MIDWAY SUNSET
Cogeneration Company

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November 08, 2010 CC-1629

Ms. Christina Snow
Compliance Project Manager
California Energy Commission
Siting Transmission and Environmental Protection Division
1516 Ninth Street, MS 2000
Sacramento, CA 95814-5512

Subject: **Modification for 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 Ms. Snow:

This modification is in response to questions and comments from CEC's Mr. Joseph Hughes, Air Resources Engineer. Mr. Hughes performed a very helpful, detailed review of MSCC's amendments to the Air Quality Conditions of the initial CEC Certification. As Mr. Hughes noted, most of MSCC's amendments to Air Quality Condition 18 (AQ-18) were in response to the San Joaquin Valley Air Pollution Control District's (District) changing NOx emission limits.

MSCC's initial District emission limit for NOx was 25 ppm and was achieved by injecting water into the combustion system of the units to cool the flame. The next emission limit was 22 ppm NOx. By that time GE had developed a dry low NOx (DLN) combustion system and MSCC applied for an amendment to delete the water injection and install the DLN15 combustion system. A further reduction to 10 ppm NOx followed. GE had improved their dry low NOx technology to a DLN9 combustion system. MSCC submitted an amendment to replace the DLN15 combustion system with the DLN9. The latest NOx emission reduction for MSCC was to 5 ppm. At the time, GE had no commercially available technology better than the DLN9 so MSCC submitted an amendment to install an SCR grid in the HRSG of each unit to control the NOx emissions to 5 ppm. CEC lbs/hr and EPA lbs/MMBtu NOx emission limits were adjusted each time the District limit was lowered.

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MSCC's last application for an amendment to AQ-18 was not in response to a District requirement and was never implemented. The application was for the installation of an Evolution Rotor being developed by GE. The Evolution Rotor, as envisioned by GE, would "allow MSCC to increase output by 9 percent, lower the heat rate, and reduce emission limits for Oxides of Nitrogen (NOx) from 5 to 2 ppm, and Carbon Monoxide (CO) from 25 to 6 ppm". GE ran into technical difficulties during factory tests of the Evolution Rotor and elected not to offer it commercially. Since this is the most recent amendment to MSCC's AQ-18, it should have been the amendment used for revision of MSCC's latest application for amendment. (Please find attached a copy of Order No. 06-1030-3 ORDER APPROVING a Petition to Install an Evolution Rotor).

The following are the requested changes to the Order No. 06-1030-3 AQ-18 as the modification to MSCC's latest application: (Changes are shown as **bold** and underlined; deleted language is in ~~strikethrough.~~)

AQ-18 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 SO2
Oxides of Nitrogen	17.66 lbm/hr as NO2
Hydrocarbons (nonmethane)	9.00 lbm/hr
Carbon Monoxide	54.91 lbm/hr

~~Pollutant emissions from each combustion turbine with the Evolution Rotor installed, shall not exceed the following limits (in pounds mass per hour) with the exceptions given below.~~

~~Gas-Fired Case :~~

~~Particulate~~	~~9.98 lbm/hr~~
~~Sulfur Compounds~~	~~0.92 lbm/hr as SO2~~
~~Oxides of Nitrogen~~	~~7.06 lbm/hr as NO2~~
~~Hydrocarbons (nonmethane)~~	~~9.00 lbm/hr~~
~~Carbon Monoxide~~	~~13.18 lbm/hr~~

~~1. NOx emission concentrations during steady state operation shall not exceed 7.06 lbs/hr over a one-hour average (clock-hour basis). Steady state operation refers to any period that is not a startup or shutdown (as described in Condition of Certification AQ-44.) A clock hour in a one-hour average will commence at the top of theof the hour.~~

~~2. Compliance with the NOx emissions limitations during steady-state operation shall not be required during short-term excursions limited to a cumulative total of 10 hours per rolling 12-month period.~~

~~3. Short-term excursions are defined as 15-minute periods designated by the owner/operator (and approved by the CPM) that are the direct result of transient load conditions, not to exceed four consecutive 15-minute periods when the 15-minute average NOx concentration exceeds 2.0 ppmvd @ 15 percent O2. The maximum three-hour average NOx concentration for periods that include short-term excursions shall not exceed 5 ppmvd @ 15 percent O2. The maximum three-hour average CO concentration for periods that include short-term excursions shall not exceed 25 ppmvd @ 15 percent O2.~~

~~4. Examples of transient load conditions include, but are not limited to the following: initiation or shutdown of combustion turbine inlet air cooling, or rapid combustion turbine load changes. All emissions during short-term excursions shall accrue towards the daily and annual emissions limitations of this permit and shall be included in all calculations of daily and annual mass emission rates as required by this permit.~~

~~5. All emissions during short-term excursions shall accrue towards the hourly, daily and annual emissions limitations of these conditions and shall be included in all calculations of hourly, daily, and annual mass emission rates as required herein.~~

Verification:

(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).

Testing for VOCs and ammonia slip require samples to be sent offsite for lab tests. It has proven difficult for the testing service to get and review the lab results, complete the report, issue it to MSCC in time for MSCC's review, make any corrections if needed, re-issue it to MSCC, MSCC to approve the report and submit it in 30 days. The District has recognized the difficulty and revised Rule 1081, Section 7.3 to allow 60 days. The District has agreed to revise their condition on MSCC's Permit to Operate to agree with District Rule 1081. The District's revision will be of no avail to MSCC without the concurrent CEC revision to AQ-18 Verification condition "d".

In response to a question from Mr. Hughes, MSCC will require the installation of two new ports, one sampling port and one test port, in the bypass stack to remain in compliance with all applicable laws, ordinances, regulations, and standards. The proper placement of the ports will be coordinated with MSCC's testing consultants and approved by the District.

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

Yours Truly,

D. Faiella

Dave Faiella
Executive Director

cc: File CC-1629
G. Jans
S. Henriksen

CALIFORNIA ENERGY COMMISSION
1516 NINTH STREET
SACRAMENTO, CA 95814-5512

EVOLUTION ROTOR

STATE OF CALIFORNIA
State Energy Resources
Conservation and Development Commission

In the Matter of:	)	Docket No. 85-AFC-3C
	)	Order No. 06-1030-3
Midway Sunset Cogeneration Company	)	
MIDWAY SUNSET COGENERATION	)	ORDER APPROVING a Petition
PROJECT	)	to Install an Evolution Rotor
	)	

The Midway Sunset Cogeneration Company (MSCC), the owner/operator of the Midway Sunset Cogeneration Project, has requested to modify the facility by installing an Evolution Rotor in the Unit A Turbine. The modification will result in revisions to the California Energy Commission's Decision Condition of Certification AQ-18. The modifications to the facility will allow MSCC to increase output by 9 percent (approximately 7 megawatts), lower the heat rate, and reduce emission limits for Oxides of Nitrogen (NOx) from 5 to 2 ppm, and Carbon Monoxide (CO) from 25 to 6 pprn.

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 and CO.

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, the improved rotor can now control NOx emissions to 2 ppm and CO to 6 ppm.

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 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 SO2~~
~~Oxides of Nitrogen~~	~~36.08~~	~~lbm/hr as NO2~~
~~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:

Particulate	9.98	lbm/hr
Sulfur Compounds	0.92	lbm/hr as SO2
Oxides of Nitrogen	~~18.04~~ **17.66**	lbm/hr as NO2
Hydrocarbons (nonmethane)	9.00	lbm/hr
Carbon Monoxide	54.91	lbm/hr

Pollutant emissions from each combustion turbine with the Evolution Rotor installed, shall not exceed the following limits (in pounds mass per hour) with the exceptions given below.

Gas-Fired Case:

Particulate	**9.98**	**lbm/hr**
Sulfur Compounds	**0.92**	**lbm/hr as SO2**
Oxides of Nitrogen	**7.06**	**lbm/hr as NO2**
Hydrocarbons (nonmethane)	**9.00**	**lbm/hr**
Carbon Monoxide	**13.18**	**lbm/hr**

1. NOx emission concentrations during steady state operation shall not exceed 7.06 lbs/hr over a one-hour average (clock-

hour basis). Steady state operation refers to any period that is not a startup or shutdown (as described in Condition of Certification AQ-44). A clock hour in a one-hour average will commence at the top of the hour.

2. **Compliance with the NOx emission limitations during steady-state operation shall not be required during short-term excursions limited to a cumulative total of 10 hours per rolling 12-month period.**

3. **Short-term excursions are defined as 15-minute periods designated by the owner/operator (and approved by the CPM) that are the direct result of transient load conditions, not to exceed four consecutive 15-minute periods when the 15-minute average NOX concentration exceeds 2.0 ppmvd @ 15 percent O2. The maximum three-hour average NOx concentration for periods that include short-term excursions shall not exceed 5 ppmvd @ 15 percent O2. The maximum three-hour CO concentration for periods that include short-term excursions shall not exceed 25 ppmvd @ 15 percent O2.**

4. **Examples of transient load conditions include, but are not limited to the following: initiation or shutdown of combustion turbine inlet air cooling, or rapid combustion turbine load changes. All emissions during short-term excursions shall accrue towards the daily and annual emissions limitations of this permit and shall be included in all calculations of daily and annual mass emission rates as required by this permit.**

5. **All emissions during short-term excursions shall accrue towards the hourly, daily and annual emissions limitations of these conditions and shall be included in all calculations of hourly, daily, and annual mass emission rates as required herein.**

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.~~

To demonstrate compliance with the emission limits provided, the owner/operator shall provide initial and on-going performance tests as follows:

a. At least 60 days before commercial operation date of the power cogeneration facility, or 60 days before the permit to operate anniversary date, the owners 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 owners and conducted by a third party approved by the SJVUAPCD and CARB. The SJVUAPCD will notify the owners and the CEC of its approval, disapproval, or proposed modifications to the plan within 30 days of receipt of the plan. The owners shall incorporate the SJVUAPCD and the Commission's comments or modifications to the plan.

b. The owners shall notify the SJVUAPCD and the CEC, within five days, before the facility begins commercial operation. The owners 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 owners shall submit the results of the compliance test within 30 days of completion of the tests. The owners shall submit to the SJVUAPCD, its application for a Permit to Operate via registered mail. The owners 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.

e. <u>The owners shall include all Excursions in the Quarterly Emissions Report as a separate section (such as "breakdowns" or "excess emissions") as well as including them in all daily and annual emission calculations.</u>

IT IS SO ORDERED.

STATE OF CALIFORNIA
ENERGY RESOURCES
CONSERVATION AND
DEVELOPMENT COMMISSION

October 30, 2006
DATE

Jackalyne Pfannenstiel, Chairman