

DOCKETED

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CALIFORNIA ENERGY COMMISSION

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



DATE: September 3, 2014

TO: Interested Parties

FROM: Mary Dyas, Compliance Project Manager

**SUBJECT: ELK HILLS POWER PROJECT (99-AFC-1C)
Staff Analysis of Proposed Modifications to Extend Startup Times**

On July 31, 2014, Elk Hills Power, LLC (EHP) filed a petition with the California Energy Commission to amend the Energy Commission Decision for the Elk Hills Power Plant (EHPP). Staff prepared an analysis of this proposed change, and a copy is enclosed for your information and review.

The EHPP project is a natural gas-fired, 500-megawatt cogeneration facility that was certified by the Energy Commission in December 2000, and began commercial operation on July 23, 2003. The facility is located in western Kern County, west of Bakersfield, near the community of Tupman. In 2011, a petition to amend was approved allowing a portion of the steam generated by the EHPP to be used for gas processing in the adjoining oil fields, and thus allowing operation as a cogeneration facility. When operated as a cogeneration facility, the power output of the EHPP is reduced by 10 to 25 MW.

The proposed modifications will allow EHP to increase the allowable startup times from 2 hours to 3 hours for a regular startup; from 6 hours to 7 hours for an extended startup and to add a one-hour duration for an aborted shutdown

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 **Air Quality** condition of certification **AQ-11**. 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 Energy Commission's webpage for this facility, <http://www.energy.ca.gov/sitingcases/elkhills>, has a link to the amendment petition and staff's analysis on the right side of the webpage in the box labeled "Compliance Proceeding." Click on the "Documents for this Proceeding (Docket Log)" option. 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 October 7, 2014, Business Meeting of the Energy Commission.

Agencies and members of the public who wish to provide comments on the amendment petition are asked to submit their comments by 5:00 pm on October 3, 2014. To use the Energy Commission's electronic commenting feature, go to the Energy Commission's webpage for this facility, cited above, click on the "Submit e-Comment" link, and follow the instructions in the on-line form. Be sure to include the facility name in your comments. Once submitted, the Energy Commission Dockets Unit reviews and approves your comments, and you will receive an e-mail with a link to them.

Written comments may also be mailed or hand delivered to:

California Energy Commission
Dockets Unit, MS-4
Docket No. (99-AFC-1C)
1516 Ninth Street
Sacramento, CA 95814-5512

All comments and materials filed with and approved by the Dockets Unit will be added to the Elk Hills Docket Log and become publicly accessible on the Energy Commission's webpage for the facility.

If you have any questions, please contact Mary Dyas, Compliance Project Manager, at (916) 651-8891, or by fax to (916) 654-3882, or via e-mail at: mary.dyas@energy.ca.gov.

For information on participating in the Energy Commission's review of the petition to amend, please call the Public Adviser at (800) 822-6228 (toll-free in California) or send your e-mail to 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

ELK HILLS POWER PLANT PROJECT (99-AFC-1C)
Petition to Amend Commission Decision
EXECUTIVE SUMMARY
Mary Dyas

INTRODUCTION

On July 31, 2014, Elk Hills Power, LLC (EHP) filed a petition with the California Energy Commission (Energy Commission) requesting to modify the Final Decision for the Elk Hills Power Plant (EHPP) project. Staff has completed its review of all materials received.

The purpose of the Energy Commission’s review process is to assess any impacts the proposed modifications would have on environmental quality and public health and safety. The process includes an evaluation of the consistency of the proposed changes with the Energy Commission’s Final Decision (Decision), and if the project, as modified, will remain in compliance with applicable laws, ordinances, regulations, and standards (Title 20, Calif. Code of Regulations, section 1769).

This Staff Analysis contains the Energy Commission staff’s evaluation of the affected technical area of Air Quality.

PROJECT LOCATION AND DESCRIPTION

The **EHPP** is a natural gas-fired, 500-megawatt cogeneration facility that was certified by the Energy Commission in its December 2000 Decision, and began commercial operation on July 23, 2003. The facility is located in western Kern County, west of Bakersfield, near the community of Tupman.

DESCRIPTION OF PROPOSED MODIFICATIONS

The proposed modifications include modifying Condition of Certification **AQ-11** to increase the allowable startup times from 2 hours to 3 hours for a regular startup; from 6 hours to 7 hours for an extended startup and to add a one-hour duration for an aborted shutdown¹. There are no changes to short or long-term emission rates being requested.

NECESSITY FOR THE PROPOSED MODIFICATIONS

The primary purpose and need for this petition is to increase the allowed duration for extended startup and aborted shutdown conditions. During the life of the project, EHPP has been able to operate almost continuously, and hence has had only a limited number

¹ During normal operations, conditions may arise where a trip of the unit occurs. The trip prompts an immediate response from the operator to stabilize the unit and prevent a full shutdown (i.e., an “aborted shutdown”). The conditions of certification do not provide an allowance to recover from these trips and thus avoid unnecessary shutdown and subsequent startup emissions.

of extended startups. However, during extended startups, the current six-hour limitation for the complete startup cycle has been met by employing techniques that are not recommended by the original equipment manufacturer specifications and requires implementing abnormal operating procedures. Therefore, EHP is requesting an increase in the allowed duration for extended startup and aborted shutdown conditions.

STAFF'S ASSESSMENT OF THE PROPOSED PROJECT CHANGES

The technical areas contained in this Staff Analysis indicate recommended staff changes to the existing Air Quality condition of certification in the EHPP Decision. Staff has determined that by adopting the proposed changes to the existing condition, the potential impacts of the proposed changes would be reduced to less than significant levels. A summary of staff's conclusions reached in each technical area are summarized in **Executive Summary Table 1**. The details of the proposed condition change can be found in the Air Quality Staff Analysis.

Energy Commission technical staff reviewed the petition to amend for potential environmental effects and consistency with applicable laws, ordinances, regulations and standards (LORS). Staff has determined that the technical or environmental areas of biological resources, cultural resources, facility design, geological and paleontological resources, hazardous materials management, noise and vibration, public health and safety, socioeconomics, soil and water resources, traffic and transportation, transmission line safety and nuisance, transmission system engineering, visual resources, waste management, and worker safety and fire protection are not affected by the proposed changes, and no revisions or new conditions of certification are needed to ensure the project remains in compliance with all applicable LORS.

Staff determined that the technical area of air quality would be affected by the proposed project changes and have proposed revised conditions of certification in order to assure compliance with LORS and/or to reduce potential environmental impacts to a less than significant level.

STAFF RECOMMENDATIONS AND CONCLUSIONS

Staff concludes that the following required findings mandated by Title 20, section 1769(a)(3) of the California Code of Regulations can be made, and it will recommend approval of the petition to the Energy Commission:

- A. There will be no new or additional unmitigated significant environmental impacts associated with the proposed changes;
- B. The facility will remain in compliance with all applicable laws, ordinances, regulations and standards;
- C. The changes will be beneficial to the project owner because it will allow EHP to continue to comply with all currently applicable air quality laws, ordinances, regulations, and standards (LORS).

- D. There has been a substantial change in circumstances since the Energy Commission certification justifying the changes.

**Executive Summary Table 1
Summary of Impacts to Each Technical Area**

TECHNICAL AREAS REVIEWED	STAFF RESPONSE			Revised Conditions of Certification Recommended
	Technical Area Not Affected	No Significant Environmental Impact*	Process As Amendment	
Air Quality			X	X
Biological Resources	X			
Cultural Resources	X			
Geological Hazards & Resources	X			
Hazardous Materials Management	X			
Facility Design	X			
Land Use	X			
Noise and Vibration	X			
Paleontological Resources	X			
Public Health	X			
Socioeconomics	X			
Soil and Water Resources	X			
Traffic and Transportation	X			
Transmission Line Safety & Nuisance	X			
Transmission System Engineering	X			
Visual Resources	X			
Waste Management	X			
Worker Safety and Fire Protection	X			

*There is no possibility that the modifications may have a significant effect on the environment and the modification will not result in a change or deletion of a condition adopted by the commission in the final decision or make changes that would cause the project not to comply with any applicable laws, ordinances, regulations, or standards (LORS) (20 Cal. Code Regs., § 1769 (a)(2)).

ELK HILLS POWER PROJECT (99-AFC-1C)

Petition to Amend Commission Decision

AIR QUALITY ANALYSIS

Joseph Hughes

INTRODUCTION

The Elk Hills Power Project (EHPP) was licensed in December 2000 as a nominal 500 megawatt (MW), natural gas-fired, combined cycle facility. In 2011, a petition to amend was approved allowing a portion of the steam generated by the EHPP to be used for gas processing in the adjoining oil fields, and thus allowing operation as a cogeneration facility. When operated as a cogeneration facility, the power output of the EHPP is reduced by 10 to 25 MW. The power plant consist of two GE Frame 7FA combustion turbine generators (CTGs), two heat recovery steam generators (HRSGs) and exhaust stacks, and one steam turbine.

The EHPP is located on 12 acres roughly in the center of the 74 square mile Elk Hills Oil and Gas Field operated by Occidental Energy Ventures of Elk Hills, Inc. (OEHI). The site is in western Kern County, California, approximately 25 miles west of Bakersfield, California. The project site is situated near the intersection of Elk Hills Road and Skyline Road.

Elk Hills Power, LLC (EHP) is filing this petition for a proposed modification to the Commission Decision for the EHPP to extend startup durations in Condition of Certification **AQ-11**. The request would increase regular startups from two hours to three hours; increase extended startups from six hours to seven hours; and add language that would define an extended startup and allow EHPP to abort unnecessary shutdowns. There are no changes to short or long-term emission rates being requested.

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

The EHPP would continue to comply with all currently applicable air quality laws, ordinances, regulations, and standards (LORS) and changes proposed for **AQ-11** do not trigger any additional air quality LORS.

An application for this change was submitted to the San Joaquin Valley Air Pollution Control District for Permits to Operate (PTOs) #S-3523-1-9 and #S-3523-2-9. The SJVAPCD issued Authority to Construct (ATC) permits (#S-3523-1-10 and #S-3523-2-10) on July 1, 2014 demonstrating that the proposed changes comply with all applicable LORS. These ATC permits would become applicable only if the Energy Commission approves this amendment request.

BACKGROUND

AQ-11 limits regular startups to two hours, extended startups to six hours, and shutdowns to one hour. The requested modification would allow EHPP three hours for a regular startup and seven hours for an extended startup. The modification would also define an extended startup and add language allowing EHPP the ability to abort unnecessary shutdowns.

Regular startups are defined as a startup that occurs after the steam turbine has been shut down for less than 72 hours. Extended startups are defined as startups that occur after the steam turbine has been shut down for 72 hours or more.

STARTUP DURATIONS

In 2005 the Energy Commission approved a request to increase the extended startup duration from four hours to six hours (CEC 2005). It was said at that time that, *“when Elk Hills was originally licensed, the startup and shutdown emission performance of the GE Frame 7FA turbines was not well documented. Through operational experience at the EHPP, EHP determined that they could only comply with the startup duration restraint imposed by AQ-11 by deviating from the manufacturer’s recommended startup procedures”*. Currently, EHP faces a similar situation.

During the life of the plant, the EHPP has been able to operate almost continuously, and hence has had only a limited number of extended startups. However, during extended startups the current six hour limitation for the complete startup cycle has been met by employing techniques that are not recommended by the original equipment manufacturer specifications and requires implementing abnormal operating procedures. EHP has pushed the equipment to operating conditions for which it was not designed to meet. These off design procedures have, over time, degraded the equipment and it has become an increasing challenge to meet current conditions in both extended and regular startup operations. Therefore, EHP requests an increase in the allowed duration for extended startups (EHPP 2014, p. 2).

The petition to amend (EHPP 2014) provides additional details explaining the startup sequence and requirements for all equipment involved in the process, and further explains the necessity for the requested startup durations.

ABORTED SHUTDOWNS

During normal operations, conditions may arise where a trip of the unit occurs. The trip prompts an immediate response from the operator to stabilize the unit and prevent a full shutdown (i.e., an “aborted shutdown”). The conditions of certification do not provide an allowance to recover from these trips and thus avoid unnecessary shutdown and subsequent startup emissions. Examples of when a trip can occur are a change in fuel quality, a false reading, a valve failing to close, mechanical or instrumentation malfunctions, etc. During these events plant operators may be able to take immediate corrective actions to stabilize the unit in lieu of having to complete the shutdown.

Allowing EHPP the option of aborting shutdowns when a trip occurs can avoid unnecessary shutdown and startup emissions (EHPP 2014, p. 4).

ANALYSIS

Staff has reviewed the proposed changes and the reasoning behind them. Staff finds the proposed changes reasonable and supported by industry best practices. In 2005 the Energy Commission approved a request to increase the duration of the extended startup at the EHPP due to similar startup constraints. Staff understands that these constraints can degrade equipment over time; and as the equipment ages, startup limitations can become increasingly challenging while maintaining the integrity of the equipment and compliance with LORS. The request to increase the startup duration would allow the EHPP to maintain compliance with its conditions of certification without potentially damaging equipment.

Further, **AQ-13** limits hourly emissions during startup and shutdowns and **AQ-14** limits the total emissions per event for extended startups. These emission limits were previously used in the air quality impact assessment to determine that the project would comply with all ambient air quality standards. Because there would be no change to these emission limits or any hourly, daily, or annual permitted emission limits as a result of the requested increase in startup durations and incorporation of additional language defining an aborted startup, no additional impacts beyond what was previously analyzed and approved would occur.

CONCLUSIONS AND RECOMMENDATIONS

Staff recommends approval of the requested modification to allow an increase in startup durations and to add language that would allow EHPP to abort unnecessary shutdowns. There would be no change in permitted emission limits at the EHPP, and with the proposed minor modifications to the condition of certification, the project would continue to comply with all applicable LORS.

CONDITIONS OF CERTIFICATION AND PROPOSED MODIFICATIONS

The following condition of certification is being proposed for modification. ~~Strikethrough~~ is used to indicate deleted language and underline is proposed for new language.

AQ-11 Startup is defined as the period beginning with initial turbine firing until the unit meets the lb/hr and ppmv emission limits in Condition **AQ-15**. **An extended startup shall be defined as a startup that occurs after the steam turbine has been shutdown for 72 hours or more.** Shutdown is defined as the period beginning with initiation of turbine shutdown sequence and ending with cessation of firing of the gas turbine engine. **Aborted shutdown is defined as the period beginning with initiation of turbine shutdown and ends when the unit has ramped up and is meeting the**

lb/hr and ppmv emission limits. Startup and shutdown duration shall not exceed the following:

- ~~two~~**three** hours for a regular startup,
- ~~six~~**seven** hours for an extended startup,
- and one hour for a shutdown **and aborted shutdown**, per occurrence. [District Rule 2201 and 4001]

Verification: The project owner shall provide records of compliance as part of the quarterly reports of Condition **AQ-35**.

REFERENCES

CEC 2000 – California Energy Commission, Final Commission Decision for the Elk Hills Power Project, Docket No. 99-AFC-1. December 2000.

CEC 2003 – California Energy Commission, Commission Order Approving Project Modification, Order No. 03-0723-9. July 23, 2003.

CEC 2005 – California Energy Commission, Order Approving a Petition to Extend Cold Startup Time Limits, Order No. 05-0316-02. March 16, 2005

CEC 2011 – California Energy Commission, Elk Hills Power Project (99-AFC-1C), Approval of Requested Modification to Allow Operation as a Cogeneration Facility. August 19, 2011.

EHPP 2014 – Elk Hills Power, LLC, Petition for Post Certification Amendment and Changes – Air Quality (99-AFC-1). July 31, 2014.

SJVAPCD 2014 – San Joaquin Valley Air Pollution Control District, Authority to Construct, Permit #S-3523-1-10 and #S-3523-2-10. July 1, 2014.