DOCKETED

Docket Number:	01-AFC-25C
Project Title:	Malburg City of Vernon-Compliance
TN #:	223301
Document Title:	Response Letter to Bicent (California) Malburg Permit Application
Description:	Permit Applications for Turbines Modification for Bicent (California) Malburg, Facility ID 155474.
Filer:	Dana Bernard
Organization:	SCAQMD
Submitter Role:	Public Agency
Submission Date:	5/1/2018 11:21:37 AM
Docketed Date:	5/1/2018

South Coast
Air Quality Management District
21865 Copley Drive; Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov

May 1, 2018

Kyle McCormack
Environmental Manager
Bicent (California) Malburg, LLC
4963 Soto Street
Vernon, CA 90058

Subject: Permit Applications for Turbines Modification for Bicent (California) Malburg, located at 4963 Soto Street, Vernon, CA 90058 (Facility ID 155474)

Dear Mr. McCormack:

The South Coast Air Quality Management District (SCAQMD) received permit applications (Application) for the modification of the two combined-cycle turbines at Bicent (California) Malburg (Bicent), also known as the Malburg Generating Station (MGS), on November 14, 2017. The proposed modifications are to install the Siemens SGT-800 A-Plus Upgrade package on the two combustion turbines. The upgrade package will replace the Row 1 Compressor Blades with a functionally different design to increase the air flowrate and the power output of the turbines. The Application also proposed emissions-related changes, including the reduction of the turbine particulate matter emission rate from 3.89 lb/hr to 2.407 lb/hr, and changes to CEC Conditions of Certification. The Application also included air dispersion modeling and health risk assessment for the facility, including the emergency engine and cooling tower, for the California Energy Commission's (CEC) CEQA analysis.

After a detailed review of the Application, SCAQMD is submitting this request for additional information and clarification. Please note that, in addition to the information required below, other information may be needed during the course of our full engineering evaluation. Your cooperation is key to the timely review of the applications. The following issues have been identified during the review:

1. Equipment Description
   a. The steam turbine generator (STG) rating is missing from the facility permit, but will be added as part of this permit revision. Some federal regulations require the inclusion of the STG rating for analysis.

      i. For prior to the turbine upgrade, p. 16 of the Final Determination of Compliance (FDOC), dated 12/12/02 and issued 12/13/02, indicates the STG rating is 55 MW at 75 °F. Since the ratings on the facility permit equipment description are based on 38 °F, please provide the STG rating at 38 °F.

      ii. For after the turbine upgrade, please provide the STG rating at 38 °F for comparison.

2. Process Description
   a. The engineering evaluation will provide a discussion regarding how the process has changed as a result of the turbine upgrade. The Application, including the SIEMENS TECHNICAL

SERVICE PRODUCT INFORMATION SGT-800 Performance Enhancement document, provide a discussion of the equipment component changes, but not a process description.

Please provide a process description for the turbines describing how the installation of the upgrade package components will change the operation of the turbines, including the increase in air flow rate, to increase the potential power production for each turbine.

3. Rule 212--Standards for Approving Permits
The Forms 400-A indicate there are no schools (K-12) within 1000 feet of the facility property line. On p. 1-40 of the Application, *Table 19—Summary of Applicable LORS for Air Quality* does not include Rule 212.

(Please note that SCAQMD documents refer to the page numbering in the Application submitted to the SCAQMD, which may be slightly different than the page numbering in the SCAQMD application included in the *Petition to Amend A+ Turbine Upgrade* that was submitted to the CEC.)

a. Health and Safety Code §42301.9 defines "school" to mean "any public or private school used for purposes of the education of more than 12 children in kindergarten or any of grades 1 to 12, inclusive, but does not include any private school in which education is primarily conducted in private homes." Please provide the name and address of the nearest school.

b. Please provide the distance between the stack outlet of the turbine closest to this nearest school and the outer boundary of this nearest school.

c. Please provide the method by which the above distance was determined.

d. The modeling review request memo instructions now request information on the nearest school(s). On p. 2-2 of the Application, *Table 21—Sensitive Receptors Nearfield of the MGS Site* lists the nearest school at the UTM coordinates of 386964, 3761833. Is the nearest school identified above the same as the school at 386964, 3761833?

4. Proposed Emissions-Related Changes in Application

a. Turbine PM_{10} Emission Rates
The current PM_{10} and proposed PM_{10} emission rates for the turbines are discussed below.

- PM_{10} Emission Rate Prior to Turbine Upgrade (FDOC)--From p. 26 of the FDOC, issued 12/13/2002, *Table 11--Maximum Controlled Emissions* shows the maximum PM_{10} emission rate is 3.89 lb/hr for 1 turbine with duct burner based on Scenario S13 (100% load at 38 °F). P. 87 of the FDOC indicates this PM_{10} factor is based on 0.0066 lb/mmbtu from AP-42. On p. 3.1-11 of AP-42, Fifth Edition, Chapter 3.1, *Table 3.1-2a. Emission Factors for Criteria Pollutants and Greenhouse Gases from Stationary Gas Turbines* continues to show that, for natural gas-fired turbines, PM (total) is 6.0 E-03 lb/MMBtu, which converts to 3.53 lb/hr PM_{10} in the turbine exhaust. In addition, a percentage of the SO_2 in the turbine exhaust is assumed to oxidize to SO_3 in the CO catalyst and SCR. The SO_3 reacts with ammonia in the SCR to form ammonium sulfate particulates. Therefore, total PM_{10} is comprised of the PM_{10} in the turbine exhaust and the ammonium sulfate particulates. P. 87 of the FDOC explains that the PM_{10} emission rate of 3.89 lb/hr includes the additional 53% conversion of SOx to PM_{10} in the SCR.

- Proposed PM_{10} Emission Rate After Turbine Upgrade (Application)--In *Attachment 4* of the Application, *Table 1--Emissions and Operating Parameters for Gas Turbine*, dated 7/13/17, was provided by Siemens for the A-Plus Upgrade project for sixteen operating cases/scenarios. (The Application refers to operating scenarios as "cases," whereas the FDOC refers to "scenarios." These are the same sixteen operating scenarios that were provided by Alstom for the FDOC. Table 1 shows the "Total PM10 with 53% conversion of SOx to PM10" is 2.407 lb/hr for Case/Scenario S13 (100% load at 38 °F). In *Attachment 3* of the Application, *Table 1—Maximum Hourly, Daily, and Annual Emissions Calculations, Case #: Max Ops Scenario* shows the maximum emissions calculations are based on 2.41 lb/hr PM_{10}.

i. P. 1-4 of the Applications states: "Based on the Upgrade Package evaluation and data provided by Siemens, there will be the potential for an increase in the short-term (hourly) emissions of oxides of nitrogen (NOx), carbon monoxide (CO), volatile organic compounds (VOCs) and sulfur dioxide (SO2), primarily related to a small increase in the fuel use and firing temperatures. But based on the Siemens turbine performance data, there will be a slight decrease in the potential to emit of particulate matter (PM10/PM2.5)."

The comparison of the FDOC maximum rate and the Application maximum rate above shows the Application is proposing to significantly decrease the maximum PM_{10} emission rate from 3.89 lb/hr to 2.407 lb/hr (Case/Scenario S13).

aa. Please provide from Siemens a detailed discussion regarding the basis for the PM_{10} emission rates provided in *Attachment 4, Table 1--Emissions and Operating Parameters for Gas Turbine*, dated 7/13/17, in the Application.

bb. Please provide from Siemens a guarantee for the PM_{10} emission rates provided in *Table 1--Emissions and Operating Parameters for Gas Turbine*. The guarantee, if available from Siemens, should specifically guarantee the 2.407 lb/hr PM_{10} (Case/Scenario S13, 100% load at 38 °F) and 2.366 lb/hr PM_{10} (Case/Scenario S15, 100% load at 65 °F).

ii. Previous review of PM_{10} emission rates from turbines show that PM_{10} emission rates can vary depending on a variety of factors, including but not limited to manufacturer, model, location including ambient particulate matter concentration, operating characteristics of particular turbine (even if located within the same facility), selective catalytic reduction (SCR) operating characteristics, and particulate filter efficiency for the inlet air. Notwithstanding any Siemens guarantee, the SCAQMD will require a source test on each turbine after the initial startup of the turbine upgrade modifications, as discussed under question no. 5 below, to demonstrate compliance with the emission rates for PM_{10}, VOC, and SOx on which the turbine upgrade is based.

On p. 1-26 of the Application, *Table 13—Summary of Source Test Results for 2014 and 2017 (Required Triennial Tests)* shows the measured PM_{10} emission rate for Turbine 1 with Duct Burner was 0.55 lb/hr in 2014 and 0.88 lb/hr in 2017. For Turbine 2 with Duct Burner, the measured PM_{10} emission rate was 0.62 lb/hr in 2014 and 0.57 lb/hr in 2017. Although these source tests results are sufficient to demonstrate that the PM_{10} emission rate does not exceed the permitted 3.89 lb/hr, as required by condition D29.2, they will not be sufficient to support the proposed

decrease in the maximum PM_{10} emission rate from 3.89 lb/hr to 2.407 lb/hr for the turbine upgrade modification.

aa. If Siemens does not provide a guarantee for the 2.407 lb/hr PM_{10} (Case/Scenario S13) and 2.366 lb/hr PM_{10} (Case/Scenario S15), then the Application under evaluation will be based on the current PM_{10} emission rate of 3.89 lb/hr PM_{10} (Case/Scenario S13) and 3.78 lb/hr (Case/Scenario S15) from the FDOC. Please let us know if you have any comments.

bb. If Siemens provides a guarantee for the 2.407 lb/hr PM_{10} (Case/Scenario S13) and 2.366 lb/hr PM_{10} (Case/Scenario S15), then the Application under evaluation will be based on these PM_{10} emissions rates.

As discussed under question no. 5 below, condition D29.2 will be revised to require source testing for both turbines after the initial start-up of the upgraded turbines. In addition, condition D29.2 will be updated to require PM_{10} testing to be performed using EPA Method 201A and District Method 5.1, with a sampling time of 4 hours or longer as necessary to obtain a measureable amount of sample. These are the current PM_{10} testing requirements. The source test reports must be evaluated and approved by the SCAQMD Source Testing Dept. before the Permits to Construct can be converted to Permits to Operate for the turbine upgrade project.

If the source test results for PM_{10} do not demonstrate compliance with the proposed 2.4 lb/hr PM_{10} emission rate (Case/Scenario S13) which will be added to the "Emissions and Requirements" column in the facility permit, then the SCAQMD cannot convert the Permits to Construct to Permits to Operate. Bicent will be required to submit complete change of condition applications for a PM_{10} emission rate that is supported by the source tests.

Please let us know if you have any comments.

b. Condition A63.3 Emission Factors

P. 1-26 of the Application states: "As summarized in Table 12, for the monthly emissions of CO, VOC's, SOx and PM10/2.5, the applicant is not proposing any changes to existing condition A63.3 with the exception of the emission factors for compliance monitoring of PM10, VOC and SOx...." The Application, however, does not propose any revised emission factors.

As shown in *Table J1--Criteria Pollutant's Emission Factors* on p. 83 of the FDOC, the current condition A63.3 emission factors were calculated by dividing the average hourly emission rate by the average hourly gas usage (HHV), based on Scenario S15 (100% load at 65 °F). The selection of Scenario S15 as the basis was not discussed in the FDOC, but the emission factors will continued to be based on Scenario S15 for this evaluation. From p. 21 of the FDOC, the heat value is 1018 Btu/scf (HHV).

As discussed above, Siemens provided *Table 1--Emissions and Operating Parameters for Gas Turbine* for the A-Plus Upgrade project. For Case/Scenario S15, the hourly emission rates for VOC, SOx, and PM_{10} are provided in the table. The hourly fuel usage, calculated from the data in the table, is 0.5458 mmscf/hr. [(474.61 MMBtu/hr (HHV) (turbine) + 81 MMBtu/hr (HHV) (duct burner)) x mmscf/1018 MMBtu = 0.5458 mmscf/hr.] The post-

turbine upgrade gas usage of 0.5458 mmscf/hr (Case/Scenario 15) is an increase from the current 0.511 mmscf/hr (Scenario S15) from p. 83 of the FDOC.

After the upgrade, the hourly emission rates are expected to increase proportionally with the increased hourly gas usage, thereby resulting in very small changes to the emission factors. The derivation of the emission factors prior to and after the upgrade are discussed below for VOC, SOx, and PM_{10}.

i. VOC Emission Factor

Current facility permit (see FDOC, p. 83, Scenario S15) =
0.83 lb/hr ÷ 0.511 mmscfh = 1.63 lbs/mmscf

After upgrade (see *Attachment 4, Table 1*, Scenario S15) =
0.852 lb/hr ÷ 0.5458 mmscf/hr = 1.56 lbs/mmscf

For condition A63.3, the VOC emission factor will be revised from 1.63 lbs/mmscf to 1.56 lbs/mmscf for the upgrade.

Please let us know if you have any comments.

ii. SOx Emission Factor

Current facility permit (see FDOC, p. 83, Scenario S15) =
0.14 lb/hr ÷ 0.511 mmscfh = 0.28 lbs/mmscf

After upgrade (see *Attachment 4, Table 1*, Scenario S15) =
0.156 lb/hr ÷ 0.5458 mmscf/hr = 0.29 lbs/mmscf

For condition A63.3, the SOx emission factor will be revised from 0.28 lbs/mmscf to 0.29 lbs/mmscf for the upgrade.

Please let us know if you have any comments.

iii. PM_{10} Emission Factor

Current facility permit (see FDOC, p. 83, Scenario S15) =
3.78 lb/hr ÷ 0.511 mmscfh = 7.397 lbs/mmscf

After upgrade:

aa. If Siemens does not provide a guarantee for the 2.366 lb/hr PM_{10} (Case/Scenario S15), the PM_{10} emission factor will remain 7.397 lbs/mmscf. Please let us know if you have any comments.

bb. If Siemens provides a guarantee for the 2.366 lb/hr PM_{10} (Case/Scenario S15), then the PM_{10} emission factor will be based on that rate.

After upgrade (*Attachment 4, Table 1*, Scenario S15) =
2.366 lb/hr ÷ 0.5458 mmscfh = 4.33 lbs/mmscf

For condition A63.3, the PM_{10} emission factor will be revised from 7.397 lbs/mmscf to 4.33 lbs/mmscf for the upgrade. However, compliance with the 2.4 lb/hr PM_{10} rate must be demonstrated by the post-modification source tests.

Please let us know if you have any comments.

c. Condition C1.4 Monthly Fuel Limit

P. 1-26 of the Application states: "As summarized in Table 12, for the monthly emissions of CO, VOC's, SOx and PM10/2.5, the applicant is not proposing any changes to existing condition A63.3 with the exception of ... the revision of the monthly fuel limit to reflect the increased fuel requirements for the turbine upgrade."

Currently, condition C1.4 limits the fuel usage to a total of 333 MM cubic feet in any one calendar month per turbine. The Application does not propose a revised monthly fuel limit. In a letter, dated 2/9/18, Siemens indicates, however, the upgrade will raise the limit to 347.8 mmscf/month per turbine.

i. If Siemens does not provide a guarantee for the 2.366 lb/hr PM_{10} (Case/Scenario S13), condition C1.4 will continue to limit the fuel usage to 333 MM cubic feet in any one calendar month for each turbine. The condition was added to ensure that the PM_{10} emission shall not exceed 2438 lbs/month per turbine, which is the basis for the limit of 4876 lbs/month for two turbines set forth in condition A63.3.

From p. 88 of the FDOC, the maximum PM_{10} emission rate of 3.89 lb (Scenario S13) would have resulted in 2784 lb/month for one turbine, and 5568 lb/month PM_{10} for two turbines, calculated as follows:

> Maximum monthly emissions for PM_{10} = (4.37 lb/cold start-up)(1 cold start-up) + (3.65 lb/warm startup)(4 warm startups) + (0.92 lb/shutdown) (5 shutdowns) + (3.89 lb/hr normal operation)(709.5 hr) = 2784 lb/month per turbine = 5568 lb/month per two turbines → 186 lb/day PM_{10} offsets for project from the Priority Reserve.

From p. 87 of the FDOC, the 3.89 lb/hr is equal to 7.397 lb/mmscf. The 2784 lb/month per turbine would have resulted in 376 mmscf/month per turbine, calculated as follows:

> Maximum monthly fuel usage for PM_{10} = (2784 lb/month per two turbines) (mmscf/7.397 lb) = 376.4 mmscf/month per turbine

If the applicant (Vernon City, Light & Power Dept) had provided 186 lb/day PM_{10} offsets, condition A63.3 would have limited PM_{10} emissions to 5568 lb/month for the two turbines and included a PM_{10} emission factor of 7.397 lbs/mmscf. As the monthly limits and emission factors for PM_{10} and SOx would have determined the maximum fuel usage allowed (753 mmscf/month for two turbines), a separate fuel usage limit condition would not have been necessary. Since the monthly limits for CO and VOC are based on maximum commissioning emissions, neither would have resulted in the limiting fuel usage for normal operations.

However, when the SCAQMD informed the applicant that 186 lbs/day of PM_{10} offsets would be required, the applicant provided six operating scenarios for offset requirements for CO, VOC, and PM_{10} for the purpose of reducing offset requirements. The CO, PM_{10}, and VOC emissions for the six scenarios are summarized in Table L2--Monthly Emissions for Six Operating Scenarios (one Turbine, Case B) on p. 90 of the FDOC. The SCAQMD agreed to base the PM_{10} offset requirements on Scenario No. 1

of the six operating scenarios presented. Scenario No. 1 yielded 2438 lbs/month PM_{10} and 81 lbs/day of PM_{10} offsets for each turbine. The SCAQMD then revised draft condition A63.3 to reduce the monthly limit for PM_{10} from 5568 lb/month to 4876 lb/month per two turbines but retained the emission factor of 7.397 lbs/mmscf. The SCAQMD also added condition C1.4 to limit the fuel usage to 330 MM cubic feet for each turbine in any calendar month.

The SCAQMD accepted Scenario No. 1 for the purpose or reducing PM_{10} offsets only. The SCAQMD based the CO and VOC emission offsets on commissioning emissions, which are higher than normal operation emissions. The SOx emissions were below the 4 tpy threshold for offsets.

On p. 27, the engineering evaluation for the current turbine permits, Appl. Nos. 517249 and 517250, provided the following clarifications for Scenario No. 1. The emissions were based on Scenario S15 (100% load at 65 °F, with duct burner) and Scenario S11 (100% load at 65 °F, without duct burner).

> Monthly emissions for PM_{10} = (3.78 lb/hr with duct burner, Scenario S15) (240 hr) + (3.19 lb/hr without duct burner, Scenario S11) (480 hr) = 2438 lb/month per turbine = 4876 lb/month per two turbines → 162 lbs/day PM_{10} offsets for project from Priority Reserve.
>
> Monthly fuel usage for PM_{10} = (0.511 mmscf/hr with duct burner, Scenario S15)(240 hr) + (0.432 mmscf/hr without duct burner, Scenario S11) (480 hr) = 330 mmscf/month per turbine = 660 mmscf/month per two turbines

If the condition A63.3 emission factor for PM_{10} were to remain 7.397 lbs/mmscf after upgrade, but the fuel limit were to increase to 347.8 mmscf for two turbines as indicated in the Siemens letter, the resulting PM_{10} emissions of 5145 lb/month for two turbines would exceed the current condition A63.3 limit of 4876 lb/month for two turbines, as shown below.

> PM_{10} = (7.397 lbs/mmscf after upgrade)(347.8 mmscf/month per turbine) (2 turbines) = 5145 lb/month > 4876 lb/month *A63.3 limit*

If the current monthly limit for PM_{10} were to increase from 4876 lb/month to 5145 lb/month without a decrease in the PM_{10} emission factor, then 13 lbs/day PM_{10} offsets will be required.

$$\frac{(5145 \text{ lb/month} - 4876 \text{ lb/month})}{30 \text{ days}} \times 1.2 \text{ (offset ratio, ERCs)} = 12.91 \text{ lbs/day}$$

If the applicant is not proposing any changes to the PM_{10} monthly emission limit or the emission factor set forth in condition A63.3, then the applicant will need to operate fewer hours to compensate for the increased hourly fuel requirements resulting from the turbine upgrade.

As the power produced per hourly fuel use will increase after the turbine upgrade, the same monthly fuel limit will result in higher power production. As stated on p. 3 of the *Siemens Technical Service Product Information--SGT-800 Performance*

Enhancement provided in *Attachment 5*, the expected performance increase is 2 MW. The 2 MW performance increase is confirmed below.

Prior to turbine upgrade, MW/mmscf:
The generator MW rating, as well as the turbine and duct burner Btu/hr ratings, are from the current facility permit.

Power production/gas usage (Scenario S13) =

$$\frac{44.2 \text{ MW}}{[(454.05 \text{ MMBtu/hr (HHV)} + 81.2 \text{ MMBtu/hr (HHV)}] * (\text{MMscf}/1018 \text{ MMBtu HHV})]}$$

= 84.06 MW/MMscf

After turbine upgrade, MW/mmscf:
The generator MW rating, as well as the turbine and duct burner Btu/hr ratings, are from *Attachment 4, Table 1.*

Power production/gas usage (Scenario S13) =

$$\frac{48.42 \text{ MW}}{[(491.76 \text{ MMBtu/hr (HHV)} + 81.2 \text{ MMBtu/hr (HHV)}] * (\text{MMScf}/1018 \text{ MMBtu HHV})]}$$

= 86.03 MW/MMscf

Therefore, there will be an increase of approximately 2 MW/MMscf after the upgrade without an increase in the monthly fuel limit. Please let us know if you have any comments.

ii. If Siemens provides a guarantee for the 2.366 lb/hr PM_{10} (Case/Scenario S15), then the PM_{10} emission factor will be based on that rate.

After upgrade (*Attachment 4, Table 1*, Scenario S15) =
2.366 lb/hr ÷ 0.5458 mmscfh = 4.33 lbs/mmscf

For condition A63.3, the PM_{10} emission factor will be revised from 7.397 lbs/mmscf to 4.33 lbs/mmscf for the upgrade. The current monthly limits for PM_{10} and SOx, and the revised emission factors for PM_{10} (4.33 lbs/mmscf) and SOx (0.29 lbs/mmscf as calculated above), respectively, will determine the maximum fuel usage allowed (lower of the fuel usages allowed for PM_{10} or SOx). Therefore, condition C1.4 will be removed because a separate condition to limit fuel usage will not be necessary.

Please let us know if you have any comments.

d. Conditions I298.1, I298.2, I298.3, I298.4

i. P. 1-26 of the Application states: "For NOx, the slight increase in the annual emissions will be regulated under RECLAIM." As discussed below, the increase in hourly NOx emissions will not increase the RECLAIM holding requirement.

Prior to turbine upgrade:
The current facility permit requires 40,492 lbs NOx RTCs to be held per turbine/duct burner. (Conditions I298.1 + I298.2 for Turbine No. 1 RTCs , and conditions I298.3 + I298.4 for Turbine No. 2 RTCs.) Pursuant to permitting practice at that time, the maximum operating rate was used to determine the RTCs required. Specifically, the NOx RTCs were based on the maximum NOx normal operating rate of 4.08 lb/hr based on Scenario S13 (100% load at 38 °F).

After turbine upgrade:
After the turbine upgrade, 40,492 lbs NOx RTCs will continue to be required per turbine. For Scenario S13, the maximum NOx rate will increase from 4.08 lb/hr to 4.158 lb/hr. However, pursuant to permitting practice at this time, the average operating rate will be used to determine the RTCs required. For Scenario S15, the average NOx rate will increase from 3.96 lb/hr to 4.078 lb/hr. The post-modification average rate of 4.078 lb/hr rounds up to be equal to the pre-modification basis of 4.08 lb/hr. Therefore, conditions I298.1, I298.2, I298.3, and I298.4 will not be revised.

The purpose of the I298 conditions is to implement the RECLAIM NSR offset requirements of Rule 2005(f). In December 2015, Rule 2002(f) was amended to make reductions/adjustments to NOx RTC Allocation and Holdings (NOx RECLAIM shave). In response to several electrical generating facility operators' concerns with concurrent compliance with the RTC allocation shave and the NSR holding requirements per Rule 2005, Rule 2002(f)(1)(G) allows the use of three categories of RTCs to meet the NSR holding requirements. Therefore, additional RTCs are not required to be purchased to meet the I298 conditions because of the NOx RECLAIM shave.

Please let us know if you have any comments.

5. New Source Testing Requirements
   a. Condition D29.2 requires source testing for PM (will be updated to PM_{10}), VOC, and SOx at least once every three years for the purposes of New Source Review. A source test will be required for each turbine after the initial startup of the turbine upgrade modification, which will **reset** the triennial testing schedule. As part of the modification, the source test methods will be updated to current requirements. As discussed above, the source test reports must be evaluated and approved by the SCAQMD Source Testing Dept. before the Permits to Construct can be converted to Permits to Operate for the turbine upgrade project.

      i. The condition will be revised to require a source test within 180 days of initial startup of the turbine upgrade modification. Please comment on whether the 180 days will allow sufficient time for source testing after the startup.

   b. Condition D29.3 requires testing for NH_3 at least annually. A source test will be required for each turbine after the startup of the turbine.

      i. The condition will be revised to require a source test within 180 days of initial startup of the turbine upgrade modification. Please comment on whether the 180 days will allow sufficient time for source testing after the startup.

6. Cooling Tower

a. Cooling Tower Registration Permit

Rule 219—Equipment Not Requiring a Written Permit Pursuant to Regulation II was amended on 5/5/17 to require the cooling tower to be registered, pursuant to subparagraph (d)(3)(B) which states:

> (d) Utility Equipment - General
> (3) Water cooling towers and water cooling ponds, both not used for evaporative cooling of process water or used for evaporative cooling of water from barometric jets or from barometric condensers and in which no chromium compounds are contained, including:
> (A) Cooling towers used for comfort cooling; and
> (B) Industrial cooling towers located in a chemical plant, refinery or other industrial facility, provided a filing pursuant to Rule 222 is submitted to the Executive Officer.

Rule 222--Filing Requirements for Specific Emission Sources Not Requiring a Written Permit Pursuant to Regulation II and Form 222-CT Registration for Industrial Cooling Tower are available on the SCAQMD website (aqmd.gov). Please submit a registration application to the Permit Services Dept. at the address on the upper right hand corner of the Form 400-A. Permit Services will forward the application to the permitting team that handles registration applications.

b. Cooling Tower PM_{10} Emissions Calculations

P. 4-9 of the *Petition to Amend A+ Turbine Upgrade* states: "As shown in Table 1, there is an additional increase in PM10 emissions from the cooling tower due to the increase in water circulation to provide the additional heat rejection necessary to accommodate the increase in generation. Therefore, we propose the following modification to Condition of Certification AQ-C7.

AQ-C7 PM10 emissions from the cooling tower (in total) shall not exceed ~~6.2~~ ***7.3*** lb/day."

Following are questions on the emissions calculations for PM_{10} from the cooling tower provided in the Application.

i. From *Attachment 3* of the Application, *Table 5—Cooling Towers-Wet Surface Condensers*, the circulation rate is 26,952.4 gal/min, increased from the original 25,000 gal/min (p. 29 of FDOC). The new circulation rate appears to have been derived by multiplying the 25,000 gal/min by the ratio of the new rating for turbine/duct burner after the upgrade to the current rating of the turbine/duct burner on the facility permit, but there appears to have been some rounding. Please provide the basis for the derivation of the 26,952.4 gal/min.

ii. From *Table* 5, the make-up water TDS is 1125 mg/l (or ppmw) from the "water analysis," increased from 1000 mg/l from p. 29 of the FDOC. Please provide a copy of the referenced water analysis.

c. Cooling Tower Hazardous and Toxic Pollutants

i. From *Attachment 3* of the Application, *Table 7—Calculation of Hazardous and Toxic Pollutant Emissions from Cooling Towers,* the concentration of the Rule 1401

constituents is from: "Water analysis data supplied by project applicant on 10/20/17, sample date 10/18/17, Table page 2." Please provide a copy of the referenced water analysis data report.

7. Commissioning

In lieu of requiring steady state BACT at all times, an alternative BACT which limits and minimizes emissions during periods when steady state BACT is not achievable, such as during commissioning, has been accepted by EPA. Consequently, there will be permit condition requirements for the commissioning of the two turbines after the turbine upgrade.

a. P. 1-4 of the Application states: "As the commission activities associated with the upgrade will occur over an approximate two to three-week period, the proposed project will still safely allow for full compliance with the existing monthly emission limits in the current PTO." P. 1-36 states: "The commissioning activities associated with the upgrade package will occur over a period of two weeks rather than over the originally assessed two-month period."

i. Please forward the commissioning activity parameters and emissions-related data provided by Siemens. The table should include each activity with the associated (1) duration; (2) CTG load; (3) fuel use, (4) % reduction for NOx, CO, and VOC; and (5) lbs of NOx, CO, VOC, SOx, and $PM_{10}/PM_{2.5}$.

ii. The information provided should provide sufficient information to ascertain the following items, which will be included in a new commissioning permit condition:

aa. Total commissioning hours of fired operation for each turbine.

bb. Commissioning hours without control for each turbine.

cc. Emission factors for NOx, CO, VOC, $PM_{10}/PM_{2.5}$, and SOx emissions for the commissioning period.

8. Air Dispersion Modeling

a. Turbine Operating Scenarios

i. Turbine Normal Operating Conditions

aa. On p. 1-33, *Table 16—Worst-Case Stack Parameters and Emission Rates* shows the operating scenario for the 1-hour averaging period is Case/Scenario S14. Please confirm that S14 is the scenario for the state 1-hr and federal 1-hr standards.

bb. The SCAQMD engineering evaluation will show the derivation of the modeled emission rates. To that end, please provide the following clarifications.

1) For the annual averaging period, *Table 16—Worst-Case Stack Parameters and Emission Rates* indicates Case/Scenario S15 is the basis for the modeling. On the *Attachment 6 MGS Emission Rates and Stack Parameters for Refined Modeling* table, the "Annual Emissions Calculations (lbs/yr)" shows 35,896.0 lb NOx/yr and 1381.28 lb/yr SO2 for 8633 hours of normal operations. That would correspond to NOx and SO_2 emission rates, respectively, for Case/Scenario S13. Please explain the discrepancy between the scenarios.

2) For the 1-hr, 3-hr, 8-hr, and 24-hr averaging periods which include only normal operating emissions with no turbine startups/shutdowns, *Table 16* indicates Scenario S14 is the basis for the modeling. Our review of the emission rates indicates the basis is Scenario S14. Therefore, the basis for both the modeling and emission rates is Scenario S14.

For the separate modeling provided for the 8-hour averaging period which includes normal operating emissions and turbine startups/shutdowns, *Table 16* indicates Scenario S1 is the basis for the modeling. Our review of the emission rates indicate the basis is Scenario S13. Therefore, the basis for the modeling is S1 but the basis for the emission rates is S13.

a) Please explain the criteria for selecting the modeling scenario.

b) Please explain the criteria for selecting the emission rates scenario.

ii. Turbine Commissioning

aa. Which operating scenarios were the 1-hour and 8-hour commissioning modeling based on?

b. Normal Operating Conditions Modeling

i. Turbine PM_{10} Modeling

On p. 1-33 of the Application, *Table 16—Worst-Case Stack Parameters and Emission Rates* indicates the PM_{10} modeling for the 24-hour and annual averaging periods were based on 0.4207 g/sec (3.339 lb/hr) PM_{10}. Footnote b states: "PM10/PM2.5 emissions based on permit limit of 29.25 tons/year total for both turbines." The footnote is referring to the condition A63.3 limit of 4876 lbs in any one month for the two turbines. As discussed for question no. 4 above, the 4876 lbs is not based on the maximum emission rate for PM_{10}.

On p. 42 of the FDOC, *Table 24—Maximum Hourly and Annual Emissions for Normal Operation [one CT]* indicates the original modeling for the turbine was based on 4.95 lb/hr PM_{10} (Scenario S13, 100% load at 38 °F). Footnote c states: "Includes PM_{10} from natural gas combustion and the incremental increase in PM_{10} emissions due to conversion of SO_2 to SO_3 in the presence of SCR/CO catalyst [80% conversion of SO_2 to SO_3 and all SO_3 converts to ammonium sulfate]." The note below *Table 24* states: "All 3 above tables (22, 23 & 24) show PM_{10} emissions calculations as per the original estimate of 80% conversion of SO_2 to SO_3 and eventually to ammonium sulfate. Applicant revised this estimate [with 53% conversion and SOx emission factor of 0.6 lb/mmscf (instead of 0.83 lb/mmscf] and provided a supplement document on July 18, 2002. As per this revised estimate total PM_{10} emissions are lower. For normal operation (worst case), the revised PM_{10} will be 3.89 lb/hr. Since the modeling analyses were performed with the higher emissions data and were compliant with the standards, the revised PM_{10} emissions are not listed above." To summarize, as the original modeling based on 4.95 lb/hr PM_{10} showed compliance with air quality standards, the modeling was not required to be revised when the applicant reduced the PM_{10} emission rate to 3.89 lb/hr.

aa. 24-Hour Averaging Period

1) If Siemens does not provide a guarantee for the 2.407 lb/hr PM_{10} (Case/Scenario S13), then please revise the PM_{10} modeling for the turbines to be based on the current maximum emission rate of 3.89 lb/hr for the 24-hour averaging period.

Please let us know if you have any comments.

2) If Siemens provides a guarantee for the 2.407 lb/hr PM_{10} (Case/Scenario S13), then the modeling for the 24-hour averaging period will not need to be revised to use the maximum PM_{10} emission rate of 3.89 lb/hr, because the proposed PM_{10} emission rate of 2.407 lb/hr PM_{10} will be lower than the 3.339 lb/hr that was modeled.

Please let us know if you have any comments.

bb. Annual Averaging Period

The $PM_{10}/PM_{2.5}$ emissions are based on permit limit of 29.25 tons/yr total for both turbines (4876 lb/month x 12 months x ton/2000 lb). This is acceptable for the annual averaging period.

Please let us know if you have any comments.

ii. Fire Pump Modeling

For the FDOC, the SCAQMD did not require modeling for the fire pump because SCAQMD Rule 1304(a)(4) exempts emergency engines, operating no more than 200 hours per year, from modeling and offset requirements. Also, the SCAQMD did not require a health risk assessment because Rule 1401(g)(1)(F) exempts emergency engines, operating no more than 200 hours per year, from HRA requirements. The CEC, however, required the applicant to provide air dispersion modeling and an HRA for the fire pump. After reviewing the analyses, the CEC included Condition of Certification AQ-C8 in its Final Staff Assessment.

Condition of Certification AQ-C8 currently prohibits testing the fire pump on a day in which either combustion turbine has had a startup or shut down. In the Petition to CEC, Bicent is proposing to modify the restriction to allow testing of the fire pump on the same day as a startup or shutdown event but prohibit the testing during the same hour as a startup (cold and non-cold) or shutdown event.

The Application provided air dispersion modeling and an HRA for the fire pump. The air dispersion modeling was based on 52 hours but the HRA was based on 199 hours. On 1/16/18, the SCAQMD e-mailed CEC questions regarding requirements for emergency engine modeling and HRA, including whether the 52 hours for the modeling and 199 hours for the HRA are correct. Consequently, the CEC asked the consultant, Greg Darvin, to check on whether the different schedules were consistent with the original modeling and HRA. On 1/19/18, Mr. Darvin e-mailed that, as the original modeling and HRA were both based on 199 hours, he would revise the air quality modeling for the fire pump to be based on 199 hours. The SCAQMD requested that the 199 hours be increased to the currently allowed 200 hours, as set forth in condition C1.5.

aa. Please revise the NOx, SO_2, and PM_{10} air dispersion modeling for the fire pump to be based on 200 hours for the annual averaging period because the CEC has requested the same number of operating hours as in the original modeling for the FDOC.

bb. As the 1-hour NO_2 and SO_2 NAAQS assessment for the fire pump is based on annual average emissions per USEPA guidance for intermittent sources, please revise the federal 1-hour modeling for NO_2 and SO_2 to be based on 200 hours.

cc. The *Attachment 6 MGS Emission Rates and Stack Parameters for Refined Modeling* was missing from the SCAQMD application but included in the *Petition to Amend A+ Turbine Upgrade* submitted to the CEC.

On p. 1-33 of the Application, *Table 16—Worst-Case Stack Parameters and Emission Rates* shows fire pump emission rates that are reflective of the hourly emission rates for the fire pump, device D48, permitted under A/N 482576, on the facility permit. The *MGS Emission Rates and Stack Parameters for Refined Modeling* table, however, shows fire pump emission rates that are reflective of one-half of the hourly emission rates for the fire pump, device D46, permitted under A/N 403104 in the FDOC, but never installed.

In addition, *Table 16* reflects the revised PM_{10} rate of 7.27 lb/day for the cooling tower that will become effective after the turbine upgrade, but the *Attachment 6* table still reflects the original 6.24 lb/day, effective prior to the turbine upgrade.

Please update the *MGS Emission Rates and Stack Parameters for Refined Modeling* table and *Table 16* to reflect the revised final modeling.

c. Startup/Shutdown Modeling

i. 1-Hour Averaging--Cold Start One Turbine

aa. Condition A99.3 limits NOx emissions for a cold start to 122.8 lbs and 120 minutes. The *MGS Emission Rates and Stack Parameters for Refined Modeling* table shows the modeled emission rate for NOx for a one-hour averaging period is one-half of the 122.8 lbs, which is 61.40 lbs/hr.

The assumption that the mass emissions for NOx for the first hour of startup is the same as the second hour of startup is not correct. P. 23 of the FDOC explains that during the start-up period, NOx and CO emissions will be higher due to the lack of dry low NOx control in the turbines until a 50% load is reached and the unavailability of control equipment until the proper operating temperatures are reached. P. 41 of the FDOC shows that the original modeling for start-ups was based on the maximum hourly emissions, which takes place during the first hour when the catalysts are not warmed up.

P. 23 of the FDOC provides *Table 7—Start-up Scenarios Emissions*, which summarizes the NOx, CO, and VOC emissions data provided by Alstom for cold starts, warm starts, and hot starts. An excerpt from *Table 7* is reproduced below to provide data on the percentage of NOx and CO emissions emitted in the first hour of a cold startup.

Table 7—Start-up Scenarios Emissions [worst case 38°F]

Time Period, Minutes	Fuel Use, scf/period	NOx, lbs/period	CO, lbs/period
0 – 30	68,100	10.65	17.35
30 – 60	94,500	2.45	6.95
60 – 90	199,000	1.50	0.10
90 - 120	235,000	1.15	0.10
2 hr. cold start	**596,600**	**15.75**	**24.5**

The cold start emissions for NOx were increased from 15.75 lb/cold start to 122.8 lb/cold start under application nos. 517249 and 517250, which are the current permits for the two turbines. The increase was required because of actual CEMS data.

The first hour of emissions for the 122.8 lb per cold start is estimated below.

$(10.65 + 2.45)/15.75 * 122.8 \text{ lb} = 102.14 \text{ lb}$

Please revise the 1-hour modeling for a cold start to be based on 102.14 pounds NOx, an increase from the 61.40 lbs/hr that was modeled.

bb. Condition A99.4 limits CO emissions for a cold start to 204.8 lbs and 120 minutes. The *MGS Emission Rates and Stack Parameters for Refined Modeling* table shows the modeled emission rate for CO for a one-hour averaging period is one-half of the 204.8 lbs, which is 102.4 lbs/hr. As discussed above, the assumption that the mass emissions for CO for the first hour of startup is the same as the second hour of startup is not correct.

The cold start emissions for CO were increased from 24.5 lb/cold start to 204.8 lb/cold start under application nos. 517249 and 517250, which are the current permits for the two turbines. The increase was required because of actual CEMS data.

The first hour of emissions for the 204.8 lb per cold start is estimated below.

$(17.35 + 6.95)/24.5 * 204.8 \text{ lb} = 203.13 \text{ lb}$

Please revise the 1-hour modeling for a cold start to be based on 203.13 pounds CO, an increase from the 102.4 pounds that was modeled.

cc. P. 1-37 of the Application indicates during a cold start, only one turbine will be undergoing the start cycle. On p. 1-33, *Table 16—Worst-Case Stack Parameters and Emission Rates* shows for the "Averaging Period: 1-hour for Cold Start-up Periods (Case 1)," one turbine is modeled.

Other applicants provide modeling for the simultaneous operation of turbines. The Application provides modeling for one turbine. While the first turbine is undergoing a cold startup, will the second turbine be simultaneously operating at normal operating conditions or undergoing a shutdown? If so, please provide modeling for one turbine in cold start-up and the other turbine in normal operation/shutdown (worst case). Permit condition(s) will be added to limit startups/shutdowns/normal operation for both turbines to the scenarios that are

demonstrated to be in compliance with ambient air quality standards by dispersion modeling.

d. Commissioning

i. P. 1-37 of the Application indicates commissioning activities are assumed to occur for only one turbine at a time and the fire pump will not be tested during commissioning activities. The CO and NOx emissions rates for one turbine were provided, as well as the maximum impacts for CO and NOx.

Other applicants provide modeling for the simultaneous operation of turbines. The Application provides modeling for one turbine. Typically, once a turbine has been commissioned, it starts normal operation, while the second turbine is undergoing commissioning. When the second turbine is undergoing commissioning, will the first turbine be simultaneously undergoing normal operations, including cold start, non-cold startup, shutdown, and normal operations? If so, please provide modeling for one turbine undergoing commissioning and the other turbine in normal operation/cold start/non-cold start/shutdown (worst case). Permit condition(s) will be added to limit commissioning and startups/shutdowns/normal operation for both turbines, as well fire pump testing, to the scenarios that are demonstrated as compliant by dispersion modeling.

9. Turbine Health Risk Assessment (HRA)

a. Modeling Scenario

i. P. 12 of the *Air Quality Modeling Protocol, October 2017* in *Attachment 6* of the Application states: "For the HRA analyses, the annual average operating condition (100% load at 59 °F) will be assessed." Please confirm that the maximum hourly impacts and the maximum annual impacts were based on Scenario S14 (100% load at 59 °F).

b. *Attachment 3 Table 6—Calculation of Hazardous and Toxic Pollutant Emissions from Combustion Turbines*

i. *Table 6* states that, based on maximum annual turbine fuel use (annual avg conditions), the annual fuel use is 4774.810 mmscf/yr for the annual toxic emissions for each turbine.

An independent calculation shows the annual fuel use is 4781.08 mmscf/yr, as shown below.

> Annual emissions, lb/yr = (Emission Factor) [average hourly heat input rate of 474.61 MMBtu/hr, turbine + 81 MMBtu/hr, duct burner (HHV) (Scenario S15, 100% load at 65 °F)] (8760 hr/yr maximum per *Table 6*) (scf/1018 Btu) = (Emission Factor) (4781.08 MMscf/yr)

Please provide the emissions calculations for the derivation of the 4774.810 mmscf/yr, which will be included in the engineering evaluation.

c. On p. 2-9 of the Application, *Table 27—MGS Health Risk Assessment Summary* provides a condensed summary of HRA results. The table provides facility-wide cancer risks with and without the fire pump, chronic health indices with and without the fire pump, and acute hazard indices with and without the fire pump. The table also provides the cancer risk and chronic hazard index for the fire pump.

i. For the purpose of Rule 1401 compliance, please provide cancer risks, chronic hazard indices, and acute hazard indices for the sensitive/residential receptors and the worker receptors for each turbine as required by Rule 1401.

ii. For the purpose of CEQA analysis for CEC, please provide facility-wide cancer risks, chronic hazard indices, and acute hazard indices for sensitive/residential and worker receptors.

d. Toxic Emission Factors for Turbines

i. For future turbine projects and for this project only if the health risk assessment for the turbines is required to be revised based on the above questions, please use the following emission factors. The emission factors from AP-42 are in terms of lb/mmbtu. If the usage is in terms of lb/mmscf, then please convert the lb/mmbtu to lb/mmscf using the natural gas heat content, which is 1018 btu/scf HHV for Bicent.

Pollutant	**Emission Factor Lb/MMBtu [1]**	**Emission Factor lb/MMscf**
Acetaldehyde [2]	1.76E-04	~~0.179168~~ **0.1901**
Acrolein [2]	3.62E-06	~~0.003685~~ **0.003910**
Ammonia		5 ppm
Benzene [2]	3.26E-06	~~0.003319~~ **0.003521**
1,3-Butadiene	4.3E-07	~~0.000438~~ **0.0004644**
Ethylbenzene	3.2E-05	~~0.032576~~ **0.03456**
Formaldehyde [2]	3.60E-04	~~0.366480~~ **0.3888**
Hexane **Note: AP-42 does not provide a factor.**	0.0000	0.0000
Naphthalene	1.3E-06	~~0.001323~~ **0.001404**
PAHs, not including Naphthalene [3] [2.2E-06 – 1.3E-06 = 0.90E-06 lb/MMBtu]	0.90E-06	~~0.000916~~ **0.000972**
Propylene **Note: AP-42 does not provide a factor.**	0.0000	0.0000
Propylene Oxide	2.9E-05	~~0.029522~~ **0.03132**
Toluene	1.3E-04	~~0.132340~~ **0.1404**
Xylene	6.4E-05	~~0.065152~~ **0.06912**

1 Emission factors based on AP-42, Section 3.1, Final Section, Table 3.1-3--Emission Factors for Hazardous Air Pollutants from Natural Gas-Fired Stationary Gas Turbine (Uncontrolled), April 2000, unless otherwise noted in footnote 2. To convert from lb/MMBtu to lb/MMscf, multiply by 1018 Btu/scf, as provided on p. 21 of FDOC.

2 Acetaldehyde, acrolein, benzene, and formaldehyde emission factors are based on AP-42, Section 3.1, Background Information, Table 3.4-1--Summary of Emission Factors for Natural Gas-Fired Gas Turbines, April 2000. These emission factors include control by CO catalyst. To convert from lb/MMBtu to lb/MMscf, multiply by 1018 Btu/scf.

3 Carcinogenic PAHs only. Naphthalene is subtracted from the total PAHs and considered separately in the HRA.

10. Regulation XXXI—Acid Rain Permit Program (40 CFR Parts 72, 73, 74, 75, 76, 77, and 78 - Acid Rain Provisions)
On p. 1-40 of the Application, *Table 19—Summary of Applicable LORS for Air Quality* provides the following analysis for 40 CFR 72-75 (Acid Rain): "MGS will submit updated applications for inclusion to the Acid Rain program and allowance system. Current CEMS meets all 40 CFR 72-75 requirements." As the SCAQMD regulatory analysis will discuss how a facility is in compliance with regulatory requirements, please provide a more complete regulatory analysis, as requested below.

    a. "MGS will submit updated applications for inclusion to the Acid Rain program and allowance system."

        i. Please identify the applicable Acid Rain requirements and discuss how compliance will be achieved.

    b. "Current CEMS meets all 40 CFR 72-75 requirements."

        i. Please identify the applicable Acid Rain requirements and discuss how compliance has been achieved.

    c. Alternative Monitoring Plan (AMP)
        i. Has Bicent obtained EPA approval to accept the RECLAIM CEMS data for showing compliance with the Part 75 CEMS, under an Alternative Monitoring Plan (AMP)?

        ii. If so, please send me a copy of the Alternative Monitoring Plan.

11. Subpart KKKK—Standards of Performance for Stationary Combustion Turbines
On pp. 1-41 to 1-43, the Application provides a regulatory analysis for Subpart KKKK. The analysis for §§60.4395, 60.4400 and 60.4405 states: "MGS expects that several of the present permit conditions will be modified to address these Subpart KKKK requirements."

    A permit condition with specific requirements to ensure compliance with Subpart KKKK will be added. The NOx CEMS will be required to comply with NSR, RECLAIM, Subpart KKKK, and Acid Rain.

    a. §60.4305—Does this subpart apply to my stationary combustion turbine?
        i. §60.4305(a) If you are the owner or operator of a stationary combustion turbine with a heat input at peak load equal to or greater than 10.7 gigajoules (10 MMBtu) per hour, based on the higher heating value of the fuel, which commenced construction, modification or reconstruction after February 18, 2005, your turbine is subject to this subpart. Only heat input to the combustion turbine should be included when determining whether or not this subpart is applicable to the turbine. Any additional heat input to associated heat recovery steam generators (HRSG) or duct burners should not be included when determining the peak heat input. However, this part does apply to emissions from any associated HRSG and duct burners.

            40 CFR 60 Subpart A—General Provisions provides definitions for "construction" and "modification."

- *§60.2 Definitions*

  Commenced means, with respect to the definition of *new source* in section 111(a)(2) of the Act, that an owner or operator has undertaken a continuous program of construction or modification or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction or modification.

  Construction means fabrication, erection, or installation of an affected facility.

  Modification means any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted into the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) into the atmosphere not previously emitted.

- *§60.14 Modification*

  (a) Except as provided under paragraphs (e) and (f) of this section, any physical or operational change to an existing facility which results in an increase in the emission rate to the atmosphere of any pollutant to which a standard applies shall be considered a modification within the meaning of section 111 of the Act. Upon modification, an existing facility shall become an affected facility for each pollutant to which a standard applies and for which there is an increase in the emission rate to the atmosphere.

  (b) Emission rate shall be expressed as kg/hr of any pollutant discharged into the atmosphere for which a standard is applicable. The Administrator shall use the following to determine emission rate:

  (1) Emission factors as specified in the latest issue of "Compilation of Air Pollutant Emission Factors," EPA Publication No. AP-42, or other emission factors determined by the Administrator to be superior to AP-42 emission factors, in cases where utilization of emission factors demonstrates that the emission level resulting from the physical or operational change will either clearly increase or clearly not increase.

  (g) Within 180 days of the completion of any physical or operational change subject to the control measures specified in paragraph (a) of this section, compliance with all applicable standards must be achieved.

  (h) No physical change, or change in the method of operation, at an existing electric utility steam generating unit shall be treated as a modification for the purposes of this section provided that such change does not increase the maximum hourly emissions of any pollutant regulated under this section above the maximum hourly emissions achievable at that unit during the 5 years prior to the change.

Questions

aa. As discussed below under §60.4320, the NOx limit differs depending on whether construction or modification was commenced after 2/18/05. The original applications were submitted on 12/7/01 and the turbines were put into service in July 2005. Therefore, construction was likely to have commenced prior to 2/18/05. 40 CFR 51.165(a)(1)(xv) provides the following definition: "*Begin actual construction* means in general, initiation of physical on-site

construction activities on an emissions unit which are of a permanent nature. Such activities include, but are not limited to, installation of building supports and foundations, laying of underground pipework, and construction of permanent storage structures. With respect to a change in method of operating this term refers to those on-site activities other than preparatory activities which mark the initiation of the change."

The FDOC determined the turbines were subject to 40 CFR Subpart GG--Standards of Performance for Stationary Gas Turbines, which covers turbine engines that commenced construction after October 3, 1977 and before February 18, 2005. The SCAQMD application files indicate original construction commenced in 2003. Therefore, this analysis will be based on construction not commencing after 2/18/05, unless Bicent has information that construction commenced after 2/18/05. Please let us know if you have any comments.

bb. If the construction did not commence after 2/18/05, then the SCAQMD analysis will conclude that modification commenced after 2/18/05. The turbine upgrade will meet the definition of "modification," pursuant to §60.14 Modification, because the maximum hourly emissions for NOx will increase above the maximum hourly emissions prior to the upgrade. In addition, the NOx emissions are subject to a standard pursuant to Subpart KKKK. Please let us know if you have any comments.

b. §60.4320 What emission limits must I meet for nitrogen oxides (NOx)?

i. §60.4320(a) You must meet the emission limits for NOx specified in Table 1 of this subpart.

aa. On p. 1-41, the Application states: "Section 60.4320 requires turbines to meet the applicable NOx standard in Table 1 of the subpart. The proposed natural gas fired turbines heat input are each 480 MMBTU/Hr, therefore the NOx limit as listed in Table 1 is 25 ppmvd at 15% O2 or 1.2 lb/MW-Hr when operating at or above 75% peak load and 96 ppmvd at 15% O2 or 4.7 lb/MW-hr when operating below 75% of peak load."

The SCAQMD interpretation of Table 1 is as follows. Table 1 provides different limits depending on whether construction or modification commenced after February 18, 2005. §60.4305(a) indicates applicability is based on the heat input of the combustion turbine at peak load. Therefore there will be one NOx limit based on the peak load of the turbine (not including the duct burner), not the proposed two limits based on operation at or above 75% peak load and on operation at below 75% of peak load, respectively. The peak load of the turbine is 454.05 MMBtu/hr if construction commenced after 2/18/05, and 491.76 MMBtu/hr if modification commenced after 2/18/05.

If Subpart KKKK is applicable because original construction commenced after 2/18/15, then for a new turbine firing natural gas (> 50 MMBtu/hr and ≤ 850 MMBtu/hr), the limit is 25 ppm at 15% O2. If Subpart KKKK is applicable because a modification (turbine upgrade) commenced after 2/18/15, then for a modified turbine firing natural gas (> 50 MMBtu/hr and ≤ 850 MMBtu/hr), the limit is 42 ppm at 15% O_2.

Please let us know if you have any comments.

c. §60.4345--What are the requirements for the continuous emission monitoring system equipment, if I chose to use this option?
P. 1-42 of the Application summarizes the requirements for §60.4345, then states: "The current certified CEMS systems meet these requirements."

Note: ***SCAQMD rule analyses are required to discuss how a facility is in compliance with regulatory requirements. Please discuss below how the NOx RECLAIM CEMS meets the Subpart KKKK §60.4345 requirements.***

i. §60.4345(a) Each NOX diluent CEMS must be installed and certified according to Performance Specification 2 (PS 2) in appendix B to this part [Performance Specifications], except the 7-day calibration drift is based on unit operating days, not calendar days. With state approval, Procedure 1 in appendix F [Quality Assurance Procedures] to this part is not required. Alternatively, a NOX diluent CEMS that is installed and certified according to appendix A of part 75 of this chapter [Specifications and Test Procedures] is acceptable for use under this subpart. The relative accuracy test audit (RATA) of the CEMS shall be performed on a lb/MMBtu basis.

aa. Is the NOx RECLAIM CEMS installed and certified pursuant to Performance Specification 2 (PS 2) in appendix B to this part [Performance Specifications], except the 7-day calibration drift is based on unit operating days, not calendar days?

bb. If so, was state/EPA approval received (or expected to be received) to not require Procedure 1 in appendix F [Quality Assurance Procedures] to this part?

cc. Alternatively, is the NOX RECLAIM CEMS installed and certified according to appendix A of part 75 of this chapter [Specifications and Test Procedures] as Bicent is an acid rain facility?

dd. Please confirm the relative accuracy test audit (RATA) of the NOx RECLAIM CEMS is performed on a lb/MMBtu basis.

ii. §60.4345(b) As specified in §60.13(e)(2), during each full unit operating hour, both the NO_x monitor and the diluent monitor must complete a minimum of one cycle of operation (sampling, analyzing, and data recording) for each 15-minute quadrant of the hour, to validate the hour. For partial unit operating hours, at least one valid data point must be obtained with each monitor for each quadrant of the hour in which the unit operates. For unit operating hours in which required quality assurance and maintenance activities are performed on the CEMS, a minimum of two valid data points (one in each of two quadrants) are required for each monitor to validate the NO_x emission rate for the hour.

aa. Please confirm the NOx RECLAIM CEMS is in compliance with the above requirements.

iii. §60.4345(c) Each fuel flowmeter shall be installed, calibrated, maintained, and operated according to the manufacturer's instructions. Alternatively, with state approval, fuel flowmeters that meet the installation, certification, and quality assurance requirements of appendix D to part 75 of this chapter [Optional SO_2 Emissions Data Protocol for Gas-Fired and Oil-Fired Units] are acceptable for use under this subpart.

aa. Is each fuel flowmeter installed, calibrated, maintained, and operated according to the manufacturer's instructions?

bb. Alternatively, was state/EPA approval received (or expected to be received) to allow fuel flowmeters to meet the installation, certification, and quality assurance requirements of appendix D to part 75 of this chapter [Optional SO_2 Emissions Data Protocol for Gas-Fired and Oil-Fired Units] as Bicent is an acid rain facility?

iv. §60.4345(d) Each watt meter, steam flow meter, and each pressure or temperature measurement device shall be installed, calibrated, maintained, and operated according to manufacturer's instructions.

aa. Please confirm compliance with the above requirements.

v. §60.4345(e) The owner or operator shall develop and keep on-site a quality assurance (QA) plan for all of the continuous monitoring equipment described in paragraphs (a), (c), and (d) of this section. For the CEMS and fuel flow meters, the owner or operator may, with state approval, satisfy the requirements of this paragraph by implementing the QA program and plan described in section 1 of appendix B to part 75 of this chapter [Quality Assurance and Quality Control Procedures].

aa. Please confirm Malburg has developed and is keeping on-site a quality assurance (QA) plan for all of the continuous monitoring equipment described in paragraphs (a), (c), and (d) of this section for the NOx RECLAIM CEMS.

bb. Alternatively, was state/EPA approval received (or expected to be received) for the CEMS and fuel flow meters to satisfy the requirements of this paragraph by implementing the QA program and plan described in section 1 of appendix B to part 75 of this chapter [Quality Assurance and Quality Control Procedures] as Bicent is an acid rain facility?

d. §60.4395 When must I submit my reports?
All reports required under §60.7(c) must be postmarked by the 30th day following the end of each 6-month period.

i. On p. 1-43, the Application indicates for §60.4395, MGS expects that several of the present permit conditions will be modified to address the Subpart KKKK requirements. Please explain which present permit conditions must be modified and how the permit conditions must be modified.

e. §60.4400 How do I conduct the initial and subsequent performance tests, regarding NO_X?

i. §60.4400(a) You must conduct an initial performance test, as required in §60.8. Subsequent NOx performance tests shall be conducted on an annual basis (no more than 14 calendar months following the previous performance test).

(1) There are two general methodologies that you may use to conduct the performance tests. For each test run:

(i) Measure the NO_X concentration (in parts per million (ppm)), using EPA Method 7E or EPA Method 20 in appendix A of this part. For units complying with the output based standard ...; or

(ii) Measure the NO_X and diluent gas concentrations, using either EPA Methods 7E and 3A, or EPA Method 20 in appendix A of this part. Concurrently measure the heat input to the unit....

(2) Sampling traverse points for NO_X and (if applicable) diluent gas are to be selected following EPA Method 20 or EPA Method 1 (non-particulate procedures), and sampled for equal time intervals.

(3) Notwithstanding paragraph (a)(2) of this section, you may test at fewer points than are specified in EPA Method 1 or EPA Method 20 in appendix A of this part if the following conditions are met: ....

aa. On p. 1-43, the Application indicates that for §60.4400, MGS expects that several of the present permit conditions will be modified to address the Subpart KKKK requirements. Please explain which present permit conditions must be modified and how the permit conditions must be modified.

ii. §60.4400(b) The performance test must be done at any load condition within plus or minus 25 percent of 100 percent of peak load. You may perform testing at the highest achievable load point, if at least 75 percent of peak load cannot be achieved in practice. You must conduct three separate test runs for each performance test. The minimum time per run is 20 minutes.

....

(5) If you elect to install a CEMS, the performance evaluation of the CEMS may either be conducted separately or (as described in §60.4405) as part of the initial performance test of the affected unit.

aa. Please explain which present permit conditions must be modified and how the permit conditions must be modified.

f. §60.4405 How do I perform the initial performance test if I have chosen to install a NOX-diluent CEMS?

If you elect to install and certify a NOX-diluent CEMS under §60.4345, then the initial performance test required under §60.8 may be performed in the following alternative manner:

i. §60.4405(a) Perform a minimum of nine RATA reference method runs, with a minimum time per run of 21 minutes, at a single load level, within plus or minus 25 percent of 100 percent of peak load. The ambient temperature must be greater than 0 °F during the RATA runs.

aa. On p. 1-43, the Application indicates that for §60.4405, MGS expects that several of the present permit conditions will be modified to address the Subpart KKKK requirements. Please explain which present permit conditions must be modified and how the permit conditions must be modified.

ii. §60.4405(b) For each RATA run, concurrently measure the heat input to the unit using a fuel flow meter (or flow meters) and measure the electrical and thermal output from the unit.

aa. Please explain which present permit conditions must be modified and how the permit conditions must be modified.

iii. §60.4405(c) Use the test data both to demonstrate compliance with the applicable NO_x emission limit under §60.4320 and to provide the required reference method data for the RATA of the CEMS described under §60.4335.

aa. Please explain which present permit conditions must be modified and how the permit conditions must be modified.

iv. §60.4405(d) Compliance with the applicable emission limit in §60.4320 is achieved if the arithmetic average of all of the NO_x emission rates for the RATA runs, expressed in units of ppm or lb/MWh, does not exceed the emission limit.

aa. Please explain which present permit conditions must be modified and how the permit conditions must be modified.

g. Alternative Monitoring Plan (AMP)

i. Is Bicent expected to apply for EPA approval to accept the RECLAIM CEMS data for showing compliance with the Part 60 CEMS, under an Alternative Monitoring Plan (AMP)?

12. Subpart TTTT—Standards of Performance for Greenhouse Gas Emissions for Electric Generating Units

a. §60.5509 Am I subject to this subpart?

i. §60.5509(a) Except as provided for in paragraph (b) of this section, the GHG standards included in this subpart apply to any steam generating unit, IGCC, or stationary combustion turbine that commenced construction after January 8, 2014 or commenced reconstruction after June 18, 2014 that meets the relevant applicability conditions in paragraphs (a)(1) and (2) of this section....

aa. The construction date is known to be before 1/8/14. Therefore, it needs to be established that the turbine upgrade does not constitute a "reconstruction." P. 1-44 of the Application correctly defines "reconstruction" from *40 CFR 60 Subpart A—General Provisions.*

- *§60.15 Reconstruction*

(b) "Reconstruction" means the replacement of components of an existing facility to such an extent that:

(1) The fixed capital cost of the new components exceeds 50 percent of the fixed capital cost that would be required to construct a comparable entirely new facility, and

(2) It is technologically and economically feasible to meet the applicable standards set forth in this part.

(c) "Fixed capital cost" means the capital needed to provide all the depreciable components.

The analysis on p. 1-44 of the Application states: "Per MGS, the upgrade cost per turbine is significantly less than the 50% cost threshold noted above, and as such the upgrade is not conserved "reconstruction".

1) Please provide the approximate cost of the upgrade per turbine

2) Please provide an estimated cost of a new turbine with the upgrades.

bb. P. 1-44 states that, in addition, the MGS turbines are not subject to Subpart TTTT because of §60.5509(b)(7):

> §60.5509(b) You are not subject to the requirements of this subpart if your affected EGU meets any of the conditions specified in paragraphs (b)(1) through (10) of this section.
>
> (7) Your EGU is a steam generating unit or IGCC that undergoes a modification resulting in an hourly increase in CO_2 emissions (mass per hour) of 10 percent or less (2 significant figures). Modified units that are not subject to the requirements of this subpart pursuant to this subsection continue to be existing units under section 111 with respect to CO_2 emissions standards.

The analysis in the Application states that MGS believes, based upon a review of current and proposed turbine operations, that the upgraded turbines will not result in an emission increase of CO_2 of greater than 10% (mass emissions per hour).

The SCAQMD interpretation of the above exemption is that it does not apply to the MGS turbines, because a turbine does not qualify as a "steam generating unit" or an "IGCC," as defined in §60.5580. Please let us know if you have any comments.

The information provided and discussed above will be included in the SCAQMD's engineering evaluation. The SCAQMD is requesting specific information, not a revision of the Application, to allow the expeditious completion of the engineering evaluation.

Please feel free to contact me at (909) 396-2643/alee@aqmd.gov, or Vicky Lee at 909-396-2284/vlee1@aqmd.gov for further information or clarification.

Sincerely,

Andrew Y. Lee, P.E.
Sr. Engineering Manager
Engineering and Permitting

AYL:BC:RC:VL

cc: Dr. Laki Tisopulos, SCAQMD
Anwar Ali, CEC (Anwar.Ali@energy.ca.gov)
Nancy Fletcher, CEC (Nancy.Fletcher@energy.ca.gov)
Kyle McCormack, Bicent (kmccormack@heorotpower.com)
Gregory Darvin, Atmospheric Dynamics (darvin@atmosphericdynamics.com)