✓ BKK

DOD T-3

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF HAWAII

In the Matter of the Application of HAWAIIAN ELECTRIC COMPANY, INC. For Approval of Rate Increases and Revised Rate Schedules and Rules, and for Approval and/or Modification of Demand-Side and Load Management Programs and Recovery of Program Costs and DSM Utility Incentives.	)	Docket No. 04-0113

FILED
2005 JUN 14 P 1:48
PUBLIC UTILITIES COMMISSION

Direct Testimony of

Maurice Brubaker

On behalf of

The United States Department of Defense

Project 8308
June 14, 2005

BAI
BRUBAKER & ASSOCIATES, INC.

St. Louis, MO 63141-2000

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF HAWAII

In the Matter of the Application of **HAWAIIAN ELECTRIC COMPANY, INC.** **For Approval of Rate Increases and Revised Rate Schedules and Rules, and for Approval and/or Modification of Demand-Side and Load Management Programs and Recovery of Program Costs and DSM Utility Incentives.**	**Docket No. 04-0113**

Direct Testimony of Maurice Brubaker

Q **PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

A Maurice Brubaker. My business address is 1215 Fern Ridge Parkway, Suite 208, St. Louis, Missouri 63141-2000.

Q **WHAT IS YOUR OCCUPATION?**

A I am a consultant in the field of public utility regulation and president of Brubaker & Associates, Inc., energy, economic and regulatory consultants.

Q **PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND EXPERIENCE.**

A I have been involved in the regulation of electric utilities, competitive issues and related matters over the last three decades. Additional information is provided in Appendix A, attached to this testimony.

INTRODUCTION AND SUMMARY

Q ON WHOSE BEHALF ARE YOU APPEARING IN THIS PROCEEDING?

A Our Firm is under contract with the United States Department of the Navy, Utility Rates and Studies Office, to perform utility cost allocation, cost of service, rate design and other special studies. The Navy represents the Department of Defense and all other Executive Agencies of the Federal Government (DOD) in certain assigned geographical areas. The DOD installations on Hawaii are major purchasers of electricity from Hawaiian Electric Company (HECO), purchasing in excess of 1 billion kilowatthours of electricity per year from HECO. Most of DOD's electricity is purchased under the PT and PP rate schedules.

Q WHAT SUBJECTS ARE ADDRESSED IN YOUR TESTIMONY?

A My testimony addresses class cost of service, revenue allocation and rate design issues. Other witnesses appearing for the DOD will address cost of capital and accounting issues.

Q DOES THE REVENUE REQUIREMENT, WHICH YOU HAVE USED FOR PURPOSES OF YOUR COST OF SERVICE, REVENUE ALLOCATION AND RATE DESIGN ANALYSIS, TAKE INTO ACCOUNT ADJUSTMENTS PROPOSED BY OTHER DOD WITNESSES?

A No, it does not. For ease of comparison and to illustrate costing and rate design principles, I have utilized the revenue requirement claims that have been made by HECO. Use of those numbers is strictly for that purpose, and should not be interpreted as an endorsement of HECO's claims. In the final analysis, all adjustments found appropriate by the Commission should be incorporated into the cost of service study.

Q HAVE YOU ATTEMPTED TO ADJUST HECO'S FILING TO RECOGNIZE THE SEPARATION OF THE DEMAND-SIDE MANAGEMENT (DSM) ISSUES INTO A SEPARATE PROCEEDING?

A Yes. The first section of my analysis (reflected on Exhibit Nos. DOD-301 through DOD-309) deals with the case as filed by HECO, while the second section of my testimony and analysis (Exhibits DOD-310 through DOD-318) provides similar information but with the approximately $30 million of DSM revenue requirements removed.

Exhibit DOD-319 provides a pictorial representation of HECO's method of service to customers on Schedules PT and PP. Exhibit DOD-320 provides a summary of the calculations for a further refinement of the voltage level distinctions within Schedule PP.

Q DOES REMOVING THE DSM COSTS MATERIALLY AFFECT THE RESULTS OF THE COST OF SERVICE STUDY?

A No, it does not. Classes that are below cost with the DSM included continue to be below cost with the DSM excluded; and classes that are above cost with the DSM included continue to be above cost with the DSM excluded.

<u>CONCLUSIONS AND RECOMMENDATIONS</u>

Q WHAT ARE YOUR CONCLUSIONS AND RECOMMENDATIONS?

A My conclusions and recommendations may be summarized as follows:

1. The embedded cost methodology employed by HECO is generally consistent with industry practice and is suitable for use in this proceeding.

2. The proposed across-the-board increase does not move classes closer to cost of service; instead, it moves all the major classes further away from cost.

3. The Commission should direct that the rate increase resulting from this proceeding be allocated in such a way that existing interclass subsidies will be reduced by 50%.

4. If the Commission finds that the magnitude of the overall increase is such that moving 50% of the way toward cost would be too large of an impact on certain customers, it should adopt a multi-step phase-in to achieve that movement over a reasonable period of time.

5. HECO's class cost of service study, for the first time, separately identifies the costs associated with serving Schedule P customers at the transmission level, the primary level and at the secondary level.

6. The voltage-differentiated analysis of Schedule P shows that the transmission level customers produce a rate of return that is significantly higher than the rate of return produced by primary voltage level customers and by secondary voltage level customers.

7. Regardless of any adjustments between broad classes to reduce subsidies, the Commission should adjust Schedule P charges among the three voltage levels in order to bring the rates of return together. Because there are only a few transmission level customers, this adjustment can be made with just a minor change to the primary and secondary voltage level rates.

8. Within Schedule P Primary (PP), an additional distinction should be made to recognize that service is provided in two ways. In some instances, a customer is served at the primary voltage level from a HECO-owned singe-customer substation that is fed from the transmission system. In other instances, a customer receives service at the primary voltage level from HECO's primary distribution circuits. It is more costly to provide this distribution primary service than it is to provide the substation service. This further refinement should be made within Schedule PP.

GENERAL CONCEPTS AND PRINCIPLES

Q BEFORE DISCUSSING IN DETAIL YOUR ANALYSIS AND RESULTS, PLEASE DESCRIBE THE GENERAL PRINCIPLES AND PROCEDURES THAT SHOULD BE FOLLOWED IN COST OF SERVICE, REVENUE ALLOCATION AND RATE DESIGN.

A The most important aspect in each of these is cost of service. Cost of service means the sum total of the directly assignable plus appropriately allocated share of each item of cost that goes to each customer class in the class cost of service study. It also extends to the rate design and means that to the extent possible the elements of the rate structure should mirror costs as well.

Q PLEASE BRIEFLY SUMMARIZE WHY YOU BELIEVE IT IS IMPORTANT THAT THE ALLOCATION OF REVENUE REQUIREMENTS TO CLASSES AND THE DESIGN OF RATES BE BASED ON COST?

A The use of cost as a basis for allocating the total revenue requirement among classes is critical for three reasons. First, it is the only objective definition of basic fairness that applies to this task. The basic premise is that each customer should pay costs associated with its consumption but not that of others. Because individual rates for each customer are not practical, it is necessary to group customers into classes. Therefore, the first step in ensuring that each customer pays only costs associated with its own purchases is to make sure that the revenue requirement of the class follows this same principle.

Second, if the allocation of revenues to classes departs from cost, efficiency suffers. Class revenues used as the basis for designing specific rates provide critical signals to customers of the cost consequences of purchases. If these signals are distorted because the rates are designed on class revenues that are not closely related to class costs, the customers will make inefficient choices concerning their use of resources (not just electricity, but competing energy sources and energy efficiency options). The resulting wasteful use of resources is a bad result for the customer, the utility, the state of Hawaii and society in general.

Third, an allocation of revenues to classes that is not based on cost will result in revenue instability for the utility. The utility will only recover the test year revenue requirement from a class if the actual billing units happen to exactly equal those estimated for the test year. If class revenues and rates track costs, then changes in class revenues and costs will move in step when actual consumption differs from test year consumption and the utility will remain whole. If, however, the revenue requirement of a particular class is less than cost and that class grows relative to the test year assumptions, the result will be a revenue shortfall for the utility which will lead to another rate case and higher rates for all customers.

For much the same reasons, the design of the customer, demand and energy charges within each tariff should also be guided by cost of service. This is appropriate not only to charge customers the appropriate share of costs, but also to give customers the proper price signal so they can make rational responses to the tariff.

Q WHAT KIND OF CLASS COST OF SERVICE STUDIES DID HECO FILE?

A HECO filed an embedded cost of service study and a marginal cost of service study.

Q ARE THERE FUNDAMENTAL DIFFERENCES BETWEEN THE TWO KINDS OF STUDIES?

A Yes. An embedded cost of service study allocates the costs which a utility actually incurs to provide service (based on an historic period or, as here, a projected test year) to customer classes based on factors that describe how customers cause the utility to incur costs.

A marginal cost study, on the other hand, does not represent the utility's actual costs or revenue requirement and cannot be calculated in a straightforward manner. It is an estimate of the cost to serve "one more" customer, "one more" kilowatt of demand or "one more" kilowatthour of energy. In addition, if marginal costs are calculated for each customer class, and then added together, the sum of these costs will not equal the utility's revenue requirement. Therefore, even after marginal costs are calculated, a process must be developed to reconcile these calculated marginal costs to the utility's revenue requirement – otherwise setting rates equal to calculated marginal cost would produce an under-recovery of revenues or an over-recovery of revenues.

Q WHICH IS THE PREFERABLE APPROACH TO DETERMINING CLASS COST OF SERVICE?

A In my view, an embedded cost of service study is the appropriate approach. It is a reflection of costs actually incurred, not a theoretical construct based on the cost of serving "one more" customer, kW or kWh.

Q HOW DO YOU ADDRESS THE THEORETICAL ARGUMENTS THAT SOME WOULD SAY SUPPORT THE USE OF MARGINAL COSTS OVER EMBEDDED COSTS?

A The economic justification for marginal cost pricing exists only in theory. The underpinning of the theoretical justification for the use of marginal cost is the assumption that all other goods and services in the economy are priced at their respective marginal cost. This obviously is a situation which is unlikely to exist. Furthermore, the marginal costs consistent with economic theory are the marginal "social" costs and not the real world economic costs. Social costs would, for example, exclude income taxes, which are simply transfer payments and not resource costs.

Q WHAT IS YOUR RECOMMENDATION?

A Based on these considerations I recommend that the Commission utilize HECO's embedded class cost of service study as a basis for determining the revenue requirements that should be assigned to each customer class.

Q HAVE YOU REVIEWED HECO'S EMBEDDED CLASS COST OF SERVICE STUDY AS PRESENTED BY WITNESS ESTRELLA SEESE?

A Yes, I have.

Q DO YOU HAVE ANY OVERALL COMMENTS WITH RESPECT TO HECO'S EMBEDDED CLASS COST OF SERVICE STUDY?

A Yes. In general, the HECO class cost of service study uses reasonable methods. I have reviewed the principal separations of costs between fixed and variable and the fixed costs between demand-related and customer-related costs. I find these to be reasonable and consistent with general industry practice.

Q WHAT ARE THE MOST INFLUENTIAL ALLOCATORS IN A CLASS COST OF SERVICE STUDY?

A The most influential allocators, in terms of affecting the results, are the allocation of fuel and other energy-related costs, and the allocation of fixed costs associated with the generation and transmission systems.

HECO has allocated the fuel, variable purchased power charges and other variable costs using class energy consumption, adjusted for losses to the level of service at which each customer class receives electricity.

The fixed costs associated with the generation and transmission system have been allocated to classes using what is known as the average and excess demand allocation methodology (AED). As Ms. Seese explains, under this methodology class average demands and class maximum demands are taken into account. The allocation factor has two components. The first component is the average demand of each class. The second component is the difference between the maximum demand of a class and the classes' average demand. The average component is given a weighting equal to the utility system load factor, and the excess component is given a weighting equal to one minus the system load factor.

Q IS THIS AED METHODOLOGY APPROPRIATE FOR THE HECO SYSTEM?

A Yes. The HECO system has a relatively high load factor, has relatively low seasonality (which means that there are not pronounced differences among the peak demands for the 12 months of the year), and has a fairly broad peak on the peak days (meaning that loads are at or near the maximum demand for an extended period of time on the day of the monthly system peak). Given these load characteristics the AED allocation methodology continues to be appropriate for the HECO system.

Q PLEASE BRIEFLY DESCRIBE THE STEPS OF FUNCTIONALIZATION, CLASSIFICATION AND ALLOCATION.

A Functionalization refers to the grouping of costs into the major aspects of a utility's operation; namely, production, transmission, distribution, customer accounting and general.

Classification refers to the identification of the functionalized costs as being demand-related, energy-related or customer-related in nature.

Allocation refers to the development of factors to be applied to the various revenue requirement elements (after they have been functionalized and classified) in order to develop the cost of serving each of the various customer classes.

Q PLEASE DEFINE DEMAND, ENERGY, AND CUSTOMER, AS THESE TERMS APPLY TO ELECTRIC UTILITY COST OF SERVICE.

A Demand is analogous to speed, which measures how fast one is traveling, i.e., the rate of moving over the ground. Likewise, a customer's demand indicates the rate of energy consumption; that is, how much energy is being consumed at that moment. Demand is an extremely important concept in electric utility operations because it establishes the size of the production facilities (or purchased power capacity), as well as the size of the transmission and distribution facilities which must be provided to meet customer demands the instant that they arise.

Energy-related costs are those which basically vary with the number of kilowatthours sold, such as the fuel and other variable components of purchased power cost. Whereas demand is analogous to the speed or rate of travel, energy is analogous to the distance traveled.

Customer-related costs are those which are incurred simply as a consequence of serving a customer, irrespective of the demand imposed and the energy consumed. Examples are the cost of meters, service drops, and customer meter reading, billing and accounting expenses. Also, a significant portion of the distribution system is required simply to make power available throughout the utility's service territory, regardless of the level of demands, and is therefore also considered customer-related.

Q IS THIS COST OF SERVICE APPROACH WHICH YOU HAVE DESCRIBED USED THROUGHOUT THE ELECTRIC UTILITY INDUSTRY?

A Yes. Every logical cost analysis must use the procedures of functionalization, classification, and finally, allocation to classes.

Q DOES THE APPLICATION OF THESE COSTING PRINCIPLES RESULT IN DIFFERENCES IN THE PER UNIT COST OF SERVING DIFFERENT TYPES OF CUSTOMERS?

A Yes. Typically, large users, such as those taking service on Schedules PT and PP, are less costly to serve than other customers because of differences in:

(1) level on the system where the customer is served,
(2) load factor, and
(3) size.

These differences are evident in HECO's cost of service studies.

Q WHAT IS THE LEVEL ON THE SYSTEM WHERE THE CUSTOMER IS SERVED AND HOW DOES IT AFFECT COST OF SERVICE?

A The system level at which service is provided refers to where on the system the customer is electrically and physically located. Rate PT customers take service from the high voltage transmission system through substations that they own. This means that HECO must invest only in the generation system and the transmission lines and bulk substations. Other customers take service at lower voltage levels, which may require such additional investment as distribution step-down substations, primary lines, secondary transformers, and secondary lines. The higher the voltage level the lower the losses incurred in moving the power from the generator to the customer because of the lesser number of transformations involved and the shorter distances.

In addition, when power is delivered at a high voltage level HECO avoids making the investment in the lower voltage distribution system facilities that are required to serve other customers. This also reduces the cost of providing the service. I will discuss this issue in more detail when I address the design of the "P" group of rate schedules.

Q WHAT IS LOAD FACTOR AND HOW DOES IT AFFECT COST OF SERVICE?

A Load factor measures the intensity of use of the demand placed on the system. It is the ratio between the kilowatthours actually used and the kilowatthours that would have been used had the maximum demand been experienced during the entire year. Customers with a steady use will have a high load factor, customers with erratic, seasonal or daily variations will have a lower load factor. A customer with a high load factor makes much more efficient use of the capacity which is required to meet the maximum demands, and therefore causes the fixed costs to be spread over more kilowatthours of output. This has the effect of reducing the per unit cost of service.

Q HOW DOES SIZE AFFECT COST OF SERVICE?

A Customer size affects cost of service by allowing costs which are relatively fixed--such as meter reading, billing and postage--to be spread over more kilowatthour sales, thereby reducing the per unit cost.

In addition, larger customers are typically served from larger transformers than are smaller customers. The investment associated with large capacity transformers, per unit of capability, is generally less than the cost per unit of capability associated with smaller facilities. Thus, customer size produces certain economies in these facilities, and thereby reduces cost of service.

COST OF SERVICE RESULTS INCLUDING DSM

HECO's Proposed Increase

Q WHAT IS SHOWN ON EXHIBIT DOD-301?

A This exhibit shows how HECO has proposed to allocate its proposed revenue increase, including the DSM cost increase that has been separated from this case. As mentioned previously, I will describe the cost of service results first using what HECO filed, and then later will present the results with the DSM costs removed. Essentially, DOD-301 shows that HECO has proposed an equal percentage increase.

Q IS AN EQUAL PERCENTAGE INCREASE APPROPRIATE?

A No. To understand why, please refer to Exhibit DOD-302. This exhibit shows the results of HECO's cost of service study at present rates. In addition to the information shown in HECO's exhibits, I have added a Column 7, which is called "subsidy."

Subsidies

Q WHAT DOES THE SUBSIDY REPRESENT?

A The subsidy indicates the revenue dollars by which a rate schedule or group deviates from the level required to produce the system average rate of return, or in other words, to pay its cost of service, no more and no less.

A negative number means that a class is below its cost of service, while a positive number indicates that a class is above its cost of service. With the exception of the relatively small Schedule F class, only the residential class (Schedule R) is below cost. Given that there are these significant differences from cost, an across-the-board increase is simply not appropriate because it will not move rates closer to cost.

Q CAN YOU ILLUSTRATE?

A Yes. Please refer to Exhibit DOD-303. Calculations on this exhibit are similar to those on the previous one, except that all the numbers relate to the cost of service results at HECO's proposed rates which are derived by application of an equal percentage or across-the-board increase to all classes.

Q WHAT MOVEMENTS TOWARD OR AWAY FROM COST OF SERVICE ARE PRODUCED BY THIS ACROSS-THE-BOARD ALLOCATION?

A Please refer to Exhibit DOD-304. Columns 1 and 2 show the subsidies at present rates and at HECO's proposed rates, and are shown on the two preceding exhibits. Column 3 shows the amount of change in the subsidy, and Column 4 shows the direction of change. Only the relatively small Schedules G and H move closer to cost. All of the other classes move further away from cost. Those that are below cost now, namely Schedule R and F, are further below cost with the across-the-board increase. All of the other schedules which are above cost move further above cost, except for the relatively small Schedule G and Schedule H groupings.

Q HAVE YOU CALCULATED HOW HECO'S PROPOSED INCREASE WOULD NEED TO BE ALLOCATED IN ORDER TO MAKE SOME MEANINGFUL MOVEMENT TOWARD COST OF SERVICE?

A Yes, I have. Exhibit DOD-305 shows how HECO's proposed increase would need to be distributed in order to move each class 25% of the way to cost of service. In other words, to reduce the existing level of the subsidies by 25%, rather than to increase them significantly. As compared to an overall average increase of roughly 10%, class and group increases would range from approximately 3% (Schedule PT) to about 15% (Schedule R).

Exhibit DOD-306 shows that somewhat larger increases would be required to move 50% of the way to cost of service.

Service Levels Within Schedule P

Q I NOTE THAT WITHIN YOUR PRECEDING EXHIBITS YOU HAVE SHOWN SCHEDULES PS, PP AND PT GROUPED TOGETHER AND THEN TOTALED. WHAT IS THE ORIGIN OF THESE RATE SCHEDULES?

A Prior to the summer of 2001, HECO had a rate schedule "P." Within Schedule P there were various adjustments for different voltage levels and methods of service. In the summer of 2001, HECO applied for and received approval to create three separate rate schedules. These three schedules were revenue neutral to each customer and simply reconfigured how the rate was presented in the tariffs. Instead of having a single rate with a number of service and voltage level adjustments, HECO created three tariffs with adjustments depending on whether the customer's consumption was metered at the high voltage side of the step-down substation, or at the low voltage side.

Q PRIOR TO THE SEPARATION OF SCHEDULE P, DID HECO ATTEMPT TO SEPARATELY IDENTIFY THE COSTS ASSOCIATED WITH EACH OF THESE THREE GROUPS?

A No. Historically, the class cost of service study looked at Schedule P as a single group. It did not attempt to separately cost out the service supplied to customers at transmission, primary and secondary voltages.

Q WHAT DOES EXHIBIT DOD-307 SHOW?

A This exhibit focuses on the cost of service results for the three broad groups of customers within Schedule P. Column 1 shows the rates of return at present rates for these three groups, and are the same as displayed in Column 5 on Exhibit DOD-302.

Column 2 indexes these rates of return to the system average, and these index values are the same as those shown in Column 6 on Exhibit DOD-302.

Q WHAT IS SHOWN IN COLUMN 3 ON EXHIBIT DOD-307?

A Column 3 shows the index of the rates of return for these three groups as compared to the Schedule P total rate of return at present rates. This permits a clearer distinction of the relative differences in rates of return among these three groups of customers without the implication of shifting any revenues between the Schedule P customers and other schedules. In other words, it internalizes the examination and makes it a rate design issue rather than a revenue allocation issue. It is important to keep this distinction in mind since adjustments internal to the group of Schedule P customers can and should be made independent of any decisions about how to spread any change in revenues among broad customer groups.

Q HOW DO YOU ASSESS THE RESULTS SHOWN ON EXHIBIT DOD-307?

A I think the clearest fact that emerges from this analysis is that the price differences or distinctions among voltage levels of service heretofore included in the rates was insufficient to capture the actual cost of service differences. This is particularly apparent with respect to the transmission service level customers, known now as Schedule PT.

Q WHAT IS SHOWN IN COLUMN 4?

A Column 4 shows the increases or decreases from the revenues at present rates required to equalize the rates of return within Schedule P, without moving any revenue dollars to other schedules. Because there are a relatively small number of customers and loads on Schedule PT, the decrease in recoveries from Schedule PT can be appropriately recovered from Schedule PS and PP without significantly impacting those customers. As noted in Column 5, the required percentage increase in revenue recovery from Schedule PS would be 0.82%, and from Schedule PP would be 0.31%.

Q WHAT IS SHOWN ON EXHIBIT DOD-308?

A This analysis is similar to the one presented on Exhibit DOD-307, except that it presents the analysis from the point of view of accepting the amount of increase allocated to the Schedule P group by HECO as a part of its $100 million rate increase request. Note that the rate of return for Schedule P in total would be 11.88%, which is 130% of the 9.11% rate of return HECO has proposed. Column 3 shows the index of the rate of return of each group of customers to the overall rate Schedule P rate of return. Again, this is done to focus on the rate design issue as opposed to revenue allocation between groups or schedules outside of Rate P. The results are quite similar to those shown at present rates, and again the percentage changes in Schedules PS and PP are relatively modest and can be made without unduly impacting other customer classes.

Q WHY IS IT APPROPRIATE TO MAKE THESE ADJUSTMENTS WITHIN SCHEDULE P, EVEN IF THE OVERALL INCREASE IS ACROSS THE BOARD?

A I believe it is appropriate because of the severe cost recovery differences that exist within the Schedule P group of customers. This internal cross-subsidy existed previously but was not discernable because the cost of service studies that were conducted did not make the distinctions among voltage levels that the current study does. Thus, to the extent that one would judge that the existing total revenues from

Schedule P, as they exist now and/or as they would exist with a uniform percentage increase overall are appropriate, there is no valid reason for the disproportionate burden carried by the PT customers as compared to other customers, now that the cost differences have been determined.

Q WHAT ADJUSTMENTS TO THE SPECIFIC VALUES OF DEMAND CHARGES WOULD BE REQUIRED TO ACCOMPLISH THESE EQUALIZATIONS?

A This is presented on Exhibit DOD-309. Columns 1 and 2 are taken from the two preceding exhibits, Column 3 is the billing demand taken from the Company's rate schedule revenue calculation exhibits, and Columns 4 and 5 are the result of dividing Column 3 into Columns 2 and 1, respectively.

COST OF SERVICE RESULTS
EXCLUDING INCREASES IN DSM COSTS

Q EARLIER YOU INDICATED YOU HAD ANALYZED THE COST OF SERVICE STUDY AND RESULTS AFTER ADJUSTING HECO'S FILING TO REMOVE THE APPROXIMATELY $30 MILLION INCREASE PROPOSED FOR DSM COSTS. WHERE IS THAT SHOWN?

A This is presented on Exhibits DOD-310 through DOD-318. The order of exhibits and the content is the same as in the first nine. A comparison of Exhibits DOD-311 through DOD-313 to the previously discussed Exhibits DOD-302 through DOD-304 indicate generally the same results. Because the amounts at issue are smaller the subsidies are slightly smaller, but do not differ significantly. In developing these exhibits we continue with HECO's proposed equal percentage increase approach, as shown on Exhibit DOD-310.

Q PLEASE EXPLAIN EXHIBITS DOD-314 AND DOD-315.

A These exhibits show the increases over present rates required to reduce present subsidies by 25% and 50%, respectively. Because the dollar amounts of increase here are smaller than in the $100 million increase case, customer impacts would also be smaller at any given level of movement toward cost of service. Of course, to the extent that the Commission does not approve other aspects of HECO's proposed increase, the percentage increase would be smaller and the impacts also would be smaller.

RECOMMENDED ALLOCATION OF ANY INCREASE

Q WHAT IS YOUR RECOMMENDATION?

A I recommend that the Commission direct HECO to implement any approved rate increase by allocating the revenue increase among customer classes (viewing Schedule P in total and adjusting for equal rates of return among the three groups of customers within Schedule P as shown on Exhibits DOD-316 through DOD-318), with the objective of reducing the existing interclass subsidies by at least 50%. If the Commission determines that the impacts are too large on customers who are below cost, then I recommend that the Commission direct HECO to phase-in the adjustment over a period of not more than two years from the effective date of the rates approved in this case.

Q WHY IS IT APPROPRIATE TO EXPLICITLY PROVIDE FOR THE PHASE-IN NOW?

A It is not known when HECO may again file for a change in rates. At the time of the last case (decided in 1995) the Commission commented that a small two-step increase with very modest movement toward cost was appropriate at the time because it was likely that HECO would file for an additional rate increase within five years (see Order No. 14412 in Docket No. 7766, dated December 11, 1995 at Page 107). Of course, it has been nearly ten years and no further movement has taken place. It is therefore appropriate for the Commission to take the opportunity now to order this adjustment.

OTHER RATE DESIGN ISSUES

Q YOU HAVE PREVIOUSLY DISCUSSED THE THREE PRINCIPAL GROUPINGS OF CUSTOMERS WITHIN WHAT WAS FORMERLY SCHEDULE P. DO YOU BELIEVE THAT THE THREE GROUPINGS OF CUSTOMERS PROVIDES AN ADEQUATE RECOGNITION OF COST, CONSIDERING THE VARIOUS WAYS SERVICE IS PROVIDED UNDER SCHEDULE P?

A No. While I believe the Schedule PT and PS tariffs are appropriate (with the adjustments to equalize rates of return that I previously mentioned), an additional distinction could and should properly be made within Schedule PP.

Q PLEASE EXPLAIN.

A Please refer to Exhibit DOD-319. On the left side of the exhibit is shown how the PT customers receive service. They receive service directly from HECO's transmission system through a substation that is owned by the customer.

In the center is shown a Schedule PP customer that is fed from a HECO-owned dedicated single customer substation that also is fed from the transmission system.

The third manner of service is shown on the right hand side and illustrates a customer that also receives service at the primary voltage level, but in addition to a substation requires the use of a primary distribution line. Both customers pay the same rate in HECO's tariffs, even though the cost to serve the customer in the center is lower because there are fewer losses and also because there is less investment in equipment. I believe it would be appropriate to make a distinction within the PP group of customers to recognize this dedicated single customer substation service, which is less costly to provide than service from primary distribution circuits.

Q **HAVE YOU ESTIMATED WHAT DIFFERENCE IN PRICE WOULD BE APPROPRIATE?**

A Yes. This is summarized on Exhibit DOD-320. Line 1 shows the test year billing determinants for Rate Schedule PP separated between those associated with customers receiving dedicated substation service and those receiving regular primary distribution service. As a supplemental response to DOD/HECO-IR-2-6, HECO provided the calendar year 2003 billing determinants for customers receiving dedicated substation service. To develop a number for the test year, I applied the overall 5% growth rate which HECO had used for the Schedule P class of customers from 2003 to the test year. This produced 2,500,000 kW of billing determinants for the dedicated substation customers. The balance, shown in column 2, was obtained by subtracting the 2,500,000 from HECO's estimated billing determinants for Schedule PP for the test year.

Q **HAVING DETERMINED THE BILLING DETERMINANTS, WHAT WAS THE NEXT STEP?**

A The next step was to determine the amount of costs included in the tariffs for Schedule PP customers that related to the recovery of the costs associated with primary lines. This is shown on line 2. As revealed in HECO's workpapers (WP 2202, page 4) HECO's current rates include in Schedule PP an amount equal to $1.17/kW-month for primary lines. Note that the same amount is included for all customers, regardless of how service is taken.

Based on this information, I also considered the fact that there may be some investment beyond the low side of the HECO-owned dedicated substation that is necessary to connect the customer to that substation. To be on the conservative side, I therefore used only approximately one-half of the cost to develop a credit for dedicated substation service. To make sure that Schedule PP returned to HECO the full amount of revenue assigned to it, I calculated, as shown in column 2, that an adder of 86¢/kW-month should apply to customers receiving regular distribution primary service.

Q HOW WOULD THE RATE BE STRUCTURED?

A Rate Schedule PP would contain a single value demand charge. It would be calculated as if this distinction were not being made. Then, there would be a credit provided for customers taking dedicated substation service, and an adder applicable to those who were not.

Q HAVE YOU MADE THE SAME CALCULATIONS AT HECO'S PROPOSED RATE LEVELS?

A Yes. This is shown on lines 4 and 5 of Exhibit DOD-320. HECO's workpapers (WP 2202, page 7) show that at its proposed rate levels the amount included in all billing demand for Schedule PP customers is $1.85/kW-month for primary distribution lines. Following the same logic I outlined above, I propose a credit at proposed rates of

90¢/kW-month to dedicated substation customers, which results in an adder of $1.30/kW-month for regular primary distribution service customers.

Q DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A Yes, it does.

Qualifications of Maurice Brubaker

Q PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A Maurice Brubaker. My business address is 1215 Fern Ridge Parkway, Suite 208, St. Louis, Missouri 63141.

Q PLEASE STATE YOUR OCCUPATION.

A I am a consultant in the field of public utility regulation and President of the firm of Brubaker & Associates, Inc., energy, economic and regulatory consultants.

Q PLEASE SUMMARIZE YOUR EDUCATIONAL BACKGROUND AND EXPERIENCE.

A I was graduated from the University of Missouri in 1965, with a Bachelor's Degree in Electrical Engineering. Subsequent to graduation I was employed by the Utilities Section of the Engineering and Technology Division of Esso Research and Engineering Corporation of Morristown, New Jersey, a subsidiary of Standard Oil of New Jersey.

In the Fall of 1965, I enrolled in the Graduate School of Business at Washington University in St. Louis, Missouri. I was graduated in June of 1967 with the Degree of Master of Business Administration. My major field was finance.

From March of 1966 until March of 1970, I was employed by Emerson Electric Company in St. Louis. During this time I pursued the Degree of Master of Science in Engineering at Washington University, which I received in June, 1970.

In March of 1970, I joined the firm of Drazen Associates, Inc., of St. Louis, Missouri. Since that time I have been engaged in the preparation of numerous studies relating to electric, gas, and water utilities. These studies have included analyses of the cost to serve various types of customers, the design of rates for utility services, cost forecasts, cogeneration rates and determinations of rate base and operating income. I have also addressed utility resource planning principles and plans, reviewed capacity additions to determine whether or not they were used and useful, addressed demand-side management issues independently and as part of least cost planning, and have reviewed utility determinations of the need for capacity additions and/or purchased power to determine the consistency of such plans with least cost planning principles. I have also testified about the prudency of the actions undertaken by utilities to meet the needs of their customers in the wholesale power markets and have recommended disallowances of costs where such actions were deemed imprudent.

I have testified before the Federal Energy Regulatory Commission (FERC), various courts and legislatures, and the state regulatory commissions of Alabama, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, Florida, Georgia, Guam, Hawaii, Illinois, Indiana, Iowa, Kentucky, Louisiana, Michigan, Missouri, Nevada, New Jersey, New Mexico, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, South Carolina, South Dakota, Texas, Utah, Virginia, West Virginia, Wisconsin and Wyoming.

The firm of Drazen-Brubaker & Associates, Inc. was incorporated in 1972 and assumed the utility rate and economic consulting activities of Drazen Associates, Inc., founded in 1937. In April, 1995 the firm of Brubaker & Associates, Inc. was formed. It includes most of the former DBA principals and staff. Our staff includes consultants with backgrounds in accounting, engineering, economics, mathematics, computer science and business.

During the past ten years, Brubaker & Associates, Inc. and its predecessor firm has participated in over 700 major utility rate and other cases and statewide generic investigations before utility regulatory commissions in 40 states, involving electric, gas, water, and steam rates and other issues. Cases in which the firm has been involved have included more than 80 of the 100 largest electric utilities and over 30 gas distribution companies and pipelines.

An increasing portion of the firm's activities is concentrated in the areas of competitive procurement. While the firm has always assisted its clients in negotiating contracts for utility services in the regulated environment, increasingly there are opportunities for certain customers to acquire power on a competitive basis from a supplier other than its traditional electric utility. The firm assists clients in identifying and evaluating purchased power options, conducts RFPs and negotiates with suppliers for the acquisition and delivery of supplies. We have prepared option studies and/or conducted RFPs for competitive acquisition of power supply for industrial and other end-use customers throughout the Unites States and in Canada, involving total needs in excess of 3,000 megawatts. The firm is also an associate member of the Electric Reliability Council of Texas.

In addition to our main office in St. Louis, the firm has branch offices in Phoenix, Arizona; Chicago, Illinois; Corpus Christi, Texas; and Plano, Texas.

MEB:cs/8308/64985

HAWAIIAN ELECTRIC COMPANY, INC.
DOCKET NO. 04-0113, TEST YEAR 2005

Proposed Revenue Increase

Line	Rate Class	Present Revenues (000)	Proposed Increase Amount (000)	Proposed Increase Percent
		(1)	(2)	(3)
1	Schedule R	$ 319,950.4	$ 31,941.5	9.98%
2	Schedule G	60,944.5	6,048.5	9.92%
3	Schedule J	255,463.2	25,135.7	9.84%
4	Schedule H	6,935.4	684.8	9.87%
5	Schedule PS	99,216.4	9,759.2	9.84%
6	Schedule PP	231,130.2	22,735.4	9.84%
7	Schedule PT	18,151.9	1,786.0	9.84%
8	Schedule P Total	348,498.5	34,280.6	9.84%
9	Schedule F	5,315.1	522.7	9.83%
10	Total	$ 997,107.1	$ 98,613.8	9.89%

HAWAIIAN ELECTRIC COMPANY, INC.
DOCKET NO. 04-0113, TEST YEAR 2005

Summary of Class Rates of Return, Indexes and Subsidies at Present Rates

Line	Rate Class	Operating Revenues (000) (1)	Operating Expenses (000) (2)	Operating Income (000) (3)	Rate Base (000) (4)	Rate of Return (5)	Index[1] (6)	Subsidy[2] (000) (7)
1	Schedule R	$ 319,950.4	$ 313,732.8	$ 6,217.6	$ 476,942.3	1.30%	32	$ (23,467.8)
2	Schedule G	60,944.5	54,195.9	6,748.6	88,765.0	7.60%	188	5,689.4
3	Schedule J	255,463.2	238,036.7	17,426.5	243,597.7	7.15%	177	13,646.3
4	Schedule H	6,935.4	6,477.2	458.2	8,503.2	5.39%	133	206.4
5	Schedule PS	99,216.4	95,448.2	3,768.2	86,382.1	4.36%	108	501.8
6	Schedule PP	231,130.2	222,575.3	8,554.9	183,367.3	4.67%	116	2,065.2
7	Schedule PT	18,151.9	16,793.4	1,358.5	10,421.5	13.04%	323	1,686.3
8	Schedule P Total	348,498.5	334,816.9	13,681.6	280,170.9	4.88%	121	4,253.4
9	Schedule F	5,315.1	5,222.4	92.7	6,805.7	1.36%	34	(327.7)
10	Total	$ 997,107.1	$ 952,481.9	$ 44,625.2	$ 1,104,784.8	4.04%	100	$ 0.0

Notes:

[1] An index below 100 means a class is below the system rate of return and would require an above average percent increase. An index above 100 means a class is above the system rate of return and would require a below average percent increase.

[2] A negative number indicates the amount of subsidy a class is receiving. A positive number indicates the amount of subsidy a class is providing.

HAWAIIAN ELECTRIC COMPANY, INC.
DOCKET NO. 04-0113, TEST YEAR 2005

Summary of Class Rates of Return, Indexes and Subsidies at Proposed Rates

Line	Rate Class	Operating Revenues (000)	Operating Expenses (000)	Operating Income (000)	Rate Base (000)	Rate of Return	Index[1]	Subsidy[2] (000)
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	Schedule R	$ 351,891.9	$ 327,934.0	$ 23,957.9	$ 472,652.6	5.07%	56	$ (34,355.6)
2	Schedule G	66,993.0	56,884.7	10,108.3	87,953.5	11.49%	126	3,769.5
3	Schedule J	280,598.9	249,192.8	31,406.1	240,268.2	13.07%	143	17,119.1
4	Schedule H	7,620.2	6,781.8	838.4	8,411.2	9.97%	109	129.8
5	Schedule PS	108,975.6	99,779.3	9,196.3	85,090.0	10.81%	119	2,598.4
6	Schedule PP	253,865.6	232,657.2	21,208.4	180,377.4	11.76%	129	8,590.5
7	Schedule PT	19,937.9	17,585.3	2,352.6	10,187.0	23.09%	254	2,562.3
8	Schedule P Total	382,779.1	350,021.8	32,757.3	275,654.4	11.88%	130	13,751.1
9	Schedule F	5,837.8	5,454.2	383.6	6,737.0	5.69%	63	(413.9)
10	Total	$ 1,095,720.9	$ 996,269.3	$ 99,451.6	$ 1,091,676.9	9.11%	100	$ (0.0)

Notes:

1 An index below 100 means a class is below the system rate of return and would require an above average percent increase. An index above 100 means a class is above the system rate of return and would require a below average percent increase.

2 A negative number indicates the amount of subsidy a class is receiving. A positive number indicates the amount of subsidy a class is providing.

DOD-304
Docket No. 04-0113

HAWAIIAN ELECTRIC COMPANY, INC.
DOCKET NO. 04-0113, TEST YEAR 2005

Comparison of Subsidies at Present and Proposed Rates

Line	Rate Class	Subsidy at Present Rates (000)	Subsidy at Proposed Rates (000)	Change in Subsidy Amount (000)	Change in Subsidy Direction of Change
		(1)	(2)	(3)	(4)
1	Schedule R	$ (23,467.8)	$ (34,355.6)	$ (10,887.8)	Further Below Cost
2	Schedule G	5,689.4	3,769.5	(1,919.9)	Closer to Cost
3	Schedule J	13,646.3	17,119.1	3,472.8	Further Above Cost
4	Schedule H	206.4	129.8	(76.6)	Closer to Cost
5	Schedule PS	501.8	2,598.4	2,096.5	Further Above Cost
6	Schedule PP	2,065.2	8,590.5	6,525.2	Further Above Cost
7	Schedule PT	1,686.3	2,562.3	876.0	Further Above Cost
8	Schedule P Total	4,253.4	13,751.1	9,497.8	Further Above Cost
9	Schedule F	(327.7)	(413.9)	(86.2)	Further Below Cost
10	Total	$ 0.0	$ (0.0)	$ (0.0)	

Note: A negative number indicates the amount of subsidy a class is receiving.
A positive number indicates the amount of subsidy a class is providing.

HAWAIIAN ELECTRIC COMPANY, INC.
DOCKET NO. 04-0113, TEST YEAR 2005

Increase Over Present Revenues to Reduce Subsidies by 25%

Line	Rate Class	Present Revenues (000)	Required Increase Amount (000)	Required Increase Percent
		(1)	(2)	(3)
1	Schedule R	$ 319,950.4	$ 48,696.3	15.22%
2	Schedule G	60,944.5	6,546.0	10.74%
3	Schedule J	255,463.2	18,251.3	7.14%
4	Schedule H	6,935.4	709.8	10.23%
5	Schedule PS	99,216.4	7,537.2	7.60%
6	Schedule PP	231,130.2	15,693.8	6.79%
7	Schedule PT	18,151.9	488.4	2.69%
8	Schedule P Total	348,498.5	23,719.5	6.81%
9	Schedule F	5,315.1	690.9	13.00%
10	Total	$ 997,107.1	$ 98,613.8	9.89%

HAWAIIAN ELECTRIC COMPANY, INC.
DOCKET NO. 04-0113, TEST YEAR 2005

Increase Over Present Revenues to Reduce Subsidies by 50%

Line	Rate Class	Present Revenues (000)	Required Increase Amount (000)	Required Increase Percent
		(1)	(2)	(3)
1	Schedule R	$ 319,950.4	$ 54,563.2	17.05%
2	Schedule G	60,944.5	5,123.7	8.41%
3	Schedule J	255,463.2	14,839.8	5.81%
4	Schedule H	6,935.4	658.2	9.49%
5	Schedule PS	99,216.4	7,411.7	7.47%
6	Schedule PP	231,130.2	15,177.5	6.57%
7	Schedule PT	18,151.9	66.9	0.37%
8	Schedule P Total	348,498.5	22,656.1	6.50%
9	Schedule F	5,315.1	772.8	14.54%
10	Total	$ 997,107.1	$ 98,613.8	9.89%

HAWAIIAN ELECTRIC COMPANY, INC.
DOCKET NO. 04-0113, TEST YEAR 2005

Adjustments to Present Schedule P Voltage Level Rates to Equalize Rates of Return within Schedule P

		At Present Rates			Revenue Increase/ (Decrease) to Equalize ROR within Schedule P	
Line	Rate Class	Rate of Return	Index to System Total	Index to Total P	Amount (000)	Percent
		(1)	(2)	(3)	(4)	(5)
1	Schedule PS	4.36%	108	89	$ 809.6	0.82%
2	Schedule PP	4.67%	116	96	718.5	0.31%
3	Schedule PT	13.04%	323	267	(1,528.1)	-8.42%
4	Schedule P Total	4.88%	121	100	$ (0.0)	0.00%

HAWAIIAN ELECTRIC COMPANY, INC.
DOCKET NO. 04-0113, TEST YEAR 2005

Adjustments to Proposed Schedule P Voltage Level Rates to Equalize Rates of Return within Schedule P

		At Proposed Rates			Revenue Increase/ (Decrease) to Equalize ROR within Schedule P	
Line	Rate Class	Rate of Return	Index to System Total	Index to Total P	Amount (000)	Percent
		(1)	(2)	(3)	(4)	(5)
1	Schedule PS	10.81%	119	91	$ 1,646.4	1.51%
2	Schedule PP	11.76%	129	99	407.7	0.16%
3	Schedule PT	23.09%	254	194	(2,054.1)	-10.30%
4	Schedule P Total	11.88%	130	100	$ (0.0)	0.00%

HAWAIIAN ELECTRIC COMPANY, INC.
DOCKET NO. 04-0113, TEST YEAR 2005

Change in Demand Charges to Equalize Rates of Return within Schedule P

Line	Rate Class	Revenue Increase/(Decrease) to Equalize ROR within Schedule P: At Present Rates (000)	Revenue Increase/(Decrease) to Equalize ROR within Schedule P: At Proposed Rates (000)	Billing Demand (MW)	Increase/(Decrease) in Demand Charge: At Present Rates (000)	Increase/(Decrease) in Demand Charge: At Proposed Rates (000)
		(1)	(2)	(3)	(4)	(5)
1	Schedule PS	$ 809.6	$ 1,646.4	1,903.1	$ 0.43	$ 0.87
2	Schedule PP	718.5	407.7	4,291.9	0.17	0.10
3	Schedule PT	(1,528.1)	(2,054.1)	317.6	(4.81)	(6.47)

HAWAIIAN ELECTRIC COMPANY, INC.
DOCKET NO. 04-0113, TEST YEAR 2005

Equal Percent Revenue Increase with DSM Adjustment

Line	Rate Class	Present Revenues (000) (1)	Proposed Increase Amount (000) (2)	Proposed Increase Percent (3)
1	Schedule R	$ 319,950.4	$ 22,203.1	6.94%
2	Schedule G	60,944.5	4,229.3	6.94%
3	Schedule J	255,463.2	17,728.0	6.94%
4	Schedule H	6,935.4	481.3	6.94%
5	Schedule PS	99,216.4	6,885.2	6.94%
6	Schedule PP	231,130.2	16,039.4	6.94%
7	Schedule PT	18,151.9	1,259.7	6.94%
8	Schedule P Total	348,498.5	24,184.2	6.94%
9	Schedule F	5,315.1	368.8	6.94%
10	Total	$ 997,107.1	$ 69,194.8	6.94%

HAWAIIAN ELECTRIC COMPANY, INC.
DOCKET NO. 04-0113, TEST YEAR 2005

Summary of Class Rates of Return, Indexes and Subsidies at Present Rates with DSM Adjustment

Line	Rate Class	Operating Revenues (000)	Operating Expenses (000)	Operating Income (000)	Rate Base (000)	Rate of Return	Index[1]	Subsidy[2] (000)
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	Schedule R	$ 319,950.4	$ 303,058.4	$ 16,892.0	$ 475,506.3	3.55%	63	$ (18,076.9)
2	Schedule G	60,944.5	54,354.4	6,590.1	89,313.3	7.38%	130	2,751.2
3	Schedule J	255,463.2	235,084.0	20,379.2	244,072.3	8.35%	147	11,781.3
4	Schedule H	6,935.4	6,504.9	430.5	8,563.2	5.03%	89	(98.4)
5	Schedule PS	99,216.4	93,783.2	5,433.2	86,324.0	6.29%	111	975.0
6	Schedule PP	231,130.2	219,595.0	11,535.2	183,571.3	6.28%	111	2,039.8
7	Schedule PT	18,151.9	16,873.5	1,278.4	10,550.0	12.12%	214	1,224.2
8	Schedule P Total	348,498.5	330,251.7	18,246.8	280,445.3	6.51%	115	4,239.0
9	Schedule F	5,315.1	5,256.6	58.5	6,883.2	0.85%	15	(596.3)
10	Total	$ 997,107.1	$ 934,510.0	$ 62,597.1	$ 1,104,783.6	5.67%	100	$ (0.0)

Notes:

[1] An index below 100 means a class is below the system rate of return and would require an above average percent increase. An index above 100 means a class is above the system rate of return and would require a below average percent increase.

[2] A negative number indicates the amount of subsidy a class is receiving. A positive number indicates the amount of subsidy a class is providing.

HAWAIIAN ELECTRIC COMPANY, INC.
DOCKET NO. 04-0113, TEST YEAR 2005

Summary of Class Rates of Return, Indexes and Subsidies and Assuming an Equal Percent Increase with DSM Adjustment

Line	Rate Class	Operating Revenues (000)	Operating Expenses (000)	Operating Income (000)	Rate Base (000)	Rate of Return	Index[1]	Subsidy[2] (000)
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	Schedule R	$ 342,153.5	$ 313,454.1	$ 28,699.4	$ 471,306.8	6.09%	67	$ (25,607.1)
2	Schedule G	65,173.8	56,334.2	8,839.6	88,513.2	9.99%	110	1,395.8
3	Schedule J	273,191.2	243,364.7	29,826.5	240,712.2	12.39%	136	14,205.0
4	Schedule H	7,416.7	6,730.3	686.4	8,472.2	8.10%	89	(153.6)
5	Schedule PS	106,101.6	96,999.0	9,102.6	85,018.9	10.71%	118	2,441.4
6	Schedule PP	247,169.6	227,077.9	20,091.7	180,528.1	11.13%	122	6,557.1
7	Schedule PT	19,411.6	17,461.1	1,950.5	10,311.0	18.92%	208	1,818.7
8	Schedule P Total	372,682.7	341,537.9	31,144.8	275,858.0	11.29%	124	10,817.3
9	Schedule F	5,683.9	5,428.7	255.2	6,813.3	3.75%	41	(657.4)
10	Total	$ 1,066,301.9	$ 966,850.0	$ 99,451.9	$ 1,091,675.7	9.11%	100	$ 0.0

Notes:

[1] An index below 100 means a class is below the system rate of return and would require an above average percent increase. An index above 100 means a class is above the system rate of return and would require a below average percent increase.

[2] A negative number indicates the amount of subsidy a class is receiving.
A positive number indicates the amount of subsidy a class is providing.

HAWAIIAN ELECTRIC COMPANY, INC.
DOCKET NO. 04-0113, TEST YEAR 2005

Comparison of Subsidies at Present and Equal Percent Increase Rates with DSM Adjustment

Line	Rate Class	Subsidy at Present Rates (000)	Subsidy at Equal Percent Increase Rates (000)	Change in Subsidy: Amount (000)	Change in Subsidy: Direction of Change
		(1)	(2)	(3)	(4)
1	Schedule R	$ (18,076.9)	$ (25,607.1)	$ (7,530.2)	Further Below Cost
2	Schedule G	2,751.2	1,395.8	(1,355.4)	Closer to Cost
3	Schedule J	11,781.3	14,205.0	2,423.7	Further Above Cost
4	Schedule H	(98.4)	(153.6)	(55.3)	Further Below Cost
5	Schedule PS	975.0	2,441.4	1,466.4	Further Above Cost
6	Schedule PP	2,039.8	6,557.1	4,517.3	Further Above Cost
7	Schedule PT	1,224.2	1,818.7	594.5	Further Above Cost
8	Schedule P Total	4,239.0	10,817.3	6,578.3	Further Above Cost
9	Schedule F	(596.3)	(657.4)	(61.1)	Further Below Cost
10	Total	$ (0.0)	$ 0.0	$ 0.0	

Note: A negative number indicates the amount of subsidy a class is receiving.
A positive number indicates the amount of subsidy a class is providing.

HAWAIIAN ELECTRIC COMPANY, INC.
DOCKET NO. 04-0113, TEST YEAR 2005

Increase Over Present Revenues to Reduce Subsidies by 25% with DSM Adjustment

Line	Rate Class	Present Revenues (000) (1)	Required Increase Amount (000) (2)	Required Increase Percent (3)
1	Schedule R	$ 319,950.4	$ 34,252.5	10.71%
2	Schedule G	60,944.5	4,896.9	8.04%
3	Schedule J	255,463.2	12,359.0	4.84%
4	Schedule H	6,935.4	561.1	8.09%
5	Schedule PS	99,216.4	5,175.0	5.22%
6	Schedule PP	231,130.2	11,012.1	4.76%
7	Schedule PT	18,151.9	359.1	1.98%
8	Schedule P Total	348,498.5	16,546.2	4.75%
9	Schedule F	5,315.1	579.0	10.89%
10	Total	$ 997,107.1	$ 69,194.8	6.94%

HAWAIIAN ELECTRIC COMPANY, INC.
DOCKET NO. 04-0113, TEST YEAR 2005

Increase Over Present Revenues to Reduce Subsidies by 50% with DSM Adjustment

Line	Rate Class	Present Revenues (000)	Required Increase Amount (000)	Required Increase Percent
		(1)	(2)	(3)
1	Schedule R	$ 319,950.4	$ 38,771.7	12.12%
2	Schedule G	60,944.5	4,209.1	6.91%
3	Schedule J	255,463.2	9,413.6	3.68%
4	Schedule H	6,935.4	585.7	8.45%
5	Schedule PS	99,216.4	4,931.3	4.97%
6	Schedule PP	231,130.2	10,502.2	4.54%
7	Schedule PT	18,151.9	53.0	0.29%
8	Schedule P Total	348,498.5	15,486.5	4.44%
9	Schedule F	5,315.1	728.1	13.70%
10	Total	$ 997,107.1	$ 69,194.8	6.94%

HAWAIIAN ELECTRIC COMPANY, INC.
DOCKET NO. 04-0113, TEST YEAR 2005

Adjustments to Present Schedule P Voltage Level Rates to Equalize Rates of Return within Schedule P with DSM Adjustment

		At Present Rates			Revenue Increase/ (Decrease) to Equalize ROR within Schedule P	
Line	Rate Class	Rate of Return	Index to System Total	Index to Total P	Amount (000)	Percent
		(1)	(2)	(3)	(4)	(5)
1	Schedule PS	6.29%	111	97	$ 329.8	0.33%
2	Schedule PP	6.28%	111	97	735.0	0.32%
3	Schedule PT	12.12%	214	186	(1,064.8)	-5.87%
4	Schedule P Total	6.51%	115	100	$ 0.0	0.00%

HAWAIIAN ELECTRIC COMPANY, INC.
DOCKET NO. 04-0113, TEST YEAR 2005

Adjustments to Proposed Schedule P Voltage Level Rates to Equalize Rates of Return within Schedule P with DSM Adjustment

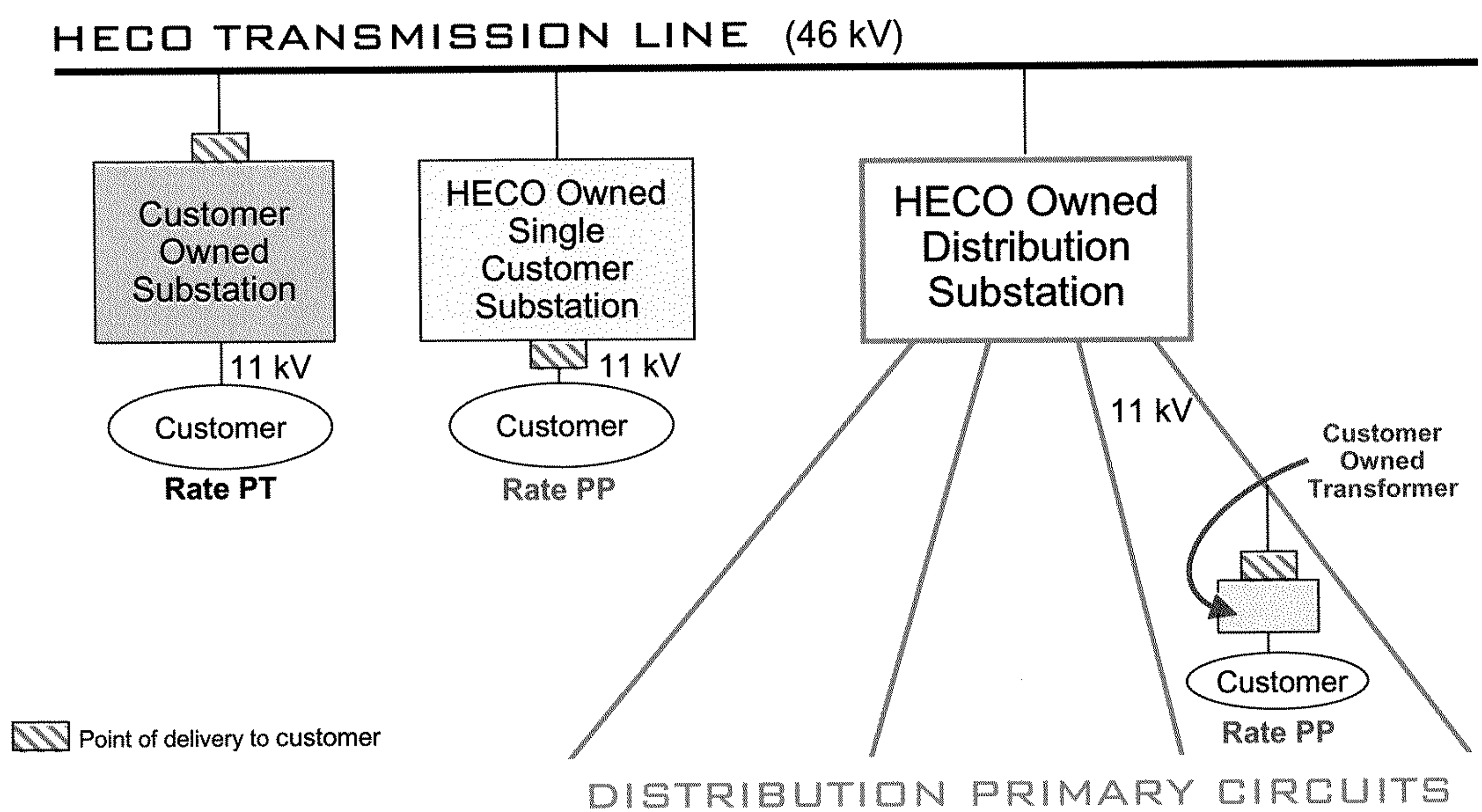
		At Proposed Rates			Revenue Increase/ (Decrease) to Equalize ROR within Schedule P	
Line	Rate Class	Rate of Return	Index to System Total	Index to Total P	Amount (000)	Percent
		(1)	(2)	(3)	(4)	(5)
1	Schedule PS	10.71%	118	95	$ 892.4	0.84%
2	Schedule PP	11.13%	122	99	522.0	0.21%
3	Schedule PT	18.92%	208	168	(1,414.4)	-7.29%
4	Schedule P Total	11.29%	124	100	$ 0.0	0.00%

HAWAIIAN ELECTRIC COMPANY, INC.
DOCKET NO. 04-0113, TEST YEAR 2005

Change in Demand Charges to Equalize Rates of Return within Schedule P with DSM Adjustment

		Revenue Increase/(Decrease) to Equalize ROR within Schedule P			Increase/(Decrease) in Demand Charge	
Line	Rate Class	At Present Rates (000)	At Proposed Rates (000)	Billing Demand (MW)	At Present Rates (000)	At Proposed Rates (000)
		(1)	(2)	(3)	(4)	(5)
1	Schedule PS	$ 329.8	$ 892.4	1,903.1	$ 0.17	$ 0.47
2	Schedule PP	735.0	522.0	4,291.9	0.17	0.12
3	Schedule PT	(1,064.8)	(1,414.4)	317.6	(3.35)	(4.45)

Illustration of Service Provided Under Schedules PT and PP



HAWAIIAN ELECTRIC COMPANY, INC.
DOCKET NO. 04-0113, TEST YEAR 2005

Voltage Level Refinement to Schedule "PP"

Line	Description	Dedicated Substation Customer (1)	Regular Primary Distribution Customer (2)
1	Test Year Billing Determinants (kW-Mo)	2,500,000	1,741,900
	At Present Rates		
2	Cost/kW-Mo of Primary Lines Allocated	$ 1.17	$ 1.17
3	Proposed Credit / Adder	$ (0.60)	$ 0.86
	At Proposed Rates		
4	Cost/kW-Mo of Primary Lines Allocated	$ 1.85	$ 1.85
5	Proposed Credit / Adder	$ (0.90)	$ 1.30

CERTIFICATE OF SERVICE

I hereby certify that one copy of the foregoing DIRECT TESTIMONY OF MAURICE BRUBAKER was duly served upon the following parties, by personal service, hand-delivery, and/or U.S. mail, postage prepaid, and properly addressed pursuant to HAR sec. 6-61-21(d).

William A. Bonnet
Vice President, Government and Community Affairs
Hawaiian Electric Company, Inc.
P.O. Box 2750
Honolulu, Hawaii 96840

Patsy H. Nanbu
Director, Regulatory Affairs
Hawaiian Electric Company, Inc.
P.O. Box 2750
Honolulu, Hawaii 96840

Thomas W. Williams, Jr., Esq.
Peter Y. Kikuta, Esq.
Goodsill Anderson Quinn & Stifel
1800 Alii Place
1099 Alakea Street
Honolulu, Hawaii 96813

Department of Commerce and Consumer Affairs — 6 Copies
State of Hawaii
Division of Consumer Advocacy
335 Merchant Street, Room 326
Honolulu, Hawaii 96813

DATED: Honolulu, Hawaii, June 14, 2005

RANDALL Y.K. YOUNG
Associate Counsel
Naval Facilities Engineering Command, Pacific