



|                                   |
|-----------------------------------|
| <b>DOCKET</b><br><b>85-AFC-3C</b> |
| DATE <u>OCT 04 2010</u>           |
| RECD. <u>OCT 25 2010</u>          |

October 04, 2010

CC-1624

Mr. Dale Rundquist  
Compliance Project Manager  
California Energy Commission  
Energy Facilities Siting Division  
1516 Ninth Street  
Sacramento, CA 95814-5512

**Subject: CEC Docket 85-AFC-3C Post Certification Amendments for Units A, B & C (Administrative Changes to Unit A & C Administrative Changes to Unit B Plus Revising Unit B's DLN9 Combustion System to a DLN1+ Combustion System)**

Dear Mr. Rundquist:

MSCC is licensed by the California Energy Commission as a cogeneration facility comprised of three GE Frame 7E combustion turbine generators (CTGs). The CTGs produce electricity for sale to the CAISO and across the fence to one of MSCC's partners. Waste heat from each CTG is routed through its heat recovery steam generator (HRSG) to produce steam used in the adjoining oil field for thermally enhanced oil recovery (TEOR). In order to accommodate the declining steam demands of the steam host, MSCC is proposing to operate Unit B (SJVAPCD permitted unit S-1135-225) in the future as either a cogeneration unit or a peaking unit.

MSCC's permitted 5ppm NOx emission limit is currently met through the use of GE's DLN9 combustion system (NOx emission not to exceed 9ppm) in conjunction with an ammonia injected SCR grid that reduces the NOx emissions to 5ppm or less. The SCR grid is installed internal to the HRSG and is bypassed when Unit B is operated as a peaking unit. NOx emissions released through the bypass stack are controlled only by the DLN9 combustion system and the permitted 5ppm limit cannot be met.

GE has recently developed a DLN1+ combustion system that can meet MSCC's permitted 5ppm NOx emission limit without the use of the SCR. MSCC is proposing an amendment to upgrade Unit B's existing DLN9 combustion system with the recently developed DLN1+ combustion system, thereby continuing to meet the permitted NOx emission of 5ppm when Unit B is operated in bypass as a peaking unit. The proposed amendment includes leaving the SCR grid and ammonia injection system intact for use when Unit B is required as a cogeneration unit. If or when the SCR system is used, MSCC will meet all the SCR conditions, including the calculation and recording of ammonia slip.

The request for a Post Certification Amendment is for conversion of Unit B's DLN-9 dry low NOx emission control system to a DLN-1+ control system and to make administrative changes to Units A, B, and C SJVAPCD's Permits To Operate.

The first administrative change to MSCC's SJVAPCD permits is to revise the equipment description for each CTG from 75 MW to 78.2 MW. This is not a physical increase in the units' ratings but reflects a revision from the nominal rating used during the pre-construction licensing/permitting process to the nominal rating of the final purchased equipment. Over the years our industry has faced more frequent and more detailed regulatory scrutiny and this revision should alleviate future confusion as to the nominal rating of the units.

The second administrative change requests the extension of the 30 day submission window for the annual compliance testing report listed on MSCC's SJVAPCD permit for each CTG to 60 days as allowed by the SJVAPCD Rule 1081, Section 7.3. Additional required testing for VOCs and ammonia slip have made it difficult to meet the 30 day submission window.

The following is in response to the California Energy Commission's Rule of Practice and Procedure & Power Plant Site Certification Regulations Section 1769 (a) (1):

**(A) A complete description of the proposed modifications, including new language for any conditions that will be affected:**

Unit B's DLN-9 combustion chambers, liners and burner heads will be replaced with DLN-1+ combustion chambers, liners and burner heads. The end result will be a unit, Unit B, which will meet the permitted NOx emission limits while bypassing the HRSG and SCR grid to operate as a peaking unit.

The following condition is from the September 9, 2003 approval of Docket No. 85-AFC-3C, Order No. 03-0909-02.(Please see attached.) Changes to the Midway Sunset Cogeneration Project Decision are shown as **bold** and underlined; deleted language is in ~~strikethrough~~.

AQ-18 ~~Pollutant emissions from each DLN-9 dry low NOx combustion turbine without SCR controls shall not exceed the following limits (in pounds mass per hour, lbm/hr) except during times of start up or shutdown (as described in Condition of Certification AQ-44):~~

~~Gas-Fired Case:~~

|                                      |                                |
|--------------------------------------|--------------------------------|
| <del>Particulate</del>               | <del>9.98 lbm/hr</del>         |
| <del>Sulfur Compounds</del>          | <del>0.92 lbm/hr as SO2</del>  |
| <del>Oxides of Nitrogen</del>        | <del>36.08 lbm/hr as NO2</del> |
| <del>Hydrocarbons (nonmethane)</del> | <del>9.00 lbm/hr</del>         |
| <del>Carbon Monoxide</del>           | <del>54.91 lbm/hr</del>        |

Pollutant emissions from each ~~SCR-controlled~~ combustion turbine shall not exceed the following limits (in pounds mass per hour, lbm/hr) except during times of start-up or shutdown (as described in Condition of Certification AQ-44):

~~Gas-Fired Case:~~

|                           |                                 |
|---------------------------|---------------------------------|
| Particulate               | 9.98 lbm/hr                     |
| Sulfur Compounds          | 0.92 lbm/hr as SO <sub>2</sub>  |
| Oxides of Nitrogen        | 18.04 lbm/hr as NO <sub>2</sub> |
| Hydrocarbons (nonmethane) | 9.00 lbm/hr                     |
| Carbon Monoxide           | 54.91 lbm/hr                    |

Verification: ~~The combustion turbines identified as Units A and B shall have completed the installation and testing of the SCR system no later than April 30, 2004. The combustion turbine identified as Unit C shall have completed the installation and testing of "SCR system no later than April 30, 2005.~~

(The only revision to the verification conditions is in the first line of condition "d." as follows: "The project owner shall submit the results of the compliance test within ~~30~~ 60 days of completion of the tests." This revision agrees with SJVAPCD Rule 1081, Section 7.3).

**(B) A discussion of the necessity for the proposed modification:**

The proposed modification will accommodate the declining steam demands of MSCC's steam host while maintaining the availability of electric power to the grid with Unit B as a peaking Unit.

**(C) If the modification is based on information that was known by the petition during the certification proceeding, an explanation of why the issue was not raised at that time;**

DLN-1+ technology was not available during the certification process.

**(D) If the modification is based on new information that changes or undermines the assumptions, rationale, findings, or any other bases of the final decision, an explanation of why the change should be permitted;**

This modification does not change or undermine the assumption, rationale finding or other bases of the final decision.

**(E) An analysis of the impacts the modification may have on the environment and proposed measures to mitigate any significant adverse impacts;**

The only impact this modification will have on the environment is a reduction of ammonia slip whenever Unit B is operated as a peaking unit.

- (F) **A discussion of the impact of the modification on the facility's ability to comply with applicable laws, ordinances, regulations, and standards;**

This modification will not impact the facility's ability to comply with applicable laws, ordinances, regulations and standards.

- (G) **A discussion of how the modification affects the public;**

This modification would allow MSCC to operate Unit B as a peaking unit to supply electric power to the grid with the attendant reduction of ammonia slip.

- (H) **A list of property owners potentially affected by the modification;**

No property owners will be affected by this modification.

- (I) **A discussion of the potential effect on nearby property owners, the public and the parties in the application proceedings;**

Since there is no change in the permitted emissions limits, there will be no potential effect on nearby property owners other than a slight reduction of ammonia slip.

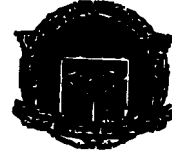
If you have any questions or comments, please call me at (661) 768-3020 or Ray Smith at (661) 768-3016.

Yours Truly,



Dave Faiella  
Executive Director

CC: File CC-1624  
G. Jans  
S. Henriksen



# California Energy Commission Business Meeting

Tuesday, September 9, 2003

1516 Ninth Street  
Hearing Room A, First Floor  
10 a.m.  
Sacramento, California  
(Wheelchair Accessible)

## THE COMMISSION WILL CONSIDER THE FOLLOWING ITEMS:

1. **CONSENT CALENDAR.** (Items on the Consent Calendar will be taken up and voted on as a group. A Commissioner may request that an item be discussed and moved to later on the agenda)
  - a. **CALIFORNIA AIR RESOURCES BOARD.** Possible approval of a no-cost time extension to Public Interest Energy Research (PIER) Contract 700-98-027 to collect data and produce air quality computer models. These models will address the long range NOx transport issue unique to thermal power plants and other large point sources. Contact: Guido Franco, (916) 654-3940 and Marla Mueller, (916) 654-4894.
2. **MIDWAY SUNSET COGENERATION PROJECT (85-AFC3C).** Possible approval of a petition to add Selective Catalytic Reduction systems to meet revised San Joaquin Valley Air Pollution Control District rules. If approved, the NOx emissions limit will be reduced by half. Contact: Connie Bruins, (916) 654-4545. (15 minutes)
3. **PICO POWER PROJECT.** Possible approval of the Presiding Member's Proposed Decision (PMPD) recommending certification for the 147-megawatt Pico Power Project in the City of Santa Clara, proposed by Silicon Valley Power. Contact: Gary Fay, (916) 654-3893. (1 hour)
4. **SMUD COSUMNES POWER PLANT PROJECT.** Possible consideration and approval of the SMUD Cosumnes Power Plant 1 Presiding Member's Proposed Decision (PMPD) recommending granting of certification with conditions. Contact: Garret Shean, (916) 653-6421. (1 hour)
5. **PALOMAR ENERGY PROJECT (01-AFC-24).** Consideration and possible ruling on

request filed by Intervenor Powers' counsel regarding his ability to participate via teleconference at the August 6, 2003, Commission hearing on the PMPD. Contact: Susan Geftter, (916) 653-6110. (15 minutes)

6. **PALOMAR ENERGY PROJECT (01-AFC-24).** Consideration of any petitions for reconsideration filed pursuant to Public Resources Code section 25530. Contact: Susan Geftter, (916) 653-6110. (30 Minutes)

7. **Minutes**

Approval of Minutes from the September 3, 2003 business meeting.

8. **Commission Committee and Oversight**

A discussion on Commission Committee and Oversight matters may be held.

9. **Chief Counsel's Report**

The Commission may adjourn to closed session with its legal counsel to determine whether facts and circumstances exist that warrant the initiation of litigation [Government Code section 11126(e)(3)] or whether facts and circumstances exist that constitute a significant exposure to litigation against the Commission [Government Code section 11126(e)(2)].

10. **Executive Director's Report**

Closed session may be held on personnel matters.  
[Authority: Government Code, Section 11126(a).]

11. **Public Adviser's Report**

12. **Public Comment**

People may speak up to five minutes on any matter concerning the Commission

The Commission may recess the meeting and continue it later for purposes of a general discussion of Commission internal organization and policy. No action will be taken at such a continued session. The Commission will announce whether it plans to continue the meeting in this manner and the time and location at the end of Item 12.

If you require special accommodations, contact Lourdes Quiroz at (916) 654-5146, five days prior to the meeting.

News media inquiries should be directed to:  
Claudia Chandler, Assistant Director -- (916) 654-4989

Questions about participation in the Business Meeting should be directed to: Roberta Mendonca, Public Adviser -- (916) 654-4489 or (800) 822-6228

Should you wish to participate via telephone, call toll free 1-888-823-5065 on Business Meeting days after 10:01 a.m. (PDT). When asked, please answer "Business Meeting and Mr. Jerome Lee" and the operator will connect you into the meeting. Should you want to speak on a specific item, please inform the operator that you want to speak and the item number. Please be aware that while the Commission makes this opportunity to participate by telephone available in an effort to make its hearings inclusive, parties who have comments that they consider to be essential for the Commission to hear should consider attending the hearing in person because there are occasional technical problems with our telephonic link. The Commission will make every effort to avoid these problems but it cannot accept responsibility for them.

To reduce paper and mailing costs, the Energy Commission offers an automated e-mail system to alert you about Business Meeting agendas on the Internet. To subscribe via e-mail, please go to our site [www.energy.ca.gov/listservers/](http://www.energy.ca.gov/listservers/). Those subscribing to the e-mail may wish to discontinue receiving agendas by U.S. Mail. To remove your name from the mailing list, send the mailing label on the envelope to: California Energy Commission, 1516 9th St., MS 38, Sacramento, CA, 95814 and ask that your name be deleted, or e-mail [bmccann@energy.state.ca.us](mailto:bmccann@energy.state.ca.us) and request that your name be removed from List 15. Please include the number that is located on the upper left corner of the mailing label.

Energy Commission Web Site - [www.energy.ca.gov](http://www.energy.ca.gov)

---

| [Back to Main Page](#) | [Homepage](#) | [Calendar](#) | [Directory/Index](#) | [Search](#) |

---

State Of California

The Resources Agency of California

## Memorandum

Date : September 3, 2003  
 Telephone: (916) 654-4545

To: BOB THERKELSEN  
 Executive Director

File: Issues1.doc

From: California Energy Commission - Terry O'Brien, Deputy Director  
 1516 Ninth Street  
 Sacramento, CA 95814-5512

Terry O'Brien

Subject: ITEM FOR THE SEPTEMBER 9, 2003 BUSINESS MEETING  
 MIDWAY SUNSET COGENERATION PROJECT AMENDMENT PETITION

**ENERGY COMMISSION ACTION REQUESTED and SUMMARY OF PROPOSED AMENDMENT**

Staff recommends that the California Energy Commission (Energy Commission) approve Midway Sunset Cogeneration Company's (MSCC) petition filed on June 11, 2003, to modify the Midway Sunset Cogeneration Project (85-AFC-3C).

MSCC is proposing to add Selective Catalytic Reduction (SCR) systems, to reduce NOx emissions and meet the San Joaquin Valley Air Pollution Control District's (District) NOx compliance limit of 5 ppm at 15 percent O<sub>2</sub> (District Rule 4703, "Stationary Gas Turbines" [amended April 25, 2002] Standard, Tier 2).

**PROJECT BACKGROUND**

The Midway Sunset Project is a 225 MW, cogeneration, natural gas-fired power plant that began operation in May 1989. The facility is located in Fellows in Kern County, California, and uses cogeneration steam to aid in the enhanced oil recovery process.

**SUMMARY OF STAFF'S ANALYSIS**

District Rule 4703 is intended to control NOx emissions from stationary gas-turbine systems. Based on their size and application (larger than 10 MW and a combined-cycle application), MSCC has chosen the "Standard Tier 2" emission limit and corresponding timing of implementation for the facility. Thus, MSCC will be required to limit the project NOx emissions from each of the three exhaust stacks to 5 ppm at 15 percent O<sub>2</sub>. Two turbine trains must be completed by April 30, 2004 and the remaining train by April 30, 2005, or 30 days after the first major overhaul after April 30, 2004.



Bob Therkelsen  
September 3, 2003  
Page 2

Adding SCR systems to the facility helps control NOx emission, but also produces "ammonia slip" (ammonia remaining in stack from the ammonia injection process). Although the District is limiting ammonia slip to 10 ppm at 15 percent O<sub>2</sub> (per District regulatory practices), Energy Commission staff is recommending that ammonia slip be limited to 5 ppm. Staff is proposing this lower limit based on 1) the SCR manufacturer's guarantee, 2) previously licensed projects, and 3) the California Air Resources Board guidelines. MSCC agrees with staff's proposal and the addition of Conditions of Certification AQ-48 through AQ-54.

By adding SCR systems to the Midway Sunset facility there will be an increase in ammonia (ammonia slip) in the ambient air. This increase in ammonia could contribute to the formation of a component of PM-10 (Secondary PM-2.5). Therefore, staff maintains that this lower ammonia slip limit is particularly important because the District is non-attainment for PM-10 emissions. The 5 ppm ammonia slip limit will help to mitigate the potential increase to Secondary PM-2.5.

Energy Commission staff reviewed this request to assess the impacts of this proposal on environmental quality, and public health and safety, and determined that the only technical area affected is air quality. The attached detailed air quality analysis includes an evaluation of the consistency of the proposed revision with the Energy Commission's Decision, and concludes that the project, as modified, will allow the facility to remain in compliance with applicable laws, ordinances, regulations, and standards (LORS) (*Title 20, California Code of Regulations, Section 1769*).

### **PUBLIC REVIEW**

A Notice of Receipt was mailed to the post-certification mailing list on June 24, 2003. The attached staff analysis was mailed to affected public agencies on August 21, 2003. The staff analysis also was posted on the Energy Commission website. To date, no public or agency comments on the staff analysis have been received.

### **STAFF CONCLUSION AND RECOMMENDATION**

As mandated by Title 20, section 1769(a)(3) of the California Code of Regulations, the Energy Commission may only approve project modifications if specific findings are met. Following staff's review of the proposed amendment, and with the adoption of the revised conditions of certification identified in the staff analysis and the attached Order, Energy Commission staff recommends approval based on the following findings:

- A. There will be no new or additional unmitigated significant environmental impacts associated with the proposed change.

- B. The facility will remain in compliance with all applicable laws, ordinances, regulations, and standards, subject to the provisions of Public Resources Code section 25523.
- C. The changes will be beneficial to the public, as the modification will result in an overall net air quality benefit for NOx.
- D. There has been a substantial change in circumstances resulting in information that was not available to the parties prior to the Energy Commission certification. Specifically, improved SCR systems can now control NOx emissions to below 5 ppm at 15 percent O<sub>2</sub>.

Based on the above findings, staff recommends approval of the petition and revisions to the air quality conditions of certification as presented in the attached staff analysis and order.

**COMPLIANCE PROJECT MANAGER**

The Compliance Project Manager is Connie Bruins, (916) 654-4545.

**Attachments**

**Midway Sunset Cogeneration Power Project (85-AFC-3)**  
**Request to Amend the Air Quality Conditions of Certification**  
**Prepared by: Joseph M. Loyer**

**Amendment Request**

The Midway Sunset Cogeneration Company (MSCC) has submitted a petition to amend the Energy Commission's Decision Condition of Certification Air Quality 18 (AQ-18) and add Conditions of Certification AQ-48 through AQ-54 for the Midway Sunset Cogeneration Power Plant (MSPP) to reflect the addition of ammonia injected Selective Catalytic Reduction (SCR) systems in order to reduce NOx emissions.

**Background**

The MSPP is a 225 megawatt (MW) cogeneration power plant located near the City of Fellows in Western Kern County in the San Joaquin Valley inside the North Midway Sunset oil field. MSPP includes three turbine trains, each consisting of a GE Frame 7E gas turbine, dry-low NOx combustors (DLN), and an unfired heat recovery steam generator. MSPP has been base loaded (operating at the maximum available level for the maximum available time) providing steam and power to the Midway Sunset oil field thermally enhanced oil recovery activities since May of 1989.

MSPP was originally licensed with water-injected Quiet Combustors. These were later retrofitted (via petition to amend) with DLN-15 combustors and then finally retrofitted with DLN-9 combustors. MSCC included in these petitions the surrender of the ability to burn Number 2 fuel oil. These petitions resulted in the reduction of NOx emissions from the MSPP and were proposed by MSCC to comply with the District's retrofit rule, Rule 4703.

**Laws Ordinances Regulations and Standards**

Other than demonstrating compliance with Rule 4703, no laws, ordinances, regulations or standards will be affected by the proposed modifications.

Rule 4703 is intended to control NOx emissions from stationary gas-turbine systems that are equal to or greater than 0.3 MW and/or have a maximum heat input rate of 3,000,000 Btu per hour (with exceptions provided). Rule 4703 allows several options for compliance depending on size, application and timing of implementation. Based on their size and application (larger than 10 MW and a combined-cycle application), MSCC has chosen the "Standard, Tier 2" emission limit and corresponding timing of implementation for the MSPP. Thus, MSCC will be required to limit the project NOx emissions from each exhaust stack to 5 ppm at 15 percent O<sub>2</sub> with a three-hour rolling average, with two trains to be completed by April 30, 2004 and the remaining train by April 30, 2005 or 30 days after the next major overhaul after April 30, 2004.

**Analysis**

Condition of Certification AQ-18 establishes the hourly emission limits for the MSPP. The original license established hourly emission limits assuming that MSPP would use

water-injected Quiet Combustors, but was amended to allow for the installation of (first) DLN-15 Combustors and (subsequently) DLN-9 Combustors over a period of years during the normal major overhaul schedule for the project.

MSCC proposes to eliminate the emission limits pertaining to the Quiet Combustors and the DLN-15 Combustors as they have all been successfully replaced with the DLN-9 Combustors. Furthermore, MSCC proposes to retain the emission limits for the DLN-9 Combustors and add emission limits for the staged installation of the SCR systems. This will allow MSCC to install the SCR systems during the normal major overhaul schedule. While both sets of emission limits will establish limits for all the criteria pollutants, the only difference between the two are the NOx emission limits. MSCC proposes to lower the NOx emission limit from 36.08 pounds-mass per hour (lbm/hr) to 18.04 lbm/hr (i.e., by half, from 10 to 5 ppm).

MSCC proposes to install ammonia-injected SCR systems to control NOx emissions. SCR systems emit a small amount of unreacted ammonia into the stack emissions, referred to as ammonia slip. The California Air Resources Board (CARB) staff guidelines recommend an ammonia slip limit of 5 ppm @ 15 percent O<sub>2</sub> averaged over 24 hours for this class of turbine. The Energy Commission has recently licensed several power plants at the 5 ppm ammonia limit. MSCC has included with their petition a manufacturer's performance guarantee of 5 ppm ammonia slip @ 15 percent O<sub>2</sub>. However, from the District's Best Available Control Technology (BACT) determination procedures, the District is proposing an ammonia slip limit of 10 ppm @ 15 percent O<sub>2</sub> averaged over 24 hours. Staff recommends and MSCC has agreed to the 5 ppm ammonia slip limit based on the CARB recommendation and the manufacturer's guarantee. Conditions of Certification AQ-49 through AQ-54 contain the additional requirements for monitoring, recording and reporting ammonia slip emissions.

### Conclusions and Recommendations

Staff has analyzed the proposed changes and concludes that there are no significant impacts associated with approval of the petition. Staff concludes that the proposed changes are based on information that was not available during the original licensing procedures. Staff concludes that the proposed language retains the intent of the original Energy Commission Decision and Conditions of Certification. Staff recommends the following modifications to Condition of Certification AQ-18, and the addition of Conditions of Certification AQ-48 through AQ-54.

### Proposed Modifications to the Air Quality Conditions of Certification

The following changes to the conditions of certification have been either added or are modifications of the original. New language is in bold/underline and deleted language is in ~~strike through~~.

**AQ-18** ~~Pollutant emissions from each water injection combustion turbine shall not exceed the following limits (in pounds mass per hour, lbm/hr) except during times of start-up or shutdown (as described in Condition of Certification AQ-44):~~

**Gas-Fired Case:**

|                           |       |                           |
|---------------------------|-------|---------------------------|
| Particulate               | 9.98  | lbm/hr                    |
| Sulfur Compounds          | 0.92  | lbm/hr as SO <sub>2</sub> |
| Oxides of Nitrogen        | 79.04 | lbm/hr as NO <sub>2</sub> |
| Hydrocarbons (nonmethane) | 9.00  | lbm/hr                    |
| Carbon Monoxide           | 94.00 | lbm/hr                    |

~~Pollutant emissions from each DLN-15 dry low NOx combustion turbine shall not exceed the following limits (in pounds mass per hour, lbm/hr) except during times of start-up or shutdown (as described in Condition of Certification AQ-44):~~

**Gas-Fired Case:**

|                           |       |                           |
|---------------------------|-------|---------------------------|
| Particulate               | 9.98  | lbm/hr                    |
| Sulfur Compounds          | 0.92  | lbm/hr as SO <sub>2</sub> |
| Oxides of Nitrogen        | 59.90 | lbm/hr as NO <sub>2</sub> |
| Hydrocarbons (nonmethane) | 9.00  | lbm/hr                    |
| Carbon Monoxide           | 54.91 | lbm/hr                    |

Pollutant emissions from each DLN-9 dry-low NOx combustion turbine without SCR controls shall not exceed the following limits (in pounds mass per hour, lbm/hr) except during times of start-up or shutdown (as described in Condition of Certification AQ-44):

**Gas-Fired Case:**

|                           |       |                           |
|---------------------------|-------|---------------------------|
| Particulate               | 9.98  | lbm/hr                    |
| Sulfur Compounds          | 0.92  | lbm/hr as SO <sub>2</sub> |
| Oxides of Nitrogen        | 36.08 | lbm/hr as NO <sub>2</sub> |
| Hydrocarbons (nonmethane) | 9.00  | lbm/hr                    |
| Carbon Monoxide           | 54.91 | lbm/hr                    |

Pollutant emissions from each SCR controlled combustion turbine shall not exceed the following limits (in pounds mass per hour, lbm/hr) except during times of start-up or shutdown (as described in Condition of Certification AQ-44):

**Gas-Fired Case:**

|                                  |              |                                 |
|----------------------------------|--------------|---------------------------------|
| <u>Particulate</u>               | <u>9.98</u>  | <u>lbm/hr</u>                   |
| <u>Sulfur Compounds</u>          | <u>0.92</u>  | <u>lbm/hr as SO<sub>2</sub></u> |
| <u>Oxides of Nitrogen</u>        | <u>18.04</u> | <u>lbm/hr as NO<sub>2</sub></u> |
| <u>Hydrocarbons (nonmethane)</u> | <u>9.00</u>  | <u>lbm/hr</u>                   |
| <u>Carbon Monoxide</u>           | <u>54.91</u> | <u>lbm/hr</u>                   |

**Verification:** ~~The combustion turbine identified as Unit B shall have completed the installation and testing of DLN-9 technology no later than January 31, 2001. The combustion turbine identified as Unit A shall have completed the installation and testing of DLN-9 technology no later than May 31, 2001. The combustion turbine identified as Unit C shall have completed the installation and testing of DLN-9 technology no later than June 30, 2001. The combustion turbines identified as Units A and B shall have completed the installation and testing of the SCR system no later than April 30, 2004. The combustion turbine identified as Unit C shall have completed the installation and testing of SCR system no later than April 30, 2005.~~

- a. At least 60 days before the commercial operation date of the power cogeneration facility, or 60 days before the permit to operate anniversary date, the project owner shall submit to the SJVUAPCD, CARB and the CEC a detailed performance test plan for the power plant's AECS. The performance test will be funded by the project owner and conducted by a third party approved by the SJVUAPCD and CARB. The SJVUAPCD will notify the project owner and the CEC of its approval, disapproval, or proposed modifications to the plan within 30 days of receipt of the plan. The project owner shall incorporate the SJVUAPCD and the Energy Commission's comments or modifications to the plan.
- b. The project owner shall notify the SJVUAPCD and the CEC, within five days, before the facility begins commercial operation. The project owner shall also notify the SJVUAPCD one week prior to the beginning of testing to allow the SJVUAPCD to observe and/or conduct concurrent sampling.
- c. Compliance with emission limits shall be demonstrated by a SJVUAPCD-witnessed sample collection performed by an independent testing laboratory within 60 days after startup of this equipment and annually within 60 days prior to permit anniversary date.
- d. The project owner shall submit the results of the compliance test within 30 days of completion of the tests. The project owner shall submit to the SJVUAPCD, its application for a Permit to Operate via registered mail. The project owner shall submit a copy of the application to the CEC within 10 days of its submittal to the SJVUAPCD. The SJVUAPCD shall approve or disapprove the application as prescribed in the SJVUAPCD rules.

**AQ-48** The emission of unreacted ammonia slip from any exhaust stack shall not exceed 5 ppm @ 15 percent O<sub>2</sub> averaged over 24 hours.

**Verification:** The owner shall monitor and record the ammonia slip from each exhaust stack as required in Conditions of Certification AQ-49 through AQ-54. The owner shall report the ammonia slip as part of the quarterly emission report required by Condition of Certification AQ-21.

**AQ-49** Each CTG shall be equipped with a continuously recording emission monitor preceding the SCR module measuring NO<sub>x</sub> concentration for the purpose of calculating ammonia slip. The owner shall check, record and

quantify the calibration drift (CD) at two concentration values at least once daily (approximately 24 hours). The calibration shall be adjusted when ever the daily zero or high-level CD exceeds 5 percent. If either the zero or high-level CD exceeds 5 percent for five consecutive daily periods, the analyzer shall be deemed out-of-control. If either the zero or high-level CD exceeds 10 percent during any CD check, the analyzer shall be deemed out-of-control. If the analyzer is out-of-control, the owner shall take appropriate corrective action and then repeat the CD check.

**Verification:** The owner shall report the CD checks for each day as part of the quarterly emission report required by Condition of Certification AQ-21.

**AQ-50** Each ammonia injection grid shall be equipped with an operational ammonia flow-meter and injection pressure indicator.

**Verification:** The owner shall make the site available for inspection by the SJVUAPCD, CARB and the CEC during construction and operation with reasonable notice.

**AQ-51** Each heat recovery steam generator design shall provide for additional selective catalytic reduction and oxidation catalyst if required to meet NOx and CO emission limits.

**Verification:** The owner shall make the site available for inspection by the SJVUAPCD, CARB and the CEC during construction and operation with reasonable notice.

**AQ-52** The owner shall monitor and record the exhaust gas temperature at the selective catalytic reduction and oxidation catalyst inlets.

**Verification:** The owner shall report the inlet temperature as recorded as part of the quarterly emission report required by Condition of Certification AQ-21.

**AQ-53** Ammonia shall be injected whenever the selective catalytic reduction system catalyst exceeds the minimum ammonia injection temperature recommended by the manufacturer.

**Verification:** The owner shall report the ammonia injection rate as part of the quarterly emission report required by Condition of Certification AQ-21.

**AQ-54** Compliance with the ammonia slip limits (Condition of Certification AQ-48) shall be demonstrated by using the following calculation procedure:

$$A_s = ((a - (b \times c / 1,000,000)) \times 1,000,000 / b) \times d$$

where:  $A_s$  = ammonia slip (ppmv @15 percent O<sub>2</sub>)

$a$  = ammonia injection rate (lbs/hr)/17(lbs/lb. mol)

$b$  = dry exhaust gas flow rate (lbs/hr)/(29(lbs/lb. mol)

c = change in measured NOx concentration across the catalyst (ppmv @ 15 percent O2), and

d = correction factor. The correction factor shall be derived annually during compliance testing by comparing the measured and calculated ammonia slip.

**Verification:** The owner shall report ammonia slip required in Condition of Certification AQ-48 via the indicated calculation procedure. The owner shall submit for approval the ammonia source testing protocols no later than 30 days prior to the annual ammonia slip source-testing date. The owner shall notify the CEC and the SJVUAPCD no later than 10 days prior to the date of the annual ammonia source test. The owner shall submit for approval the results of the annual ammonia source test including any changes to the correction factor "d" above within 90 days of the completion of the annual ammonia source test.



## CALIFORNIA ENERGY COMMISSION

516 NINTH STREET  
SACRAMENTO, CA 95814-5512



STATE OF CALIFORNIA  
State Energy Resources  
Conservation and Development Commission

In the Matter of:

Midway Sunset Cogeneration Company  
MIDWAY SUNSET COGENERATION  
PROJECT

) Docket No. 85-AFC-3C  
) Order No. 03-0909-02

) ORDER APPROVING a Petition  
) to Add Selective Catalytic  
) Reduction Systems

The Midway Sunset Cogeneration Company (MSCC), the owner/operator of the Midway Sunset Cogeneration Project, has requested to modify the facility by adding Selective Catalytic Reduction systems. The modifications will result in revisions to the California Energy Commission's Decision (Condition of Certification AQ-18 will be modified and Conditions of Certification AQ-48 through AQ-54 will be added). The modifications to the facility will allow MSCC to reduce NOx emissions and meet the San Joaquin Valley Air Pollution Control District's NOx compliance limit of 5 ppm at 15 percent O<sub>2</sub> (District Rule 4703, "Stationary Gas Turbines" [amended April 25, 2002] Standard, Tier 2).

### COMMISSION FINDINGS

Based on staff's analysis, the Commission concludes that the proposed changes will not result in any significant impact to public health and safety, or the environment. The Commission finds that:

- A. There will be no new or additional unmitigated significant environmental impacts associated with the proposed change.
- B. The facility will remain in compliance with all applicable laws, ordinances, regulations, and standards, subject to the provisions of Public Resources Code section 25523.
- C. The changes will be beneficial to the public, as the modification will result in an overall net air quality benefit for NOx.
- D. There has been a substantial change in circumstances resulting in information that was not available to the parties prior to the Energy Commission certification. Specifically, improved SCR systems can now control NOx emissions to below 5 ppm at 15 percent O<sub>2</sub>.

## CONCLUSION AND ORDER

The Energy Commission approves and hereby adopts MSCC's amendment petition and the proposed modified and added conditions in accordance with Title 20, Section 1769 (a) (3) of the California Code of Regulations. The following changes to the Midway Sunset Cogeneration Project Decision are shown as **bold** and underlined; deleted language is in ~~strikethrough~~.

**AQ-18** ~~Pollutant emissions from each water injection combustion turbine shall not exceed the following limits (in pounds mass per hour, lbm/hr) except during times of start-up or shutdown (as described in Condition of Certification AQ-44):~~

~~Gas-Fired Case:~~

|                                      |                  |                                     |
|--------------------------------------|------------------|-------------------------------------|
| <del>Particulate</del>               | <del>9.98</del>  | <del>lbm/hr</del>                   |
| <del>Sulfur Compounds</del>          | <del>0.92</del>  | <del>lbm/hr as SO<sub>2</sub></del> |
| <del>Oxides of Nitrogen</del>        | <del>79.01</del> | <del>lbm/hr as NO<sub>2</sub></del> |
| <del>Hydrocarbons (nonmethane)</del> | <del>9.00</del>  | <del>lbm/hr</del>                   |
| <del>Carbon Monoxide</del>           | <del>94.00</del> | <del>lbm/hr</del>                   |

~~Pollutant emissions from each DLN-15 dry-low NO<sub>x</sub> combustion turbine shall not exceed the following limits (in pounds mass per hour, lbm/hr) except during times of start-up or shutdown (as described in Condition of Certification AQ-44):~~

~~Gas-Fired Case:~~

|                                      |                  |                                     |
|--------------------------------------|------------------|-------------------------------------|
| <del>Particulate</del>               | <del>9.98</del>  | <del>lbm/hr</del>                   |
| <del>Sulfur Compounds</del>          | <del>0.92</del>  | <del>lbm/hr as SO<sub>2</sub></del> |
| <del>Oxides of Nitrogen</del>        | <del>59.90</del> | <del>lbm/hr as NO<sub>2</sub></del> |
| <del>Hydrocarbons (nonmethane)</del> | <del>9.00</del>  | <del>lbm/hr</del>                   |
| <del>Carbon Monoxide</del>           | <del>54.91</del> | <del>lbm/hr</del>                   |

Pollutant emissions from each DLN-9 dry-low NO<sub>x</sub> combustion turbine without SCR controls shall not exceed the following limits (in pounds mass per hour, lbm/hr) except during times of start-up or shutdown (as described in Condition of Certification AQ-44):

Gas-Fired Case:

|                           |       |                           |
|---------------------------|-------|---------------------------|
| Particulate               | 9.98  | lbm/hr                    |
| Sulfur Compounds          | 0.92  | lbm/hr as SO <sub>2</sub> |
| Oxides of Nitrogen        | 36.08 | lbm/hr as NO <sub>2</sub> |
| Hydrocarbons (nonmethane) | 9.00  | lbm/hr                    |
| Carbon Monoxide           | 54.91 | lbm/hr                    |

Pollutant emissions from each SCR controlled combustion turbine shall not exceed the following limits (in pounds mass per hour, lbm/hr) except

during times of start-up or shutdown (as described in Condition of Certification AQ-44):

Gas-Fired Case:

|                                  |              |                                 |
|----------------------------------|--------------|---------------------------------|
| <u>Particulate</u>               | <u>9.98</u>  | <u>lbm/hr</u>                   |
| <u>Sulfur Compounds</u>          | <u>0.92</u>  | <u>lbm/hr as SO<sub>2</sub></u> |
| <u>Oxides of Nitrogen</u>        | <u>18.04</u> | <u>lbm/hr as NO<sub>2</sub></u> |
| <u>Hydrocarbons (nonmethane)</u> | <u>9.00</u>  | <u>lbm/hr</u>                   |
| <u>Carbon Monoxide</u>           | <u>54.91</u> | <u>lbm/hr</u>                   |

**Verification:** ~~The combustion turbine identified as Unit B shall have completed the installation and testing of DLN-9 technology no later than January 31, 2001. The combustion turbine identified as Unit A shall have completed the installation and testing of DLN-9 technology no later than May 31, 2001. The combustion turbine identified as Unit C shall have completed the installation and testing of DLN-9 technology no later than June 30, 2001. The combustion turbines identified as Units A and B shall have completed the installation and testing of the SCR system no later than April 30, 2004. The combustion turbine identified as Unit C shall have completed the installation and testing of SCR system no later than April 30, 2005.~~

- a. At least 60 days before the commercial operation date of the power cogeneration facility, or 60 days before the permit to operate anniversary date, the project owner shall submit to the SJVUAPCD, CARB and the CEC a detailed performance test plan for the power plant's AECS. The performance test will be funded by the project owner and conducted by a third party approved by the SJVUAPCD and CARB. The SJVUAPCD will notify the project owner and the CEC of its approval, disapproval, or proposed modifications to the plan within 30 days of receipt of the plan. The project owner shall incorporate the SJVUAPCD and the Energy Commission's comments or modifications to the plan.
- b. The project owner shall notify the SJVUAPCD and the CEC, within five days, before the facility begins commercial operation. The project owner shall also notify the SJVUAPCD one week prior to the beginning of testing to allow the SJVUAPCD to observe and/or conduct concurrent sampling.
- c. Compliance with emission limits shall be demonstrated by a SJVUAPCD-witnessed sample collection performed by an independent testing laboratory within 60 days after startup of this equipment and annually within 60 days prior to permit anniversary date.
- d. The project owner shall submit the results of the compliance test within 30 days of completion of the tests. The project owner shall submit to the SJVUAPCD, its application for a Permit to Operate via registered mail. The project owner shall submit a copy of the application to the CEC within 10 days of its submittal to the SJVUAPCD. The SJVUAPCD shall approve or disapprove the application as prescribed in the SJVUAPCD rules.

**AQ-48** The emission of unreacted ammonia slip from any exhaust stack shall not exceed 5 ppm @ 15 percent O<sub>2</sub> averaged over 24 hours.

**Verification:** The owner shall monitor and record the ammonia slip from each exhaust stack as required in Conditions of Certification AQ-49 through AQ-54. The owner shall report the ammonia slip as part of the quarterly emission report required by Condition of Certification AQ-21.

**AQ-49** Each CTG shall be equipped with a continuously recording emission monitor preceding the SCR module measuring NOx concentration for the purpose of calculating ammonia slip. The owner shall check, record and quantify the calibration drift (CD) at two concentration values at least once daily (approximately 24 hours). The calibration shall be adjusted when ever the daily zero or high-level CD exceeds 5 percent. If either the zero or high-level CD exceeds 5 percent for five consecutive daily periods, the analyzer shall be deemed out-of-control. If either the zero or high-level CD exceeds 10 percent during any CD check, the analyzer shall be deemed out-of-control. If the analyzer is out-of-control, the owner shall take appropriate corrective action and then repeat the CD check.

**Verification:** The owner shall report the CD checks for each day as part of the quarterly emission report required by Condition of Certification AQ-21.

**AQ-50** Each ammonia injection grid shall be equipped with an operational ammonia flow-meter and injection pressure indicator.

**Verification:** The owner shall make the site available for inspection by the SJVUAPCD, CARB and the CEC during construction and operation with reasonable notice.

**AQ-51** Each heat recovery steam generator design shall provide for additional selective catalytic reduction and oxidation catalyst if required to meet NOx and CO emission limits.

**Verification:** The owner shall make the site available for inspection by the SJVUAPCD, CARB and the CEC during construction and operation with reasonable notice.

**AQ-52** The owner shall monitor and record the exhaust gas temperature at the selective catalytic reduction and oxidation catalyst inlets.

**Verification:** The owner shall report the inlet temperature as recorded as part of the quarterly emission report required by Condition of Certification AQ-21.

**AQ-53** Ammonia shall be injected whenever the selective catalytic reduction system catalyst exceeds the minimum ammonia injection temperature recommended by the manufacturer.

**Verification:** The owner shall report the ammonia injection rate as part of the quarterly emission report required by Condition of Certification AQ-21.

**AQ-54** Compliance with the ammonia slip limits (Condition of Certification AQ-48) shall be demonstrated by using the following calculation procedure:

$$A_s = ((a - (b \times c / 1,000,000)) \times 1,000,000 / b) \times d$$

where:  $A_s$  = ammonia slip (ppmv @ 15 percent O<sub>2</sub>)

$a$  = ammonia injection rate (lbs/hr)/17(lbs/lb. mol)

$b$  = dry exhaust gas flow rate (lbs/hr)/(29(lbs/lb. mol)

$c$  = change in measured NO<sub>x</sub> concentration across the catalyst (ppmv @ 15 percent O<sub>2</sub>), and

$d$  = correction factor. The correction factor shall be derived annually during compliance testing by comparing the measured and calculated ammonia slip.

**Verification:** The owner shall report ammonia slip required in Condition of Certification AQ-48 via the indicated calculation procedure. The owner shall submit for approval the ammonia source testing protocols no later than 30 days prior to the annual ammonia slip source-testing date. The owner shall notify the CEC and the SJVUAPCD no later than 10 days prior to the date of the annual ammonia source test. The owner shall submit for approval the results of the annual ammonia source test including any changes to the correction factor "d" above within 90 days of the completion of the annual ammonia source test.

IT IS SO ORDERED.

STATE OF CALIFORNIA  
ENERGY RESOURCES  
CONSERVATION AND  
DEVELOPMENT COMMISSION

DATE \_\_\_\_\_

WILLIAM J. KEESE, Chairman