

Tabulation of Open Venting at HGP-A

ATTACHMENT B

March 1982 - June 15, 1989
(7 1/3 years)

	<u>DATE</u>	<u>TIME</u>	<u>HOURS</u>	<u>REASON</u>
1982	3-1-82 thru		6 est.	Intermittent venting for load testing
	7-25-82	0000 - 0550	5 1/2	John Zink and emergency treatment trip
	7-27-82		1	John Zink trip
	8-1-82		2	County water loss
	8-11-82		4 est.	System off-line
	8-13-82 thru 8-18-82		8	John Zink repair
1983	10-7-83	0800 - 1000	2	NCG line plugged
1984	3-20-84 thru 3-21-84	0800 - 1530 0700 - 2125	7 1/2 14 1/4	Annual overhaul and system overhaul
1985	2-5-85	0800 - 1600	8	Repairs/Maintenance: Clean concrete sparger outlet pipes, service LV-B and three brine line butterfly valves.
	8-14-85 thru 8-15-85	0800 - 1600	8	Repairs/Maintenance: 1) Installed 3 each 3" brine ball valves. 2) Cleaned out and replaced concrete sparger outlet spool pieces. 3) Replaced emergency abatement caustic tower. 4) Repaired caustic pump expansion joint.
		0800 - 1600	8	

	<u>DATE</u>	<u>TIME</u>	<u>HOURS</u>	<u>REASON</u>
	9-10-85	0750 - 1550	8	
	thru			
	9-11-85	0715 - 1530	8 1/4	Annual Overhaul
	12-31-85	1500	9	
	thru			
1986	1-1-86	thru		Repairs: Replaced metal rupture disc in turbine exhaust line.
		0130	1 1/2	
	10-28-86	0830 - 1600	7 1/2	
	thru			
	10-29-86	0920 - 1400	4 1/2	Annual Overhaul
1987	4-16-87	0800 - 1500	7	Repairs:
				1) Installed 1" drain valve on the main steam line.
				2) Installed 3" ball valve on the flash separator brine line.
				3) Repaired flash separator lever trip.
	11-5-87	0800 - 1600	8	Install TPC Steam Line Interconnect
	11-11-87	0800 - 1400	6	Repair leaking brine line valve.
	11-18-87	0800 - 1500	7	Replace PV-1 bypass piping.
	11-24-87	0800 - 1600	8	
	thru			
	11-25-87	0800 - 1600	8	Annual Overhaul
	12-1-87		2	Maintenccance/Overhaul
	12-8-87		7	Maintenance/Overhaul
	12-10-87		7	Maintenance/Overhaul

	<u>DATE</u>	<u>TIME</u>	<u>HOURS</u>	<u>REASON</u>
1988	9-21-88	730 - 1400	6 1/2	Annual Overhaul
1989	2-10-89	0800 - 1400	6	Repairs: Renovate brine flow and clean the separator.
	4-25-89	0800 - 1500	7	Replace 4" separator valve.

SUMMARY OF OPEN VENTING AT HGP-A

ATTACHMENT B

<u>YEARS</u>	<u>HOURS</u> (open venting)	<u>ANNUAL PERCENTAGE</u>
10mo. 1982	18.	0.235 %
1983	2	0.025 %
1984	31 3/4	0.362 %
1985	49 1/4	0.562 %
1986	13 1/2	0.154 %
1987	60	0.685 %
1988	6 1/2	0.074 %
6mo. 1989	13	0.297 %
64240 hrs.	194.5 (8.1 days)	0.303 %

$$\frac{194.5 \text{ hrs.}}{7.33 \text{ yrs.}} = 26.5 \text{ hrs./yr. average}$$

$$= 1.11 \text{ days/year average}$$

HIGH 1987 60 hrs. (2.5 days)
 LOW 1983 2 hrs. (0.08 days)

TOTAL HOURS IN 1 YEAR 365d x 24 = 8760 hrs.

NATURAL ENERGY LABORATORY OF HAWAII

Puna Geothermal Facility

HGP-A Fact Sheet

Year	Net Kwh Generated	Cumulative Kwh	Months Operating
1982	15,252,800		9
1983	19,327,608	34,580,408	12
1984	20,646,000	55,226,408	12
1985	18,854,200	74,080,608	12
1986	17,534,600	91,615,208	12
1987	14,106,400	105,721,608	12
1988	16,225,300	121,946,908	12
1989	2,654,800	124,501,708	<u>2</u>
			83 months or 6 years 11 months thru Feb., 1989
Average	17,991,575		

Barrels of Oil Conserved
To Date

$$\frac{124,501,708 \text{ kwh}}{500 \text{ kwh/bbl}} = 249,000 \text{ bbl}$$

Barrels of Oil Conserved
per Year

$$\frac{17,991,575 \text{ kwh/yr.}}{500 \text{ kwh/bbl}} = 35,980 \text{ bbl/year}$$

NATURAL ENERGY LABORATORY OF HAWAII

Puna Geothermal Facility

HGP-A Cash Flows

Average
1983-86

1982 1983 1984 1985 1986

Annual Basis

Net KWH/yr	15252800	19327608	20646000	18854200	17534600	
Net MW Generated	1.74	2.21	2.36	2.15	2.0	
Revenues	\$823574	\$1041342	\$1260767	\$1212752	\$1082433	
Expenses wo/int.	830460	1000441	928521	1105542	923883	
Earnings/Losses	-6886	40901	332246	107210	158550	\$159730
YEAR END DEBT	\$1068688	\$940559	\$293730	\$158279	0	

Per Month Basis

Ave. KWH/mo.	1694756	1610634	1720500	1571180	1461220	
Revenues	\$91508	\$86779	\$105064	\$101063	\$90203	
Expenses wo/int.	92273	83370	77377	92128	76990	
Earnings/Losses	-765	3409	27687	8935	13213	\$13310
Highest Revenues	100908	102566	111799	120445	105095	
Lowest Revenues	67889	67425	87705	49242	82302	
Highest Costs	142229	137976	123100	119356	120638	
Lowest Costs	55798	58460	39590	58464	35496	

2 Mar 87

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