

CALIFORNI ENERGY COMMISSION1516 NINTH STREET
SACRAMENTO, CA 95814-5112

DATE: June 14, 2011

TO: Interested Parties

FROM: Christine Stora, Compliance Project Manager

SUBJECT: Gateway Generating Station Project (00-AFC-1C)
Staff Analysis of Proposed Modifications To Reduce Emissions Limits

On April 2, 2011, Pacific Gas and Electric Company (PG&E) filed a petition with the California Energy Commission to amend the Energy Commission Decision for the Gateway Generating Station Project. Staff prepared an analysis of this proposed change, and a copy is enclosed for your information and review.

The Gateway Generating Station project is a 530 MW combined cycle power plant located east of the City of Antioch, in Contra Costa County. The project was certified by the Energy Commission on May 30, 2001, and began commercial operation on January 4, 2009.

The proposed modifications will allow PG&E to reduced emissions limits as follows:

1. A NO_x emission limit of 2.0 ppmv, 1-hour average, 15% O₂ (excluding start-ups and shut-downs);
2. An annual NO_x mass emission limit of 139.2 tpy rolling 12-month average;
3. An annual SO₂ mass emission limit of 18.5 tpy rolling 12-month average; and,
4. A PM₁₀ emission limit of 7.50 lb/hr without duct burners (0.004 lb/mmBtu) and 9.0 lb/hr with duct burners (0.004 lb/mmBtu).

These proposed modifications are necessary in order to further reduce maximum allowable emissions from the GGS and to ensure consistency between the CEC conditions of certification, the conditions of the operating permits to be issued by the Bay Area Air Quality Management District (BAAQMD), and the United States District Court's March 3, 2011 order (United States of America v. PG&E, 2011 U.S. Dist. LEXIS 27022).

Energy Commission staff reviewed the petition and assessed the impacts of this proposal on environmental quality, public health and safety, and proposes revisions to existing conditions of certification for Air Quality (AQ-1, AQ-25, AQ-25.2 and new conditions CD-1, CD-2, CD-3, CD-4). It is staff's opinion that, with the implementation of revised conditions, the project will remain in compliance with applicable laws, ordinances, regulations, and standards 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 August 24, 2011 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 July 13, 2011.

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Comments may be submitted by fax to (916) 654-3882, or by e-mail to cstora@energy.state.ca.us. If you have any questions, please contact me at (916) 654-4745.

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

GATEWAY GENERATING STATION (00-AFC-1C)

Request to Amend Air Quality Conditions of Certification

Jacquelyn Leyva

INTRODUCTION

On April 2, 2011, the Pacific Gas and Electric Company (PG&E) filed a petition with the California Energy Commission (Energy Commission requesting to modify the Gateway Generating Station. The 530-megawatt project was certified by the Energy Commission on May 30, 2001. Construction of the facility started late in 2001 and was suspended in February of 2002 due to financial difficulties of the owner Mirant Delta, LLC. On July 19, 2006, the Energy Commission approved the addition of PG&E as co-owner of the project with Mirant. On January 3, 2007, the Energy Commission approved PG&E's petition to remove Mirant as a co-owner and change the name of the facility to the Gateway Generating Station. PG&E restarted construction in February of 2007. On August 1, 2007, the Energy Commission approved a major project amendment, which including replacing the wet cooling tower with an air cooled condenser (ACC) and a wet surface air cooler (WSAC), and the elimination of the use of steam power augmentation and the addition of an oil/water separator. On August 26, 2009 the Energy Commission issued an order amending the Decision by modifying equipment and changing various air quality conditions of certification. The Gateway Generating Station first fired the gas turbines during November 2008. The facility is located on Wilbur Avenue, east of the city of Antioch, in Contra Costa County.

The current amendment request would modify several Air Quality conditions to reflect the Bay Area Air Quality Management District (BAAQMD) current conditions and the Prevention of Significant Deterioration (PSD) enforcement action that has been resolved by an approved Second Amended Consent Decree dated March 3, 2011 (Civil Action No. 09-4503 SI) that was entered by the United States District Court for the Northern District of California in *United States of America v. PG&E*, 2011 U.S. Dist LEXIS 27022 (N.D. Cal March 3, 2011). This amendment will also update any remaining minor administrative differences. The modification to the Commission Decision will include the following reduced emissions limits:

- A reduced NO_x emission limit from 2.5 ppmv to 2.0 ppmv, dry basis, over a 1-hour average, 15% O₂ (excluding start-ups and shut-downs);
- A reduced annual NO_x mass emission limit from 174.3 to 139.2 tons per year (tpy) over a rolling 12-month average;
- A reduced annual SO₂ mass emission limit from 48.5 to 18.5 tons per year (tpy) over a rolling 12-month average; and,
- A reduced PM₁₀ emission limit from 11 to 7.50 pound per hour (lb/hr) without duct burners or from 0.00588 to (0.004 lb/mmBtu) and reduced from 13 to 9.0 pound per hour (lb/hr) with duct burners or (0.00584) reduced to (0.004 lb/mmBtu).

Staff notes that the project was issued a Notice of Violation (NOV) for PSD permit non-compliance on August 13, 2009. Entry into the Consent Decree fully resolved PG&E's

NOV for non-compliance with the Federal Prevention of Significant Deterioration requirements under the Clean Air Act.

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

The project's proposed amendment is subject to all the LORS described in the Final Staff Assessment (FSA) (CEC 2001a).

The original Energy Commission Decision certifying the Gateway Generating Station and all amendments thereafter concluded that the project is in compliance with all applicable laws, ordinances, regulations and standards (LORS). The project, as proposed for modification herein, will be subject to even more stringent emission limits and will continue to comply with all applicable LORS.

This amendment will implement the consent decree conditions as adopted by the Federal Government in our Conditions of Certification as Consent Decree Conditions. The Consent Decree (CD) conditions will comply and are more restrictive than the Best Available Control Technology (BACT) determination from the original Energy Commission Decision from 2001 and the more restrictive CD conditions would need to be complied with in order for Gateway Generating Station to continue to comply with all LORS.

SETTING

The project setting has not changed from the original FSA. For convenience, staff includes a table, **AIR QUALITY Table 1**, which summarizes the area's current designation status for various applicable current state and federal air quality standards.

**AIR QUALITY Table 1
BAAQMD Current Designation Status**

Pollutant	Averaging Time	California Status	Federal Status
Ozone (O ₃)	8 Hour	N/A	Non-attainment
	1 Hour	Non-attainment	N/A
Carbon Monoxide (CO)	8 Hour	Attainment	Attainment
	1 Hour	Attainment	Attainment
Nitrogen Dioxide (NO _x)	Annual	N/A	Attainment
	1 Hour	Attainment	Unclassified ^a
Sulfur Dioxide (SO ₂)	Annual	N/A	Attainment
	24 Hour	Attainment	Attainment
	1 Hour	Attainment	N/A
PM10	Annual	Non-attainment	N/A
	24 Hour	Non-attainment	Unclassified
PM2.5	Annual	Non-attainment	Attainment
	24 Hour	N/A	Non-attainment ^b

Notes: Unclassified means the area is treated as it is attainment
 N/A= no standard applies or not applicable
 a The effective date of this designation will be January 2012.
 b The effective date of this designation was December 14, 2009.

ANALYSIS

PREVIOUS AMENDMENT CHANGES

On August 26, 2009 the Energy Commission issued an order amending the Energy Commission Decision by modifying equipment and changing various air quality Conditions of Certification. Specifically, below are items that were changed and amended in the previous adopted amendment and will not be discussed in this amendment. The items were as follows:

- Replaced the permitted natural gas-fired pre-heater with a smaller dewpoint heater and increased allowable daily hours of operation;
- Replaced the motor driven fire water pump with a 300 kW diesel engine fire water pump;
- Revised the facility PM10 emission limits to reflect elimination of the wet cooling tower;
- Revised references to “Contra Costa Unit 8” and “CC8” to reflect the current project name;
- Deleted references to steam injection and/or power augmentation; and,
- Made minor conforming changes for consistency with the District issued permit.

PROJECT EMISSION PROFILE CHANGES

The facility was certified in 2001. The Commission Decision included specific daily and annual criteria emission limits. In this proposed revision to the Decision, the facility's current daily emission limits for CO are not changed.

ANALYSIS OF SPECIFIC AMENDMENT ADDITIONS

Proposed Reduction in NO_x Emission Limits to Reflect Consent Decree (CD) Conditions

The consent decree condition will revise the permit limits for NO_x to reflect the decrease NO_x emission limit from 2.5 ppmv, dry basis, over 1-hour average, 15% O₂ (excluding start-ups and shut-downs) to 2.0 ppmv, dry basis, over 1-hour average, 15% O₂ (excluding start-ups and shut-downs). This change will be covered in **CD-1(a)** and **CD-2**. The decrease in emissions limit from the Consent Decree will also reduce the annual NO_x mass emissions limit from 174.3 to 139.2 tons of NO_x (as NO₂) per year. The new condition reducing NO_x emissions is **CD-3(a)**.

Proposed Reduction in SO₂ and PM10 Emission Limits to Reflect CD Conditions

The applicant requests the decrease in SO₂ mass emissions limits and PM10 emission limit to decrease the pounds per hour with and without the duct burners. Annual SO₂ mass emissions limit would decrease from 48.5 to 18.5 tons of SO₂ per year. The new conditions reducing SO₂ emissions are **CD-3(b)** and **CD-4**. The PM10 emission limit would decrease from 11 to 7.5 pounds per hour or 0.00588 to 0.004 pounds per MMBtu without duct burners, and from 13 to 9.0 pounds per hour or 0.00584 to 0.004 pounds per MMBtu of natural gas fired when the Heat Recovery Steam Generators (HRSG) duct burners are in operation. The new condition reducing PM10 emissions will be **CD-**

1(b). Staff recommends adoption of the condition **CD-3(b)**, **CD-4**, and **CD-1** respectively.

Administrative Changes to Air Quality Conditions

In this amendment there are a few administrative changes for consistency with the air district permit that are considered to be administrative changes and will not change permit limits. In the definitions section, for the defined term of heat input, the acronym for higher heating value (HHV) was omitted in the original decision and is now being inserted. AQ-1 will now include conditions AQ-13 through -44 instead of -47 to be consistent with the current Energy Commission license.

- **AQ-25** will now include a subsection **AQ-25.1** and **AQ-25.2** to separate the Toxic Air Contaminant (TAC) emissions from the Hazardous Air Pollutant (HAP) emissions, respectively. No limits will be changing as a result from the change and is strictly an administrative change to be consistent with the air district permit. These pollutants are separated because the TACs are triggers to then test for HAPs and should remain separate in conditions for consistency with the air district permit.

CONCLUSIONS AND RECOMMENDATIONS

- The project would comply with the Second Amended Consent Decree entered by the United States District Court for the Northern District of California on March 3, 2011 in United States of America v. PG&E, 2011 U.S. Dist LEXIS 27022 (N.D. Cal March 3, 2011). Entry into the Consent Decree fully resolved PG&E's alleged non-compliance with the federal Prevention of Significant Deterioration requirements under the Clean Air Act.
- The amendment requested by the applicant would make our permit consistent with the terms of the settlement agreement, and will include in our license the more stringent requirements.
- The amendment would not increase the impacts from the project, and would decrease baseline conditions.
- The amendment will not cause a significant impact to the environment and reduces emissions; therefore, the changes will improve baseline conditions.
- The added conditions from this amendment would reduce emission limits on NO_x, SO₂, and PM₁₀ emission limits.
- The NO_x emission limit would decrease from 2.5 ppmv, dry basis, over 1-hour average, 15% O₂ (excluding start-ups and shut-downs) to 2.0 ppmv, dry basis, over 1-hour average, 15% O₂ (excluding start-ups and shut-downs). This change will be covered in **CD-1(a)** and **CD-2**.
- Annual NO_x mass emissions limit would decrease from 174.3 to 139.2 tons of NO_x (as NO₂) per year. The new condition reducing NO_x emissions is **CD-3(a)**.

- Annual SO₂ mass emissions limit would decrease from 48.5 to 18.5 tons of SO₂ per year. The new conditions reducing SO₂ emissions are **CD-3(b)** and **CD-4**.
- The PM₁₀ emission limit would decrease from 11 to 7.5 pounds per hour or 0.00588 to 0.004 pounds per MMBtu without duct burners, and from 13 to 9.0 pounds per hour or 0.00584 to 0.004 pounds per MMBtu of natural gas fired when the HRSG duct burners are in operation. The new condition reducing PM₁₀ emissions will be **CD-1(b)**.
- This amendment proposes Consent Decree (CD) Conditions that will be adopted into the Energy Commission Decision to be more strict than current Air Quality Conditions of Certification. As a result, this amendment will not have any adverse air quality effects on the environment.
- Staff also recommends approval to all administration changes to various Conditions of Certification as they would not result in any significant impacts to the environment.

AMENDED AND PROPOSED CONDITIONS OF CERTIFICATION

Below is a list of the revised Air Quality Conditions of Certification, which were originally contained in the Decision (CEC 2001b), and a brief discussion of the proposed changes. The proposed new conditions (**CD-1 to CD-4**) are a result of the Second Amended Consent Decree entered by the United States District Court for the Northern District of California on March 3, 2011. The District will issue an amended DOC after the Energy Commission approves the amendment, including the revised Air Quality Conditions of Certification. ~~Strikeout~~ is used to indicate deleted language and **underline and bold** for new language.

CONDITIONS OF CERTIFICATION:

- In the definitions section, the acronym for higher heating value (HHV) was omitted in the original decision and is now being inserted.
- **AQ-1** will now include Conditions **AQ-13** through **-44** instead of **-47** to be consistent with the Air District permit.
- **AQ-25** will now include a subsection **AQ-25.1 and AQ-25.2** to separate the Toxic Air Contaminant (TAC) emissions from the Hazardous Air Pollutant (HAP) emissions, respectively. No limits will be changing as a result from the change and is strictly an administrative change to be consistent with the air district permit. These pollutants are separated because the TACs are triggers to then test for HAPs and should remain separate in conditions for consistency with the air district permit.
- Under the Consent Decree (**CD-1 to CD-4**) will be more stringent than the current conditions in the original decision and will reduce emissions to satisfy the federal Prevention of Significant Deterioration requirements under the Clean Air Act.

CONDITIONS OF CERTIFICATION

Definitions:

1-hour period:	Any continuous 60-minute period beginning on the hour.
Calendar Day:	Any continuous 24-hour period beginning at 12:00 AM or 0000 hours.
Year:	Any consecutive twelve-month period of time.
Heat Input:	All heat inputs refer to the heat input at the higher heating value (HHV) of the fuel, in Btu/scf.
Rolling 3-hour period:	Any three-hour period that begins on the hour and does not include start-up or shut down periods.
Firing Hours:	Period of time during which fuel is flowing to a unit, measured in fifteen-minute increments.
MM Btu:	million British thermal units
Gas Turbine Start-up Mode:	The lesser of the first 256 minutes of continuous fuel flow to the Gas Turbine after fuel flow is initiated or the period of time from Gas Turbine fuel flow initiation until the Gas Turbine achieves two consecutive CEM data points in compliance with the emission concentration limits of conditions 20(b) and 20(d).
Gas Turbine Shut-down mode:	The lesser of the 30 minute period immediately prior to the termination of fuel flow to the Gas Turbine or the period of time from non-compliance with any requirement listed in Conditions 20 (b) and 20(d) until termination of fuel flow to the Gas Turbine.
Specified PAHs:	The polycyclic aromatic hydrocarbons listed below shall be considered to Specified PAHs for these permit conditions. Any emission limits for Specified PAHs refer to the sum of the emissions for all six of the following compounds. Benzo[a]anthracene Benzo[b]fluoranthene Benzo[k]fluoranthene Benzo[a]pyrene Dibenzo[a,h]anthracene Indeno[1,2,3-cd]pyrene
Corrected Concentration:	The concentration of any pollutant (generally NO _x , CO, or NH ₃) corrected to a standard stack gas oxygen concentration. For emission point P-11 (combined exhaust of S-41 Gas Turbine and S-42 HRSG duct burners) and emission point P-12 (combined exhaust of S-43 Gas Turbine and S-44 HRSG duct burners) the standard stack gas oxygen concentration is 15% O ₂ by volume on a dry basis.
Commissioning Activities:	All testing, adjustment, tuning, and calibration activities recommended by the equipment manufacturers and the GGS construction contractor to insure safe and reliable steady state operation of the gas turbines, heat recovery steam generators, steam turbine, and associated electrical delivery systems.
Commissioning Period:	The Period shall commence when all mechanical, electrical, and control systems are installed and individual system start-up has been completed, or when a gas turbine is first fired, whichever occurs first. The period shall terminate when the plant has completed performance testing, and is available for commercial operation.
Precursor Organic Compounds (POCs):	Any compound of carbon, excluding methane, ethane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate.
CEC CPM:	California Energy Commission Compliance Program Manager
GGS:	Gateway Generating Station

CONDITIONS FOR THE COMMISSIONING PERIOD

AQ-1 The owner/operator of the GGS shall minimize emissions of carbon monoxide and nitrogen oxides from S-41 and S-43 Gas Turbines and S-42 and S-44 Heat Recovery Steam Generators (HRSGs) to the maximum extent possible during the commissioning period. Conditions AQ-1 through 12 shall only apply during the commissioning period as defined above. Unless otherwise indicated, Conditions AQ-13 through ~~44~~7 shall apply after the commissioning period has ended.

Verification: The owner/operator shall submit a monthly compliance report to the California Energy Commission (CEC) Compliance Project Manager (CPM). In this report the owner/operator shall indicate how this condition is being implemented.

AQ-25 Toxic and HAP Emission Limits

AQ-25.1 The maximum projected annual toxic air contaminant emissions (per condition 28) from the Gas Turbines and HRSGs combined (S-41, S-42, S-43, and S-44) shall not exceed the following limits:

4,102 pounds of formaldehyde per year
506 pounds of benzene per year
38 pounds of specified polycyclic aromatic hydrocarbons (PAHs) per year

Unless the following requirement is satisfied:

The owner/operator shall perform a health risk assessment using the emission rates determined by source test and the most current Bay Area Air Quality Management District approved procedures and unit risk factors in effect at the time of the analysis. This risk analysis shall be submitted to the District and the CEC CPM within 60 days of the source test date. The owner/operator may request that the District and the CEC CPM revise the carcinogenic compound emission limits specified above. If the owner/operator demonstrates to the satisfaction of the APCO that these revised emission limits will result in a cancer risk of not more than 1.0 in one million, the District and the CEC CPM may, at their discretion, adjust the carcinogenic compound emission limits listed above. (TRMP)

Verification: Compliance with condition AQ-28 shall be deemed as compliance with this condition. In addition, approval by the District and the CEC CPM of the reports prepared for this condition will constitute a verification of compliance with this condition.

AQ-25.2 The maximum projected annual Hazardous Air Pollutant (HAP) emissions from the Gas Turbines and HRSGs combined (S-41, S-42, S-43, and S-44) shall not exceed the following limit:

20,000 pounds of hexane per year
(US-CAA, Section 112(g))

Conformance with this limit shall be verified by the source testing in AQ-32.

Verification: Compliance with condition AQ-28 shall be deemed as compliance with this condition. In addition, approval by the District and the CEC CPM of the reports prepared for this condition will constitute a verification of compliance with this condition.

**ADDITIONAL CONDITIONS FROM APPROVED FEDERAL CONSENT DECREE
(CIVIL ACTION NO. 09-4503 SI) INCLUDED BY PG&E'S REQUEST**

CD-1. The Gas Turbines (S-41 & S-43) and HRSGs (S-42 & S-44) shall comply with requirements (a) and (b) under all operating scenarios, including duct burner firing mode, except as specified in Condition CD-2.

- a. **The nitrogen oxide emission concentration at emission points P-11 and P-12 each shall not exceed 2.0 ppmv, on a dry basis, corrected to 15% O₂, averaged over any 1-hour period.**
- b. **Particulate matter (PM₁₀) mass emissions at P-11 and P-12 each shall not exceed 7.50 pounds per hour when the HRSG duct burners are not in operation. Particulate matter (PM₁₀) mass emissions at P-11 and P-12 each shall not exceed 9.0 pounds per hour when the HRSG duct burners are in operation. Particulate matter (PM₁₀) mass emissions at P-11 and P-12 each shall not exceed 0.004 lb/MMBtu of natural gas fired. (Basis: Voluntary-Consent Decree)**

CD-2. NO_x emissions during Natural-Gas Combustion Turbine Start-up Mode and during Natural-Gas Combustion Turbine Shutdown Mode shall not be included in calculating compliance with the one-hour 2.0 ppmv NO_x concentration emission limit set forth in Condition CD-1. Natural-Gas Combustion Turbine Start-up Mode is the lesser of the first 256 minutes of continuous fuel flow to the natural gas-fired combustion turbine after fuel flow is initiated or the period of time from natural gas-fired combustion turbine fuel flow initiation until the natural gas-fired combustion turbine achieves two consecutive continuous emission monitor data points in compliance with the 2.0 ppmv NO_x emission concentration limit. Natural-Gas Combustion Turbine Shutdown Mode is the lesser of the 30 minute period immediately prior to the termination of fuel flow to the natural gas-fired combustion turbine or the period of time from noncompliance with the 2.0 ppmv NO_x emission concentration limit until termination of fuel flow to the natural gas fired combustion turbine. (Basis: Voluntary-Consent Decree)

CD-3. Cumulative combined emissions from the Gas Turbines and HRSGs (S-41, S-42, S-43, and S-44), including emissions generated during gas turbine start-ups and shutdowns, shall not exceed the following limits during any consecutive twelvemonth period:

- a. **139.2 tons of NO_x (as NO₂) per year**
- b. **18.5 tons of SO₂ per year**

(Basis: Voluntary-Consent Decree)

CD-4. The Gas Turbines (S-41 and S-43) and HRSG Duct Burners (S-42 and S-44) shall be fired exclusively on natural gas with a maximum sulfur content no greater than 1 grain per 100 standard cubic feet.

(Basis: Voluntary–Consent Decree)

REFERENCES

CEC 2001a - California Energy Commission, Final Staff Assessment of the Contra Costa Unit 8 Power Plant Project (00-AFC-1). February 9, 2001.

CEC 2001 b - California Energy Commission, Commission Final Decision of the Contra Costa Unit 8 Power Plant Project (00-AFC-1). May 30, 2001.

PG&E 2011 – Pacific Gas and Electric Company. Gateway Generating Station Amendment (formally known as the Contra Costa Generating Station). Received 4/4/2011.