NORTH COAST UNIFIED AIR QUALITY MANAGEMENT DISTRICT

2300 Myrtle Avenue, Eureka, CA 95501

Phone: (707) 443.3093 Fax: (707) 443.3099

ENGINEERING EVALUATION FOR PROPOSED SIGNIFICANT MODIFICATION OF TITLE V PERMIT TO OPERATE NCU 059-12

THE HUMBOLDT BAY REPOWERING PROJECT

APPLICATION #:	NCU 059-12; HBGS
EVALUATION DATE:	October 14, 2009 Rev. December 18, 2009
EVALUATION BY:	Jason L. Davis

Table of Contents

ATTACHMENTS

Authority To Construct & Prevention of Significant Deterioration Permit 443-1

Engineering Evaluation for Amendments to ATC / PSD 443-1

FACILITY NAME
Pacific Gas & Electric Company (PG&E), Humboldt Bay Generation Station (HBGS).

LOCATION OF EQUIPMENT
The project is located within a 143-acre site at 1000 King Salmon Ave, 3 miles southwest of the city of Eureka. It will be sited within the boundaries of PG&E's existing Humboldt Bay Power Plant complex which has been renamed as the Humboldt Bay Generating Station.

INTRODUCTION
Since the mid 1950's, PG&E has operated various pieces of equipment at the facility to produce electricity for commercial distribution. Currently, two natural gas fired boilers and two turbines are authorized for use under Title V Permit To Operate NCU 059-12. These existing units are nearing the end of their service life. PG&E is proposing to install a 163 MW nominal power plant consisting of ten 16.3 MW nominal dual-fuel fired reciprocating engines to replace the existing equipment. PG&E will decommission the existing power plant following commissioning of the ten 16.3 MW Wärtsilä reciprocating engines described above. Authority To Construct and a Prevention of Significant Deterioration Permit (ATC 443-1) for construction of the reciprocating engines was issued by the District on April 14, 2008. The new engines were required to demonstrate compliance with Best Available Control Technology (BACT) requirements as well as Prevention of Significant Deterioration (PSD) requirements.

Recently, PG&E has applied for a series of modifications to ATC 443-1 in order to enhance their ability to comply with permit conditions. The District has proposed to issue a revised ATC / PSD permit for the project which is the subject of a separate evaluation. Additionally, PG&E has applied for a renewal of the existing Title V permit. As a part of the renewal, two additional pieces of equipment are proposed to be added which were previously designated as insignificant equipment and have been in operation at the facility for a number of years.

APPLICATIONS SUBJECT TO REVIEW
The following applications are the subject of this evaluation.

- Application for Significant Modification – addition of devices identified in application # 025 which were previously designated as insignificant sources.
- Application for Significant Modification – addition of Wärtsilä engines and ancillary support equipment listed in ATC / PSD 443-1.
- Application for Renewal of Title V Permit To Operate

Application #025
In 2005, the District notified PG&E that several pieces of equipment previously listed as insignificant equipment on NCU 059-12 were in fact subject to District Rule 102. Consequently, PG&E applied for permits to operate in April of 2005. After review of the application materials and District Rules, the District has determined the following with regard to the devices and their respective permit applicability.

Device	Permit Required	Basis
Emergency Backup Fire Pump	Yes – Designated as "D-8"	Diesel Fired and Greater Than 50 Horse Power
Emergency Backup Generator	No	Exempt, Propane Fired District Rule 102
Emergency Black Start – Generac	Yes – Designated as "D-23"	Diesel Fired and Greater Than 50 Horse Power
Portable Gorman-Rupp Water Pump #1	No	Retired From Service
Portable Gorman-Rupp Water Pump #2	No	Retired From Service

Devices added to the Authorized Equipment Section of the Permit

Device D-8	**Fire Pump – Emergency Backup**
Manufacturer	Caterpillar
Model, Year Manufactured	3304 DI, 1993
Serial Number	83Z00622
Rating - Output	95 bhp
Device D-23	**Emergency Black Start**
Manufacturer	Generac
Model, Year Manufactured	SD130, 1999
Serial Number	G3675D18EBYLC
Rating - Output	195 bhp

The devices were previously designated as insignificant emission units and have been in operation at the facility for several years. Thus, inclusion on the authorized equipment list will not result in any actual or tangible emission increases from the facility. However, emission limits for each device are proposed to be established as indicated in the table below. Emission limits were calculated based upon regulatory limits and manufacture's data; operation of 50 hours per year was assumed. Operation will be limited to emergency events and for periodic maintenance and testing purposes. D-8 and D-23 will be retired during the decommissioning phase of the old plant and their permits surrendered.

Unit	Pollutant	g/Hp – hr	lb/hr
D-8 Fire Pump	CO	7.16	1.50
	DPM	2.34	0.5
	NOx	33.32	6.98
	ROC (non-methane HC)	3.25	0.68
	SOx	-	0.0024
D-23 Black Start Generator	CO	0.95	0.41
	DPM	0.14	0.06
	NOx	6.79	2.92
	ROC (non-methane HC)	0.42	0.18
	SOx	-	0.0781

ATC / PSD 443-1

The new plant will consist of ten Wärtsilä 18V50DF16.3 MW lean-burn reciprocating engines, equipped with selective catalytic reduction (SCR), oxidation catalyst, and associated support equipment including continuous emissions monitors. The primary fuel will be natural gas with diesel pilot injection, and the backup fuel will be diesel. The applicant will also install a diesel-fired emergency back-up generator and a diesel-fired fire pump. PG&E has identified and will be providing offsets for the project. The tables below summarize pollutant emissions during operation of the existing units and during operation of the new units.

Emissions from Existing Plant

Pollutant	Annual Emissions In tons per year
Carbon Monoxide (CO)	125.8
Oxides of Nitrogen (NOx)	1,123.3
Oxides of Sulfur (SOx)	43.3
Particulate Matter	34.4
Reactive Organic Carbon (ROC)	27.5
Hazardous Air Pollutants	0.76

Emissions from New Equipment

Pollutant	Annual Emissions In tons per year	Change in Emissions in tons per year "( )" denotes a reduction
Carbon Monoxide (CO)	172.7	46.9
Oxides of Nitrogen (NOx)	179.1	(944.1)
Oxides of Sulfur (SOx)	4.3	(38.9)
Particulate Matter (PM10)	119.8	85.4
Reactive Organic Carbon (ROC)	190.8	163.3
Hazardous Air Pollutants	25.7	24.9

Please refer to the Application For Certification (AFC), Final Determination of Compliance, and the Engineering Evaluation for ATC / PSD 443-1 for additional information. The current version of ATC / PSD 443-1 permit and the Engineering Evaluation are attached.

PM2.5 Compliance During the Commissioning Period

In order to ensure compliance with the PM2.5 standard, limits on heat input available and limits on the quantity of fuel which may be combusted by the Wartsilla engines were established. In the draft version of the Title V Permit, activity which occurred during the Commissioning Period was exempt from these limits. Based upon comments received during the public comment period, the District has elected modify Conditions #97 and #98 to include language such that fuel burned during the Commissioning Period will accrue toward the hourly, daily, and annual limits. The modifications to the conditions are found below.

97. The Permittee shall not operate reciprocating internal combustion engines S-1 through S-10 in such a manner so as to exceed the heat input capacities listed in Table 4.1 below calculated as a sum of all 10 engines. Fuel combusted during compliance testing shall not accrue toward the limitations established in this condition. *[District Rule 102 §5.0]*

Table 4.1 Heat Input Limitations S-1 Through S-10 Engines Combined

Sum of All 10 Units		Heat Input, MMBtu (HHV)		
		Hourly	**Daily**	**Annual**
Natural Gas Mode[1]	**Natural Gas**	1,439	34,536	9,277,233
	Diesel Pilot	7.9	190	51,576
Diesel Mode	**Diesel**	1,489	30,376	148,900

Note:

1) Total Heat Input in Natural Gas Mode is the sum of natural gas and diesel pilot.

~~2) This limit applies to operation for maintenance and testing, and during periods of Natural Gas Curtailments as defined in this permit. The limit shall not apply to fuel consumed during the Commissioning Period.~~

~~3) This limit was established to ensure compliance with the $PM_{2.5}$ standard~~

98. The Permittee shall not exceed the diesel fuel firing limits while operating reciprocating engines S-1 through S-10 in the modes listed below. Fuel Combusted during Compliance Testing shall not accrue toward the limitations established in this condition. *[District Rule 102 §5.0]*

A. Natural Gas Mode.

Table 4.2 Diesel Fuel Firing Limitations (Pilot)

Engines S-1 Through S-10	Gallons of Diesel Fuel		
	Hourly 3 hr rolling average	Daily (Calendar Day)	Annual 365 day rolling average
All Combined	58	1,402	376,734

B. Diesel Mode

Table 4.3 Diesel Fuel Firing Limitations

Engines S-1 Through S-10	Gallons of Diesel Fuel		
	Hourly 3 hr rolling average	Daily (Calendar Day)	Annual 365 day rolling average
Per Engine	1,088	26,106	-
All Combined	10,876	221,877	1,087,630

~~Notes:~~

~~1) This limit applies to operation for maintenance and testing, and during periods of Natural Gas Curtailments as defined in this permit. The limit shall not apply to fuel consumed during the Commissioning Period.~~

~~2) This limit was established to ensure compliance with the $PM_{2.5}$ standard (85% average load)~~

Conclusion

The proposed modifications described in this evaluation should not impede or preclude the applicant's ability to comply with all local, state, and federal emission requirements when the equipment is operated in accordance with the Authority to Construct Temporary Permit Operate #443-1 as amended. Further, staff has evaluated the information presented by the applicant and applicable rules and regulations, and believes sufficient evidence exists for the APCO to make the determinations required under District Regulation V, and to issue the proposed significant modifications to Title Permit To Operate NCU 059-12.

Evaluation Prepared by: _____ Date: 12/18/09

Jason L. Davis, Division Manager