

CALIFORNIA ENERGY COMMISSION

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



California Energy Commission

DOCKETED
09-AFC-5C

TN # 68292

NOV. 01 2012

DATE: November 1, 2012

TO: Interested Parties

FROM: Dale Rundquist, Compliance Project Manager

SUBJECT: **Abengoa Mojave Solar Power Project (09-AFC-5C)**
Staff Analysis of Proposed Modifications to clarify required
fire protection measures for the project's solar fields

On July 27, 2012, Mojave Solar LLC filed a petition with the California Energy Commission to amend the Energy Commission Decision for the Abengoa Mojave Solar Power Project. Staff prepared an analysis of this proposed change, and a copy is enclosed for your information and review.

The Abengoa Mojave Solar project will be a 250 MW solar power plant located near the community of Hinkley in San Bernardino County, California. The project was certified by the Energy Commission on September 8, 2010, and is currently under construction.

The proposed modifications will clarify contradictory language regarding fire water loops and hydrants in the solar fields.

Energy Commission staff reviewed the petition and assessed the impacts of this proposal on environmental quality, public health and safety, and proposes revisions to the Commission Decision and existing condition of certification **HAZ-7**. 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 modification 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/abengoa/. 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 12, 2012, Business Meeting of the Energy Commission.

Agencies and members of the public who wish to provide written comments on the Staff Analysis are asked to submit comments to the Energy Commission Dockets Unit. Please include the docket number 09-AFC-5C in the subject line of your comments. Those submitting comments electronically should provide them in either Microsoft Word format or as a Portable Document Format (PDF) to docket@energy.ca.gov. Please include your name or organization's name in the file name. Those preparing non-electronic written comments should mail or hand deliver them to:

California Energy Commission
Dockets Unit, MS-4
Docket No. 09-AFC-5C
1516 Ninth Street
Sacramento, CA 95814-5512

All written comments and materials filed with the Dockets Unit will become part of the public record of the proceeding. Additionally, comments may be posted on the website.

If you have questions about the amendment request or staff's analysis, please contact Dale Rundquist, Compliance Project Manager at (916) 651-2072 or email at Dale.Rundquist@energy.ca.gov.

If you desire information on participating in the Energy Commission's review of the project, please contact the Energy Commission's Public Adviser, Jennifer Jennings, at (916) 654-4489 or toll free in California, at (800) 822-6228. The Public Adviser's Office can also be contacted via email 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.state.ca.us.

Enclosure

ABENGOA MOJAVE SOLAR POWER PROJECT (09-AFC-5C)

Petition to Amend Final Commission Decision Introduction and Summary

Prepared by: Dale Rundquist

INTRODUCTION AND SUMMARY

On July 27, 2012, Abengoa Solar Inc., owner of the Abengoa Mojave Solar Power Plant project (AMS), filed a petition with the California Energy Commission (Energy Commission) requesting to modify Condition of Certification **HAZ-7** and wording in the Energy Commission Decision (Decision) for the AMS Power Plant project. The 250-megawatt project was certified by the Energy Commission on September 8, 2010, and began construction on August 29, 2011. The facility is located near the town of Hinkley in San Bernardino County, California.

The proposed amendment requests that the applicability of the National Fire Protection Association's (NFPA) "Recommended Practice for Fire Protection for Electric Generating Plants and High-Voltage Direct Current Converter Stations", Standard Number 850 (NFPA 850)¹ to the project site be clarified so that the Decision is consistent with the design of the facility's fire protection system. The Petition also asks that the reference to a fire water loop be removed from the condition of certification **HAZ-7**.

NFPA 850 provides recommendations (not requirements) for fire protection for electric generating power plants. Because a local fire protection agency can determine its own fire suppression needs using NFPA guidance, the project owner worked with the San Bernardino County Fire Department (SBCFD) to determine acceptable fire suppression systems and protocols for the facility.

As a result of this consultation, the project owner has stated that the application of the NFPA Standard 850 recommendations, particularly the placement of fire hydrants throughout the solar fields, will not enhance site safety or protect critical plant equipment for the following reasons:

- An HTF fire is not effectively fought with water;
- If hydrants are placed in the solar field and used by firefighting personnel, it would result in extreme danger to the firefighters because of the possibility of personnel being trapped inside the web of HTF piping; and
- Sections of the solar loops within the solar field can be isolated or bypassed so that if a fire ignites, it will be allowed to burn out while the rest of the loops continue to operate and produce power.

¹ The Decision states (on page 179) that "(d)uring operation, the project will meet the fire protection and suppression requirements of the California Fire Code, all applicable recommended National Fire Protection Association (NFPA) standards (including Standard 850 addressing fire protection at electric generating plants)..."

Energy Commission technical staff reviewed the petition to amend for potential environmental effects and consistency with applicable LORS. Staff has determined that the technical or environmental areas of air quality, biological resources, cultural resources, facility design, land use, noise and vibration, paleontological resources, public health, soil and water resources, traffic and transportation, transmission line safety and nuisance, transmission system engineering, visual resources, and waste management are either not affected by the proposed changes or the changes have no significant environmental impact in these areas, and no revisions or new conditions of certification are needed to ensure the project remains in compliance with all applicable LORS. Table 1 summarizes staff's review.

Staff determined Hazardous Materials Management Condition of Certification **HAZ-7** should be modified for clarification that fire water loops need not be placed in the solar fields.

TABLE 1 - TECHNICAL AREAS REVIEWED

TECHNICAL AREAS REVIEWED	STAFF RESPONSE			New, Revised, or Removed Conditions of Certification Recommended
	Technical Area Not Affected	No Significant Environmental Impact*	Process As Amendment	
Air Quality	X			
Biological Resources		X		
Cultural Resources		X		
Hazardous Materials Management			X	X
Facility Design	X			
Land Use	X			
Noise and Vibration	X			
Paleontological Resources	X			
Public Health	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 & 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)).

ABENGOA MOJAVE SOLAR POWER PROJECT (09-AFC-5C)

Petition to Amend Final Commission Decision Hazardous Materials and Fire Protection Staff Analysis

Prepared by: Alvin Greenberg

INTRODUCTION

Staff is in agreement with Abengoa Mojave Solar (AMS) that the September 2010 Final Energy Commission Decision (Decision) (CEC 2010) contains contradictory language regarding the requirement for fire water loops in the solar fields. The Decision states in various paragraphs that “fire protection for each solar field would be provided by zoned isolation of the heat transfer fluid (HTF) lines in the event of a rupture that results in fire” (CEC 2010, p.19), that “fire hydrants must be located throughout the facility at code-approved intervals” (CEC 2010, p.179), and that “the project will meet the fire protection and suppression requirements of the California Fire Code, all applicable recommended National Fire Protection Association (NFPA) standards (including Standard 850 (NFPA 850) addressing fire protection at electric generating plants), and all Cal/OSHA requirements.” (CEC 2010, p.179) A plain reading of NFPA 850 shows that fire water loops are required for the solar fields not solely for suppression of an HTF fire but also to prevent escalation to adjacent on-site structures, piping, mirrors, and command & control systems, as well as off-site rangelands or roadways.

NFPA 850, 2010 version, section 11.5.3 states the following:

“Hydrants should be placed strategically about the solar field so as to provide coverage of all HTF piping associated with solar collection assemblies and HTF supply and distribution piping. This will help in early manual fire fighting and exposure control.”

The Decision also required that the fire water pipes into the solar fields that crossed roads must be underground (see condition **HAZ-7**). Therefore, while one section of the Decision spoke about no need for fire water loops and hydrants in the solar fields, other sections and requirements did speak to that requirement. Staff is therefore in agreement with AMS that clarification is needed.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS) COMPLIANCE

No LORS applicable to the project have changed since the Commission Decision was published in September 2010.

ANALYSIS

Normally in all other siting cases including gas-fired power plants and all the other thermal solar power plants that intended to use a combustible Heat Transfer Fluid, staff would require compliance with all NFPA standards. However, in this case, the San

Bernardino County Fire Department (SBCFD) has expressed a view different from other jurisdictions, and staff must consider the local fire department's views. NFPA provides guidance to fire departments, and as such, fire departments can interpret the guidance for their jurisdiction. The SBCFD feels that the circumstances are such that they will not enter this solar field if it was on fire. Deputy Chief Peter Brierty told Energy Commission staff of this position in a personal conversation and reiterated that position in a conference call with the project owner and staff on June 27, 2012 (Brierty 2012). Before arriving at this policy, SBCFD staff reviewed the situation and re-visited an existing solar power plant. Deputy Chief Brierty felt that in a rescue attempt, adequate water would be available via pumper trucks and water tenders so that life-saving actions could occur without fire water loops in the solar fields. He also stated that in this setting, a fire in the project solar fields would not pose a threat to offsite structures or vegetation, limiting potential escalation of a fire. Given this position of the local fire department, staff believes that requiring fire water loops and hydrants in the solar fields would result in a cost expenditure that would be wasted as the fire hydrants would go unused.

This unique position of a local fire department has not before been encountered by Energy Commission staff and yet it is clear that it does not seem prudent to require the construction of fire water loops and hydrants that would not be used. This interpretation is unique to the specifics of this project. Indeed, in contrast to the position of the SBCFD, the Riverside County Fire Department has stated that it wishes to follow all the requirements of NFPA 850, and Energy Commission staff is in agreement with the placement of fire water mains and hydrants in the solar fields of the Genesis Solar Project that has a similar solar thermal trough design using HTF.

CONCLUSIONS AND RECOMMENDATIONS

Given the unique position of the local Fire Authority (the SBCFD) that it would not enter this solar field during a solar field fire or use fire water loops to suppress such a fire, staff does not oppose the requested amendment to **HAZ-7** sought by AMS for clarification that fire water loops need not be placed in the solar fields. Staff proposed changes for **HAZ-7** and changes to Decision language supporting the amendment are shown below.

PROPOSED MODIFICATION TO COMMISSION DECISION

The following modifications to Hazardous Materials condition of certification **HAZ-7** and to page 179 of the Commission Decision reflect staff's analysis. The required changes are shown in ~~strike through~~ and **bold underline**.

HAZ-7 The project owner shall ensure that all pipes carrying heat transfer fluid (HTF), **and** all command and control systems, ~~and the fire water loop~~ that are required to cross Harper Lake Road or Lockhart Road will be placed underground for the crossing. The pipes and lines shall be installed in a protective structure underneath the road and the HTF pipes shall have expansion loops aboveground on either side of the road. The engineering

design plans shall be provided to the CPM for review and approval prior to the commencement of the solar array construction.

Verification: At least sixty (60) days prior to the commencement of solar array piping construction, the project owner shall provide the design drawings as described above to the CPM for review and approval.

The following are recommended changes to the Decision language such that the SBCFD's interpretation of NFPA 850 for this project and setting are applied, and changes to condition **HAZ-7** are supported.

Decision on Page 179:

During operation, the project will meet the fire protection and suppression requirements of the California Fire Code, ~~all applicable recommended National Fire Protection Association (NFPA) standards (including Standard 850 addressing fire protection at electric generating plants), and all Cal/OSHA requirements.~~ **The project will meet all applicable recommended National Fire Protection Association (NFPA) standards, including Standard 850 addressing fire protection at electric generating plants, within the power islands. Application of NFPA Standard 850 within each solar field is only required to the extent that application of this standard is necessary for the safety of project personnel and firefighters.** Fire suppression elements will include both fixed and portable fire extinguishing systems. (Exs. 1, § 5.18.3.3; 301, pp. 5.14-18 – 5.14-19.) The fire protection system will be designed to protect personnel and limit property loss and plant downtime in the event of a fire. In addition to the fixed fire protection system, smoke detectors, flame detectors, high temperature detectors, **and** appropriate class of service portable extinguishers, ~~and fire hydrants~~ must be located throughout the facility at code-approved intervals, **and fire hydrants must be located at code approved intervals throughout each power island.** These systems are standard requirements of the NFPA and the Uniform Fire Code (UFC). (*Id.*)

REFERENCES

CEC 2010 - California Energy Commission. Commission Decision for Abengoa Mojave Solar Project (09-AFC-5). September 2010.

NFPA 850, 2010 version, section 11.5.3

Abengoa 2012 – Abengoa Mojave Solar Petition to Modify the Decision to clarify the required fire protection measures for the project's solar fields. July 2012.

Brierty 2012 – Record of Conversation between Deputy Chief Peter Brierty, Energy Commission Staff and AMS, June 27, 2012