

CALIFORNIA ENERGY COMMISSION

1516 NINTH STREET
SACRAMENTO, CA 95814-5512
www.energy.ca.gov



DATE: June 29, 2012
TO: Interested Parties
FROM: Dale Rundquist, Compliance Project Manager

California Energy Commission

DOCKETED
07-AFC-9C

TN # 66043

JUN 29 2012

SUBJECT: Canyon Power Plant (07-AFC-9C)
Staff Analysis of Proposed Modifications to increase the carbon monoxide startup limit required in AQ-2.

On May 8, 2012, the Southern California Public Power Authority filed a petition with the California Energy Commission (Energy Commission) requesting to modify the Canyon Power Project. Staff prepared an analysis of this proposed change, and a copy is enclosed for your information and review.

The Canyon Power Project is a 200 MW power plant located in the City of Anaheim, in Orange County. The project was certified by the Energy Commission on March 17, 2010, and began commercial operation in November, 2011.

The proposed modifications will increase the carbon monoxide (CO) startup limit in Condition of Certification **AQ-2** from 6.3 pounds per hour (lb/hr) to 11.6 lb/hr. The change is needed to allow the operation of the CPP turbines in compliance with applicable air quality regulations and permits and bring **AQ-2** in conformance with changes to the Permit to Operate made by the South Coast Air Quality Management District (SCAQMD). The proposed CO startup limit is consistent with other similar peaking projects recently permitted by the Energy Commission and the SCAQMD.

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 condition of certification for **AQ-2**. It is staff's opinion that, with the implementation of the revised condition, 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 have 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 September 12, 2012 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 30, 2012.

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 Dale.Rundquist@energy.ca.gov. 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.ca.gov. News media inquiries should be directed to the Energy Commission Media Office at (916) 654-4989, or by e-mail at mediaoffice@energy.ca.gov.

Enclosure

CANYON POWER PLANT (07-AFC-9C)
Request to Amend Final Commission Decision
Air Quality Analysis
Nancy Fletcher

INTRODUCTION

In May 2012, Southern California Public Power Authority (SCPPA) filed a petition (Canyon 2012) with the California Energy Commission (Energy Commission) requesting an amendment to the Conditions of Certification for the Canyon Power Plant (CPP). CPP is a nominal 200-megawatt natural gas-fired simple cycle power plant consisting of four combustion turbines equipped with water injection, selective catalytic reduction and an oxidation catalyst system. Other equipment includes a cooling tower, step up transformers, buried transmission lines, an aqueous ammonia storage tank, two water storage tanks and a black start engine. CPP is located in the City of Anaheim and is dedicated to generating power to serve retail customers. The city of Anaheim operates CPP. The original Commission Decision approving the Project was issued on March 17, 2010, construction began on April 5, 2010 and CPP has been in commercial operation since November 2011.

SCPPA is requesting a revision to the conditions of certification to increase the carbon monoxide (CO) start-up emissions limit from 6.3 pounds per hour (lb/hr) to 11.6 pounds per hour for the combustion turbines. The 6.3 lb/hr emissions limit was an estimate provided by the vendor prior to construction. The vendor does not guarantee CO start-up mass emission rates. The turbines occasionally have been unable to meet that limit during start-up due to high CO emissions levels calculated by the data acquisition handling system (DAHS) during the first minute of start-up operation. The equipment was inspected and both the turbine vendor and the operator for CPP determined the turbines, emission control systems, and recording and monitoring systems were all operating and performing as designed. Applications were submitted to the South Coast Air Quality Management District (SCAQMD) for a change of condition to SCAQMD permits, including a de minimis significant permit revision to the Title V operating permit, to increase the hourly CO start-up emissions limit from 6.3 lb/hr to 11.6 lb/hr, consistent with start-up emission limits set by SCAQMD for more recent power plants, including Riverside Energy Resource Center (08-SPPE-1). This modification does not result in a physical change to equipment or operating conditions. The modification does not result in any other increase to the emission limits for the turbines or result in an exceedance to an ambient air quality standard. Therefore, offsets are not required and a new toxic evaluation does not need to be performed.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS COMPLIANCE

SCAQMD approved the requested modifications and determined the project would comply with their regulations. The conditions of certification in the original Commission Decision and any and all amendments thereafter ensure that the project will remain in compliance with all applicable laws, ordinances, regulations and standards (LORS). The project, as proposed for modification herein, will continue to comply with all applicable LORS.

SETTING

The project is located in the City of Anaheim in Orange County and is considered part of the South Coast Air Basin. For convenience, staff includes **Air Quality Table 1**, which summarizes the area's attainment status for current state and federal ambient air quality standards for the South Coast Air Basin, however the proposed revision only pertains to CO emissions, and the region is in attainment for state and federal CO standards.

**Air Quality Table 1
Federal and State Attainment Status
Orange County, South Coast Air Basin**

Pollutant	State Classification	Federal Classification
Ozone (O ₃) (1-hr and 8-hr) ^a	Non-attainment	Non-attainment
Carbon Monoxide (CO)	Attainment	Attainment
Nitrogen Dioxide (NO ₂)	Attainment	Attainment
Sulfur Dioxide (SO ₂)	Attainment	Attainment
PM10	Non-attainment	Non-attainment
PM2.5	Non-attainment	Non-attainment

Source: <http://www.arb.ca.gov/regact/2011/area11/areaattc.pdf>

^a Federal designation reflects the 8-hr standard. The national 1-hr standard was revoked June 15, 2005.

ANALYSIS

The petition submitted by SCPA requests the modification of Condition of Certification **AQ-2** to increase the hourly start-up emission limit from 6.3 lb/hr to 11.6 lb/hr for CO. The original limit was based off a vendor estimate during the licensing period. During initial operation, some start-up events resulted in emission rates exceeding the 6.3 lb/hr limit. The problem is intermittent as other start-ups on the same day were below the emission limit. The City of Anaheim, along with the turbine vendor, conducted an investigation to determine the cause of the exceedances. It was determined no equipment malfunction occurred and the turbine, continuous emission monitoring system (CEMS) and data acquisition system (DAHS) all perform as designed. The vendor does not guarantee CO mass emission limits during the start-up period. It was determined the following conditions could cause variability during the first minute of a start-up:

1. Differences in the CO and oxygen analyzers response times could affect the calculated CO emissions for the first minute.
2. The initial opening of the natural gas valve during a turbine start can result in turbulent fuel flow that could affect the fuel flow measurements during the first minute.

3. Initiating fuel flow to a turbine during the end of a CEMS/DAHS clock minute could result in the CEMS/DAHS not recording the information until the next clock minute.

The facility's owner conducted a search of other turbines of the same model and vendor recently permitted. Two comparable facilities, Mariposa Energy Project and City of Riverside Energy Resource Center, were identified. Mariposa Energy Project has a CO start-up limit of 17.3 lb/hr and the Riverside facility has a CO start-up limit of 11.60 lb per each 60 consecutive start-up minutes. The proposed amended CO start-up emission limit is consistent with the City of Riverside Energy Resource Center and less than the Mariposa Energy Project CO start-up limit approved by the Commission in May 2011.¹

On January 27, 2012, SCPPA submitted applications with the SCAQMD requesting the same increase to the CO start-up emissions limit for the turbines from 6.3 lb/hr to 11.6 lb/hr for facility permits. The proposed change to Condition of Certification **AQ-2**, reflects the proposed change to the SCAPCD permits.

The project area is currently in attainment for CO. The proposed increase to the CO start-up emission rate should not cause or contribute to a violation of an ambient air quality standard. The maximum modeled impact of worst case start-up and full load operations for the operations were included in the original Commission Decision. The worst case scenario included the maximum impact from the turbines and the blackstart engine. These values are included in the "Modeled Project Impact" column of **Air Quality Table 2**. To demonstrate the

Air Quality Table 2
Comparison of Maximum CO Impacts to Ambient Air Quality Standard ($\mu\text{g}/\text{m}^3$)

Pollutant	Averaging Time	Modeled Project Impact ^a	Increased Project Impact	Background ^b	Total Impact	Limiting Standard
CO	1 hour	77.37	142	8,510	8,652	23,000
	8 hour	6.36	12	4,544	4,556	10,000

Source: ^a CEC 2010

^b SCPPA 2012 Note: the ambient CO background concentration reflects the value used in SCAQMD's regulatory analysis. These limits are higher than the background limits used in the decision.

increase to the turbine CO emission rate is not expected to significantly increase the total CO impact. The modeled CO concentration from the equipment was increased by a ratio of 11.6/6.3. This is a conservative approach because the black start engine had a larger maximum CO impact than the turbines and allowable emissions from this engine will not increase due to the proposed change. Therefore, the actual facility's allowed emission increase and associated air quality impact is expected to be lower than the increase calculated in the "Increased Project Impact" column of **Air Quality Table 2**. As demonstrated in **Air Quality Table 2**, after adding the increased CO impact to the background value, the result remains very low when compared to the ambient air quality

¹ Mariposa Energy Project is not yet operational, so the actual CO start-up emission rate has not yet been determined.

standard. Staff concludes that it is not necessary to conduct a more thorough air quality impact assessment using an air quality impact model because the conclusions would not change. In addition, the proposed change does not result in a change to the emissions of any toxic air contaminant. Therefore, the toxic air contaminant analysis presented in the original Commission Decision is not impacted by the proposed change to the CO start-up emission limit.

CONCLUSIONS AND RECOMMENDATIONS

Energy Commission staff recommends approval of the requested change to Condition of Certification **AQ-2** for CPP. An increase in the hourly start-up emission limit for CO will enable the facility to operate in compliance with the conditions of certification. The requested changes will conform with the applicable LORS related to air quality and will not result in significant air quality impacts. The requested changes have already been incorporated into the PTO and Title V permit by the SCAQMD.

PROPOSED AND AMENDED CONDITIONS OF CERTIFICATION

Staff recommends the following change to Air Quality Condition of Certification **AQ-2**. Deleted language is shown in ~~strikethrough~~ and new language is shown in **bold underline**.

AQ-2 The 2.5 ppm NO_x, 4.0 ppm CO, and 2.0 ppm ROG emission limits shall not apply during turbine commissioning, start-up, and shutdown periods. Commissioning shall not exceed 156 hours total. Each start-up shall not exceed 35 minutes. Each shutdown shall not exceed 10 minutes. Each turbine shall be limited to a maximum of 240 start-ups per year.

NO_x, CO, and ROG emissions for an hour that includes a full start-up sequence of ~~35 minutes, followed immediately by a turbine trip, a five minute purge period during which no fuel is burned, and the first 20 minutes of a restart sequence~~ shall not exceed 14.27 lbs for NO_x, ~~6.3~~**11.6** lbs for CO, and 1.29 lbs for ROG and for the hour which ~~that~~ includes a shutdown 4.07 lbs for NO_x, 4.15 for CO, and 1.27 lbs for ROG. **For the purpose of defining an hour that includes a start-up, the period begins when natural gas is first introduced into the turbine and ends after 50 minutes. The worst case includes a full start-up sequence of 35 minutes, followed immediately by a turbine trip, a five minute purge period during which no fuel is burned, and the first 20 minutes of restart sequence.**

The project owner shall maintain records in a manner approved by the District to demonstrate compliance with this condition and the records shall be made available to District personnel upon request.

For the purposes of this condition, start-up shall be defined as the start-up process to bring the turbine to full successful operation.

[RULE 1703(a)(2) – PSD-BACT, 10-7-1988; RULE 2005, 5-6-2005; RULE 1303(a)(1)-BACT, 5-10-1996; RULE 1303(a)(1)-BACT, 12-6- 2002]

[Devices subject to this condition: D1, D7, D13, D19]

Verification: The project owner shall provide start-up and shutdown occurrence and duration data as part as part of the Quarterly Operation Report (**AQ-SC10**). The project owner shall make the site available for inspection of the commissioning and start-up/shutdown records by representatives of the District, ARB and the Commission.

REFERENCES

SCPPA 2012 - Canyon Power Plant Amendment 1 May, 2012.

MBUAPCD 2010 - Monterey Bay Unified Air Pollution Control District. Evaluation Report, Preliminary Decision on Proposed Permit to Operate for King City Energy Center, LLC. September 14, 2010.

CEC 2010 - California Energy Commission Final Commission Decision – Canyon Power Plant (07-AFC-9) March 2010