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OFFICE OF ENERGY

May 8, 2001

Mr. David Stewart-Smith, Secretary
Oregon Energy Facility Siting Council
Oregon Department of Energy
625 Marion St. N.E., Suite 1
Salem, Oregon 97301-3742

Subject: Klamath Expansion Project, a Temporary Energy Generating Facility - Request For Exemption from the Requirement for a Site Certificate

Dear Mr. Stewart-Smith:

In accordance with ORS 469.320(7)(a), as amended by 2001 SB 843, PacifiCorp Power Marketing (PPM) is submitting this request for determination that the Klamath Expansion Project (the Project) qualifies for exemption from the requirement for a Site Certificate. The Project qualifies for this exemption under ORS 469.320(2)(g). This request is submitted contingent upon 2001 SB 843 being signed by the Governor.

The Project is a temporary facility with a nominal generating capacity of 100 MW and is being proposed in response to the current and projected need for additional generating capacity in the western United States. The Project is a natural gas-fired, simple cycle, combustion turbine power generation facility that will be located adjacent the Klamath Cogeneration Project currently under construction southwest of the City of Klamath Falls. The Project will consist principally of two Pratt & Whitney FT8 Twin Pacs and will interconnect with the PacifiCorp 540 kV transmission line at the adjacent Klamath Cogeneration Project switchyard. The enclosed material (15 copies) describes the Project more fully. A check in the amount of \$2,500.00 to cover the filing fee is also enclosed.

PPM has received a Conditional Use Permit from Klamath County and has applied to the Oregon Department of Environmental Quality for an Air Contaminant Discharge Permit for the Project. The current project schedule calls for the Project to be operational by October 2001.

If you have any questions or require additional information, please contact Peter Mostow at (503) 294-9338, Thor Hibbeler at (415) 831-4121 or me at 503-813-5177.

Sincerely,

A handwritten signature in black ink, appearing to read "Richard M. Torsen".

Richard M. Torsen
Project Manager

cc: P. Mostow, Stoel, Rives
T. Hibbeler, NCI

Encl:

KLAMATH EXPANSION PROJECT

Request for Exemption

from

Requirement for a Site Certificate

Submitted by

PacifiCorp Power Marketing

May 7, 2001

KLAMATH EXPANSION PROJECT

Owner Information

The Klamath Expansion Project (the Project) is being developed by PacifiCorp Power Marketing (PPM), a wholly owned subsidiary of ScottishPower and an affiliate of PacifiCorp. Ownership of the Project will be transferred to a special purpose subsidiary of PPM prior to commencement of operations. The Project will be operated by Pacific Klamath Energy, Inc., an affiliate of PPM and the operator of the Klamath Cogeneration Project (KCP).

Project Description

The proposed Klamath Expansion Project is a natural gas-fired, combustion turbine-based, simple-cycle power generation facility. The Project is based on advanced aero-derivative gas turbine-generator design and uses four natural gas-fired combustion turbines (CTs) to generate electricity. The Project will have a nominal (new and clean) electric generating capacity of 100 MW (net) at annual average operating conditions. Natural gas will be the only fuel used.

The proposed Project will be located on approximately four acres of land leased from Collins' Products in Klamath County, outside the city limits of Klamath Falls, Oregon. The Project site is in Section 18 of Township 39 South, Range 9 East about one-half mile west of the US Highway 97 bridge over the Klamath River. The Project site will be adjacent to the southwest corner of the KCP, which is currently under construction. Exhibits 1 and 2 provide the site plan and general arrangement drawings for the Project.

The Project will consist of three major pieces of equipment: two CT-generator sets and one transformer. Each of the CT-generator sets consists of two Pratt & Whitney (P&W) model FT8 natural gas-fired combustion turbines linked to a single generator. Each of these two CT/one generator units is called a Twin Pac. Exhibit 3 provides a plan and elevation drawing for the Project equipment. The two Twin Pacs (four CTs/two generators in total) will generate electricity at 13.8 KiloVolts (kV). The Project's 13.8 – 540 kV transformer will connect the Project's output

to the PacifiCorp 540 kV transmission line at the KCP switchyard immediately north of the Project site.

The FT8 Twin Pac is a completely self-contained, automatic, gas turbine powered electric generating unit containing all the equipment necessary for local automatic operation. The Twin Pac consists of three primary units – the gas turbine unit, the generator unit, and the electrical/control unit. The Twin Pac turbine and generator units consist of two opposed industrial gas turbines directly connected through a diaphragm coupling to a single double-ended electric generator. The electrical/control unit includes the 15kV switchgear and all of the controls and instrument necessary for operation. The 15kV switchgear is connected to the generator by a prefabricated, totally enclosed, weatherproof 15 kV class bus duct. The turbine/generator and electrical control units are housed in all-weather steel enclosures including lighting and electrical services. Fire protection equipment is provided in the gas turbine enclosure.

The generating plants, as erected on site, are ready for connection to the transmission system and water and fuel supply systems. The package concept of this type of power plant coupled with their relatively small size allow these generating plants to be readily installed in almost any location and conveniently relocated or combined with other units to meet an area's changing load requirements.

Electricity generated by the Project will be supplied to the state's electrical grid via PacifiCorp's 540 kV transmission line that loops through the adjacent KCP switchyard. The Project will not require any new off-site transmission lines. Additional facilities include water injection pumps for emissions control, and other miscellaneous equipment.

Water for the Project will be acquired from the City of Klamath Falls. Project water uses will consist of demineralized water for nitrogen oxides (NO_x) emissions control (water injection) and CT inlet air (evaporative) cooling. The amount of water required for the proposed Project (approximately 125 gallons per minute) can be supplied within the city's existing water rights. The Project will generate neither a continuous nor significant amount of wastewater. Process water used (for water injection into the CT combustion systems and evaporative cooling) will be evaporated in the exhaust stacks. There will be no sanitary wastewater. Sanitary facilities of the

KCP will be used instead of locating similar facilities at the Project site, since the operating personnel of the KCP will also operate the Project. Intermittent wastewater generated by the Project, e.g., CT wash rinse water, plant drains, will be routed to a holding tank and trucked off-site for recycling/disposal or sent through a connection to the KCP's wastewater collection system.

Other ancillary services required for the Project will also be acquired from the Klamath Cogeneration Project. An interconnection will be made to the KCP air system to provide service and/or instrument air to the turbine generator systems. CT auxiliary equipment and starting power will normally be provided through a backfeed from the transmission line. The power feed for all other balance of plant equipment not provided with the P&W CT equipment will be through a connection with the KCP auxiliary power system. This auxiliary system will provide power to yard lighting, wastewater sump pumps and other balance of plant support systems.

Natural gas will be provided through Pacific Gas & Electric Gas Transmission's (PG&E GT's) Medford Lateral with a new pipeline tap and meter/regulator facility located near the existing meter/regulator station for the KCP. PG&E GT will provide the meter and regulators in a new building to be located in an easement on the south side of the existing PG&E GT right-of-way. Controls and communications equipment for the new facility is expected to be located in the existing station control building. Piping will be extended by PG&E GT to the Project's property line for interconnecting the new meter/regulator station to the Project. The on-site fuel gas system will include the necessary lateral piping, pressure relief valves, isolation valves and gas scrubbers to interconnect the PG&E GT pipeline to the CT fuel systems.

Basis for Exemption

In order to qualify for the exemption under ORS 469.320(2)(g), the Project must meet two criteria. First, it must be a "temporary generating facility" as defined in ORS 469.320(8)(b). Second, it must comply with all applicable carbon dioxide emissions standards. As demonstrated below, the Project meets both criteria.

1. The Project is a Temporary Energy Generating Facility

A “temporary energy generating facility” is defined in ORS 469.320(8)(b) as follows:

“‘Temporary energy generating facility’ means an electric power generating facility, including a thermal power plant and a combustion turbine power plant, but not including a hydropower plant, with a nominal electric generating capacity of no more than 100 megawatts that is operated for no more than 24 months from the date of initial commercial operation.”

The Project meets this definition. First, the Project is a combustion turbine electric power generating facility with a nominal electric generating capacity of 100 MW (refer to Exhibit 4). Second, the Project will be operated pursuant to ORS 469.320(2)(g) for not more than 24 months from the date of initial commercial operation.

The electrical output of the combustion turbine generating facility varies with ambient temperature such that it is possible for the new and clean capacity to exceed 100 MW at certain times. PPM will implement control limits to assure that the nominal electric generating capacity of the facility does not exceed 100 MW.

2. The Project Complies With Applicable Carbon Dioxide Emissions Standards

Because the Project is a base load generating facility, the applicable carbon dioxide emissions standard is found at OAR 345-024-0550. This standard requires that the carbon dioxide emissions rate from the Project not exceed 0.675 pounds of carbon dioxide per kilowatt hour of net electric power output. If emissions reductions are required, ORS 469.320(2)(g) requires the applicant to agree to provide appropriate funds to a qualified organization.

Table A shows the applicable parameters for calculation of the Project’s carbon dioxide emissions, including the electric generating capacity at the annual average ambient temperature and the associated heat rate.

Table B shows the gross carbon dioxide emissions from the Project over 24 months, the required emissions reductions, and the resulting amount of offset funds. Based on these calculations, the required offset funds (including contracting and selection funds) are \$312,000. The Applicant agrees to pay these funds to the Oregon Climate Trust, in a lump sum payment, prior to commencement of construction of the Project.

A. Parameters for Potential Generating Plant

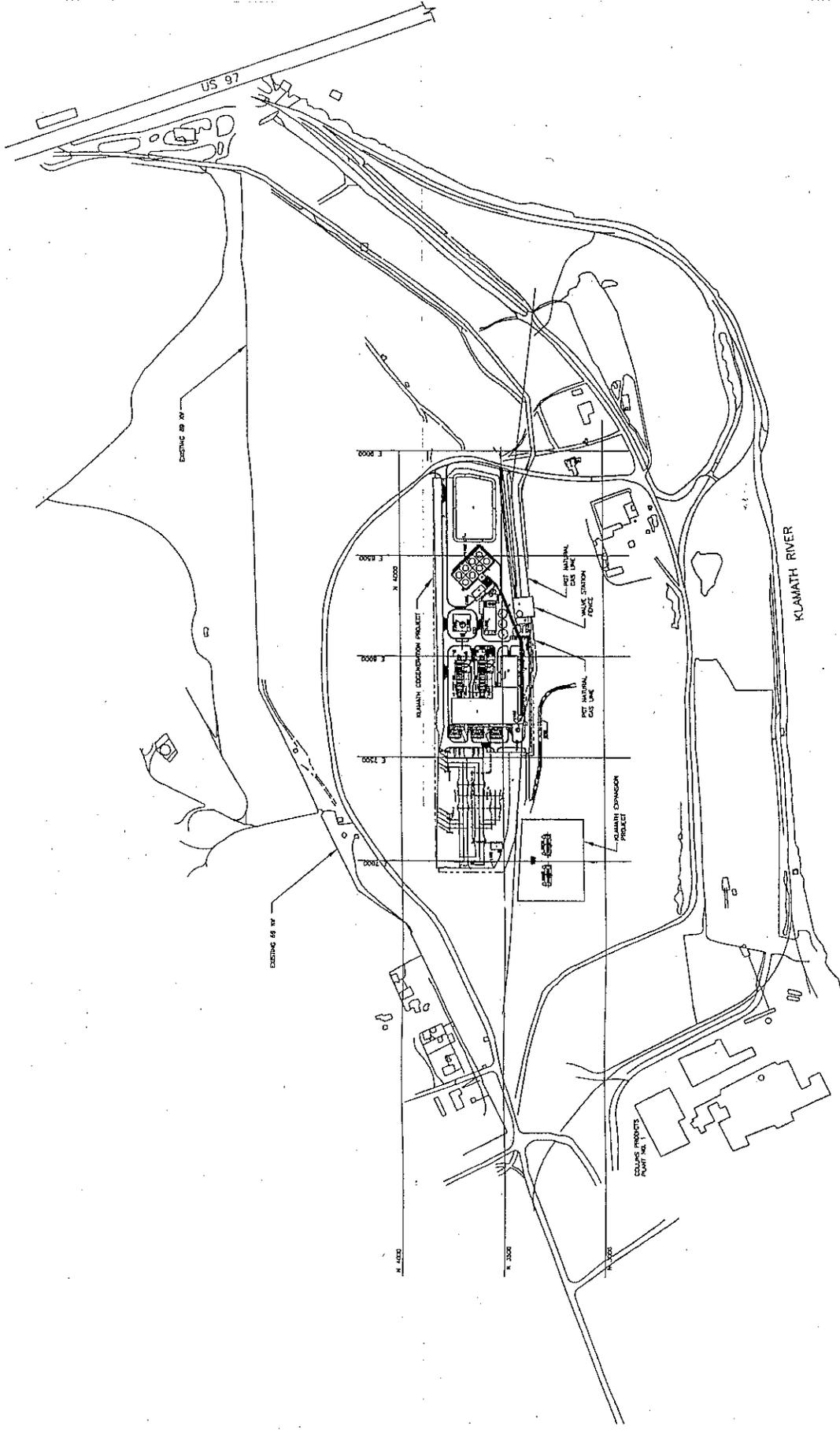
Net Power Output (kW)	101,039
New and Clean Heat Rate (Btu/kWh) HHV	10,199
Annual Hours of Operation	8,760

B. Application of CO₂ Standard to Generating Plant

Net Power Output (kW)	101,039
Capacity Factor	100%
Fuel	Natural gas
Annual Hours of Operation	8,760
Annual Generation (million kWh/yr)	885
Deemed Life of Plant (years) by Statute or Rule	2
Total Plant Output (million kWh)	1,770
Heat Rate (Btu/kWh) HHV	10,199
CO ₂ Emissions Rate (lb. CO ₂ /Btu)	0.000117
Total CO ₂ Emissions (million lb.)	2,112
Gross CO ₂ Emissions rate (lb. CO ₂ /kWh)	1.193
CO ₂ Standard (lb. CO ₂ /kWh)	0.675
Excess CO ₂ Emissions (lb. CO ₂ /kWh)	0.518
Excess Tons CO ₂ (million tons)	0.459
Offset Fund Rate (\$/ton CO ₂)	\$0.57
Offset Funds Required (\$ million)	\$0.2615
Contracting and Selection Funds (\$ million)	\$0.0505
Total Monetary Path Requirement (\$ million)	\$0.312

Exhibits:

1. Figure 1 - Site Plan
2. Figure 2 - General Arrangement
3. Figure 3 - Plan & Elevation
4. Plant Performance Values
 - a. Turbine Purchase Agreement, Article SC-8 (4 sheets)
 - b. Pratt & Whitney Proposal, Section B.2 FT-8 Equipment Overview, Performance and Emissions Data
 - c. Calculation of Annual Performance Characteristics (3 sheets)



GRAPHIC SCALE
 500 250 0 250
 (IN FEET)

SCALE
 ERI ME
 DATE
 DRAWN BY
 CHECKED BY
 DATE

KLAMATH EXPANSION PROJECT
 SITE PLAN
 FIGURE 1

PACIFICORP POWER MARKETING

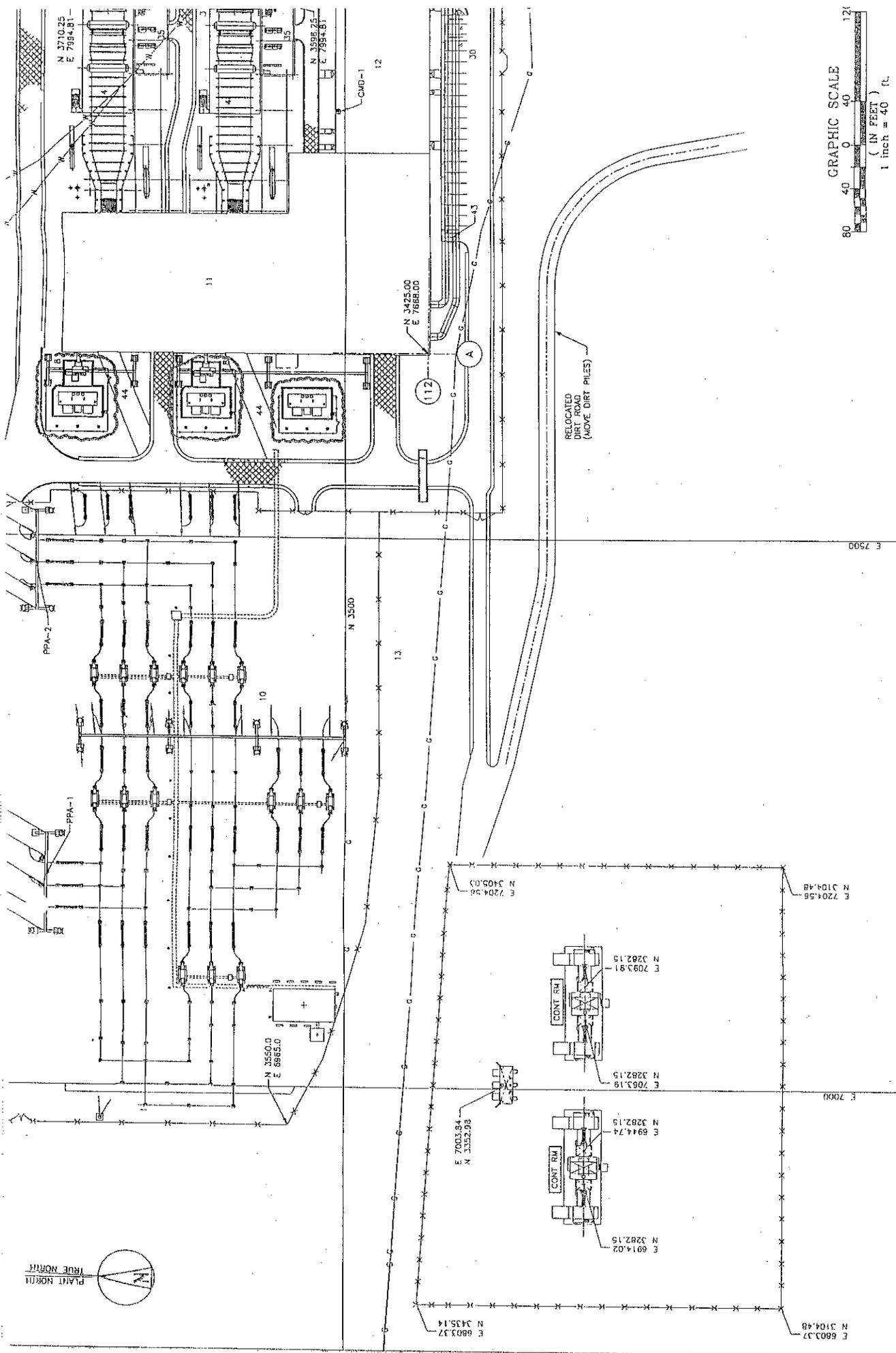
ENGINEERING
 175 W. 1000
 SUITE 100
 FAIRFIELD, CALIFORNIA 94533

CONSTRUCTION
 175 W. 1000
 SUITE 100
 FAIRFIELD, CALIFORNIA 94533

PHONE: 707-433-9984
 FAX: 707-433-9981
 EMAIL: PMP@pacifi.com

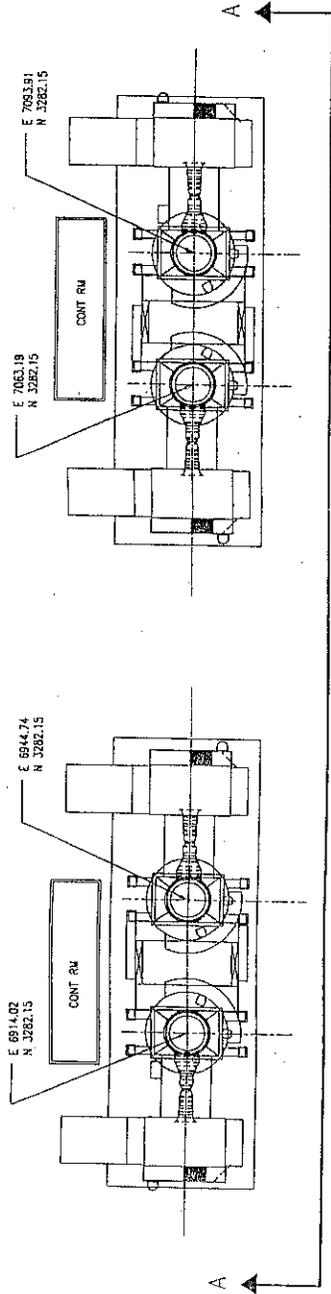
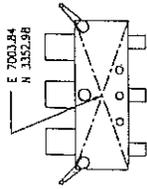
NO.	DATE	DESCRIPTION	BY	CHKD.
1	1-13-00	PRELIMINARY		
2	2-13-00	PRELIMINARY		
3	2-13-00	PRELIMINARY		
4	2-13-00	PRELIMINARY		
5	2-13-00	PRELIMINARY		
6	2-13-00	PRELIMINARY		
7	2-13-00	PRELIMINARY		
8	2-13-00	PRELIMINARY		
9	2-13-00	PRELIMINARY		
10	2-13-00	PRELIMINARY		

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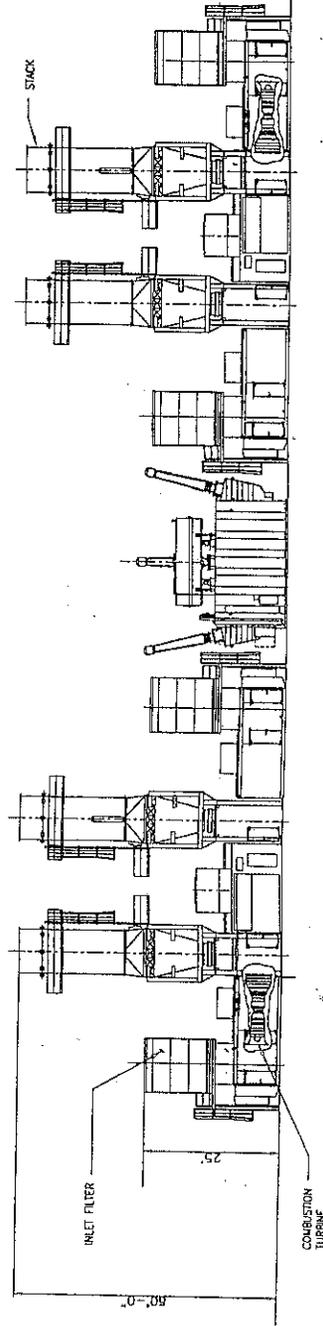


GRAPHIC SCALE
 80 40 0 40 120
 (IN FEET)
 1 inch = 40 ft.

ENGINEERING 186 THOMAS BLVD FAIRFIELD, CALIFORNIA 94533 PHONE: 707-433-9984 FAX: 707-433-9984 EMAIL: PAC@pac2k.com		CONSTRUCTION PACIFICORP POWER MARKETING	
KLAMATH EXPANSION PROJECT GENERAL ARRANGEMENT FIGURE 2		SOURCE: JOB NO. DATE: DRAWN BY: CHECKED: DESIGNED:	



PLAN



ELEVATION

NO.	DATE	BY	CHKD.	DESCRIPTION
1	3-7-01	PROJ/MANAGER		PRELIMINARY
2	3-7-01	PROJ/MANAGER		PRELIMINARY
3	3-7-01	PROJ/MANAGER		PRELIMINARY
4	3-7-01	PROJ/MANAGER		PRELIMINARY
5	3-7-01	PROJ/MANAGER		PRELIMINARY
6	3-7-01	PROJ/MANAGER		PRELIMINARY
7	3-7-01	PROJ/MANAGER		PRELIMINARY
8	3-7-01	PROJ/MANAGER		PRELIMINARY
9	3-7-01	PROJ/MANAGER		PRELIMINARY
10	3-7-01	PROJ/MANAGER		PRELIMINARY

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PACIFICORP POWER MARKETING

KLAMATH EXPANSION PROJECT
 PLAN AND ELEVATION
 FIGURE 3

TURBINE PURCHASE AGREEMENT

This Turbine Purchase Agreement ("Purchase Agreement") dated this 2nd day of March, 2001, is entered into by and between:

PacifiCorp Power Marketing, Inc. (the "Buyer"), a corporation organized and existing under the laws of Oregon and having a place of business at 830 N. E. Holladay Street, Suite 250, Portland, Oregon 97232; and

P2 Energy, LLC. (the "Seller"), a limited liability company organized and existing under the laws of Delaware and having a place of business at 1165 Northcase Parkway, Marietta, Georgia 30067;

(together, the "Parties").

WHEREAS Seller is engaged in the business of manufacturing and delivering various kinds of power plant equipment; and

WHEREAS Buyer desires to purchase two (2) FT8 Twin Pac Turbine Generator Sets and auxiliary components.

NOW, THEREFORE, in consideration of the mutual promises stated herein, the Parties agree as follows:

1. Scope of Supply

Seller shall supply the Equipment and services required under this Purchase Agreement and as further described in Exhibit 1.

2. Price

In consideration of the supply of the equipment and services Buyer shall pay to Seller the "Contract Price" as stated in Section SC-2 of the Special Conditions.

3. Schedule

Seller shall have the equipment ready to ship in accordance with the Contract Schedule as set forth in Exhibit 1 and Section SC-1 and SC-7 of the Special Conditions.

4. Contract Documents

The entire Agreement between the Parties shall consist of this Purchase Agreement and the documents described in Section SC-10 of the Special Conditions.

5. Contract Effective Date

The Purchase Agreement shall become effective when signed by both Parties.

GTG Unit #2 using Seller's Power Turbines, to be followed by a second performance test (after water washing the gas generators) just prior to the change out of Seller's Power Turbines with Buyer's new Power Turbines. The first two test calibrations, when compared to one another, will reveal the amount, if any, of permanent deterioration on the gas generators for the time they were operated since installation. Upon installation of Buyer's new Power Turbines in each GTG Unit, a third performance test will be conducted. The original performance guarantees in SC-8 (and in any Exhibits referenced therein) will then be adjusted for the deterioration, if any, that is revealed from the first two performance tests of each GTG Unit ("Adjusted Performance Guarantees"). The Adjusted Performance Guarantees will be measured against the third performance test for purposes of determining whether or not the Performance Guarantees are met.

SC-8 PERFORMANCE GUARANTEES

- 8.1 Seller guarantees to Buyer that the Electrical Capacity of each GTG Unit as determined during an Electrical Capacity Test shall be equal to or greater than the value specified in Exhibit 1 (Section B.2 FT-8 Equipment Overviews, Performance and Emissions Data) for Electrical Output.
- 8.2 Seller guarantees to Buyer that the Heat Rate of each GTG Unit as determined by a Heat Rate Test, shall be less than or equal to the value specified in Exhibit 1 (Section B.2 FT-8 Equipment Overviews, Performance and Emissions Data) for Heat Rate.
- 8.3 In the event the Equipment fails to meet the Performance Guarantees specified in SC-8.1 and 8.2, the Equipment must, at a minimum, achieve the Minimum Performance Standards in which case Seller shall be required to pay liquidated damages in accordance with SC-7.2. Failure of the Equipment to achieve the Minimum Performance Standards during performance testing at the Jobsite, shall constitute a failure by Seller to perform a material provision of the Agreement, as provided in GC-12.1.
- 8.4 Seller also guarantees to Buyer that each GTG Unit, when tested at the Jobsite in accordance with the testing criteria as agreed upon by the parties shall not exceed the guaranteed emissions levels set forth in Exhibit 1 Section B.2 (FT-8 Equipment Overviews, Performance and Emissions Data).
- 8.5 Seller guarantees to Buyer that each of the GTG Units shall function, at or below the noise level specified in Exhibit 1 Section B.2 (FT-8 Equipment Overviews, Performance and Emissions Data).

SC-9 LIMITATION OF LIABILITY

- 9.1 The total liability of the Seller under this Agreement whether based in contract, liquidated damages, warranty, tort (including negligence), strict liability, or otherwise, arising out of the performance of this Agreement or from the manufacture, sale, delivery, resale, repair, installation, technical direction of installation, replacement or use of any Equipment shall not exceed an amount equal to the Contract Price (the "Liability Cap").
- 9.2 IN NO EVENT, WHETHER AS A RESULT OF BREACH OF CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE), STRICT LIABILITY, INDEMNITY, OR OTHERWISE, SHALL SELLER (INCLUDING ITS SUBCONTRACTORS OR SUPPLIERS) OR BUYER BE LIABLE TO THE OTHER FOR LOSS OF PROFIT OR REVENUES, LOSS OF USE OF THE EQUIPMENT OR ANY ASSOCIATED EQUIPMENT, COST OF CAPITAL, COST OF SUBSTITUTE EQUIPMENT, OR SERVICES, COST OF SUBSTITUTE FACILITIES, REPLACEMENT POWER, DOWNTIME COSTS, OR CLAIMS OF BUYER'S OR SELLER'S CUSTOMERS OR FOR SPECIAL, CONSEQUENTIAL, INCIDENTAL, INDIRECT OR EXEMPLARY.

SC-10 CONTRACT DOCUMENTS ORDER OF PRECEDENCE

IN WITNESS WHEREOF the Parties have caused this document to be executed by their authorized representatives.

SELLER:

BUYER:

P2 Energy, LLC

PacifiCorp Power Marketing, Inc.

By:

[Handwritten signature: Swift Tarbell]

By:

Printed Name: SWIFT TARBELL

Printed Name: _____

Title: AREA DIRECTOR

Title: _____

Date: March 2, 2001

Date: March 2, 2001

FT8-1 Twin Pac Estimated Performance and Emissions Data PacifiCorp

Natural Gas, Water Injected to 25 PPM NOx

Guaranteed values are noted by (G); all other data is expected.

		Base Bid			Option with		
		No Evaporative Coolers			80% Effective Evap. Coolers		
Tamb	Deg F	30	60	90	30	60	90
Altitude	Feet	4150	4150	4150	4150	4150	4150
Relative Humidity	%	60	40	20	60	40	20
Inlet Temperature	Deg F	30	60	90	30	50	68
Inlet Loss	in.H2O	3.0	3.0	3.0	3.6	3.6	3.6
Exhaust Loss	in.H2O	2.0	2.0	2.0	2.0	2.0	2.0
Fuel LHV	BTU/lb	20592	20592	20592	20592	20592	20592
Gross Power	kW	53092	46934	40306	52956	49616	45376
Gross Heat Rate	BTU/kWh	9066	9248	9636	9074	9172	9346
Power Island Aux. Loads	kW	235	235	235	242	242	242
Net Power (4)	kW	52957	46699	40070 (G)	52714	49374	45134
Net Heat Rate(LHV)	BTU/kWh	9106	9295	9850 (G)	9116	9217	9396
Fuel Flow - per GT	PPH	11688	10540	9431	11668	11050	10297
GT Exh. Flow - per GT	PPS	180.0	166.7	150.6	179.7	171.9	162.4
GT Exh. Temp	Deg F	828	842	878	828	840	852
<u>Emissions at GT Exit (per GT)</u>							
NOx	PPMVD*	25.0	25.0	25 (G)	25.0	25.0	25.0
	PPH	27.4	24.7	22.1	27.3	25.9	24.1
CO	PPMVD*	80.0	80.0	80 (G)	80.0	80.0	80.0
	PPH	53.3	48.1	43.0	53.2	50.4	47.0
VOC	PPMVD*	6.0	6.0	6.0	6.0	6.0	6.0
	PPH	2.3	2.1	1.8	2.3	2.2	2.0
PM10 (Filterable)	PPH	3.0	3.0	3.0	3.0	3.0	3.0
Stack Exit Flow per GT	PPS	180.0	166.7	150.6	179.7	171.9	162.4
	ACFM	418827	392451	364670	418487	404805	386755
Stack Exit Temp	Deg F	828	842	878	828	840	852
Stack Gas Density	lb/ft3	0.0258	0.0255	0.0248	0.0258	0.0255	0.0252
<u>Stack Exh. Composition</u>							
N2	% Vol	73.13	72.94	72.75	73.12	72.59	72.16
Ar	% Vol	0.87	0.87	0.87	0.87	0.87	0.86
CO2	% Vol	3.11	3.03	3.00	3.12	3.08	3.03
H2O	% Vol	9.34	9.49	9.68	9.34	9.97	10.49
O2	% Vol	13.55	13.67	13.68	13.55	13.48	13.46

* referenced to 15% O2

2/13/01

- Notes:
1. Based on fuel composition supplied by customer. Fuel supplied to gas turbines must meet PWPS fuel specification, FR-2.
 2. Water used for injection must meet AR-1.
 3. "Separate" exhaust configuration capable of accepting CO converter.
 4. Net Power = Power measured at the generator terminals minus the indicated power island aux. loads.

Actual* Recorded Data from
 Klamath Falls 2 SSW, Oregon, Monthly Average Temperature from Western Regional Climate Center, <http://www.wrcc.dri.edu/cgi-bin/cliMONnavt.pl?orklam>

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1987	29.85	35.09	39.9	51.78	56.75 a	66.23	63.52	68.38 a	62.57	55.35	39.29 a	30.73 a	50.04
1988	26.69 d	35.98	41.56	48.28	52.15	61.58	72.1	69.52	60.35	55.65	37.17	29.27	49.19
1989	23.76	25.8	39.45 a	50.43	52.56	63.15	71.1	64.84	60.22	47.76	37.65	32.66	45.3
1990	32.81	30.68	41.34	51.3	50.08	61.05	70.79	67.35	63.1	49.5	36.48	23.55	48.17
1991	31.47	41.02	37.4	43.13	49.61	57.53	71.66	68.98	66.15	54	40.32	33.26	49.54
1992	33.69	41.45	46.08	51.7 b	54.06	66.2	70.24	71.73	61.05	53.02	37.85	26.05	51.93
1993	24.44	28.78 a	43.08	44.57	56.21	58.2	61.26	65.82	62.05	51.9	34.23	31.81	46.86
1994	35	34.32	44.52	48.17	56.44	62.88	74.31	67.24	62.67	48.08	31.38	28.98	49.5
1995	36.85	42.68	40.06	45.32	55.37	60.35	68.08	66.16	63.78	50.39	45.33	35.82	50.85
1996	33.26	36.88	42.73	47.08	51.84	62.75	73.52	69.79	59	50.35	41.2	35.03	50.29
1997	33.5	36.73	44.26	46.02	59.77	60.23	68.92	68.89	61.18	48.34	41.48	31.23	50.05
1998	36.1	36.36	41.24	45.48	47.95	60.52	72.19	71.1	61.18	48.34	35.12 q	30.72 o	51.37

* a = 1 day missing, b = 2 days missing, etc. z = 26 or more days missing.

Deleted 1989 and 1998 Due to Significant Missing Data:

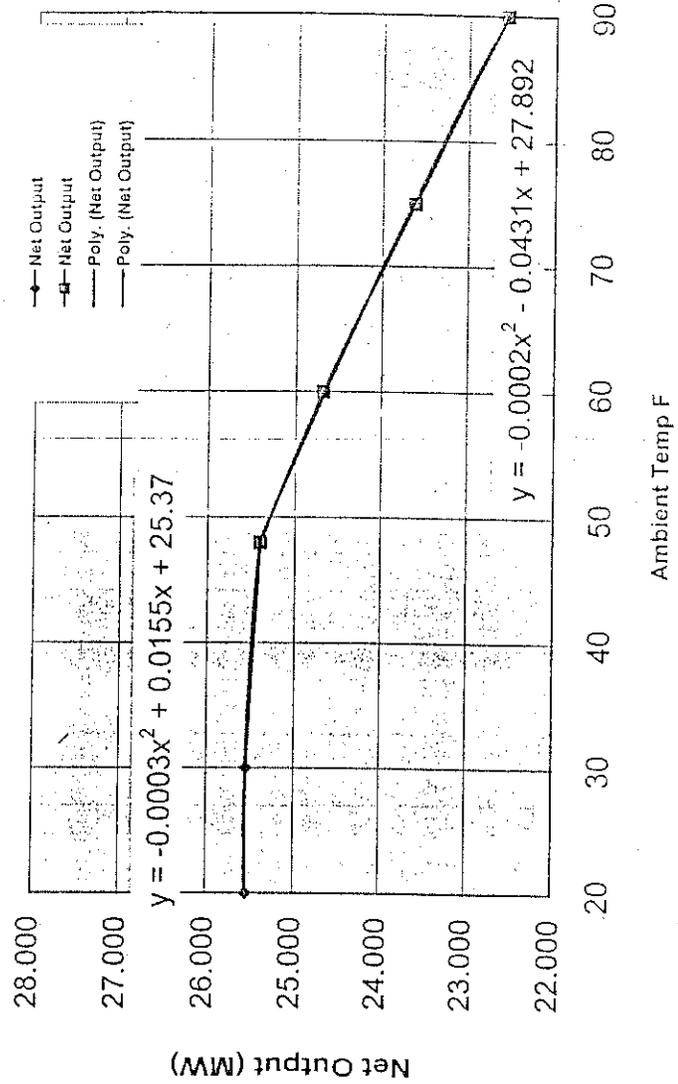
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1987	29.85	36.09	39.9	51.78	56.75 a	66.23	63.52	68.38 a	62.57	55.35	39.29 a	30.73 a	50.04
1988	26.69 d	35.98	41.56	48.28	52.15	61.58	72.1	69.52	60.35	55.65	37.17	29.27	49.19
1990	32.81	30.68	41.34	51.3	50.08	61.05	70.79	67.35	63.1	49.5	36.48	23.55	48.17
1991	31.47	41.02	37.4	43.13	49.61	57.53	71.66	68.98	66.15	54	40.32	33.26	49.54
1992	33.69	41.45	46.08	51.7 b	54.06	66.2	70.24	71.73	61.05	53.02	37.85	26.05	51.93
1993	24.44	28.78 a	43.08	44.57	56.21	58.2	61.26	65.82	62.05	51.9	34.23	31.81	46.86
1994	35	34.32	44.52	48.17	56.44	62.88	74.31	67.24	62.67	48.08	31.38	28.98	49.5
1995	36.85	42.68	40.06	45.32	55.37	60.35	68.08	66.16	63.78	50.39	45.33	35.82	50.85
1996	33.26	36.88	42.73	47.08	51.84	62.75	73.52	69.79	59	50.35	41.2	35.03	50.29
1997	33.5	36.73	44.26	46.02	59.77	60.23	68.92	68.89	61.18	48.34	41.48	31.23	50.05
1987 - 1997 Average of 10 Years	31.76	36.46	42.09	47.74	55.23	61.70	69.44	68.39	62.19	51.66	38.47	30.57	49.64

Klamath Expansion Project

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average
Mean Ambient Temperature (F)*	31.76	36.46	42.09	47.74	55.23	61.7	69.44	68.39	62.19	51.66	38.47	30.57	49.64
Hours per Month	744	672	744	720	744	720	744	744	720	744	720	744	8760
MW Hours per Month	19014	17174	19014	18273	18527	17619	17807	17863	17595	18698	18400	19014	218998
Mean Net Unit Generator Output (MW)	25.56	25.56	25.56	25.38	24.9	24.5	23.9	24.0	24.4	25.1	25.6	25.6	25.000
Mean Net Plant Generator Output (MW)	102.2	102.2	102.2	101.5	99.6	97.9	95.7	96.0	97.8	100.5	102.2	102.2	99.999

* (from sheet 3) Source is Western Regional Climate Center, <http://www.wrcc.dri.edu/>, for Klamath Falls 2 SSW

Net Generator Output vs. Ambient



Vendor Data		Performance @ Klamath Falls						Unit	4 Unit Design Case	Avg. of 4 Units Total
"New & Clean"		380	2090	3045	2045	820	380	8760		
Total Hours/Year		380	2090	3045	2045	820	380	8760		
Avg. Ambient (F)		20	30	48	60	75	90	49.64		
Operating Hours/Year		380	2090	3045	2045	820	380	8760		8760
Avg. Operating Ambient (F)		20	30	48	60	75	90	49.64		49.64
Condition	ISO	KF Winter	KF Winter	KF Winter	KF Spring	KF Summer	KF Summer			
Elevation (ft)	0	4150	4150	4150	4150	4150	4150			
Ambient Temp (F)	59	20	30	48	60	75	90			
Rel. Humidity (%)	60	60	60	50	40	30	20			
80 % Eff. Evap Cooling On?	No	No	No	No	Yes	Yes	Yes			
Engine Inlet (F)	59	20	30	48	50	59	68			
Initial New & Clean:										
Generator Net Output (MW)	27.600	25.556	25.556	25.400	24.687	23.627	22.567	24.989		99.955
Transformer Net Output (MW)	27.517	25.4793	25.479	25.324	24.613	23.558	22.499	24.914	99.655	99.856
Sustainable:										
Generator Net Output (MW)	27.048	25.045	25.045	24.892	24.193	23.154	22.116	24.489		97.956
Transformer Net Output (MW)	26.967	24.970	24.970	24.817	24.121	23.085	22.049	24.415	97.662	97.662
Net Heat Rate (Btu/kwhr, HHV)	10244	10094	10119	10180	10231	10330	10430	10199	10199	1019.2
Hourly Fuel (MMBtu/hr, HHV)	282.7	258.0	258.6	258.6	252.6	244.1	235.4	254.8	1034.4	8927.8
Annual Fuel (1000's MMBtu, HHV)								2231.9		
Daily Fuel (1000 DT/day)	6.79	6.2	6.2	6.2	6.1	5.9	5.6	6.1	24.3	24.5
Exh. Temp. (F)	838	800	828	835	840	846	852			
Exh. Flow (pph)	888000	655920	647096	628500	618660	601560	584460			
Stack Exit Elevation (ft)	60	60	60	60	60	60	60			
Water Injection (pph)	12910	11779	11808	11807	11533	11144	10747			
Water Injection (gpm)	25.9	23.7	23.7	23.7	23.2	22.4	21.6			
Water/Fuel Ratio	1.05	1.05	1.05	1.05	1.05	1.05	1.05			
Evap. Cooler Flow (pph)	0	0	0	0	1541	2047	2552			
Evap. Cooler Flow (gpm)	0	0.0	0.0	0.0	3.1	4.1	5.1			
Total Demin Water Flow (gpm)	26.9	23.7	23.7	23.7	26.3	26.5	26.7	24.69	106.3	98.76
NOx (ppmvd)	25	24.7	25	25	24.8	24.8	24.5			
NOx (pph)	29	27.3	27.3	26.5	25.9	25.3	23.9	26.34		
NOx (tons/year)		5.2	28.5	40.3	26.5	10.4	4.6	115.4		461.5
CO (ppmvd) w/o catalyst	80	80.2	80.2	79.8	79.4	79.4	78.5			
CO (pph) w/o catalyst	58.4	53.9	53.2	51.3	50.4	49.0	47.0			
CO (tons/year) w/o catalyst		10.2	55.6	78.1	51.5	20.1	8.9	224.3		897.9
CO (pph) w/catalyst		10.79	10.64	10.26	10.07	9.80	9.41	10.25		179.6
CO (tons/year) w/catalyst		2.0	11.1	15.6	10.3	4.0	1.8	44.9		
VOC (ppmvd)	6	6.0	6.0	6.0	6.0	6.0	6.0			
VOC (pph) w/o catalyst	2.4	2.29	2.26	2.19	2.16	2.10	2.04	2.19		38.3
VOC (tons/year) w/o catalyst		0.4	2.4	3.3	2.2	0.9	0.4	9.6		24.9
VOC (tons/year) w/catalyst		0.3	1.5	2.2	1.4	0.6	0.3	6.2		
Expected PM10 (pph)	1.76	1.76	1.76	1.76	1.76	1.76	1.76			
Expected PM10 (tons/year)		0.3	1.8	2.7	1.8	0.7	0.3	7.7		30.8
Inlet Pressure Drop (" H2O)	3.6	3.6	3.6	3.6	3.6	3.6	3.6			
Exhaust Pressure Drop (" H2O)	2	2	2	2	2	2	2			
Exhaust N2+AR %	74.59	73.99	73.99	73.67	73.46	73.46	73.02			
Exhaust O2 %	15.07	13.55	13.55	13.51	13.48	13.48	13.46			
Exhaust CO2 + SO2 %	2.42	3.12	3.12	3.10	3.08	3.08	3.03			
Exhaust H2O %	7.91	9.34	9.34	9.71	9.97	9.97	10.49			
Total %	99.99	100.00	100.00	99.99	99.99	99.99	100.00			

