

HEICO
1995-1999
ADEQUACY OF SUPPLY
(SPECIAL REPORTS - PERMANENT)



Warren H. W. Lee, P.E.
President

March 1, 1999

1999 MAR - 1 P 4: 04
PUBLIC UTILITIES
COMMISSION
FILED

The Honorable Chairman and Members of the
Hawaii Public Utilities Commission
465 South King Street
Kekuanaoa Building, 1st Floor
Honolulu, Hawaii 96813

Dear Commissioners:

Subject: Adequacy of Supply
Hawaii Electric Light Company, Inc.

In accordance with paragraph 5.3a of General Order No. 7, the following information is respectfully submitted.

HELCO's 1998 total system capability, at the time of the system peak, was 196,800 kW (gross) and included firm capacity power purchases of 22,000 kW from Hilo Coast Power Company ("HCPC") and 24,500 kW from Puna Geothermal Venture ("PGV"). Four MW of dispersed diesels, which were installed in November and December 1997 as part of HELCO's contingency plan, are not included as firm capacity. HELCO's system peak of 169,600 kW occurred on Monday, December 7, 1998, at approximately 6:40 p.m., and resulted in a reserve margin of 16% over the system peak. At the time of the system peak, HELCO had in place 28 load management contracts under Rider M, Rider T, and Schedule U, which reduced the evening peak by approximately 7,000 kW. In addition, HELCO had residential and commercial & industrial DSM programs in place, which reduced the system by peak an estimated 3,100 kW. These programs include a Residential Efficient Water Heating Program, Commercial & Industrial Energy Efficiency Program, Commercial & Industrial New Construction Program, and Commercial & Industrial Customized Rebate Program. Without the DSM and off-peak rider agreements, the system peak would have been approximately 179,700 kW, with a 10% reserve margin.

Please note that while PGV is contracted to deliver 30,000 kW of firm capacity, it was derated to 24,500 kW at the time of the system peak, and is still derated. Restoring firm capacity to the contracted amount will require PGV to obtain the necessary permits and drill additional production and reinjection wells. PGV's permit comment period will be closed shortly and it has already selected locations for the new wells, based on testing done in 1998. PGV has indicated to HELCO that it is on schedule to restore its firm capacity to 30,000 kW by mid-1999.

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HELCO's adequacy of supply projections for the years 1999, 2000, and 2001 are based on the following:

- The Forecast Planning Committee's Forecast of Sales, Peak and Sales Load Factor dated June 9, 1998
- The following capacity planning criteria was used to determine the need for additional generation:

The sum of the reserve ratings of all available units, minus the reserve rating of the largest available unit, minus the reserve ratings of any units on maintenance, must be equal to or greater than the system peak load to be supplied.

- Contingency options/mitigation measures, as identified in HELCO's Generation Resource Contingency Plan Update #5 (which HELCO plans to file on March 1, 1999), are addressed later in the specific year's attachment.
- Additional as-available energy for the years 1999, 2000, and 2001 is shown in Attachment 1.

Status of Supply-side Resource Plan

HELCO's current supply-side resource plan includes the near term installation of two combustion turbine generators, CT-4 (20 MW) and CT-5 (20 MW), at its Keahole Generating Station, and the installation of a 60 MW (net) dual-train combined cycle ("DTCC") qualifying cogeneration facility by Encogen Hawaii, L.P. in two phases, Phase 1 (22 MW) and Phase 2 (38 MW), near Haina, Hawaii. CT-4 and CT-5 are the first two phases of a 56 MW (net) DTCC unit at Keahole (the third phase of which would be a steam turbine generator, ST-7).

The timing of the installation of HELCO's CT-4, CT-5, and ST-7 units at Keahole has been revised several times due to delays in: (a) obtaining approval from the State Board of Land and Natural Resources ("BLNR") of a Conservation District Use Permit amendment, and (b) obtaining from the State Department of Health ("DOH") and the U.S. Environmental Protection Agency ("EPA") a Prevention of Significant Deterioration/Covered Source permit ("air permit") for the Keahole site. The only remaining permits or approvals required for the installation of CT-4, CT-5 and ST-7 at Keahole are the air permit and a permit from the BLNR to allow the withdrawal of water from HELCO's on-site brackish water supply well. (Note that should there be a delay in obtaining the permit from BLNR, HELCO will be able to exercise a commitment for temporary water service from the County of Hawaii.)



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On July 10, 1997, the Third Circuit Court issued an Amended Findings of Fact, Conclusions of Law, Decision and Order on HELCO's appeal of an order of the BLNR, along with other consolidated civil cases relating to HELCO's CDUP amendment application. The Court decision allowed HELCO to put its land at Keahole to the use requested in HELCO's CDUP amendment application. (An amended order to the same effect was issued by the Third Circuit Court on August 18, 1997.)

By letter dated October 28, 1997, the DOH issued HELCO's air permit. However, in December 1997, nine petitions for appeal of the air permit were filed with the Environmental Appeals Board ("EAB") of the U.S. EPA. On November 25, 1998, the EAB issued an Order Denying Review in Part and Remanding in Part. The EAB upheld the permit with regard to NOx netting and SO2 impact. The EAB remanded the permit back to DOH for further review with respect to issues concerning the air quality data used in DOH's ambient air quality impact report. On December 4, 1998, HELCO filed a motion for reconsideration of the EAB Order. As a result of the EAB's Order, there has been a further delay in the construction of CT-4 and CT-5. The actual length of the delay will depend on the outcome of motions for reconsideration, which are pending before the EAB, and the actions needed to address the EAB's rulings. HELCO estimates conservative in-service dates for CT-4 and CT-5 of January 2001 and March 2001, respectively. CT-4 and CT-5 could be installed sooner depending on the time required to obtain a final air permit. HELCO continues to provide the Commission with a monthly report on the status of its Keahole project. (See Docket No. 7623.)

On January 16, 1998, HELCO filed an application for approval of a Power Purchase Agreement ("PPA") and an Interconnection Agreement with Encogen Hawaii, L.P. ("Encogen"), dated October 22, 1997. The agreements were entered into following a settlement agreement between Encogen and HELCO, and are subject to Commission approval. On January 14, 1999, HELCO and Encogen signed an amendment to the PPA which, in part, provides that either party may terminate the agreement if the Commission does not issue an order within 18 months (extended from 12 months originally in the agreement) from the submission of the Application. The Commission has issued a Prehearing Order which calls for an evidentiary hearing to begin on May 4, 1999. (The schedule was set to provide the Commission with the opportunity to issue a decision within the six-month extension period, which ends July 16, 1999.)

The Encogen Phase 1 and Phase 2 in-service date deadlines in the PPA generally are tied to the Commission approval date ("PUC Approval Date") for the PPA. If the Commission order approving the PPA is appealed, the PUC Approval Date will be the earlier of the date upon which it becomes non-appealable (i.e., after successful resolution of an appeal) or two years after January 16, 1998 (with Encogen having the right to terminate the agreement if the appeal is not resolved by January 16, 2000). The PPA provides that the Phase 1 and Phase 2 in-service date deadlines are eight months and twelve months, respectively, after the PUC Approval Date (which



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is 30 days after the date of the order approving the PPA if there is no motion for reconsideration or appeal), subject to extension for force majeure (such as further delays in the issuance of Encogen's air permit). Based on the assumption that the PUC Approval Date will be 30 days after July 16, 1999, and on the in-service date deadlines in the PPA, Phase 1 could be installed in April 2000 and Phase 2 could be installed in August 2000, but they could also be delayed to 2001 or later.

HELCO's existing PPA with HCPC terminates December 31, 1999. A proposal by HCPC to provide 32 MW of capacity and energy to HELCO is currently the subject of Docket No. 97-0102. HELCO is required to offer to purchase power from a qualifying facility at a price equal to its avoided costs. An evidentiary hearing was held on April 29-30, 1998, which was limited to three issues affecting the calculation of avoided costs. On November 25, 1998, the Commission issued Decision and Order No. 16717, which provided guidance regarding the calculation of avoided costs for HCPC's proposal, and ordered HELCO to continue negotiations with HCPC for a PPA, and to submit by February 1, 1999 either a finalized PPA or the reasons why a PPA cannot be finalized. HELCO has complied with the Commission's decision with regard to the avoided cost calculations and the resumption of contract negotiations with HCPC. On February 1, 1999, HCPC filed a Report of Matters Preventing the Finalization of a PPA. On February 2, 1999, HELCO filed a Status of Negotiations report. (HELCO was granted a one-day extension to file its report.) The status of HELCO's negotiations with HCPC is set forth in HELCO's confidential February 2, 1999 Status Report. On February 24, 1999, the Commission, in Order No. 16878, reopened the docket, found "good cause to render a decision on the parties' written submissions without a hearing", and allowed the parties until March 12, 1999 to supplement their reports.

HELCO's Contingency Plan Update #5, to be filed concurrently with this report on March 1, 1999 in Docket No. 96-0029, will report the progress and accomplishments made toward maximizing the capacity of available generation, the additional capacity added to the system, and load management activities, pending installation of the next substantial increment of new capacity.

1999 HELCO Adequacy of Supply

Attachment 2 displays month-to-month Load Service Capability ("LSC") for 1999. LSC is defined as the System Capability, minus all units on maintenance, minus the largest available unit. Numeric values of the difference between the LSC and the System Peak are shown in the Difference (MW) column. LSC greater than or equal to the System Peak (load to be serviced) normally indicates that HELCO's generation capacity planning criteria is being satisfied. However, LSC margins currently include the use of mitigation measures such as a substantial amount (more than 36 MW to date) of unit retirement deferrals and rescheduled maintenance.



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HELCO's planning criteria assumes normal required maintenance intervals and planned retirements.

HELCO's 1999 total system capability (Attachment 2) includes firm power purchase contracts of 22,000 kW from HCPC, 24,500 kW from PGV (derated from 30,000 kW), and 4 MW from HELCO's four 1 MW dispersed diesels.

HELCO expects that with contingency plan measures in effect (noted on the chart), there will be sufficient reserve margin to meet the system peaks with scheduled maintenance in 1999. Although there are negative LSC differences in April and August 1999, the reserve margins in these two months will still allow the system to withstand the loss of the second largest unit on the system (Puna CT-3 or Hill 6 at 20.8 MW). Also, LSC margin shortfalls could actually be less than shown since:

- (1) HELCO currently estimates the impact from its load management contracts to be approximately 7.0 MW, but has only adjusted the system peak by 5.5 MW.¹ The 5.5 MW impact is consistent with the June 1998 load forecast.
- (2) Contributions of HELCO's as-available resources (wind and hydro), which total approximately 24 MW, could reduce LSC margin shortfalls at the system peak.

Although PGV currently estimates that it will restore output to its contracted firm capability of 30,000 kW by mid-1999, Attachment 2 shows that even with PGV at 24,500 kW, there will be sufficient reserve margin to meet the system peaks with scheduled maintenance in 1999.

2000 HELCO Adequacy of Supply

HELCO's 2000 total system capability is shown in Attachment 3a and includes 30,000 kW from PGV. Year 2000 capabilities assume that the Encogen Phase 1 CT (22 MW) is installed in April 2000 and that Phase 2 (38 MW) is installed in August 2000 for a total dual train combined cycle capacity of 60 MW (net) to HELCO. HELCO's existing PPA with HCPC for 22,000 kW of firm power terminates at the end of 1999. Due to the estimated delay in installing the next increment of new capacity until April 2000, HELCO will not be able to cover for the loss of the largest unit (PGV at 30 MW) with units on maintenance from January through March 2000, as indicated by a negative LSC difference in the last column of the chart in Attachment 3a. HELCO can, however, withstand the unplanned outage of any other individual unit in January and February, since the second largest unit on the system has a reserve capability of 20.8 MW

¹ Although HELCO's load management contracts total approximately 7.0 MW of loads curtailed at the system peak, compliance on any given night is not assured, and more importantly, the long term participation by customers has not been demonstrated.



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(Puna CT-3 or Hill 6). In March 2000, HELCO estimates having a reserve margin of approximately 18 MW over the projected system peak.

Attachment 3b illustrates total system capability if both the Encogen and Keahole projects are delayed past 2000. Should this occur, HELCO will not have sufficient LSC margin to cover the projected monthly system peaks with scheduled maintenance and loss of the largest unit. HELCO will, however, still be able to cover the projected system peak load with units on maintenance, as indicated by the positive reserve margin in Attachment 3b. HELCO's contingency plans in the event that the installation of Keahole CT-4 and CT-5 and/or the Encogen DTCC unit are further delayed will be addressed in Contingency Plan Update #5, which HELCO plans to file concurrently with this report on March 1, 1999.

2001 HELCO Adequacy of Supply

HELCO's 2001 total system capability is shown in Attachment 4 and includes 40,000 kW (gross) from Keahole CT-4 and CT-5 and firm power purchase contracts of 30,000 kW from PGV and 60,000 kW (net) from Encogen. The four 1 MW diesels are assumed to be retired. HELCO will have sufficient LSC margin to meet the system peaks in 2001, assuming that HELCO CT-4 and CT-5 are installed by January and March 2001, respectively, and that the Encogen DTCC is installed by January 2001 (and scheduled retirements can occur).

If only one of the projects (HELCO CT-4 and CT-5 or the Encogen DTCC) is installed by 2001, HELCO will still have sufficient LSC margin to meet the system peaks in 2001 assuming that a sufficient amount of existing capacity can remain operational by continuing to defer retirements.

Very truly yours,

Danman Kulee

Attachments

cc: Division of Consumer Advocacy



HELCO Unit Ratings
 As of March 1, 1999

	1998 Adequacy of Supply (Gross kW)	Current Ratings (Gross kW)
	Reserve	Reserve
Shipman Unit 1	3,400	3,400
Shipman Unit 3	7,500	7,500
Shipman Unit 4	7,700	7,700
Puna	15,500	15,500
Puna CT-3	20,800	20,800
Hill Unit 5	14,100	14,100
Hill Unit 6 (1)	23,000	20,800
Kanoelehua Unit 11	2,000	2,000
Kanoelehua Unit 15	2,750	2,750
Kanoelehua Unit 16	2,750	2,750
Kanoelehua Unit 17	2,750	2,750
Kanoelehua CT-1	11,500	11,500
Waimea Unit 8	1,000	1,000
Waimea Unit 9	1,000	1,000
Waimea Unit 10	1,000	1,000
Waimea Unit 12	2,750	2,750
Waimea Unit 13	2,750	2,750
Waimea Unit 14	2,750	2,750
Keahole Unit 18	2,750	2,750
Keahole Unit 19	2,750	2,750
Keahole Unit 20	2,750	2,750
Keahole Unit 21	2,750	2,750
Keahole Unit 22	2,750	2,750
Keahole Unit 23	2,750	2,750
Keahole CT-2 (2)	15,900	11,000
HELCO	157,400	150,300
HCPC	22,000	22,000
PGV (3)	30,000	24,500
TOTAL SYSTEM	209,400	196,800

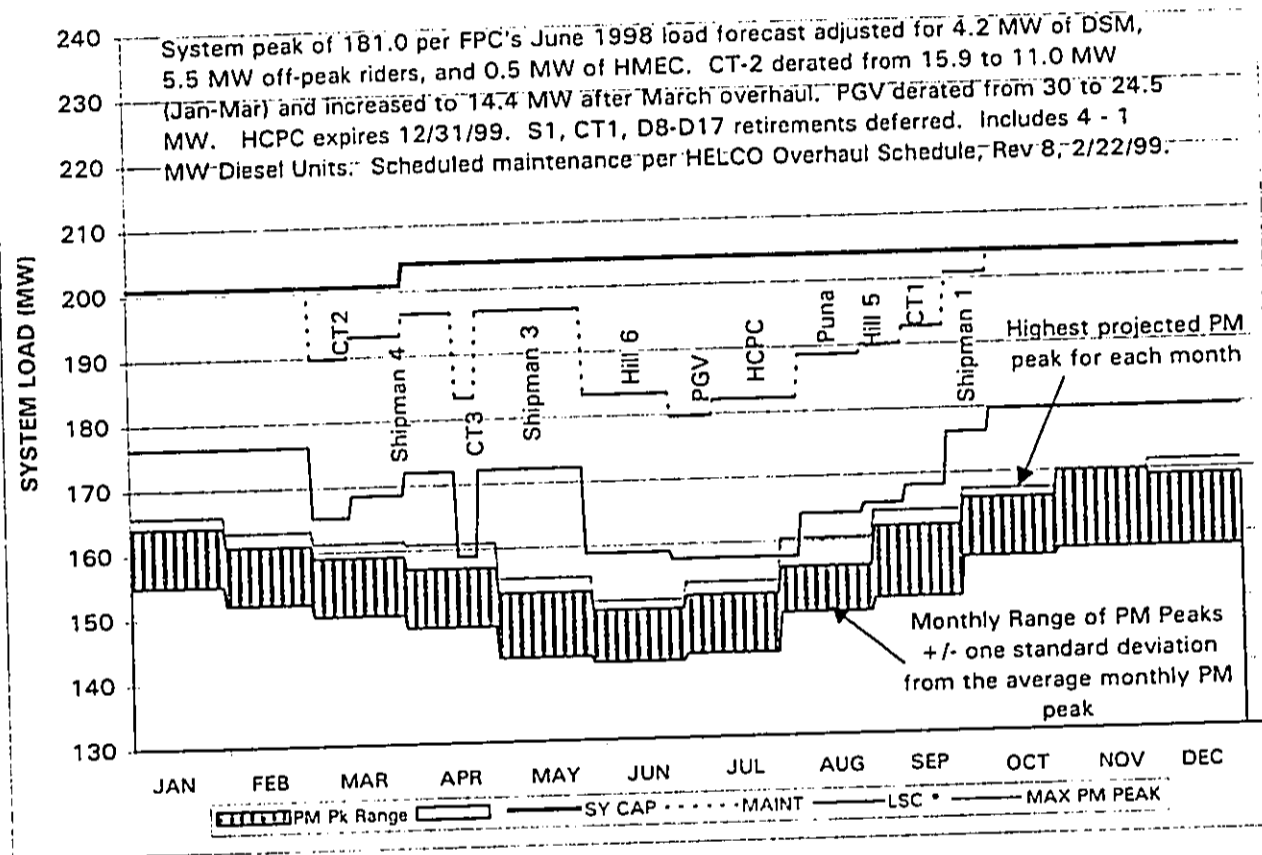
Notes

- 1) Hill 6 rating changed from 23 MW to 20.8 MW. See Section 4.4 of HELCO's Contingency Plan Update #4, filed June 12, 1998, in Docket No. 96-0029.
- 2) Keahole CT-2 temporarily derated from 15.9 MW to 11 MW. The reserve rating will be increased to 14.4 MW after completion of unit overhaul in March 1999.
- 3) PGV derated from 30 MW to 24.5 MW until restoration to full capacity, which is expected to occur in mid-1999.

As-Available Capacity
 as of March 1, 1999

<u>UNITS</u>	<u>As-Available Capacity (kW)</u>		
	<u>1999</u>	<u>2000</u>	<u>2001</u>
<u>HELCO UNITS</u>			
Hydro			
Puueo No. 1	1,500	1,500	1,500
Puueo No. 2	750	750	750
Waiau No. 1	750	750	750
Waiau No. 2	350	350	350
Wind			
Lalamilo Wind Farm	2,280	2,280	2,280
HELCO Non-Firm Total	5,630	5,630	5,630
<u>IPP UNITS</u>			
Wailuku River Hydro	11,000	11,000	11,000
Apollo Energy	7,000	7,000	7,000
Hawi Ag & Energy	200	200	200
under 100 kW	199	199	247
IPP Non-Firm Total	18,399	18,399	18,447
TOTAL NON-FIRM	24,029	24,029	24,077

1999 HELCO System Capability
CT4 & CT5 Not Installed; Encogen Not Installed
Unit Capabilities At Reserve Ratings
System Peaks



* LSC is Load Service Capability (System Capability - Maintenance - Largest Available Unit)
 ** LSC is lowest for the month

Month (1)	Systm Pk (MW) (2)	Systm Cap (MW) (3)	Maint (MW) (4)	Reserve (MW) (3)-(4)-(2)	% Reserve (less maint) (5) / (2)	Lrgst Avail (MW) (7)	LSC diff** (MW) (5) - (7)
JAN	165.7	200.8	0.0	35.1	21.2%	24.5	10.6
FEB	163.2	200.8	0.0	37.6	23.0%	24.5	13.1
MAR	161.3	200.8	11.0	28.5	17.7%	24.5	4.0
APR	160.8	204.2	20.8	22.6	14.0%	24.5	-1.9
MAY	155.3	204.2	20.8	28.1	18.1%	24.5	3.6
JUN	151.5	204.2	24.5	28.2	18.6%	22.0	6.2
JUL	154.0	204.2	24.5	25.7	16.7%	22.0	3.7
AUG	160.4	204.2	22.0	21.8	13.6%	24.5	-2.7
SEP	164.4	204.2	14.1	25.7	15.7%	24.5	1.2
OCT	167.4	204.2	3.4	33.4	19.9%	24.5	8.9
NOV	170.1	204.2	0.0	34.1	20.1%	24.5	9.6
DEC	171.3	204.2	0.0	32.9	19.2%	24.5	8.4

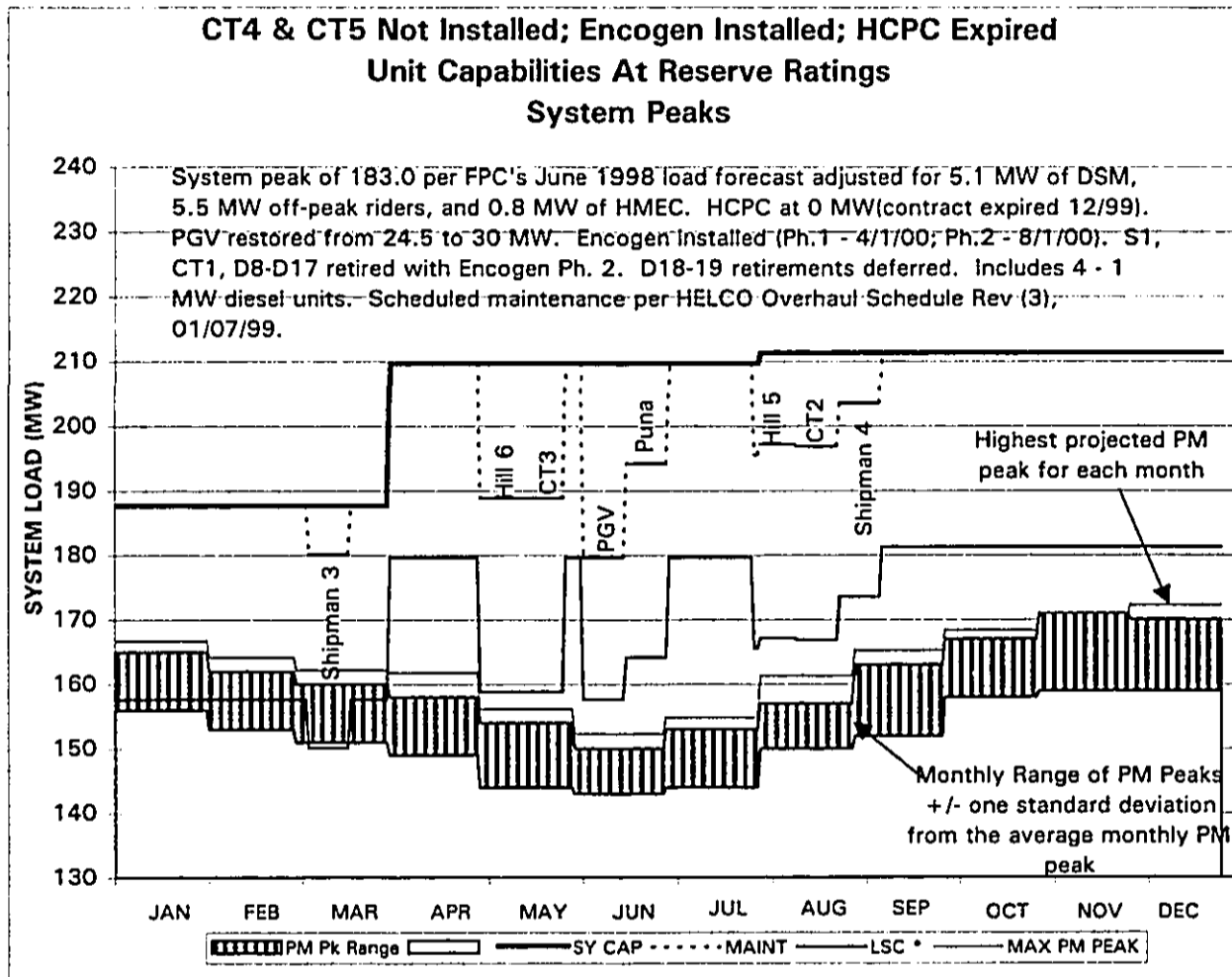
ATTACHMENT 2
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NOTES:

- Attachment 2 includes contingency plan measures: Four -- 1 MW diesel units and 36.4 MW of retirement deferrals.

2000 HELCO System Capability

**CT4 & CT5 Not Installed; Encogen Installed; HCPC Expired
 Unit Capabilities At Reserve Ratings
 System Peaks**



* LSC is Load Service Capability (System Capability - Maintenance - Largest Available Unit)

** LSC is lowest for the month

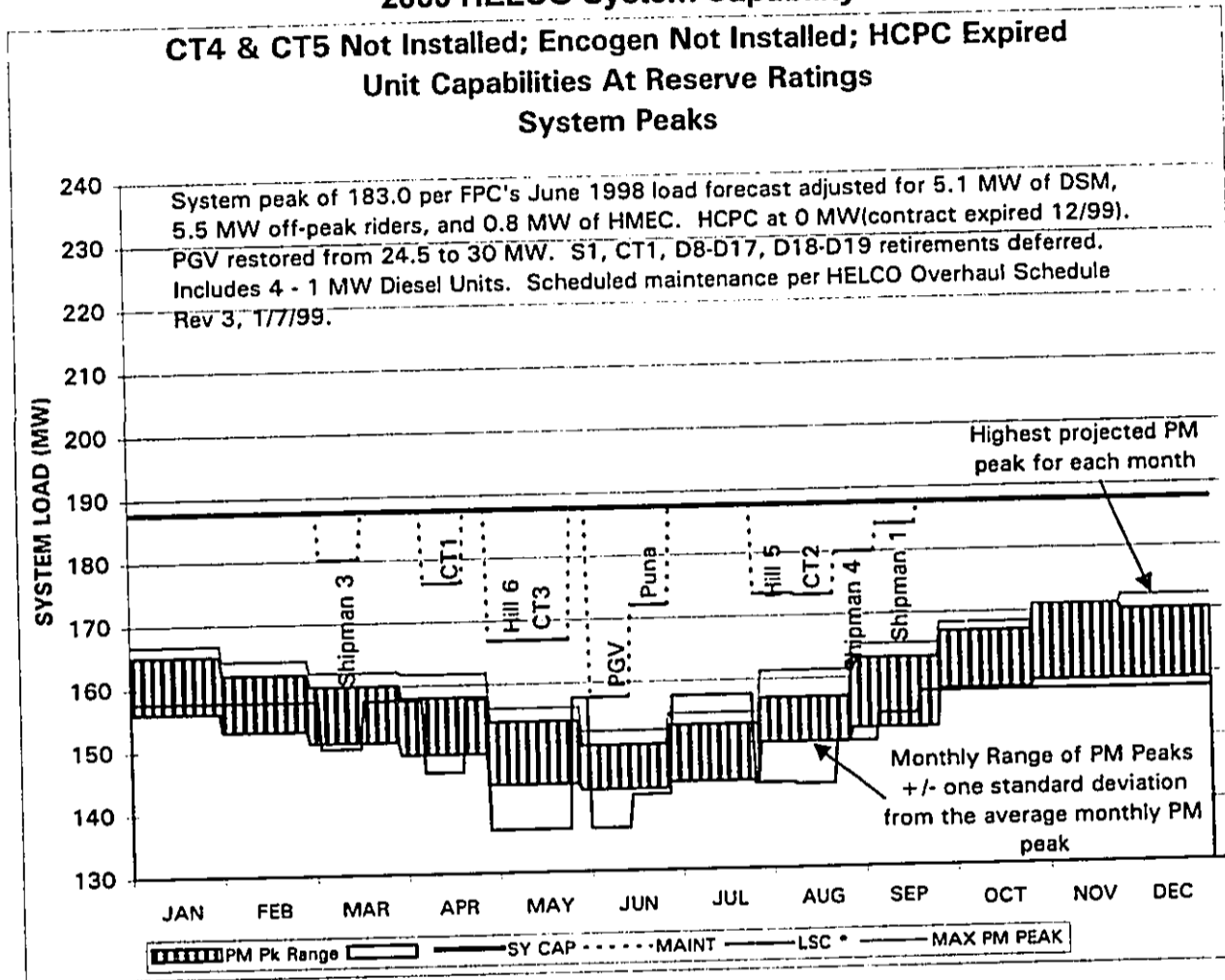
Month (1)	Systm Pk (MW) (2)	Systm Cap (MW) (3)	Maint (MW) (4)	Reserve (MW) (3)-(4)-(2)	% Reserve (less maint) (5) / (2)	Lrgst Avail (MW) (7)	LSC diff** (MW) (5) - (7)
JAN	166.8	187.7	0.0	20.9	12.6%	30.0	-9.1
FEB	164.2	187.7	0.0	23.5	14.3%	30.0	-6.5
MAR	162.2	187.7	7.5	18.0	11.1%	30.0	-12.0
APR	161.8	209.7	0.0	47.9	29.6%	30.0	17.9
MAY	156.2	209.7	20.8	32.7	21.0%	30.0	2.7
JUN	152.3	209.7	30.0	27.4	18.0%	22.0	5.4
JUL	154.9	209.7	15.5	39.3	25.4%	30.0	9.3
AUG	161.4	211.3	14.4	35.5	22.0%	30.0	5.5
SEP	165.3	211.3	7.7	38.3	23.2%	30.0	8.3
OCT	168.4	211.3	0.0	42.9	25.5%	30.0	12.9
NOV	171.1	211.3	0.0	40.2	23.5%	30.0	10.2
DEC	172.3	211.3	0.0	39.0	22.6%	30.0	9.0

NOTES:

- Attachment 3a assumes the installation of Encogen's dual train combined cycle facility in April 2000 (Phase 1 CT) and August 2000 (completion of Phase 2 DTCC) and that the HCPC contract terminates at the end of 1999.
- Upon completion of the Encogen DTCC in August 2000, Shipman 1 (3,400 kW), Waimea D-8, D-9, D-10, D-12, D-13, and D-14 (totaling 11,250 kW), Kanoelehua D-11, D-15, D-16 and D-17 (totaling 10,250 kW) and CT-1 (11,500 kW) are scheduled for retirement. The total capacity slated for retirement when the Encogen DTCC is placed into service is 36,400 kW. (Note that these retirements assume that Keahole CT-4 and CT-5 will be installed in January 2001 and March 2001, respectively. The actual retirements will depend on the capacity of the system at the time the Encogen DTCC is operational.)
- Encogen's DTCC capacity is shown as 60 MW net to HELCO.
- Keahole CT-4 and CT-5 capacity are not included.
- Attachment 3a includes contingency plan measures: Four – 1 MW diesel units and unit retirement deferrals (Shipman 1, CT-1 and diesels D8-D19 until the Encogen DTCC is completed; diesels D18-19 after the Encogen DTCC is completed).

2000 HELCO System Capability

**CT4 & CT5 Not Installed; Encogen Not Installed; HCPC Expired
 Unit Capabilities At Reserve Ratings
 System Peaks**



* LSC is Load Service Capability (System Capability - Maintenance - Largest Available Unit)
 ** LSC is lowest for the month

Month (1)	Systm Pk (MW) (2)	Systm Cap (MW) (3)	Maint (MW) (4)	Reserve (MW) (3)-(4)-(2)	% Reserve (less maint) (5) / (2)	Lrgst Avail (MW) (7)	LSC diff** (MW) (5) - (7)
JAN	166.8	187.7	0.0	20.9	12.6%	30.0	-9.1
FEB	164.2	187.7	0.0	23.5	14.3%	30.0	-6.5
MAR	162.2	187.7	7.5	18.0	11.1%	30.0	-12.0
APR	161.8	187.7	11.5	14.4	8.9%	30.0	-15.6
MAY	156.2	187.7	20.8	10.7	6.9%	30.0	-19.3
JUN	152.3	187.7	30.0	5.4	3.5%	20.8	-15.4
JUL	154.9	187.7	15.5	17.3	11.2%	30.0	-12.7
AUG	161.4	187.7	14.4	11.9	7.4%	30.0	-18.1
SEP	165.3	187.7	7.7	14.7	8.9%	30.0	-15.3
OCT	168.4	187.7	0.0	19.3	11.5%	30.0	-10.7
NOV	171.1	187.7	0.0	16.6	9.7%	30.0	-13.4
DEC	172.3	187.7	0.0	15.4	8.9%	30.0	-14.6

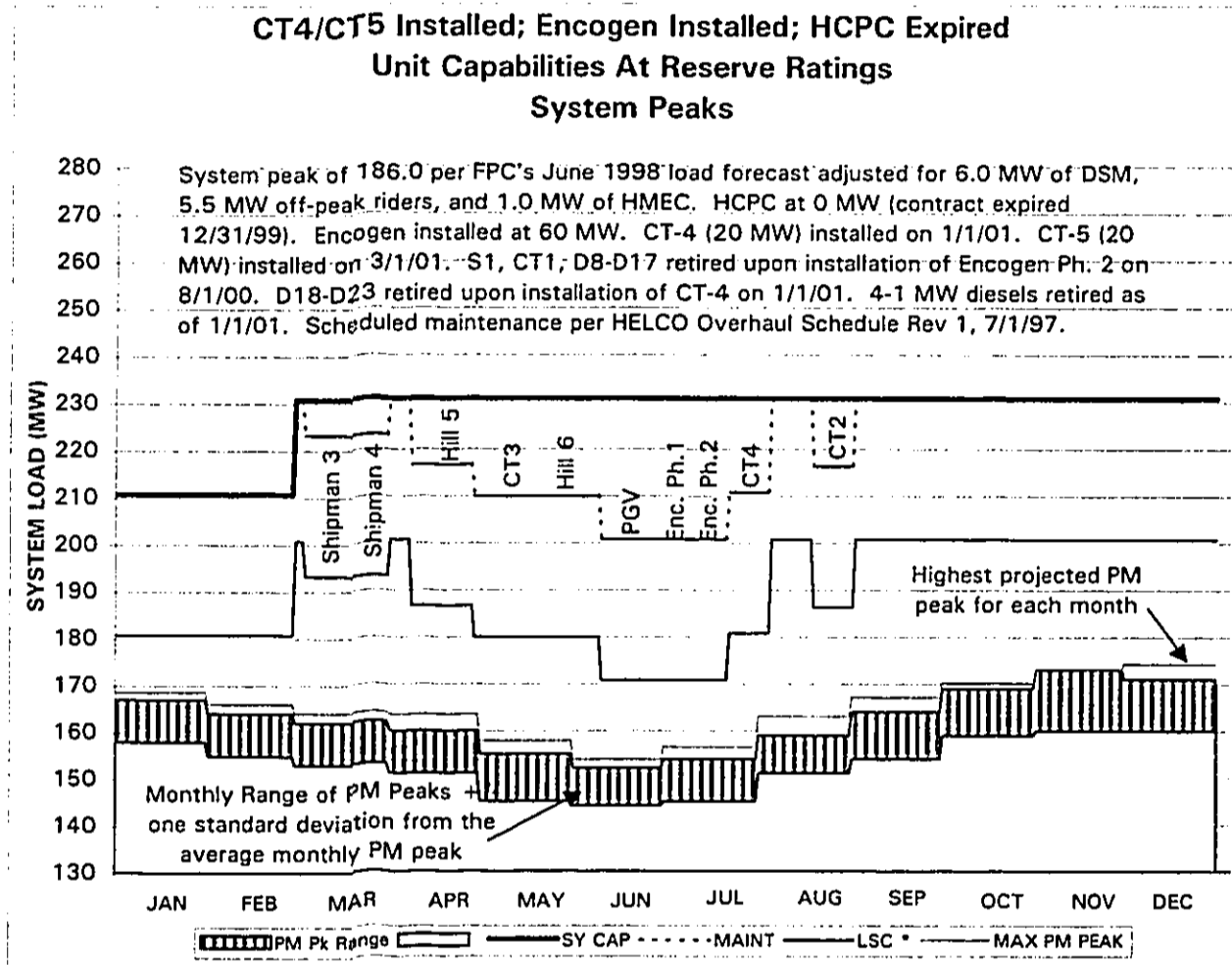
ATTACHMENT 3b
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NOTES:

- Attachment 3b assumes that installation of both the Encogen and Keahole projects are delayed past 2000, and that the HCPC contract terminates at the end of 1999.
- Attachment 3b includes contingency plan measures: Four – 1 MW diesel units and unit retirement deferrals (Shipman 1, CT-1 and diesels D8-D19).

2001 HELCO System Capability

**CT4/CT5 Installed; Encogen Installed; HCPC Expired
 Unit Capabilities At Reserve Ratings
 System Peaks**



* LSC is Load Service Capability (System Capability - Maintenance - Largest Available Unit)

** LSC is lowest for the month

Month (1)	Systm Pk (MW) (2)	Systm Cap (MW) (3)	Maint (MW) (4)	Reserve (MW) (3)-(4)-(2)	% Reserve (less maint) (5) / (2)	Lrgst Avail (MW) (7)	LSC diff** (MW) (5) - (7)
JAN	168.7	210.8	0.0	42.1	25.0%	30.0	12.1
FEB	166.1	210.8	0.0	44.7	26.9%	30.0	14.7
MAR	164.1	230.8	7.7	59.0	36.0%	30.0	29.0
APR	163.6	230.8	20.8	46.4	28.4%	30.0	16.4
MAY	157.9	230.8	20.8	52.1	33.0%	30.0	22.1
JUN	154.0	230.8	30.0	46.8	30.4%	30.0	16.8
JUL	156.6	230.8	30.0	44.2	28.2%	30.0	14.2
AUG	163.2	230.8	20.0	47.6	29.2%	30.0	17.6
SEP	167.2	230.8	14.4	49.2	29.4%	30.0	19.2
OCT	170.3	230.8	0.0	60.5	35.5%	30.0	30.5
NOV	173.0	230.8	0.0	57.8	33.4%	30.0	27.8
DEC	174.3	230.8	0.0	56.5	32.4%	30.0	26.5

NOTES:

- Attachment 4 assumes that the Encogen DTCC is installed by January 2001, and Keahole CT-4 and CT-5 are installed by January 2001 and March 2001, respectively.
- Units are retired with the installation of Keahole CT-4 and CT-5 and Encogen, as noted below:
 - Keahole: Keahole D-18, D-19, D-20, D-21, D-22 and D-23 (totaling 16,500 kW) are retired when CT-4 and CT-5 are put into service. (Note that these retirements assume that the Encogen DTCC is in-service. The actual retirements will depend on the capacity of the system at the time CT-4 and CT-5 are operational.)
 - Encogen: Upon completion of the Encogen DTCC, Shipman 1 (3,400 kW), Waimea D-8, D-9, D-10, D-12, D-13, and D-14 (totaling 11,250 kW), Kanoelehua D-11, D-15, D-16 and D-17 (totaling 10,250 kW) and CT-1 (11,500 kW) are scheduled for retirement. The total capacity slated for retirement with Encogen in service is 36,400 kW. (Note that these retirements assume that Keahole CT-4 and CT-5 will be installed in January 2001 and March 2001, respectively. The actual retirements will depend on the capacity of the system at the time the Encogen DTCC is operational.)
- Contingency planning measures are no longer in effect. The 4 MW of dispersed diesels are not included, but the DSM programs and off-peak riders continue.

Hawaii Electric Light Company, Inc. • PO Box 1027 • Hilo, HI 96721-1027

2/2 c: B-C's
CN
RN
CWL
MH

MH



Warren H. W. Lee, P.E.
President

January 30, 1998

The Honorable Chairman and Members of the
Hawaii Public Utilities Commission
465 South King Street
Kekuanaoa Building, 1st Floor
Honolulu, Hawaii 96813

PUBLIC UTILITIES
COMMISSION

1998 JAN 30 P 3:42

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Dear Commissioners:

Subject: Adequacy of Supply
Hawaii Electric Light Company, Inc.

In accordance with paragraph 5.3a of General Order No. 7, the following information is respectfully submitted.

HELCO's 1997 total system capability, at the time of the system peak, was 209,400 kW and included firm power purchase contracts of 22,000 kW from Hilo Coast Power Company ("HCPC") and 30,000 kW from Puna Geothermal Venture ("PGV"). (Four MW of dispersed diesels, installed in November and December, which are part of HELCO's contingency plan, are not included as firm capacity.) HELCO's system peak of 166,700 kW occurred on Monday, December 29, 1997, and resulted in a reserve margin of 26% over the system peak. HELCO had in place 6,600 kW of load management rates and rate riders, including Rider M, Rider T, and Schedule U. In addition, HELCO had 2.74 MW of residential and commercial & industrial DSM programs in place at the time of the system peak. These programs include a Residential Efficient Water Heating Program, Commercial & Industrial Energy Efficiency Program, Commercial & Industrial New Construction Program, and a Commercial & Industrial Customized Rebate Program. Without the DSM and off-peak rider agreements, the system peak would have been 176,040 kW, with a reserve margin of 19%.

HELCO's adequacy of supply projections for the years 1998, 1999, and 2000 are based on the following factors:

- The Forecast Planning Committee's Forecast of Sales, Peak and Sales Load Factor dated September 11, 1997, with revised DSM impacts as identified in a report titled "HELCO's DSM Modifications and Evaluation Report", dated November 15, 1997.
- The following capacity planning criteria was used to determine the need for additional generation:

The sum of the reserve ratings of all available units, minus the reserve rating of the largest available unit, minus the reserve ratings of any units on maintenance, must be equal to or greater than the system peak load to be supplied.

The Honorable Chairman and Members of the
Hawaii Public Utilities Commission
January 30, 1998
Page 2

- Contingency options/mitigation measures, as identified in HELCO's Generation Resource Contingency Plan Update #4 (which will be filed shortly), are addressed later in the specific year's attachment.
- Additional as-available energy for the years 1998, 1999, and 2000 is shown in Attachment 4.

HELCO's current supply-side resource plan includes the near term installation of two combustion turbine generators, CT-4 (20 MW) and CT-5 (20 MW), at its Keahole Generating Station, and the installation of a 60 MW dual-train combined cycle ("DTCC") qualifying cogeneration facility by Encogen Hawaii, L.P. in two phases, Phase 1 (22 MW) and Phase 2 (38 MW), near Haina, Hawaii. CT-4 and CT-5 are the first two phases of a 56 MW DTCC unit at Keahole (the third phase of which would be a steam turbine generator, ST-7).

HELCO has obtained all of the required permits and approvals for the installation of CT-4, CT-5, and ST-7. Because of continuing legal actions regarding HELCO's Amendment to the Conservation District Use Permit and appeals of HELCO's PSD/Covered Source Permit, ("air permit") to the Environmental Appeals Board ("EAB") of the U.S. Environmental Protection Agency, HELCO continues to provide the Commission with a monthly report on the status of these items. (See Docket No. 7623.) Assuming the EAB appeals are favorably resolved by June 1998 (and no stay is granted with respect to construction of the units), CT-4 and CT-5 can be installed in December 1998.

On January 16, 1998, HELCO filed an application for approval of a Power Purchase Agreement ("PPA") and an Interconnection Agreement with Encogen dated October 22, 1997. Assuming the PPA and Interconnection Agreement are approved by August 1998 (and the approvals are not appealed), and there are no delays due to an appeal of its air permit (which still must be finalized by the Hawaii Department of Health and sent to EPA for its concurrence), the two phases of the Encogen facility can be installed by April 1999 and August 1999, respectively.

HELCO's existing PPA with HCPC terminates December 31, 1999. A proposal by HCPC to provide 32 MW of capacity and energy to HELCO is currently the subject of Docket No. 97-0102. On October 21, 1997, the Commission approved HELCO's and HCPC's request that the Schedule of Proceedings in Stipulated Prehearing Order No. 15648, issued June 23, 1997, be revised, and that the date for the evidentiary hearing be continued from November 4, 1997 to January 27-28, 1998. On December 31, 1997, HCPC filed a motion for permission to submit additional rebuttal testimony and to amend the schedule. On January 12, 1998, the Commission issued an order moving the hearing date to April 29, 1998. On January 16, 1998, HELCO forwarded updated avoided cost calculations to HCPC, based on an HCPC revised pricing and technical proposal.

HELCO's contingency plans in the event of delays in the installation of CT-4 and CT-5, and/or the Encogen DTCC unit will be addressed in HELCO's Contingency Plan Update to be filed shortly in Docket No. 96-0029.



The Honorable Chairman and Members of the
Hawaii Public Utilities Commission
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1998 HELCO Adequacy of Supply

HELCO's 1998 total system capability is shown in Attachment 1 and includes firm power purchase contracts of 22,000 kW from HCPC, 30,000 kW from PGV, and 4 MW from dispersed diesels. Attachment 1 displays a month-to-month Load Service Capability ("LSC") as indicated by the dotted line. LSC is defined as the System Capability, minus all units on maintenance, minus the largest available unit. To meet the capacity planning criteria, LSC must be greater than or equal to the System Peak (load to be serviced). Numeric values of the difference between the LSC and the System Peak are shown in the Difference (MW) column. Contingency plan measures in effect are noted on the chart.

1999 HELCO Adequacy of Supply

HELCO's 1999 total system capability is shown in Attachment 2 and includes firm power purchase contracts of 22,000 kW from HCPC and 30,000 kW from PGV. 1999 capabilities assumes that CT-4 and CT-5 at the Keahole Power Plant are installed by the end of 1998. EDC phase 1 22 MW CT is assumed to be installed on April 1 and the phase 2 38 MW addition is assumed to be installed on August 1 for a total dual train combined cycle capacity of 60 MW net to HELCO.

2000 HELCO Adequacy of Supply

HELCO's 2000 total system capability is shown in Attachment 3 and includes the firm power purchase contract of 30,000 kW from PGV. HELCO's contract with HCPC for 22,000 kW of firm power terminates at the end of 1999.

Very truly yours,

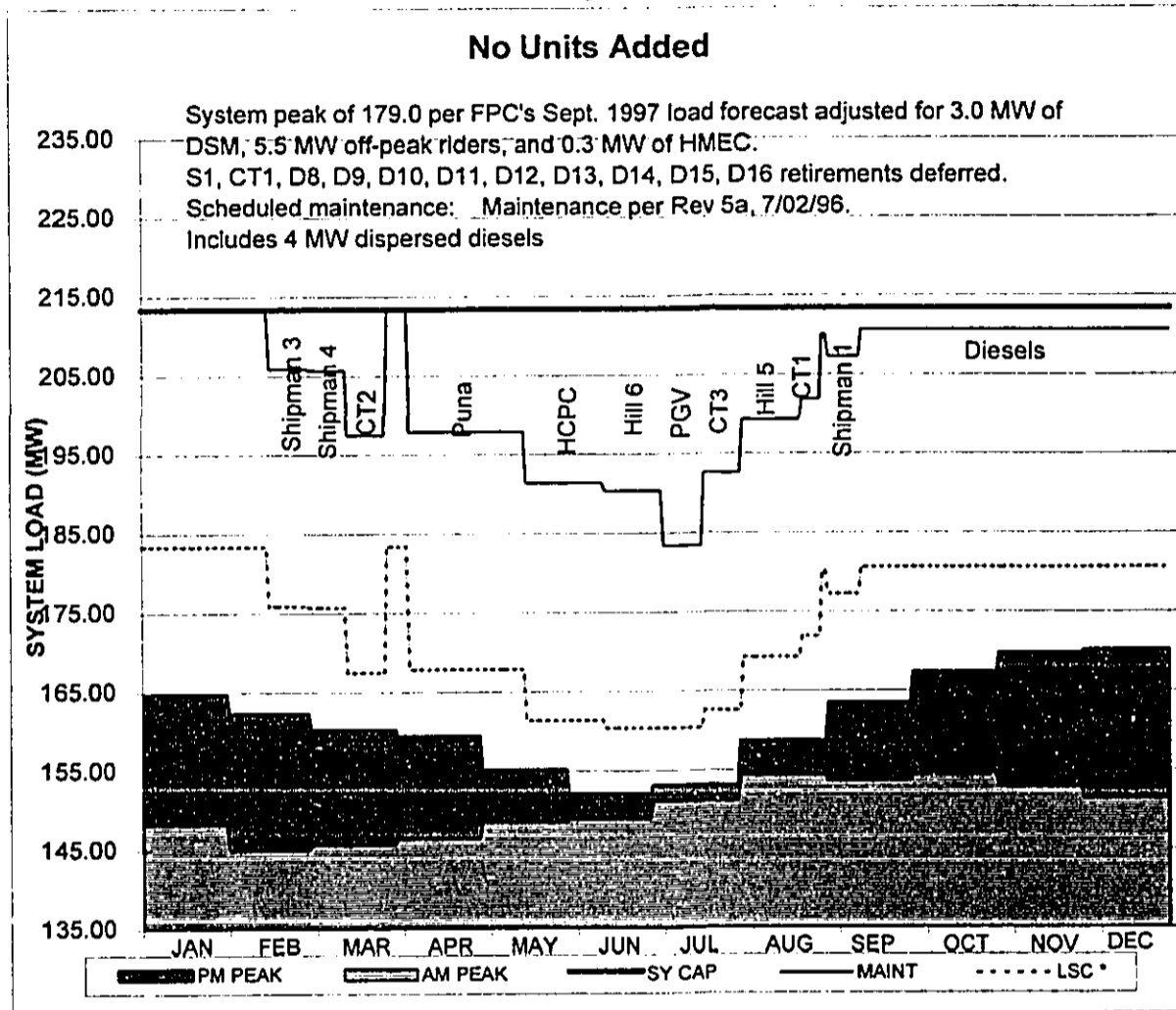
Nanea W. Lee

Attachments

cc: Division of Consumer Advocacy



1998 HELCO System Capability



* LSC is Load Service Capability (System Capacity - Maintenance - Largest Available Unit)

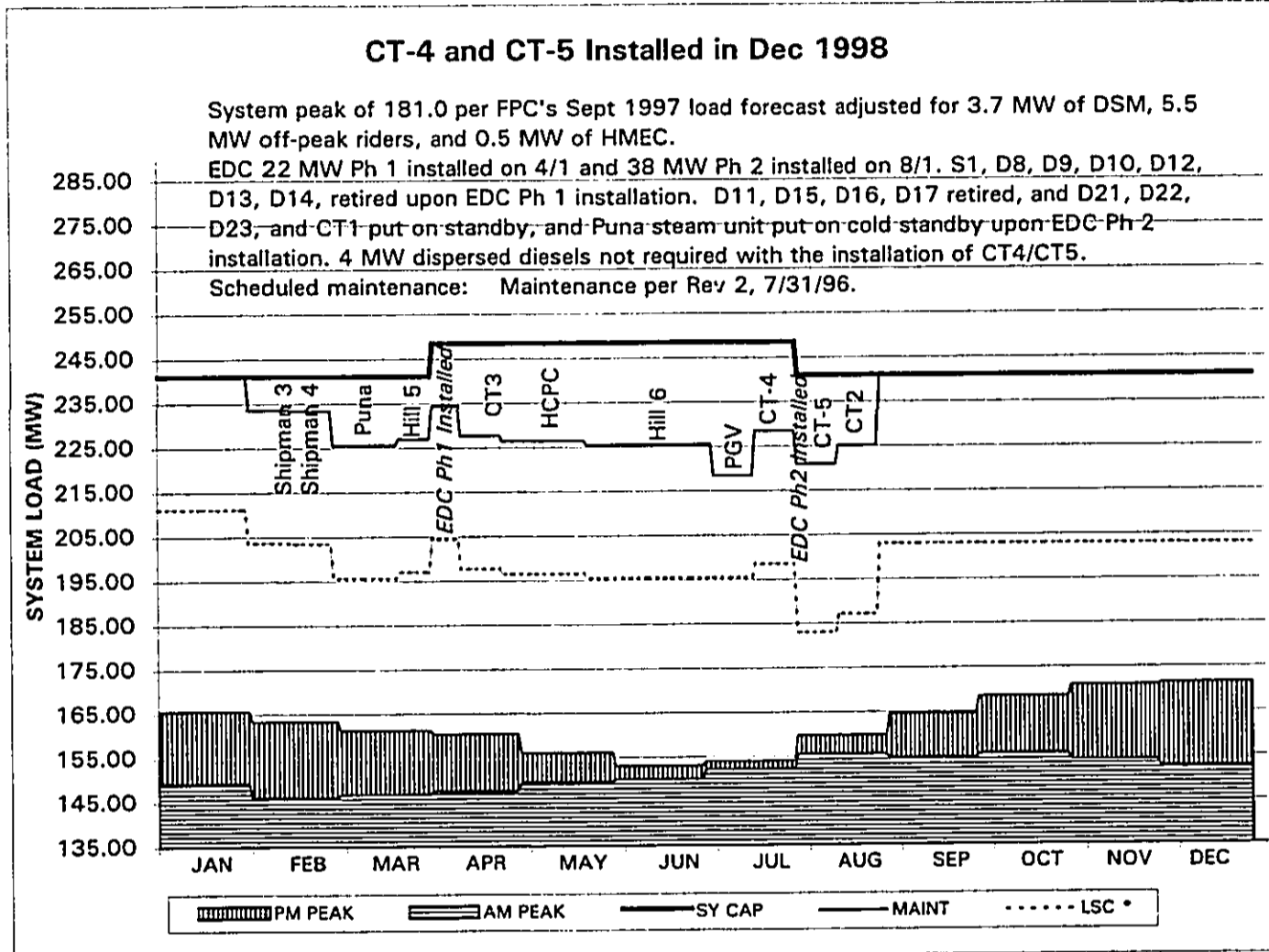
** LSC is lowest for the month

Month	AM Pk (MW)	PM Pk (MW)	Capacity (MW)	Maint (MW)	Reserve (MW)	Lrgst Avail (MW)	LSC ** (MW)	Difference (MW)
JAN	148.4	164.7	213.4	0.0	48.7	30.0	183.4	18.7
FEB	145.1	162.4	213.4	7.7	43.3	30.0	175.7	13.3
MAR	145.8	160.3	213.4	15.9	37.2	30.0	167.5	7.2
APR	146.5	159.5	213.4	15.5	38.4	30.0	167.9	8.4
MAY	148.5	155.2	213.4	22.0	36.2	30.0	161.4	6.2
JUN	149.0	152.2	213.4	23.0	38.2	30.0	160.4	8.2
JUL	151.1	153.2	213.4	30.0	30.2	23.0	160.4	7.2
AUG	154.4	158.7	213.4	20.8	33.9	30.0	162.6	3.9
SEP	153.5	163.5	213.4	6.2	43.7	30.0	177.3	13.7
OCT	154.4	167.4	213.4	2.8	43.3	30.0	180.7	13.3
NOV	152.8	169.8	213.4	2.8	40.9	30.0	180.7	10.9
DEC	151.3	170.2	213.4	2.8	40.5	30.0	180.7	10.5

NOTES:

- HELCO's Generation Resource Contingency Plan Update #4, expected to be filed shortly, reports the progress and accomplishments made toward maximizing the capacity of available generation, the additional capacity added to the system, and load management activities. The report also discusses HELCO's strategy to address uncertainties associated with the installation of the next increment of firm capacity, either HELCO's Keahole project or EDC's Hamakua project.
- Attachment 1 shows system capability without CT-4 and CT-5 capacity, which is scheduled for installation in December 1998, and includes contingency plan measures in effect.
- The December 1998 installation date for HELCO CT-4 and CT-5 at its Keahole Power Plant site assumes an estimate of 6 months to resolve the appeals to the Environmental Appeals Board to its air permit. Under the net-out provision of the air permit Keahole D-18 and D-19 (totaling 5,500 kW) are scheduled for retirement, when CT-4 is put into service and upon CT-5's installation, Unit D20 will be retired. Operation of Keahole D21 will be limited to offset NOx emissions when CT-5 is installed and Keahole D22 and D23 will operate with no limits.

1999 HELCO System Capability



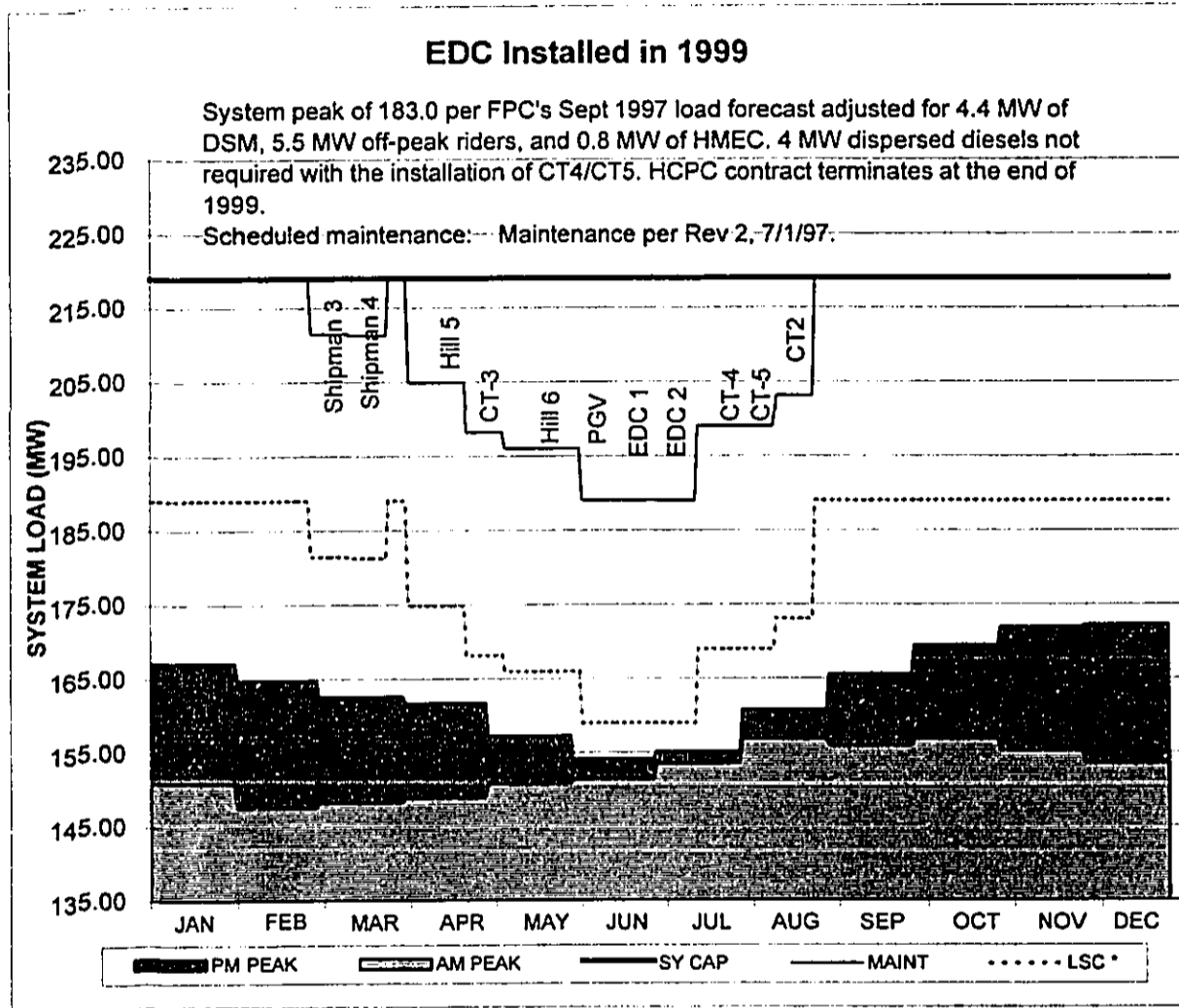
* LSC is Load Service Capability (System Capacity - Maintenance - Largest Available Unit)
 ** LSC is lowest for the month

Month	AM Pk (MW)	PM Pk (MW)	Capacity (MW)	Maint (MW)	Reserve (MW)	Lrgst Avail (MW)	LSC ** (MW)	Difference (MW)
JAN	149.3	165.6	241.2	7.5	68.0	30.0	203.7	38.0
FEB	146.1	163.3	241.2	15.5	62.4	30.0	195.7	32.4
MAR	146.8	161.2	241.2	15.5	64.4	30.0	195.7	34.4
APR	147.5	160.4	248.5	22.0	66.1	30.0	196.5	36.1
MAY	149.5	156.1	248.5	23.0	69.4	30.0	195.5	39.4
JUN	149.9	153.0	248.5	23.0	72.5	30.0	195.5	42.5
JUL	152.1	154.0	248.5	30.0	64.5	23.0	195.5	41.5
AUG	155.5	159.7	241.0	20.0	61.3	38.0	183.0	23.3
SEP	154.6	164.5	241.0	0.0	76.5	38.0	203.0	38.5
OCT	155.5	168.4	241.0	0.0	72.6	38.0	203.0	34.6
NOV	154.0	170.9	241.0	0.0	70.1	38.0	203.0	32.1
DEC	152.5	171.3	241.0	0.0	69.7	38.0	203.0	31.7

NOTES:

- EDC's installation in 1999 assumes no appeal of its air permit and no appeal of a PUC decision approving the PPA.
- Attachment 2 does not include the 4 MW of dispersed diesels, which are no longer required with the installation of CT-4 and CT-5. Units are retired with the phase 1 and phase 2 installation of EDC, as noted below. DSM programs and off-peak riders continue.
- Upon the installation of phase 1 of EDC, Shipman 1 (3,400 kW), Waimea D-8, D-9, D-10, D-12, D-13, and D-14 (totaling 11,250 kW) are scheduled for retirement. (Total of 14,650 kW to be retired.) Upon the installation of phase 2 of EDC, Kanoelehua D-11, D-15, D-16 and D-17 (totaling 10,250 kW) will be retired, and CT-1 (11,500 kW), and Keahole D-21, D-22, and D-23 (8,250 kW) will be put on standby reserve service and not counted in system capability. Puna steam unit (15,500 kW) will be put on cold standby reserve service upon the installation of phase 2 of EDC and will not be counted in system capability. (Total of 45,500 kW to be retired or put on standby.) It is expected that Puna steam unit will be returned to service when future capacity is required. The total capacity slated for retirement or standby with EDC installation is 60,150 kW.
- EDC's capacity is shown as 60 MW net to HELCO.

2000 HELCO System Capability



* LSC is Load Service Capability (System Capacity - Maintenance - Largest Available Unit)
 ** LSC is lowest for the month

Month	AM Pk (MW)	PM Pk (MW)	Capacity (MW)	Maint (MW)	Reserve (MW)	Lrgst Avail (MW)	LSC ** (MW)	Difference (MW)
JAN	151.0	167.2	219.0	0.0	51.8	30.0	189.0	21.8
FEB	147.6	164.8	219.0	7.5	46.7	30.0	181.5	16.7
MAR	148.3	162.6	219.0	7.7	48.7	30.0	181.3	18.7
APR	148.9	161.7	219.0	20.8	36.5	30.0	168.2	6.5
MAY	150.9	157.3	219.0	23.0	38.7	30.0	166.0	8.7
JUN	151.3	154.1	219.0	30.0	34.9	30.0	159.0	4.9
JUL	153.5	155.1	219.0	30.0	33.9	30.0	159.0	3.9
AUG	156.8	160.8	219.0	20.0	38.2	30.0	169.0	8.2
SEP	155.9	165.6	219.0	0.0	53.4	30.0	189.0	23.4
OCT	156.7	169.5	219.0	0.0	49.5	30.0	189.0	19.5
NOV	155.1	171.9	219.0	0.0	47.1	30.0	189.0	17.1
DEC	153.6	172.3	219.0	0.0	46.7	30.0	189.0	16.7

ATTACHMENT 3
January 30, 1998
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NOTES:

- Attachment 3 assumes the installation of EDC's dual train combined cycle facility in 1999 and that the HCPC contract terminates at the end of 1999.
- Contingency planning measures are no longer in effect. The 4 MW of dispersed diesels are not included, but the DSM programs and off-peak riders continue.

As-Available Capacity
 as of January 30, 1998

<u>UNITS</u>	<u>As-Available Capacity (kW)</u>		
	<u>1998</u>	<u>1999</u>	<u>2000</u>
<u>HELCO UNITS</u>			
Hydro			
Puueo No. 1	1,500	1,500	1,500
Puueo No. 2	750	750	750
Waiau No. 1	750	750	750
Waiau No. 2	350	350	350
Wind			
Lalamilo Wind Farm	2,280	2,280	2,280
HELCO Non-Firm Total	5,630	5,630	5,630
<u>IPP UNITS</u>			
Wailuku River Hydro	11,000	11,000	11,000
Apollo Energy	7,000	7,000	7,000
Hawi Ag & Energy	200	200	200
under 100 kW	199	199	199
IPP Non-Firm Total	18,399	18,399	18,399
TOTAL NON-FIRM	24,029	24,029	24,029



Warren H. W. Lee, P.E.
President

January 31, 1997

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PUBLIC UTILITIES
COMMISSION

The Honorable Chairman and Members of the
Hawaii Public Utilities Commission
465 South King Street
Kekuanaoa Building, 1st Floor
Honolulu, Hawaii 96813

Dear Commissioners:

Subject: Adequacy of Supply
Hawaii Electric Light Company, Inc.

In accordance with paragraph 5.3a of General Order No. 7, the following information is respectfully submitted.

HELCO's 1996 total system capability, at the time of the system peak, was 209,400 KW and included firm power purchase contracts of 22,000 KW from Hilo Coast Power Company ("HCPC") and 30,000 KW from Puna Geothermal Venture ("PGV"). HELCO's system peak of 165,800 KW occurred on Monday, November 25, 1996, and resulted in a reserve margin of 26% over the system peak. HELCO had in place 4,900 KW of off-peak Rider M Agreements and 1,600 KW of DSM programs (including free riders and preliminary estimates of the energy efficiency showerheads program) at the time of the system peak. Without the DSM and off-peak Rider M Agreements, the system peak would have been 172,300 KW, with a reserve margin of 22%.

HELCO's adequacy of supply projections for the years 1997, 1998, and 1999 are based on the following factors:

- The Forecast Planning Committee's Forecast of Sales, Peak and Sales Load Factor dated January 17, 1997, with revised DSM impacts as identified in a report titled "Updated HELCO DSM Programs", dated September 20, 1996.
- The following capacity planning criteria was used to determine the need for additional generation:

The sum of the reserve ratings of all available units, minus the reserve rating of the largest available unit, minus the reserve ratings of any units on maintenance, must be equal to or greater than the system peak load to be supplied.

- Contingency options/mitigation measures, which are addressed later in the specific year's attachment.
- Additional as-available energy for the years 1997, 1998, and 1999 is shown in Attachment 4.

The Honorable Chairman and Members of the
Hawaii Public Utilities Commission
January 31, 1997
Page 2

Please note that HELCO is currently in negotiation with a number of independent power producers regarding purchase power agreements¹. Conclusion of a firm power contract and Commission approval of that contract would substantially alter the generation capacity available to HELCO.

1997 HELCO Adequacy of Supply

HELCO's 1997 total system capability is shown in Attachment 1 and includes firm power purchase contracts of 22,000 KW from HCPC and 30,000 KW from PGV. Attachment 1 displays a month-to-month Load Service Capability ("LSC") as indicated by the dotted line. LSC is defined as the System Capability, minus all units on maintenance, minus the largest available unit. To meet the capacity planning criteria, LSC must be greater than or equal to the System Peak (load to be serviced). Actual numeric values of the difference between the LSC and the System Peak are shown in the Difference (MW) column.

1998 HELCO Adequacy of Supply

HELCO's 1998 total system capability is shown in Attachment 2 and includes firm power purchase contracts of 22,000 KW from HCPC and 30,000 KW from PGV. 1998 capabilities assumes that CT-4 and CT-5 is installed at the Keahole Power Plant in March 1, 1998, and May 1, 1998, respectively if all permits are received by June 1997². The installation of ST-7 would follow in January 1, 1999.

1999 HELCO Adequacy of Supply

HELCO's 1999 total system capability is shown in Attachment 3 and includes firm power purchase contracts of 22,000 KW from HCPC³ and 30,000 KW from PGV.

Very truly yours,

Attachments

cc: C. W. Tutto

¹ For example, see Docket No. 94-0079 regarding purchase power contract negotiations between HELCO and Enserch Development Corporation.

² See HELCO's Keahole CT-5 and ST-7, D&O 14284 Monthly Status Reports.

³ The HCPC contract terminates at the end of 1999.



1997 HELCO System Capability

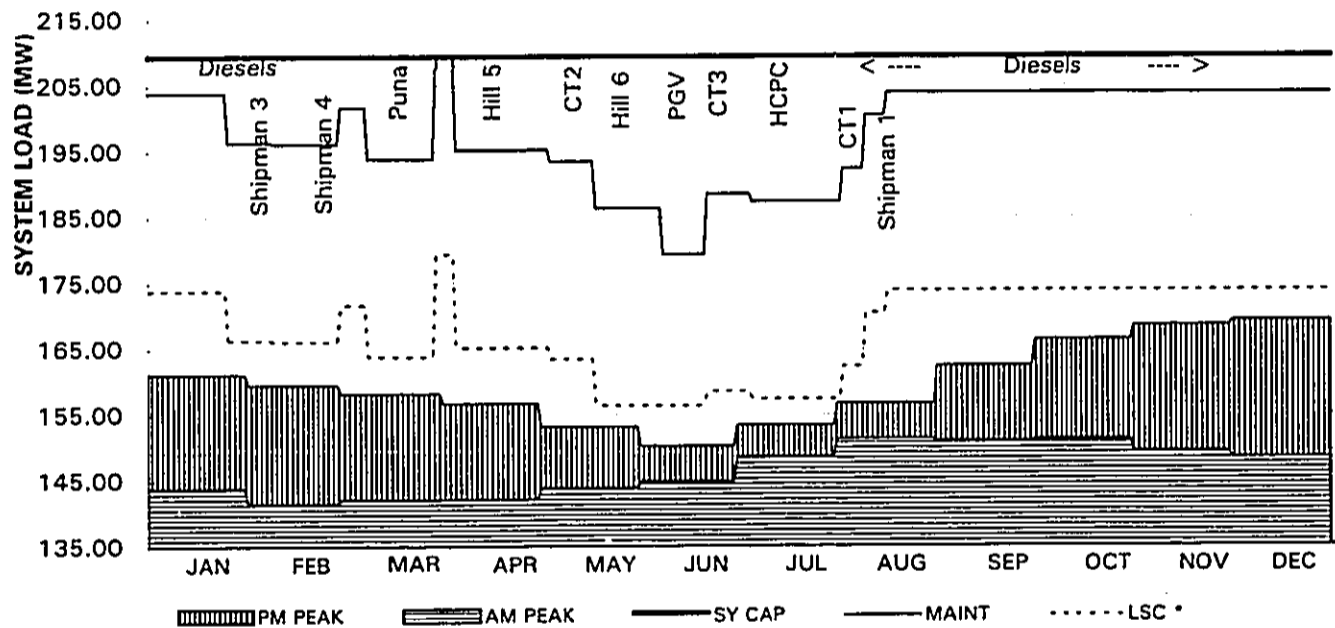
No Units Added

255.00 System peak of 176 per FPC's Jan 1996 load forecast adjusted for 2.3 MW DSM and 4.5 MW off-peak riders. DSM program implementation delayed to 1996 and ramped-up by month. PGV increased to 30 MW Oct 1, 1996.

245.00 Scheduled unit retirements:

235.00 S1, CT1, D8, D9, D10, D11, D12 deferred retirement.
 D13, D14, D15, D16 deferred retirement.

225.00 Scheduled maintenance: Maintenance per Rev 4b, 7/2/96



* LSC is Load Service Capability (System Capacity - Maintenance - Largest Available Unit)

** LSC is lowest for the month

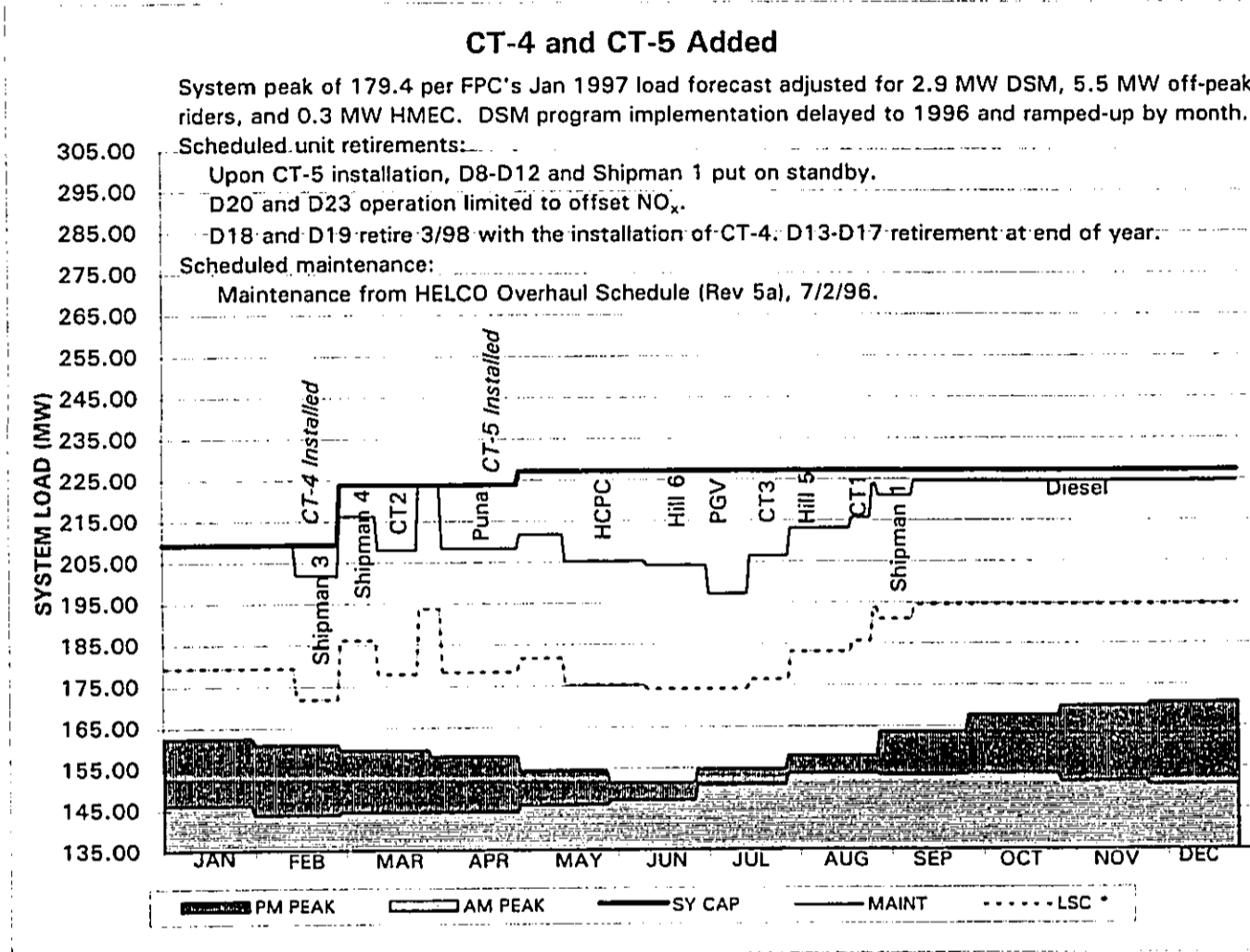
Month	AM Pk (MW)	PM Pk (MW)	Capacity (MW)	Maint (MW)	Reserve (MW)	Lrgst Avail (MW)	LSC ** (MW)	Difference (MW)
JAN	143.8	161.1	209.4	13.0	35.3	30.0	166.4	5.3
FEB	141.5	159.5	209.4	13.2	36.7	30.0	166.2	6.7
MAR	142.1	158.2	209.4	15.5	35.7	30.0	163.9	5.7
APR	142.1	156.7	209.4	14.1	38.6	30.0	165.3	8.6
MAY	143.8	153.1	209.4	23.0	33.3	30.0	156.4	3.3
JUN	144.9	150.2	209.4	30.0	29.2	23.0	156.4	6.2
JUL	148.6	153.4	209.4	22.0	34.0	30.0	157.4	4.0
AUG	151.3	156.7	209.4	22.0	30.7	30.0	157.4	0.7
SEP	150.9	162.4	209.4	5.5	41.5	30.0	173.9	11.5
OCT	151.2	166.3	209.4	5.5	37.6	30.0	173.9	7.6
NOV	149.3	168.5	209.4	5.5	35.4	30.0	173.9	5.4
DEC	148.4	169.2	209.4	5.5	34.7	30.0	173.9	4.7

NOTES:

This report assumes the following contingency options/mitigation measures have been implemented to-date:

- Performed maintenance on CT-1, which restored the capacity from 9,000 KW to a rating of 11,500 KW.
Note: During recently completed performance testing, CT-1 achieved uncorrected performance loads of 11.6-11.8 MW. However, HELCO plans to use a reserve rating of 11.5 MW for CT-1, even though the unit is capable of operating at higher loads. This represents a "conservative" estimate of the load the unit can achieve, regardless of operating conditions, e.g., temperature, humidity, cleanliness.
- Performed maintenance on diesels D-8 and D-9, which restored the capacity from 800 and 900 KW, respectively, to the nameplate ratings of 1,000 KW.
- Deferred the retirements of Units D8-12, Shipman 1, and CT-1, totaling 22,650 KW (based on restored capacities). Units D8-12 and Shipman 1 retirements are deferred until CT-5 is installed. At that time, the units will be put on standby status and not counted as firm capacity.
- Deferred the retirements of Waimea D13-D14 and Kanoelehua D15-D16 one year, to 1998.
- Submitted air permit applications to the Department of Health for five substation sites and plan to install 1 MW generators at four of the sites by late-1997. These units will be used for stand-by operation.
- Moved forward with full-scale DSM program implementation, totaling an estimated 2,200 KW peak reduction in 1997.
- Estimated 5,500 KW peak reduction due to load management, off-peak rider M agreements.
- Negotiating with other NUG developers for firm capacity.

1998 HELCO System Capability



* LSC is Load Service Capability (System Capacity - Maintenance - Largest Available Unit)
 ** LSC is lowest for the month

Month	AM Pk (MW)	PM Pk (MW)	Capacity (MW)	Maint (MW)	Reserve (MW)	Lrgst Avail (MW)	LSC ** (MW)	Difference (MW)
JAN	146.2	162.6	209.4	0.0	46.8	30.0	179.4	16.8
FEB	143.8	161.0	209.4	7.7	40.7	30.0	171.7	10.7
MAR	144.3	159.6	223.9	15.9	48.4	30.0	178.0	18.4
APR	144.4	158.0	223.9	15.5	50.4	30.0	178.4	20.4
MAY	146.1	154.4	227.3	22.0	50.8	30.0	175.3	20.8
JUN	147.2	151.5	227.3	23.0	52.7	30.0	174.3	22.7
JUL	150.9	154.7	227.3	30.0	42.6	23.0	174.3	19.6
AUG	153.7	158.0	227.3	20.8	48.4	30.0	176.5	18.4
SEP	153.3	163.8	227.3	6.2	57.3	30.0	191.1	27.3
OCT	153.6	167.8	227.3	2.8	56.7	30.0	194.5	26.7
NOV	151.7	170.0	227.3	2.8	54.5	30.0	194.5	24.5
DEC	150.7	170.7	227.3	2.8	53.8	30.0	194.5	23.8

NOTES:

- HELCO's Generation Resource Contingency Plan Update #2, dated October 1996, details the situation if Keahole CT-4, CT-5, and ST-7, or alternate firm capacity installed by Independent Power Producers, is delayed past the 1998 time frame, and recommends alternatives for meeting HELCO's 1996-1998 generation needs.
- The installation dates shown assume HELCO can install CT-4, CT-5, and ST-7 at its Keahole Power Plant site on March 1, 1998, May 1, 1998, and January 1, 1999, respectively. Additional capacity may also be installed by Independent Power Producers as well. Keahole D-18 and D-19 (totaling 5,500 KW) are scheduled for retirement on March 1, 1998, when CT-4 is put into service (as a condition of the CT-4 air permitting requirement). Upon CT-5's installation in May 1998, Units D8-12 and Shipman 1 (totaling 11,150 KW) will be put on standby service. Operation of Keahole D21 and D23 will be limited to offset NOx emissions when CT-5 is installed. Waimea D-13, D-14 and Kanoelehua D-15, D16 and D17 (totaling 13,750 KW) are scheduled for retirement in December 1998.

1999 HELCO System Capability

ST-7 Installed 1/99 and CT-6 Installed 6/99

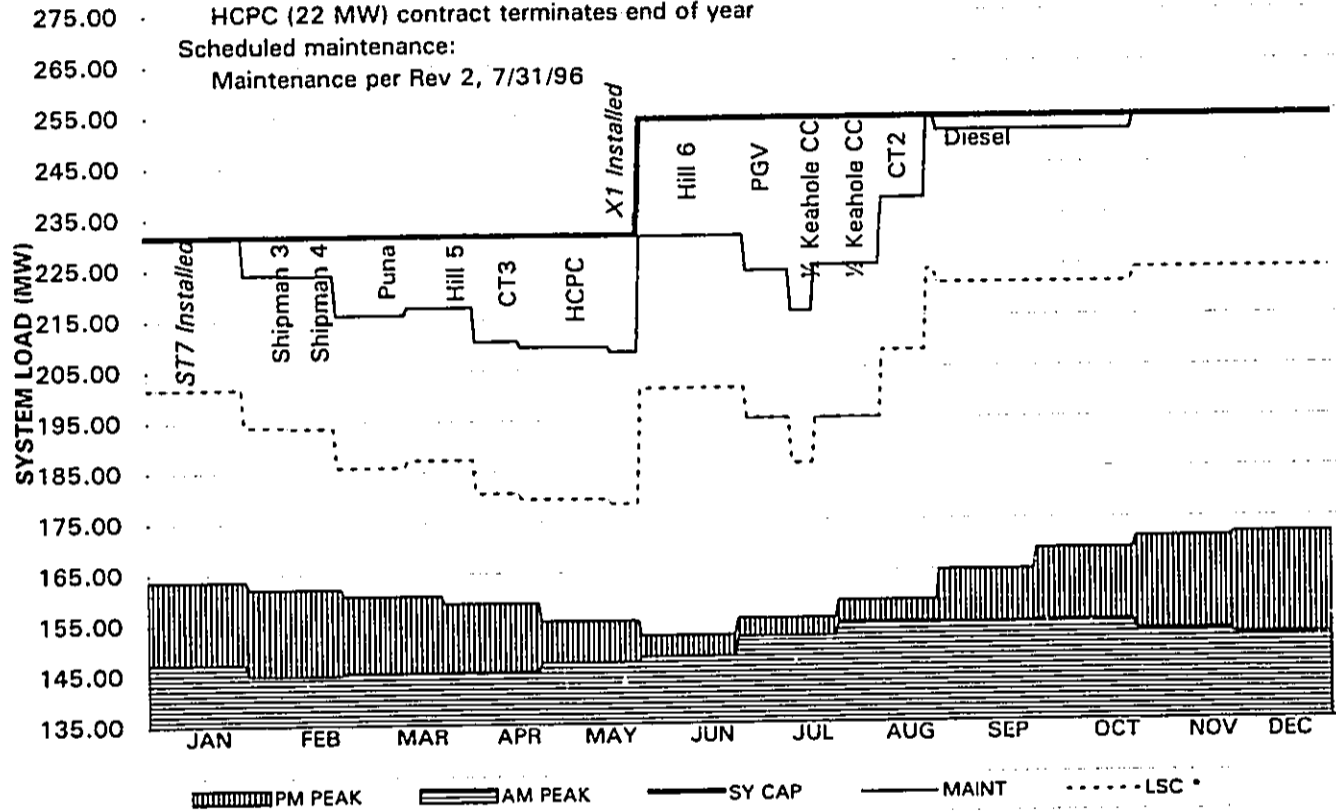
System peak of 181.4 per FPC's Jan 1997 load forecast adjusted for 3.6 MW DSM, 5.5 MW off-peak riders, and 0.5 MW HMEC.

Scheduled unit retirements:

HCPC (22 MW) contract terminates end of year

Scheduled maintenance:

Maintenance per Rev 2, 7/31/96



* LSC is Load Service Capability (System Capability - Maintenance - Largest Available Unit)

** LSC is lowest for the month

Month	AM Pk (MW)	PM Pk (MW)	Capacity (MW)	Maint (MW)	Reserve (MW)	Lrgst Avail (MW)	LSC ** (MW)	Difference (MW)
JAN	147.2	163.6	231.5	7.5	60.4	30.0	194.0	30.4
FEB	144.8	161.9	231.5	15.5	54.1	30.0	186.0	24.1
MAR	145.4	160.6	231.5	15.5	55.4	30.0	186.0	25.4
APR	145.4	159.0	231.5	22.0	50.5	30.0	179.5	20.5
MAY	147.1	155.4	231.5	23.0	53.1	30.0	178.5	23.1
JUN	148.2	152.4	254.2	23.0	78.8	30.0	201.2	48.8
JUL	152.0	155.6	254.2	38.0	60.6	29.0	186.2	30.6
AUG	154.7	159.0	254.2	29.0	66.2	30.0	195.2	36.2
SEP	154.4	164.8	254.2	2.8	86.6	30.0	221.5	56.6
OCT	154.7	168.8	254.2	2.8	82.6	30.0	221.5	52.6
NOV	152.8	171.1	254.2	0.0	83.1	30.0	224.2	53.1
DEC	151.9	171.8	254.2	0.0	82.4	30.0	224.2	52.4

As-Available Capacity
 (Greater Than 100 KW)
 as of January 31, 1997

<u>UNITS</u>	<u>As-Available Capacity (KW)</u>		
	<u>1997</u>	<u>1998</u>	<u>1999</u>
<u>HELCO UNITS</u>			
Hydro			
Puueo No. 1	1,500	1,500	1,500
Puueo No. 2	750	750	750
Waiau No. 1	750	750	750
Waiau No. 2	350	350	350
Wind			
Lalamilo Wind Farm	2,280	2,280	2,280
HELCO Non-Firm Total	5,630	5,630	5,630
<u>IPP UNITS</u>			
Wailuku River Hydro	10,000	10,000	10,000
Kamaoa Wind Partners	7,000	7,000	7,000
Hawi Agricultural Hydro	200	200	200
Kahua	365	365	365
IPP Non-Firm Total	17,565	17,565	17,565
TOTAL NON-FIRM	23,195	23,195	23,195



Warren H. W. Lee, P.E.
President

March 19, 1996

MH
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PUBLIC UTILITIES
COMMISSION

MAR 19 3 04 PM '96

FILED

The Honorable Chairman and Members of the
Hawaii Public Utilities Commission
465 South King Street
Kekuanaoa Building, 1st Floor
Honolulu, Hawaii 96813

Dear Commissioners:

Subject: Adequacy of Supply
Hawaii Electric Light Company, Inc.

In accordance with paragraph 5.3a of General Order No. 7, the following information is respectfully submitted.

HELCO's 1995 total system capability, at the time of the system peak, was 201,600 KW and included firm power purchase contracts of 22,000 KW from Hilo Coast Power Company (HCPC) and 25,000 KW from Puna Geothermal Venture (PGV). HELCO's system peak of 164,400 KW occurred on Wednesday, December 27, 1995 and resulted in a reserve margin of 23% over the system peak. HELCO had in place 3,600 KW of off-peak Rider M Agreements at the time of the system peak. Without the off-peak Rider M Agreements, the system peak would have been 168,000 KW, with a reserve margin of 20%.

HELCO's adequacy of supply projections for the years 1996, 1997, and 1998 are based on the following factors:

- The Forecast Planning Committee's Forecast of Sales, Peak and Sales Load Factor dated January 10, 1996.
- Using the following method of capacity planning criteria to determine the timing of an additional generation unit:

The sum of the reserve ratings of all available units, minus the reserve rating of the largest available unit, minus the reserve ratings of any units on maintenance, must be equal to or greater than the system peak load to be supplied.

- Contingency options/mitigation measures which are addressed later in the specific year's discussion.

The Honorable Chairman and Members of the
Hawaii Public Utilities Commission
March 19, 1996
Page 2

1996 HELCO Adequacy of Supply

HELCO's 1996 total system capability is shown in Attachment 1 and includes firm power purchase contracts of 22,000 KW from HCPC and 25,000 KW from PGV. Additional as-available energy is shown for the years 1996, 1997, and 1998 in Attachment 4. It is assumed that Keahole CT-4 and CT-5 (phases I and II of a 56,000 (net) KW dual train combined cycle unit) are not installed in 1996. In addition, the following contingency options/mitigation measures have been implemented to date:

- Deferred the retirements of Units D8-12, Shipman 1, and CT-1, totaling 19,850 KW.
- Rescheduled maintenance to further improve reserve margin, such as moving PGV from March 1996 to June 1996.
- Negotiated a short term (1995-1999) power purchase agreement for 22,000 KW of firm capacity from HCPC.
- Moved forward with full-scale DSM program implementation, totaling estimated 1,500 KW peak reduction in 1996.
- Estimated 4,500 KW peak reduction due to load management, off-peak rider M agreements.
- Continue receiving approximately 3,000 - 5,000 KW of as available energy from PGV (not included in Attachment 1) above their 25,000 KW firm power purchase contract as part of a settlement agreement for their late delivery of 25,000 KW of firm capacity. (Deliveries of this as-available energy will cease with the delivery of the additional 5,000 KW of firm capacity described in the next paragraph)
- Executed an amendment to the PGV firm capacity contract on February 12, 1996, for an additional 5,000 KW of firm capacity from PGV above their existing obligation of 25,000 KW of firm capacity. An application for this additional firm capacity has been submitted for Commission approval (Docket No. 96-0042). This 5,000 KW capability is expected to be available by October 1996.
- Negotiating with other NUG developers for firm capacity.

Attachment 1 displays a month-to-month Load Service Capability (LSC) as indicated by the dotted line. LSC is defined as the System Capability, minus all units on maintenance, minus the largest available unit. To meet the capacity planning criteria, LSC must be greater than or equal to the System Peak (load to be serviced). Actual numeric values of the difference between the LSC and the System Peak are shown in the Difference (MW) column.

Attachment 1 shows capacity planning criteria violations occurred in January and February. The violations are based on recorded system evening peaks and actual unit maintenance for the months of January and February. Although capacity planning criteria violations did occur, no generation shortfalls existed due to the availability of the largest unit.



The Honorable Chairman and Members of the
Hawaii Public Utilities Commission
March 19, 1996
Page 3

Capacity from Keahole CT-4 and CT-5 are being planned for installation in 1996 if all the regulatory and legal requirements are met. However, the additional capacity may be delayed and are thus, shown as installed in 1997. If these resources are installed in 1996, HELCO's system reliability would be improved. Additionally, HELCO's Generation Assessment and Contingency Plan Update, March 1996, further details the situation if Keahole CT-4, CT-5, and ST-7 or alternate firm capacity installed by Independent Power Producers is delayed past the 1998 time frame, and recommends alternatives for meeting HELCO's 1996-1998 generation needs. One recommendation is to proceed with the installation of 4-6 MW of temporary diesels at selected transmission and distribution substations by October 1996.

1997 HELCO Adequacy of Supply

HELCO's 1997 total system capability is shown in Attachment 2 and includes firm power purchase contracts of 22,000 KW from HCPC and 30,000 KW from PGV (assuming Commission approval of a power purchase contract with PGV for an additional 5,000 KW). In addition, the following contingency options/mitigation measures apply:

- Continue to defer the retirements of Units D8-12, Shipman 1, and CT-1, totaling 19,850 KW until after the CT-5 installation.
- Continue full-scale DSM program implementation with estimated impacts increasing to 3,000 KW.
- Estimated 4,500 KW peak reduction due to load management, off-peak rider M agreements.
- Negotiate with other NUG developers for firm capacity.

The installation dates shown assume HELCO can install CT-4, CT-5 and ST-7 at its Keahole Power Plant site in March, May, and October 1997, respectively. This capacity can also be assumed to be installed by Independent Power Producers as well. Upon CT-5's installation in May 1997, Units D8-12, Shipman 1, and CT-1 (totaling 19,850 KW) will be retired. Keahole ST-7, an 18,000 KW steam turbine (phase III of a 56,000 KW dual train combined-cycle unit), is still scheduled to be in service in October 1997. Upon construction of the ST-7 structures in March 1997, Keahole D-18 and D-19 (totaling 5,500 KW) are scheduled for retirement as a condition of the CT-4 and CT-5 permitting requirements. Waimea D-13, D-14 and Kanoelehua D-15, D16 (totaling 11,000 KW) are scheduled for retirement in December 1997.



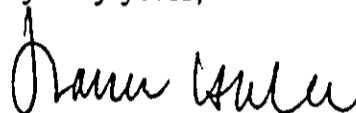
The Honorable Chairman and Members of the
Hawaii Public Utilities Commission
March 19, 1996
Page 4

1998 HELCO Adequacy of Supply

HELCO's 1998 total system capability is shown in Attachment 3 and includes firm power purchase contracts of 22,000 KW from HCPC and 30,000 KW from PGV. Kanoelehua D-17 (2,750 KW) is scheduled for retirement at the end of December 1998. In addition, the following contingency options/mitigation measures apply:

- Continue full-scale DSM program implementation with estimated impacts increasing to 5,000 KW, plus 300 KW for Hawaii Model Energy Code changes.
- Estimated 4,500 KW of peak reduction due to load management, off-peak rider M agreements.
- Evaluate repowering alternatives of either the Puna Steam Unit or Hill 5 as a contingency option or long-term resource addition.
- Install two, 2,150 KW diesel generators at a North Kohala site in March 1998 (not included in Attachment 3 capacity calculations) (Docket No. 95-0333).
- Negotiate with other NUG developers for firm capacity.

Very truly yours,

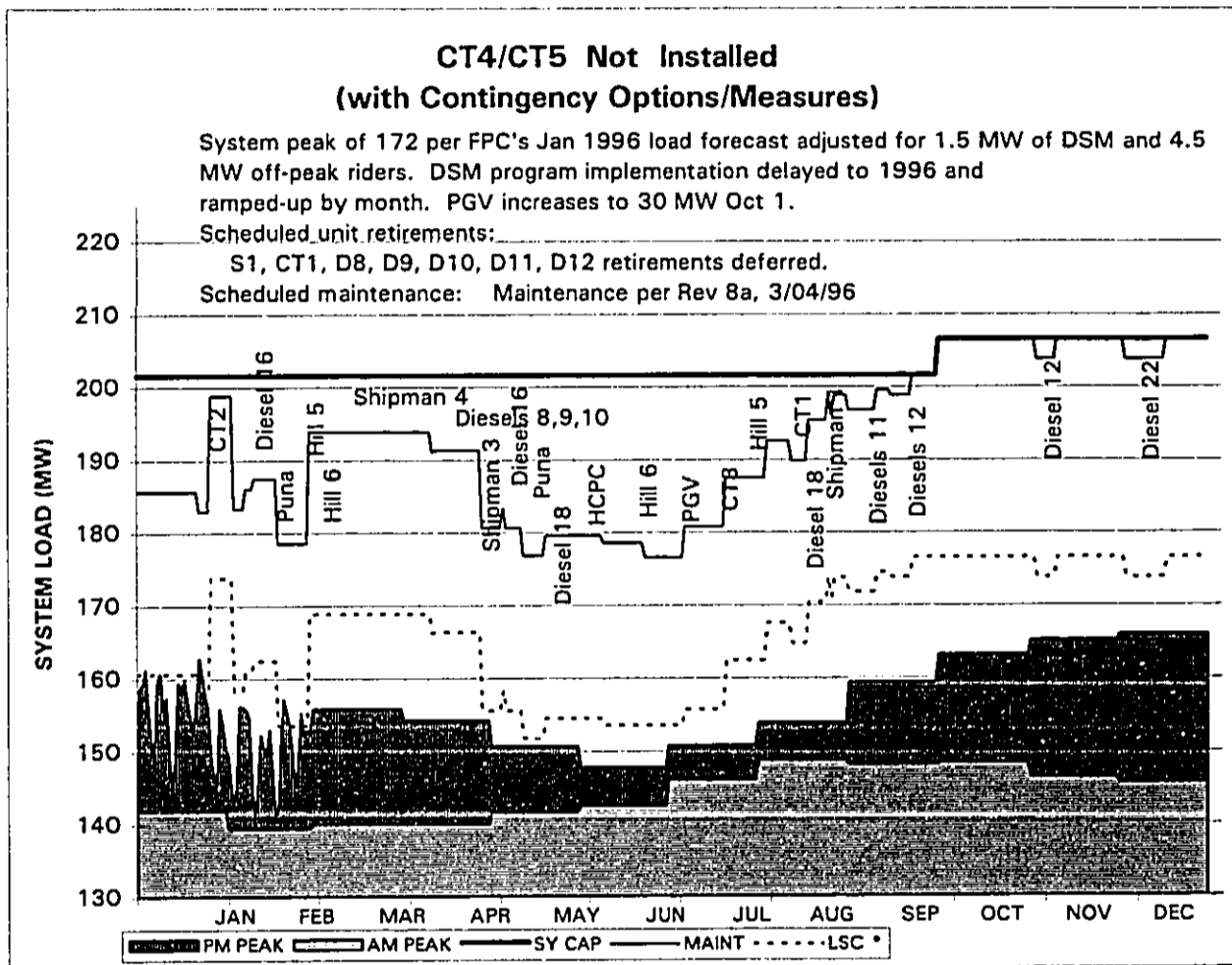


Attachments

cc: C. W. Totto



1996 HELCO System Capability



* LSC is Load Service Capability (System Capacity - Maintenance - Largest Available Unit)
 ** LSC is lowest for the month

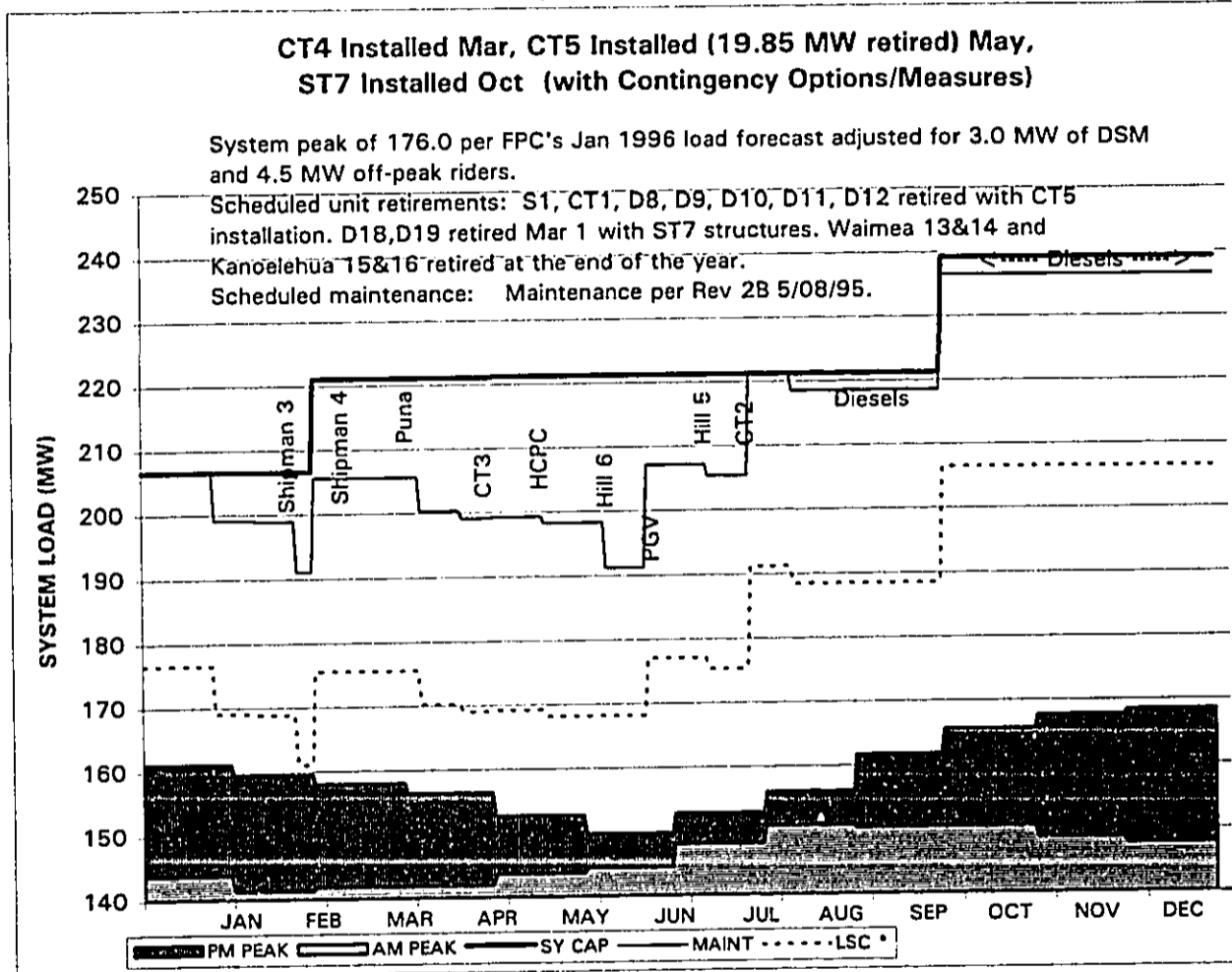
Month	Systm Pk (MW)	Systm Cap (MW)	Maint (MW)	Reserve (MW)	Lrgst Avail (MW)	LSC ** (MW)	Difference (MW)
JAN	162.9	201.6	18.7	20.1	25.0	158.0	-4.9
FEB	157.3	201.6	23.0	21.3	25.0	153.6	-3.7
MAR	155.9	201.6	7.7	38.0	25.0	168.9	13.0
APR	154.3	201.6	21.0	26.3	25.0	155.7	1.3
MAY	150.8	201.6	24.8	26.1	25.0	151.9	1.1
JUN	147.8	201.6	25.0	28.8	23.0	153.6	5.8
JUL	150.8	201.6	25.0	25.8	23.0	153.6	2.8
AUG	154.0	201.6	14.1	33.5	25.0	162.5	8.5
SEP	159.5	201.6	4.8	37.4	25.0	171.9	12.4
OCT	163.2	206.6	0.0	43.4	30.0	176.6	13.4
NOV	165.2	206.6	2.8	38.6	30.0	173.9	8.6
DEC	166.0	206.6	2.8	37.9	30.0	173.9	7.9

ATTACHMENT 2

March 19, 1996

Page 1 of 1

1997 HELCO System Capability

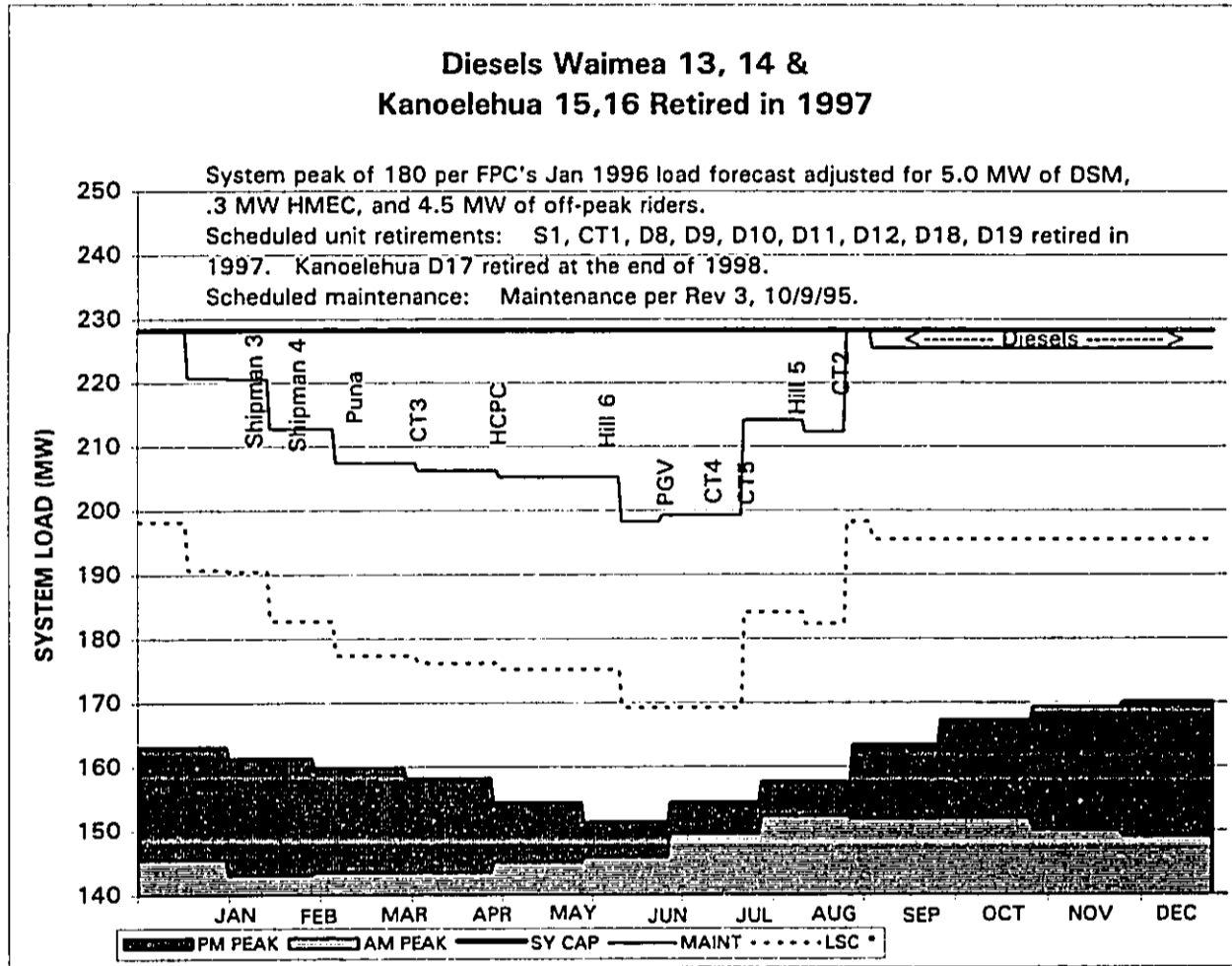


* LSC is Load Service Capability (System Capability - Maintenance - Largest Available Unit)

** LSC is lowest for the month

Month	Systm Pk (MW)	Systm Cap (MW)	Maint (MW)	Reserve (MW)	Lrgst Avail (MW)	LSC ** (MW)	Difference (MW)
JAN	161.2	206.6	7.5	37.9	30.0	169.1	7.9
FEB	159.5	206.6	15.5	31.6	30.0	161.1	1.6
MAR	158.1	221.1	15.5	47.5	30.0	175.6	17.5
APR	156.5	221.1	22.0	42.6	30.0	169.1	12.6
MAY	152.9	221.3	23.0	45.4	30.0	168.3	15.4
JUN	149.9	221.3	30.0	41.4	23.0	168.3	18.4
JUL	153.0	221.3	15.9	52.4	30.0	175.4	22.4
AUG	156.2	221.3	2.8	62.3	30.0	188.5	32.3
SEP	161.8	221.3	2.8	56.7	30.0	188.5	26.7
OCT	165.6	239.3	2.8	70.9	30.0	206.5	40.9
NOV	167.7	239.3	2.8	68.8	30.0	206.5	38.8
DEC	168.5	239.3	2.8	68.0	30.0	206.5	38.0

1998 HELCO System Capability



* LSC is Load Service Capability (System Capacity - Maintenance - Largest Available Unit)
 ** LSC is lowest for the month

Month	Systm Pk (MW)	Systm Cap (MW)	Maint (MW)	Reserve (MW)	Lrgst Avail (MW)	LSC ** (MW)	Difference (MW)
JAN	163.2	228.3	7.5	57.6	30.0	190.8	27.6
FEB	161.4	228.3	15.5	51.3	30.0	182.8	21.3
MAR	159.9	228.3	20.8	47.5	30.0	177.5	17.5
APR	158.2	228.3	22.0	48.0	30.0	176.3	18.0
MAY	154.5	228.3	23.0	50.8	30.0	175.3	20.8
JUN	151.4	228.3	30.0	46.9	29.0	169.3	17.9
JUL	154.5	228.3	29.0	44.8	30.0	169.3	14.8
AUG	157.7	228.3	15.9	54.6	30.0	182.4	24.6
SEP	163.4	228.3	2.8	62.1	30.0	195.5	32.1
OCT	167.3	228.3	2.8	58.2	30.0	195.5	28.2
NOV	169.4	228.3	2.8	56.1	30.0	195.5	26.1
DEC	170.2	228.3	2.8	55.3	30.0	195.5	25.3

As-Available Capacity
 (Greater Than 100 kw)
 as of January 31, 1996

<u>UNITS</u>	<u>As-Available Capacity (kw)¹</u>		
	<u>1996</u>	<u>1997</u>	<u>1998</u>
<u>HELCO UNITS</u>			
Hydro			
Puueo No. 1	1,500	1,500	1,500
Puueo No. 2	750	750	750
Waiau No. 1	750	750	750
Waiau No. 2	350	350	350
Wind			
Lalamilo Wind Farm	2,280	2,280	2,280
HELCO Non-Firm Total	5,630	5,630	5,630
<u>IPP UNITS</u>			
PGV	5,000		
Wailuku River Hydro	10,000	10,000	10,000
Kamaoa Wind Partners	7,000	7,000	7,000
Hawi Agricultural Hydro	200	200	200
Kahua	365	365	365
IPP Non-Firm Total	22,565	17,565	17,565
TOTAL NON-FIRM	28,195	23,195	23,195

¹ Values based on maximum contract capacity for as-available purchase power.



Warren H. W. Lee, P.E.
President

March 1, 1996

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The Honorable Chairman and Members of the
Hawaii Public Utilities Commission
465 South King Street, First Floor
Kekuanaoa Building
Honolulu, Hawaii 96813

PUBLIC UTILITIES
COMMISSION
Mar 1 10 37 AM '96
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Dear Commissioners:

Subject: 1996 Adequacy of Supply
Hawaii Electric Light Company, Inc.

cc: Helco
(Approved copy)

HELCO respectfully requests a two week extension in which to file its annual Adequacy of Supply report; from March 5 to March 19, 1996*. This request places the annual filing one day after HELCO's report is due in the Commission's Contingency Planning proceeding (Docket No. 96-0029), and will enable HELCO to incorporate its findings in the Contingency Planning proceeding in its Adequacy of Supply report. The Consumer Advocate does not object to this request.

Sincerely,

Warren H. W. Lee

cc: C. W. Tutto

REQUEST APPROVED

[Signature]
COMMISSIONER
PUBLIC UTILITIES COMMISSION
STATE OF HAWAII
DATE MAR 8 1996

* Paragraph 5.3a of G.O. No. 7 requires HELCO to file its annual Adequacy of Supply Report within 30 days after the end of the year. On February 1, 1996, the Commission approved a January 31, 1996 HELCO request for an extension of this filing until March 5, 1996, which would enable HELCO to incorporate expected February action on the pending CT-4 and CT-5 permits and HELCO purchase power contract negotiations.

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January 31, 1996

Warren H. W. Lee, P.E.
President

The Honorable Chairman and Members of the
Hawaii Public Utilities Commission
465 South King Street, First Floor
Kekuanaoa Building
Honolulu, Hawaii 96813

PUBLIC UTILITIES
COMMISSION
JAN 31 3 41 PM '96

Dear Commissioners:

cc: Helco
(Approved copy)

Subject: 1996 Adequacy of Supply
Hawaii Electric Light Company, Inc.

In accordance with paragraph 5.3a of G.O. No. 7, HELCO's Adequacy of Supply Report is due within 30 days after the end of the year. HELCO would appreciate additional time in which to prepare its annual statement indicating its adequacy of capacity; until March 5, 1996. The additional time will enable us to incorporate expected February action on the pending CT-4 and CT-5 permits and HELCO's purchase power contract negotiations. The Consumer Advocate does not object to this request.

Sincerely,

Warren H. Lee

cc: C. Tutto

REQUEST APPROVED
[Signature]
COMMISSIONER
PUBLIC UTILITIES COMMISSION
STATE OF HAWAII
DATE FEB 1 1996



Warren H. W. Lee, P.E.
President

January 31, 1995

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PUBLIC UTILITIES
COMMISSION

The Honorable Chairman and Members of the
Hawaii Public Utilities Commission
465 South King Street
Kekuanaoa Building, 1st Floor
Honolulu, Hawaii 96813

Dear Commissioners:

Subject: Adequacy of Supply
Hawaii Electric Light Company, Inc.

In accordance with paragraph 5.3a of General Order No. 7, the following information is respectfully submitted.

HELCO's instantaneous system peak occurred on Monday, December 5 and was 159,200 KW. The total system capability of HELCO had a reserve margin of 24% over the 1994 instantaneous system peak. The recorded system peak excluded 1.8 MW for six water pumping accounts which are under contract to be off-line during the peak demand hours of 5 p.m. to 9 p.m. Without this off-peak load, the system peak would have been 161,000 KW.

HELCO's 1995 total generating capability of 197,600 KW includes firm purchased power of 25,000 KW from Puna Geothermal Venture and 18,000 KW (with up to 4,000 KW additional power as described later) from Hilo Coast Processing Company.

The attached table shows the expected reserve margins over the next three years, based on the Forecast Planning Committee's 1994-1999 Sales, Peak and Sales Load Factor dated March 1, 1994.

The following method is used to determine the timing of an additional generation unit:

The sum of the reserve ratings of all available units minus the reserve rating of the largest available unit minus the reserve ratings of any units on maintenance must be equal to or greater than the system peak load to be supplied.

The Honorable Chairman and Members of the
Hawaii Public Utilities Commission
January 31, 1995
Page 2

Hamakua Sugar Company terminated power delivery to HELCO on October 5, 1994, upon completion of the last harvest. As a result, HELCO's system capability was reduced by 8 MW, from 205.6 MW to 197.6 MW.

By letter dated March 25, 1994, Hilo Coast Processing Company ("HCPC") notified HELCO of HCPC's intention to abandon the production of power on March 26, 1997 (a three year notice of intent to abandon the production of power, per HCPC's contract with HELCO). By letter dated April 22, 1994, HELCO notified HCPC of its "Preliminary Intent" to exercise its purchase option, also per the contract. By letter dated August 11, 1994, HCPC declared an impasse in negotiations with HELCO to determine the fair market value of the HCPC power plant to "a party other than HELCO" in accordance with the terms of the contract and sought to resolve the dispute by binding arbitration. HCPC completed its final harvest and discontinued sugar operations on September 2, 1994. On December 12, 1994, HCPC filed for bankruptcy and announced the closing of its power plant, which effectively suspended the arbitration proceeding. HELCO has recently negotiated an agreement with HCPC for the continued operation of the facility through 1999. A modified power purchase agreement will be submitted for Commission approval.

Subject to the modified power purchase agreement, HCPC has indicated that it can increase its power export capability to HELCO by 4 MW, as a result of discontinuing sugar operations. Currently, the export is limited to an additional 2 MW (20 MW total) due to transformer interchange limitations. The full export of an additional 4 MW (22 MW total) is expected to be available by June 1, 1995, when the transformer limitation is eliminated. For purposes of calculating reserve margins in the attached table, it has been assumed that HCPC would provide 20 MW of firm power to HELCO from January 1, 1995 through May 31, 1995 and 22 MW of firm power from June 1, 1995 and thereafter.

HELCO reached a tentative agreement with Puna Geothermal Venture ("PGV") regarding HELCO's efforts to collect sanctions from PGV for PGV's failure to meet its 25 MW capacity obligation by October 3, 1991. As of December 1994, PGV has been providing HELCO with as-available energy from 3 to 3.5 MW above the 25 MW firm power contract amount, when requested by HELCO.

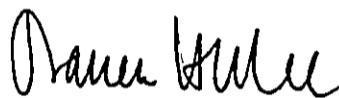


The Honorable Chairman and Members of the
Hawaii Public Utilities Commission
January 31, 1995
Page 3

The installation of the phased dual-train combined cycle unit (CT-4, CT-5, and ST-7) has been revised due to delays in obtaining approval of the Prevention of Significant Deterioration/Covered Source permit and the Conservation District Use Permit ("CDUP") amendment for the Keahole power plant site. The revised service date for CT-4 is June 1, 1996, followed by CT-5 on July 1, 1996, based on receipt of permits no later than December 28, 1995. The service dates would occur earlier in 1996, if requisite permits are received earlier. The conversion to combined cycle operation with the installation of ST-7 remains unchanged at October 1, 1997.

With this delay in the CT-4 and CT-5 service dates, the retirements of Waimea diesels 8, 9, 10, and 12, Kanoelehua diesel 11, Shipman 1, and Kanoelehua CT-1 have been deferred until CT-4 and CT-5 are in service.

Very truly yours,



Attachment

cc: C. W. Tutto



ADEQUACY OF SUPPLY
 Hawaii Electric Light Company, Inc.

Year	Year-End System Capability KW ⁽¹⁾	Without DSM		With DSM	
		System Peak KW ⁽²⁾	Reserve Margin %	System Peak KW ⁽³⁾	Reserve Margin %
Recorded 1994	197,600 ⁽⁴⁾	161,000	23	159,200	24
Forecasted 1995	201,600 ⁽⁵⁾	168,000	20	168,000	20
1996	221,750 ⁽⁶⁾	175,000	27	173,000	28
1997	223,250 ⁽⁷⁾	179,000	25	176,000	27

Notes:

- 1) The gross reserve ratings of the units are used in the determination of the system capability. HCPC capacity is assumed to be available. (See Note 5.) All unit retirements are planned for December 31 of the designated year unless otherwise noted.
- 2) The 1995 - 1997 system peaks without DSM are based on the Forecast Planning Committee's March 1, 1994 forecast.
- 3) The 1995 - 1997 system peaks with DSM are based on the Forecast Planning Committee's March 1, 1994 forecast and the DSM peak reductions are from HELCO's IRP Plan Reassessment (page 1 of Appendix D) dated June 1994, but with DSM impacts starting in 1996.
- 4) Hamakua Sugar Company terminated 8 MW power delivery on October 5, 1994.
- 5) HCPC rating is increased from 18,000 KW to 20,000 KW beginning January 1995 and is increased from 20,000 KW to 22,000 KW beginning June 1, 1995. Unit retirements previously scheduled for 1995 retirement are deferred until CT-4 and CT-5 are installed.

ADEQUACY OF SUPPLY
January 31, 1995
Page 2 of 2

- 6) Keahole CT-4, a 20,000 KW combustion turbine generator (phase I of a 58,000 KW dual train combined-cycle unit), is scheduled to be in service on June 1, 1996. Keahole CT-5, a 20,000 KW combustion turbine generator (phase II of a 58,000 KW dual train combined-cycle unit), is scheduled to be in service on July 1, 1996. Waimea D-8, 9, 10 (totalling 2.7 MW); Kanoelehua D-11 (2 MW); Waimea D-12 (2.75 MW); Shipman 1 (3.4 MW); and Kanoelehua CT-1 (9 MW) are retired after CT-4 and CT-5 are in service.
- 7) Keahole ST-7, an 18,000 KW steam turbine (phase III of a 58,000 KW dual train combined-cycle unit), is scheduled to be in service on October 1, 1997. The retirements of Keahole D-18 and D-19 (totalling 5.5 MW) are planned prior to the installation of ST-7 at Keahole as a condition to CT-4 and CT-5 permitting. Waimea D-13, 14 and Kanoelehua D-15, 16 (totalling 11 MW) are scheduled for retirement in December 1997.