

BEFORE THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF HAWAII

In the Matter of the Application of )  
 )  
 HAWAII ELECTRIC LIGHT COMPANY, INC. )  
 )  
 For Approval to Commit Funds in )  
 Excess of \$500,000 for Item P0000863, )  
 the Hill 5 Generator Stator Rewind )  
 Project. )  
 \_\_\_\_\_ )

DOCKET NO. 04-0015.

DECISION AND ORDER NO. 21066

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DEPT. OF CONSUMER AFFAIRS  
STATE OF HAWAII

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Michelle S. U. M. Kau  
for Chief Clerk of the Commission

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OF THE STATE OF HAWAII

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HAWAII ELECTRIC LIGHT COMPANY, INC. ) Docket No. 04-0015  
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Project. )  
\_\_\_\_\_ )

DECISION AND ORDER

I.

Background

HAWAII ELECTRIC LIGHT COMPANY, INC. ("HELCO") initially requested the commission's approval to commit approximately \$1,263,000 for Item P0000863, the Hill 5 Generator Stator Rewind Project ("Project").<sup>1</sup> On April 16, 2004, HELCO informed the commission that: (1) it is revising the Project's scope of work to include the full replacement of the stator iron core in lieu of just repairing the core, as initially envisioned; and (2) the Project's estimated cost, as revised, is \$2,113,000.<sup>2</sup>

HELCO makes its request to commit the funds in accordance with Section 2.3.g.2 of General Order No. 7 ("G.O. No. 7"), *Standards for Electric Utility Service in the State of Hawaii*.

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<sup>1</sup>HELCO's application, filed on January 20, 2004.

<sup>2</sup>The \$2,113,000 revised cost estimate is reflected in HELCO's letter, dated April 16, 2004, Exhibit 4, "Current Cost Estimate." See also HELCO's letter, dated April 30, 2004.

HELCO served copies of its application, as amended, upon the Department of Commerce and Consumer Affairs, Division of Consumer Advocacy ("Consumer Advocate"). On January 29, 2004, the commission approved HELCO's request to waive the G.O. No. 7, Section 2.3.g.2 requirement to file its application at least sixty (60) days prior to the commencement of construction or commitment for expenditure of funds.<sup>3</sup>

On April 14, April 30, and May 14, 2004, HELCO responded to the Consumer Advocate's initial and supplemental information requests. On June 2, 2004, HELCO clarified certain information. The Consumer Advocate does not object to the commission's approval of HELCO's application.<sup>4</sup>

## II.

### Hill Unit No. 5

Commissioned in 1965, Hill Unit No. 5 ("Hill 5") is a fossil-fueled, base-load unit, located at HELCO's Kanoelehua Baseyard in Hilo. Hill 5 consists of: (1) a 14.1 megawatt Westinghouse steam-turbine generating set, rated at 15,625 volt-amperes, 13,800 volts, three (3)-phase, 3600 revolutions-per-minute, sixty (60) hertz; and (2) a combustion engineering Model VU-60, No. 6 oil fired boiler, rated at 145,000 pounds per hour of steam.

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<sup>3</sup>Order No. 20779, filed on January 29, 2004.

<sup>4</sup>Consumer Advocate's position statement, filed on June 4, 2004.

On December 20, 2003, Hill 5 suddenly and unexpectedly tripped off-line. HELCO isolated the problem to Hill 5's generator stator winding. On December 29, 2003, HELCO's independent contractor, Advance Generator Technologies ("AGT"), inspected and conducted tests on Hill 5. AGT, following its inspection: (1) found that the insulation system on the stator winding had reached the end of its reliable service life; and (2) recommended that the stator winding be completely replaced to "as new" condition.<sup>5</sup>

HELCO explains that "[a] break-down of the insulation in the winding could result in localized heating within the stator, or more seriously, could result in excessive fault currents flowing that would cause arcing and burning and unbalanced currents within the generator."<sup>6</sup>

Subsequently, in February and March 2004, AGT performed loop tests on Hill 5. The tests discovered hot spots in three (3) separate areas of the stator iron core. These hot spots, HELCO explains, are indicative of a breakdown in the insulation. As a result, AGT recommended a full replacement of the stator iron core in lieu of just repairing the core.

HELCO states that the primary reasons for the increase in the Project's costs are: (1) the Project's revised scope to include the replacement of the stator iron core, increasing the

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<sup>5</sup>AGT is a New York-based, electrical repair service company. AGT's investigation revealed: (1) a ground fault in a top half coil at the end of the core slot; and (2) four (4) failed or weak locations within the stator winding.

<sup>6</sup>HELCO's application, at 3; and Exhibit 1, page 1, of HELCO's letter, dated April 16, 2004.

cost by \$732,000; and (2) the increase in cost to complete the stator rewind work, by \$117,000.

HELCO explains that the Project's scope of work will consist of:

1. Pre-testing to assess the condition of the generator winding and core.
2. Shipping the required materials, i.e., the new stator iron core and coil, including insulation.
3. Removing and disposing all existing winding and accessories.
4. Removing and replacing the stator iron core.
5. Installing the new stator coil, including insulation.
6. "Re-assembly of the generator and commissioning and testing of the rewound stator."<sup>7</sup>

HELCO notes that the costs for item number 3, above, will be expensed, and are not part of the capital cost estimates for its application, as amended.

During Hill 5's out-of-service time, HELCO plans to schedule either the Shipman units or Puna CT-3 to operate more shifts using overtime labor. In addition, the 2004 overhaul schedule will likely have two (2) large units out for planned maintenance throughout the first half of the year, which may have an impact on system reliability.

HELCO's latest estimate of the Project's completion date is late July 2004. AGT's warranty for the rewind work on

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<sup>7</sup>HELCO's application, at 5.

the stator is three (3) years. HELCO estimates that the rewind work should last fifteen (15) to twenty (20) years without any problems.

HELCO states that the Project is consistent with its Integrated Resource Plan, 1999 - 2018 ("IRP"). Specifically:

1. The IRP explicitly assumes a year 2015 service review date for Hill 5.

2. The Project is consistent with the assumption that Hill 5's operations will continue at least to the service review date of 2015.

3. The Project pursues a cost-effective solution for replacing the generator rotor, so that Hill 5 can continue to supply energy to HELCO's system. Thus, the Project is also consistent with and should further HELCO's IRP objectives, in particular:

A. Objective 1: Meeting the near and long-term energy needs at the lowest reasonable cost.

B. Objective 6: Supporting the Hawaii Energy Objective of achieving dependable statewide energy systems.

C. Objective 7: Complying with environmental regulations.

### III.

#### Consumer Advocate's Comments

The Consumer Advocate, in its investigation, examined: (1) the Project's necessity; (2) whether the Project is the proper option; and (3) the reasonableness of the Project's costs.

A.

Project's Necessity

Based on its testing and evaluation, AGT recommends the rewinding of the stator coils and replacement of the stator iron core. The Consumer Advocate does not take issue with this assessment.

Instead, the Consumer Advocate examined "whether the generating capacity from the Hill 5 Unit, which normally operates as a base-load unit, could be replaced with generation from other existing units on HELCO's system."<sup>8</sup>

The Consumer Advocate notes that:

1. Hill 5, as a base-loaded unit, "is designed for continuous operation and operates efficiently at a high output."<sup>9</sup>

2. Since December 20, 2003, when Hill 5 unexpectedly tripped off-line, "HELCO has run the CT-3 and Shipman units in order to replace the generation lost due to Hill 5 being out of service. CT-3 and the Shipman units, however, were designed to run as cycling units, and are thus, more costly to operate."<sup>10</sup>

3. HELCO's cost data: (A) shows that Hill 5's estimated repair costs can be recovered in less than nine (9) months based on the best case scenario that CT-3 is used to replace all of the generation from Hill 5; and (B) confirms that operating other HELCO generation in lieu of Hill 5 is more costly.

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<sup>8</sup>Consumer Advocate's position statement, at 6.

<sup>9</sup>Id.

<sup>10</sup>Id.

The Consumer Advocate concludes that repairing Hill 5 is: (1) justified by the cost analysis, which shows that operating alternative generation will cost HELCO more over time; and (2) necessary for HELCO to provide reliable electric utility service at a reasonable cost to its ratepayers.

B.

Three (3) Options

HELCO evaluated three (3) options to repair Hill 5:

1. Repair Damaged Areas Only Option.  
Estimated Cost: \$629,000.  
Estimated Completion: Six (6) weeks.
2. Complete Rewind Option.  
Estimated Cost: \$1,263,000.  
Estimated Completion: Fourteen (14) weeks.
3. Purchase New Stator Coil and Stator Core Option (as Revised).<sup>11</sup>  
Estimated Cost: \$2,107,400.  
Estimated Completion: Thirty-six (36) weeks.

HELCO considers Option No. 1 "the least attractive from a reliability perspective since testing by AGT . . . indicated that the old insulation may be sensitive to movement of the stator wedges and tightening of the through-bolts[,] " creating new problem areas that "may appear during the tightening of the bolts or even after the repaired unit is back in service."<sup>12</sup> HELCO concludes that Option No. 1 "is undesirable as it may result in unplanned failures in the near future."<sup>13</sup>

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<sup>11</sup>See HELCO's response to CA-IR-7.

<sup>12</sup>HELCO's application, at 6.

<sup>13</sup>Id.

Option No. 3, HELCO notes, "will yield similar performance results as a full rewind."<sup>14</sup> However, this option is unattractive because, although the budgetary pricing for this option is comparable with the repair option, the lead-time is very long," and Hill 5 will not be available during this period.<sup>15</sup>

HELCO selected Option No. 2, as revised.<sup>16</sup> The Consumer Advocate: (1) undertook a cost-benefit analysis of Option No. 2, as revised, and Option No. 3, as revised; and (2) compared the estimated completion dates for both options.<sup>17</sup> The Consumer Advocate concludes that Option No. 2, as revised, is the economically correct choice for repairing Hill 5.

C.

Project's Costs

The Consumer Advocate notes that:

1. Approximately ninety-three (93) per cent of the Project's costs are for AGT's services, including the completion of the Project's scope of work.

2. HELCO selected AGT based on a competitive bid process. On Oahu, AGT has worked on the Kahe Power Plant for Hawaiian Electric Company, Inc.

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<sup>14</sup>Id.

<sup>15</sup>Id. at 6 - 7.

<sup>16</sup>As previously explained, HELCO revised the Project's scope of work to include the replacement of the stator iron core. Thus, the Project's estimated cost is now \$2,113,000. Also, the Project's estimated completion date is now eighteen (18) weeks, instead of fourteen (14) weeks. See HELCO's letter, dated June 2, 2004.

<sup>17</sup>See Consumer Advocate's position statement, at 9 - 10.

3. HELCO's efforts to obtain a fair cost estimate for the Project appear reasonable.

The Consumer Advocate does not object to the Project's estimated costs at this time. That said, after it reviews the final cost report following the Project's completion, the Consumer Advocate reserves its right to "pursue issues, if any, regarding the reasonableness of including actual project costs in rate base in HELCO's next rate proceeding."<sup>18</sup>

#### IV.

##### Discussion

The commission finds that the Project is reasonable and consistent with the public interest and HELCO's IRP. The Project will allow HELCO to undertake and complete the repair of Hill 5, a base-load, generating unit. The commission, thus, will approve the expenditure of funds for the Project.

#### V.

##### Orders

###### THE COMMISSION ORDERS:

1. HELCO's request to expend an estimated \$2,113,000 for the Hill 5 Generator Stator Rewind Project is approved; provided that no part of the Project may be included in HELCO's rate base unless and until the Project is in fact installed, and is used and useful for public utility purposes.

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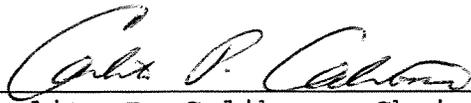
<sup>18</sup>Id. at 12.

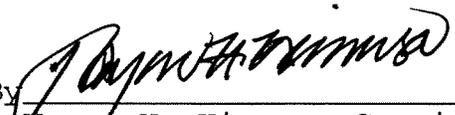
2. HELCO shall submit a report within sixty (60) days of the Project's commercial operation, with an explanation of any deviation of ten (10) per cent or more in the Project's cost from that estimated in the application. HELCO's failure to submit this report will constitute cause to limit the cost of the Project, for ratemaking purposes, to that estimated in the application.

3. HELCO shall conform to the commission's order set forth above. Failure to adhere to the commission's order shall constitute cause for the commission to void this decision and order, and may result in further regulatory action as authorized by law.

DONE at Honolulu, Hawaii this 17th day of June, 2004.

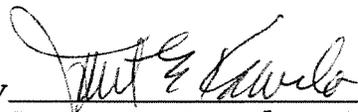
PUBLIC UTILITIES COMMISSION  
OF THE STATE OF HAWAII

By   
Carlito P. Caliboso, Chairman

By   
Wayne H. Kimura, Commissioner

APPROVED AS TO FORM:

  
Michael Azama  
Commission Counsel

By   
Janet E. Kawelo, Commissioner

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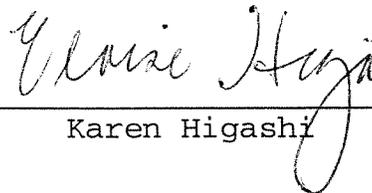
CERTIFICATE OF SERVICE

I hereby certify that I have this date served a copy of the foregoing Decision and Order No. 21066 upon the following parties, by causing a copy hereof to be mailed, postage prepaid, and properly addressed to each such party.

DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS  
DIVISION OF CONSUMER ADVOCACY  
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for \_\_\_\_\_  
Karen Higashi

DATED: June 17, 2004