

CALIFORNIA ENERGY COMMISSION

1516 NINTH STREET
SACRAMENTO, CA 95814-5512**DOCKET****01-AFC-24C**DATE OCT 26 2010RECD. OCT 27 2010

DATE: October 26, 2010
TO: Interested Parties
FROM: Dale Rundquist, Compliance Project Manager

**SUBJECT: Palomar Energy Center Project (01-AFC-24C)
Staff Analysis of Proposed Modifications to Install and Operate
Emergency Engine**

On April 27, 2010, San Diego Gas and Electric Company (SDG&E) owner of the Palomar Energy Center (PEC) filed a petition with the California Energy Commission (Energy Commission) to amend the Energy Commission Decision for the PEC Project. Staff prepared an analysis of this proposed change and a copy is enclosed for your information and review.

The PEC project is a 500 MW combined cycle power plant located in the City of Escondido in San Diego County. The project was certified by the Energy Commission on August 6, 2003, and began commercial operation on April 1, 2006.

The proposed modifications will allow SDG&E to operate this emergency engine in order to keep certain plant systems in a ready mode when electricity is unavailable from the SDG&E power grid. Several conditions of certification will be added in the Air Quality section of the Energy Commission Decision to address this modification.

Energy Commission staff reviewed the petition and assessed the impacts of this proposal on environmental quality and public health and safety and proposes several additions to existing conditions of certification for Air Quality. It is staff's opinion that, with the implementation of new air quality conditions, the project will remain in compliance with applicable laws, ordinances, regulations, and standards (LORS) and that the proposed modifications will not result in a significant adverse direct or cumulative impact to the environment (Title 20, California Code of Regulations, Section 1769).

The amendment petition and staff's analysis has been posted on the Energy Commission's webpage at www.energy.ca.gov/sitingcases. The Energy Commission's Order (if approved) will also be posted on the webpage. Energy Commission staff intends to recommend approval of the petition at the December 1, 2010 Business Meeting of the Energy Commission. If you have comments on this proposed modification, please submit them to me at the address below prior to November 9, 2010.

Dale Rundquist, Compliance Project Manager
California Energy Commission
1516 9th Street, MS-2000
Sacramento, CA 95814

Comments may be submitted by fax to (916) 654-3882, or by e-mail to drundqui@energy.state.ca.us. If you have any questions, please contact me at (916) 651-2072.

For further information on how to participate in this proceeding, please contact the Energy Commission Public Adviser's Office, at (916) 654-4489, or toll free in California at (800) 822-6228, or by e-mail at publicadviser@energy.state.ca.us. News media inquiries should be directed to the Energy Commission Media Office at (916) 654-4989, or by e-mail at mediaoffice@energy.state.ca.us.

Enclosure: Staff Analysis

PALOMAR ENERGY CENTER (01-AFC-24C)

Request to Amend Original Decision to Install and Operate Emergency Engine

Joseph Hughes

October 6, 2010

INTRODUCTION

On November 28, 2001, Palomar Energy, LLC filed an Application for Certification with the California Energy Commission seeking approval to construct and operate the Palomar Energy Center. The project was approved by the Energy Commission on August 6, 2003. On March 15, 2006, Palomar Energy, LLC transferred ownership of the 500 megawatt (MW) combined cycle plant to San Diego Gas & Electric Company (SDG&E). On April 27, 2010, SDG&E filed a petition to amend the original decision for the Palomar Energy Center (PEC).

The amendment would allow SDG&E to install and operate one 1,945 brake horsepower (bhp) emergency-use internal combustion engine (ICE) at PEC. The engine will be fired exclusively on pipeline quality natural gas fuel and drive a 1400 kilowatt (kW) electrical generator. This emergency-use device will be a critical service engine, meant to keep certain plant systems in a ready mode when electricity is unavailable from the SDG&E power grid (Petition to Amend).

LAWS, ORDINANCES, REGULATION, AND STANDARDS (LORS) - COMPLIANCE

The San Diego Air Pollution Control District (SDAPCD) released an Authority to Construct (ATC) on May 11, 2010 to allow installation of this unit. The ATC contains the permit conditions specified by the SDAPCD to ensure compliance with applicable federal, state, and local air quality requirements. The conditions include emissions limitations, operating limitations, and testing, monitoring, record keeping and reporting requirements that ensure compliance with air quality laws, ordinances, regulations and standards (LORS).

Air Quality Table 1 summarizes the applicable LORS for the facility.

Air Quality Table 1
Laws, Ordinances, Regulations, and Standards

Applicable LORS	Description
Federal	
42 U.S.C. §7401 et seq.	Federal Clean Air Act: New Source Review
40 CFR Part 60	Subpart JJJJ Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

State	
Health and Safety Code §38560(a)	Global Warming Solutions Act of 2006
Health and Safety Code §41700	"... no person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property."
Health and Safety Code §44300 et seq.	Air Toxics "Hot Spots" Information and Assessment Act of 1987
Local	
Regulation II, Rule 20	Standards for Granting Permits
Regulation IV, Rule 50	Visible Emissions
Regulation IV, Rule 51	Nuisance
Regulation IV, Rule 69.4.1	Stationary Reciprocating Internal Combustion Engines - BARCT

SETTING

Area designations have not changed significantly since the original commission decision. **Air Quality Table 2** summarizes area designation for the San Diego Air Pollution Control District.

Air Quality Table 2
Area Designation for San Diego Air Pollution Control District

Pollutant	Attainment Status ^a	
	Federal	State
Ozone	Nonattainment	Nonattainment
CO	Attainment	Attainment
NO ₂	Attainment	Attainment
SO ₂	Attainment	Attainment
PM10	Attainment	Nonattainment
PM2.5	Attainment	Nonattainment

Source: ARB 2010

^a Attainment = Attainment or Unclassified, where Unclassified is treated the same as Attainment for regulatory purposes.

ANALYSIS

In the event of a transmission outage while PEC is online, the transmission outage will usually cause the PEC to trip or shutdown, either for electrical protection of the grid

and/or generators, or due to insufficient or excessive load. The 1,945 bhp emergency-use ICE and generator would be used for emergency support to power critical equipment at the PEC during extended shutdowns due to loss of the transmission system. The PEC utilizes backup batteries as a first response to power critical support systems such as lube oil pumps and turning gear on turbines and generators. These batteries last about four hours and if the power is not restored within this time, permanent damage to rotors and bearings may occur. Backup support from the ICE and generator would ensure protection to critical power plant equipment beyond the four hour battery period and would allow the plant to resume operations once power transmission was restored (Petition to Amend).

With the exception of emergency support, the ICE would normally only be operated for maintenance testing purposes. The SDAPCD permit limits operation to no more than 52 hours per year for testing.

EMISSION CONTROLS

The applicant has proposed one 1,945 bhp, spark ignition, Cummins emergency generator engine, fired on natural gas. The engine would be lean burn, turbocharged and aftercooled, and would drive a 1,400 kw generator. The applicant has proposed an EPA certified engine, compliant with the New Source Performance Standards, Subpart JJJJ Standards of Performance for Stationary Spark Ignition Internal Combustion Engines, for the emergency generator. The proposed EPA engine would have the following emission guarantees:

NMHC + NOx: 1.07 gram/bhp-hour
 CO: 1.64 gram/bhp-hour
 VOC: 0.34 gram/bhp-hour
 PM10/PM2.5: 0.03 gram/bhp-hour
 SOx 0.002 gram/bhp-hour

EMISSION PROFILE

Emissions of criteria pollutants from the proposed emergency-use engine are estimated in **Air Quality Table 3**. The proposed operating schedule used to estimate the emission inventory was a maximum of 1 hour per day (hr/day) and 52 hours per year (hr/year) which is required for testing and maintenance purposes.

Air Quality Table 3
Maximum Estimated Emissions for the Emergency Engine

Pollutant	Maximum Hourly Emission Rate (lb/hr)	Maximum Daily Emission Rate (lb/day)	Maximum Annual Emission Rate (lb/year)
NMHC + NOx	4.59	4.59	238.6
CO	7.03	7.03	365.7
VOC	1.46	1.46	75.8
SOx	0.008	0.008	0.4
PM10	0.13	0.13	6.7

Source: Petition to Amend.

The original Energy Commission decision required that emission reduction credits (ERC's) in the amount of 149.3 tons/yr, be submitted to the SDAPCD to offset 124.4 tons/yr of NOx. The minute increase of approximately 0.12 tons/year of NOx from the emergency engine would be fully mitigated by the original ERC's provided and the overall plant emission limits would not change.

MODELING ANALYSIS

AECOM Environmental (AECOM) has conducted an air dispersion modeling analysis using AERMOD (version 09292) for the proposed emergency generator demonstrating compliance with the new federal 1-hour NO2 National Ambient Air Quality Standard (NAAQS). The meteorological data, building input parameters and terrain, were all obtained from the original modeling data provided for the Final Commission Decision, August 2003 (CEC). A comprehensive Cartesian receptor grid was developed for use in the AERMOD modeling. Emission rates, stack height, stack inside diameter, stack exit velocity and stack gas exit temperature, were provided by Cummins Power Generation on an engine data sheet. Some stack parameters were updated based on further design information to ensure lower project impacts. Additionally, to minimize air quality impacts, Palomar has agreed to a Condition of Certification that would limit weekly emergency generator testing to the hours between 10:00 am and 3:00 pm on any given day. Dispersion modeling shows that higher concentrations of NO2 occur during the early morning and late evening hours due to atmospheric stability. When the air is more stable, there is less turbulence and less mixing, resulting in less air pollutant dispersion and therefore usually increased air quality impacts near any single air pollution source.

For conservatism, staff has assumed 100% conversion of NOx to NO2 and added the 8th highest, three year average project impact to the maximum background concentration from 2007 to 2009 to show compliance with the 1-hour NO2 NAAQS. The background NO2 data was obtained from the Escondido East Parkway Monitoring Station. The Escondido monitoring station is located approximately two miles east of the project. Staff considers the background concentrations to be representative of the project site due to proximity of the monitoring station and prevailing wind directions. **Air Quality Table 4** provides a summary of the 1-hour NO2 modeling results.

Air Quality Table 4
1-Hour NO2 Modeling Results
All Results in Parts Per Billion (ppb)

Engine Contribution	Background	Total	Percent (%) of Standard
17.25 ¹	81 ²	98.25	98 ³

¹ 8th highest three year average. Testing restricted to 10 am to 3 pm.

² Maximum background concentration from 2007 to 2009.

³ Although the modeling results near the standard, staff considers this to be a very conservative approach. Actual impacts are expected to be significantly lower. It is unlikely for the highest background concentration from the last three years to overlap the 8th highest project contribution. The engine

During emergency situations when the emergency engine is forced to operate outside of the testing and maintenance schedule to provide back-up power to ensure protection to critical plant equipment, the background concentrations would be lower because other major plant equipment would not be operating. Staff concludes due to the conservatism of the analysis, the federal 1-hour NO₂ standard would not be exceeded during emergency situations.

CONCLUSIONS AND RECOMMENDATIONS

Staff recommends approval of the installation and operation of the 1,945 brake horsepower (bhp) emergency-use internal combustion engine (ICE) and generator. This is necessary to protect critical equipment from being damaged during extended transmission outages. With the incorporated Conditions of Certification, the project would continue to comply with all applicable LORS.

PROPOSED ADDITIONAL CONDITIONS OF CERTIFICATION

The following new conditions of certification would be amended in the Final Commission Decision for the Palomar Energy Center to ensure compliance with all applicable LORS. These are in addition to those contained in the previous decision. ~~Strikethrough~~ is used to indicate deleted language and underline for new language.

Emergency Engine Generator: Cummins engine, Model QSK60G

Conditions of Certification AQ-SC13 and AQ-56 through AQ-66 apply to the Emergency Engine Generator

AQ-SC13 Testing and maintenance of the emergency engine shall be preformed between the hours of 10:00 am and 3:00 pm, and shall not exceed one hour per week.

Verification: The project owner shall make the site available for inspection of equipment and records by representatives of the District, ARB, and the Energy Commission. The project owner shall provide records of dates and times of preformed testing and maintenance. See Verification for condition **AQ-56** for reporting requirements.

AQ-56 This internal combustion engine shall not exceed 52 hours of operation per calendar year for non-emergency purposes (testing and maintenance).

Verification: The project owner shall submit records required by Conditions **AQ-SC13, AQ-59, AQ-60, and AQ-62** and by this condition demonstrating compliance in the fourth quarter, Quarterly Operational Reports as required by condition **AQ-SC7**. The project owner shall submit a photograph of the engine hour meter as part of the

operation would be restricted to testing and maintenance purposes for one hour a week, 52 hours a year. Also, the use of 100% conversion of NO_x to NO₂ produces conservative values.

compliance report. The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-57 At no time shall the subject equipment cause or contribute to a public nuisance as specified in District Rule 51.

Verification: The project owner shall make the site available for inspection of equipment and records by representatives of the District, ARB, and the Energy Commission.

AQ-58 Visible emissions including crank case smoke shall comply with Rule 50. (Rule 50)

Verification: See verification for Condition **AQ-57**

AQ-59 Gaseous fuel engines shall use only gaseous fuel which contains no more than 10 grains of sulfur compounds, calculated as hydrogen sulfide, per 100 cubic feet of dry gaseous fuel at standard conditions. Gaseous fuels include natural gas, propane, liquefied petroleum gas (LPG), butane. Gasoline engines shall use only California reformulated gasoline.

Verification: The project owner shall make the site available for inspection of equipment and fuel purchase records by representatives of the District, ARB, and the Energy Commission. The owner shall report fuel specifications and quantity used annually. See Verification for Condition **AQ-56** for reporting requirements.

AQ-60 A non-resettable engine hour meter shall be installed on this engine, maintained in good working order, and used for recording engine operating hours. If a meter is replaced, the air pollution control district's compliance division shall be notified in writing within 10 calendar days. The written notification shall include the following information:

A. Old meter's hour reading.

B. Replacement meter's manufacturer name, model, and serial number if available and current hour reading on replacement meter.

C. Copy of receipt of new meter or installation work order.

D. A copy of the meter replacement notification shall be maintained on site and made available to the Air Pollution Control District upon request. (Rule 69.4.1)

Verification: The project owner shall make the site available for inspection of equipment and records by representatives of the District, ARB, and the Energy Commission. See Verification for condition **AQ-56** for reporting requirements.

AQ-61 The owner or operator of this engine shall conduct periodic maintenance of the engine and add-on control equipment, if any, as recommended by the engine and control equipment manufacturers or as specified by the engine servicing company's

maintenance procedures. The periodic maintenance shall be conducted at least once each calendar year. (Rule 69.4.1)

Verification: See verification for Condition AQ-57.

AQ-62 The owner or operator of this engine shall maintain an operating log containing, at a minimum, the following: dates and times of engine operation, indicating whether the operation was for non-emergency purposes or during an emergency situation and the nature of the emergency, if available (these records are not required if the total engine operations for any purpose, including emergency situation, do not exceed 52 hours in a calendar year); total cumulative hours of operation per calendar year, based on actual readings of engine hour meter; records of periodic maintenance including dates maintenance was performed.

Verification: The project owner shall make the site available for inspection of equipment and records by representatives of the District, ARB, and the Energy Commission. . See Verification for condition AQ-56 for reporting requirements.

AQ-63 All operational and maintenance logs required by this permit shall be kept a minimum of 3 years unless otherwise indicated by the conditions of this permit and these records shall be made available to the Air Pollution Control District upon request.

Verification: See verification for Condition AQ-57.

AQ-64 The owner or operator of the engine shall maintain the following records on site for at least the same period of time as the engine to which the records apply is located at the site:

A. Applicable fuel certification.

B. Manual of recommended maintenance provided by the manufacturer, or maintenance procedures specified by the engine servicing company.

C. Records of the annual engine maintenance including date the maintenance was performed. These records shall be made available to the Air Pollution Control District upon request. (Rule 69.4.1)

Verification: See verification for Condition AQ-57.

AQ-65 The permittee shall, upon determination of applicability and written notification by the District, comply with all applicable requirements of the Air Toxics “Hot Spots” Information and Assessment Act (California Health and Safety Code Section 44300 et seq.)

Verification: See verification for Condition AQ-57.

AQ-66 This Air Pollution Control District Permit does not relieve the holder from obtaining permits or authorizations required by other government agencies.

Verification: See verification for Condition **AQ-57.**

REFERENCES

AECOM – AECOM Environment, NO₂ Dispersion Modeling Analysis for Palomar Energy Center Emergency Generator, September 2010.

ARB - California Air Resources Board, Ambient Air Quality Standards, Area Designations <http://www.arb.ca.gov/desig/desig.htm> May 2010.

ARB2010 - California Air Resources Board, Historical Air Quality Data, Top 4 Summary Nitrogen Dioxide <http://www.arb.ca.gov/adam/topfour/topfourdisplay.php> October 2010.

CEC- California Energy Commission, Final Commission Decision, Palomar Energy Project (01-AFC-24), August 2003.

Petition to Amend - San Diego Gas & Electric Company, Petition to Amend Original Decision, Install and Operate Emergency Engine. April 27, 2010.

US EPA - Stationary Spark Ignition Internal Combustion Engines, 40 CFR 60 Subpart JJJJ. January 18, 2008.

SDAPCD - San Diego Air Pollution Control District, Authority to Construct, May, 2010.