizations	Test Year Estimates
1	Labor				
2	901 Supervision	-	-	-	-
3	902 Meter Reading	43	-	-	43
4	903 Customer Records & Collections	122	-	-	122
5	904 Uncollectibles	-	-	-	-
6	Total Labor	165	-	-	165
7	Nonlabor				
8	901 Supervision	-	-	-	-
9	902 Meter Reading	16	-	-	16
10	903 Customer Records & Collections	55	(67)	-	(12)
11	904 Uncollectibles	-	8	-	8
12	Total Nonlabor	71	(59)	-	12
13	TOTAL	236	(59)	-	177

SOURCE:
MECO-WP-710, columns H-K, page 1 of 2.

Note: Differences between exhibits and workpapers are due to rounding.

MAUI ELECTRIC COMPANY, LIMITED
MOLOKAI DIVISION

2007 TEST YEAR
CUSTOMER ACCOUNTS EXPENSE
BY LABOR AND NONLABOR EXPENSES
($ THOUSANDS)
@ PROPOSED RATES

Line		A	B	C	D
		2007			
		Operating Budget	Budget Adjustments	Normalizations	Test Year Estimates
1	Labor				
2	901 Supervision	-	-	-	-
3	902 Meter Reading	43	-	-	43
4	903 Customer Records & Collections	122	-	-	122
5	904 Uncollectibles	-	-	-	-
6	Total Labor	165	-	-	165
7	Nonlabor				
8	901 Supervision	-	-	-	-
9	902 Meter Reading	16	-	-	16
10	903 Customer Records & Collections	55	(67)	-	(12)
11	904 Uncollectibles	-	8	1	9
12	Total Nonlabor	71	(59)	1	13
13	TOTAL	236	(59)	1	178

SOURCE:
MECO-WP-710, columns H-K, page 2 of 2.
Column C: MECO-WP-711, Column E, Line 12, page 4 of 5.

Note: Differences between exhibits and workpapers are due to rounding.

Maui Electric Company, Limited
Molokai Division

CUSTOMER ACCOUNTS EXPENSE BY ACCOUNTS
($ THOUSANDS)

		A	B	C	D	E	F	G
		<----------Recorded---------->					Test Year Estimate 2007 @ Present Rates	Test Year Estimate 2007 @ Proposed Rates
Line		2001	2002	2003	2004	2005		
1	901 Supervision	0	0	0	0	0	0	0
2	902 Meter Reading	32	36	46	53	64	59	59
3	903 Records & Coll.	221	228	194	176	179	110	110
4	904 Uncollectibles	0	0	0	0	0	8	9
5	Total Customer Accounts Expense	253	264	240	229	243	177	178

SOURCE:
MECO-WP-710

Note: Differences between exhibits and workpapers are due to rounding.

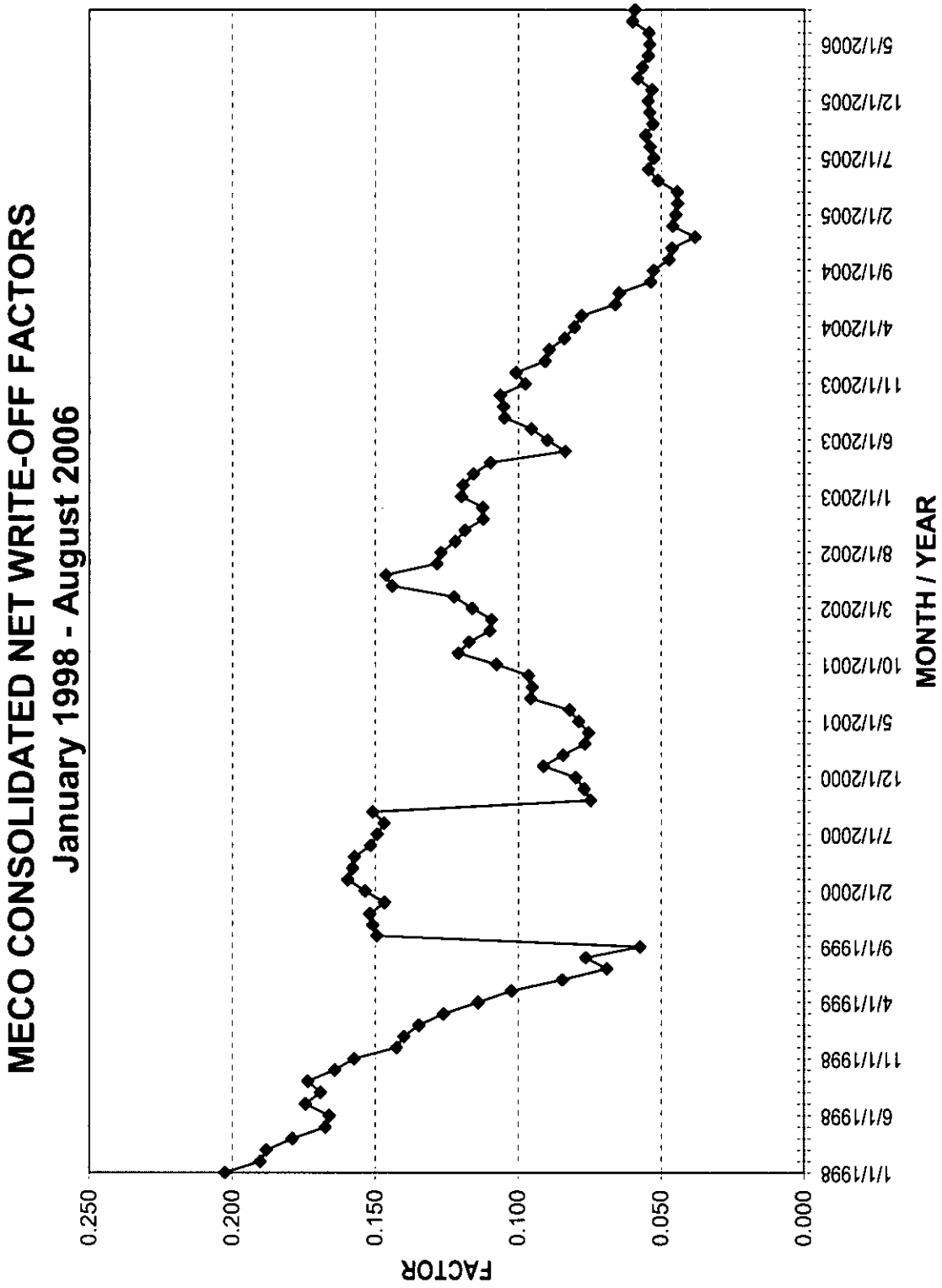
Maui Electric Company, Limited
Maui, Lanai, Molokai Divisions

CUSTOMER ACCOUNTS EXPENSE
BAD DEBT AND UNCOLLECTIBLES
($ THOUSANDS)

Line		A	B	C
		Revenue ($000s)	Uncollectible Factor	Uncollectibles ($000s)
1	2007 Operating Budget Consolidated	355,773.0	0.06%	214
	2007 Test Year Current Effective Rates			
2	Maui Division	333,075.0	0.06%	200
3	Lanai Division	10,067.0	0.06%	6
4	Molokai Division	12,631.0	0.06%	8
	2007 Operating Budget			
5	Consolidated	374,527.0	0.06%	225
	2007 Test Year Proposed Rates			
6	Maui Division	348,654.0	0.06%	209
7	Lanai Division	12,015.0	0.06%	7
8	Molokai Division	13,858.0	0.06%	9

SOURCE:
Column A, lines 1-8: MECO-2001
Column B: MECO-WP-711, column G, line 6, page 1
Column C: Column A * Column B

Note: Differences between exhibits and workpapers are due to rounding.


MECO CONSOLIDATED NET WRITE-OFF FACTORS
January 1998 - August 2006
FACTOR
0.250
0.200
0.150
0.100
0.050
0.000
MONTH / YEAR
1/1/1998
6/1/1998
11/1/1998
4/1/1999
9/1/1999
2/1/2000
7/1/2000
12/1/2000
5/1/2001
10/1/2001
3/1/2002
8/1/2002
1/1/2003
6/1/2003
11/1/2003
4/1/2004
9/1/2004
2/1/2005
7/1/2005
12/1/2005
5/1/2006

MAUI ELECTRIC COMPANY, LIMITED
(CONSOLIDATED)

2007 TEST YEAR
OTHER OPERATING REVENUE
CURRENT EFFECTIVE AND PROPOSED RATES

Line	Acct. No.	Description	A Test Year 2007 Current Effective Rates ($000)	B Test Year 2007 Proposed Rates ($000)	C Test Year 2007 Incr (%)
	450	Other Revenues			
1		Field Collection Charge	38	62	63.2%
2		Returned Check Charge	13	33	153.8%
3		Late Payment Charge (OCARS)	0	0	n/a
4		Late Payment Charge (Energy)	296	313	5.7%
5		Subtotal Other Revenues	347	408	17.6%
	451	Miscellaneous Service Revenues			
6		Svce. Establishment Charge	219	370	68.9%
7		Reconnect Charge	13	25	92.3%
8		Temporary Facilities	74	74	0.0%
9		Revenue Protection	12	12	0.0%
10		Other	0	0	n/a
11		Subtotal Misc. Service Revenue	318	481	51.3%
12	454	Rent from Electric Property	870	870	0.0%
13		TOTAL OTHER OPERATING REVENUE	1,535	1,759	14.6%

SOURCE:
MECO-712, pages 1 and 2

Note: Differences between exhibits and workpapers are due to rounding.

MAUI ELECTRIC COMPANY, LIMITED
(MAUI DIVISION)

2007 TEST YEAR
OTHER OPERATING REVENUE
CURRENT EFFECTIVE AND PROPOSED RATES

Line	Acct. No.	Description	A Test Year 2007 Current Effective Rates ($000)	B Test Year 2007 Proposed Rates ($000)	C Test Year 2007 Incr (%)
	450	Other Revenues			
1		Field Collection Charge	29	48	65.5%
2		Returned Check Charge	12	30	150.0%
3		Late Payment Charge (OCARS))	0	0	n/a
4		Late Payment Charge (Energy)	267	281	5.2%
5		Subtotal Other Revenues	308	359	16.6%
	451	Miscellaneous Service Revenues			
6		Svce. Establishment Charge	203	343	69.0%
7		Reconnect Charge	12	21	75.0%
8		Temporary Facilities	75	75	0.0%
9		Revenue Protection	12	12	0.0%
10		Other	0	0	n/a
11		Subtotal Misc. Service Revenue	302	451	49.3%
12	454	Rent from Electric Property	780	780	0.0%
13		TOTAL OTHER OPERATING REVENUE	1,390	1,590	14.4%

SOURCE:
MECO-WP-712, pages 3 and 4

Note: Differences between exhibits and workpapers are due to rounding.

MAUI ELECTRIC COMPANY, LIMITED
(LANAI DIVISION)

2007 TEST YEAR
OTHER OPERATING REVENUE
CURRENT EFFECTIVE AND PROPOSED RATES

Line	Acct. No.	Description	A Test Year 2007 Current Effective Rates ($000)	B Test Year 2007 Proposed Rates ($000)	C Test Year 2007 Incr (%)
	450	Other Revenues			
1		Field Collection Charge	1	1	0.0%
2		Returned Check Charge	0	1	n/a
3		Late Payment Charge (OCARS)			n/a
4		Late Payment Charge (Energy)	10	12	20.0%
5		Subtotal Other Revenues	11	14	27.3%
	451	Miscellaneous Service Revenues			
6		Svce. Establishment Charge	8	13	62.5%
7		Reconnect Charge	0	1	n/a
8		Temporary Facilities	0	0	n/a
9		Revenue Protection			n/a
10		Other	0	0	n/a
11		Subtotal Misc. Service Revenue	8	14	75.0%
12	454	Rent from Electric Property	19	19	0.0%
13		TOTAL OTHER OPERATING REVENUE	38	47	23.7%

SOURCE:
MECO-WP-712, pages 5 and 6

Note: Differences between exhibits and workpapers are due to rounding.

MAUI ELECTRIC COMPANY, LIMITED
(MOLOKAI DIVISION)

2007 TEST YEAR
OTHER OPERATING REVENUE
CURRENT EFFECTIVE AND PROPOSED RATES

Line	Acct. No.	Description	A Test Year 2007 Current Effective Rates ($000)	B Test Year 2007 Proposed Rates ($000)	C Test Year 2007 Incr (%)
	450	Other Revenues			
1		Field Collection Charge	8	13	62.5%
2		Returned Check Charge	1	2	100.0%
3		Late Payment Charge (OCARS)			n/a
4		Late Payment Charge (Energy)	19	20	5.3%
5		Subtotal Other Revenues	28	35	25.0%
	451	Miscellaneous Service Revenues			
6		Svce. Establishment Charge	8	14	75.0%
7		Reconnect Charge	1	3	200.0%
8		Temporary Facilities	-1	-1	0.0%
9		Revenue Protection			n/a
10		Other	0	0	n/a
11		Subtotal Misc. Service Revenue	8	16	100.0%
12	454	Rent from Electric Property	71	71	0.0%
13		TOTAL OTHER OPERATING REVENUE	107	122	14.0%

SOURCE:
MECO-WP-712, pages 7 and 8

Note: Differences between exhibits and workpapers are due to rounding.

MAUI ELECTRIC COMPANY, LIMITED

2007 TEST YEAR
CUSTOMER DEPOSITS AND INTEREST ON DEPOSITS
($ THOUSANDS)

Line		2007 Test Year A Average Deposits	2007 Test Year B Interest
1	Maui Division	3,601	216
2	Lanai Division	95	6
3	Molokai Division	186	11
4	MECO Consolidated	3,882	233

SOURCE:
MECO-WP-713

Maui Electric Company, Limited
Revenue Collection Lag Days
2001-2005

Line	A	B	C	D	E	F
	2001	2002	2003	2004	2005	5-year Average
1 Maui	36.1	35.7	35.4	35.3	35.0	35.5
2 Lanai	37.3	34.8	37.2	35.3	34.3	35.8
3 Molokai	39.3	38.6	37.6	35.8	36.6	37.6
4 MECO Consol.	36.3	35.7	35.5	35.3	35.0	35.6

	Fixed *	Variable	Total Lag	
5 Maui	15.5	20.0	35.5	
6 Lanai	15.5	20.3	35.8	
7 Molokai	15.5	22.1	37.6	
8 MECO Consol.	15.5	20.1	35.6	
9 MECO Consol.	16.0	20.0	36.0	Rounded

* Represents the mid-point of the monthly bill.
Consistent with HECO.

SOURCE:
MECO-WP-714

MAUI ELECTRIC COMPANY, LIMITED
AVERAGE STAFFING LEVELS
CUSTOMER SERVICE DEPARTMENT
2001 - 2007

Line	A	B	C	D	E	F	G	H
	<----------Recorded---------->						Increase/ (Decrease)	Test Year Estimate
	2001	2002	2003	2004	2005	2006		2007
1	38	37	37	36	37	40	3	43

SOURCE:
MECO-WP-1102