

Technical Evaluation
and
Preliminary Determination

Baptist Medical Center
Jacksonville, Duval County, Florida

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|-------------------------|--------------|
| Turbine Generator No. 1 | AC 16-150325 |
| Turbine Generator No. 3 | AC 16-150327 |

APIS No. 31DUL16001003
APIS No. 31DUL16001006

Florida Department of Environmental Regulation
Bureau of Air Quality Management
Central Air Permitting

July 29, 1988

I. NAME AND LOCATION

Baptist Medical Center
800 Prudential Drive
Jacksonville, Florida 32207

II. REVIEWING AND PROCESS SCHEDULE

Date of Receipt of Application: May 19, 1988.

Completeness Review (30 days): Department's letter of June 16, 1988.

Response to Request for Additional Information:
Baptist Medical Center's letter of June 23, 1988, received on June 24, 1988.

Application Completeness Date: June 24, 1988.

III. FACILITY INFORMATION

III.1 Facility Location

The proposed facility is located on 800 Prudential Drive in Jacksonville, Duval County, Florida. The UTM coordinates are 7436.2 E and 3353.5 N.

III.2 Standard Industrial Classification Code (SIC)

Baptist Medical Center is classified as follows:

Major Group No. 80 - Health Services

Group No. 806 - Hospitals

Industry No. 8062 - General Medical and Surgical Hospital

III.3 Facility Category

Baptist Medical Center is a major emitting facility. The proposed project will increase the overall NOx emissions by 126.5 tons per year.

IV. PROJECT DESCRIPTION

Baptist Medical Center utilizes gas turbines to generate power for internal use. The existing turbines burn natural gas as a primary fuel with number 2 fuel oil as a standby fuel. The units consist of a turbine, speed reducer, electric generator, and sound enclosure. The exhaust gas can be routed through a heat recovery boiler equipped with an economizer by using a diverting valve. The proposed project will increase the maximum averaged

output of each unit from 2300 KW to 2500 KW. The units have no add on pollution control equipment.

V. RULE APPLICABILITY

The proposed project is subject to preconstruction review under the provisions of Chapter 403, Florida Statutes, and Chapter 17-2, Florida Administrative Code (FAC).

The facility is located within the ozone nonattainment area of Duval County and within the fifty kilometers of the area of influence of the downtown Jacksonville particulate matter nonattainment area, Rule 17-2.410, FAC.

The emissions of volatile organic compounds (VOC) and particulate matter are exempted from the requirements of New Source Review for Nonattainment Areas because the modification does not constitute a new major facility in and of itself, Rule 17-2.510(2)(d)(3), FAC, and the emissions of particulate matter will not have a significant impact within the nonattainment area, Rule 17-2.510(2)(a)(2).b., FAC.

This project is for a nonprofit health facility which in accordance with the Prevention of Significant Deterioration regulations (PSD), Rule 17-2.500(2)(a), FAC, will be exempt from PSD regulation requirements for BACT and air quality analysis.

This project shall be permitted under Rule 17-2.520, Sources Not Subject to Prevention of Significant Deterioration or Nonattainment Requirements. The modified sources shall comply with: Rule 17-2.660, Standards of Performance for New Stationary Sources (NSPS); Subpart GG, NSPS for Gas Turbines; Rule 17-2.610, General Particulate Emission Limiting Standards; and, Rule 17-2.700 Stationary Point Source Emissions Test Procedures.

VII. EMISSIONS SUMMARY

VII.1 Emissions Limitations

The operation of the gas turbines will produce emissions of nitrogen oxides (NOx), sulfur dioxide (SO₂), carbon monoxide (CO), particulate matter (PM), and volatile organic compounds (VOC) to the atmosphere.

The proposed gas turbines will be operated at a maximum load of 2500 KW which will yield the following NOx emissions when burning natural gas:

| Turbine | NOx (lbs/hr) | Run Time (hr/yr) | NOx (tons/yr) |
|--------------|-----------------|---------------------|------------------|
| NATCO No. 1 | 20.9 | 8760 | 91.5 |
| Valley No. 3 | 20.9 | 8760 | 91.5 |

Table 1 summarizes the potential to emit all pollutants regulated under the act which are affected by the proposed project. These permitted emissions are in compliance with all applicable requirements of Rule 17-2, FAC.

VII.2 Air Quality Analysis

The Department has reviewed the air quality impact of nitrogen oxides emission increases of the two turbine generators. Based on a screening model that has been run for both sources, the Department has reasonable assurance that the ambient air quality standard for nitrogen dioxide will be met.

VII.3 Air Toxics Information

Currently, the Department is developing acceptable ambient concentrations for toxic substances. Specifically, pollutants classified as Category A (carcinogens and highly toxic) and Category B (moderately toxic substances).

In the event toxics emission limits are set during the term of this permit or any subsequent permit, the Department may seek modification pursuant to Rule 17-4.08, FAC.

VII. CONCLUSION

Based on the review of the data submitted by Baptist Medical Center, the Florida Department of Environmental Regulation has concluded that compliance with all applicable state air quality regulations will be achieved provided certain specific conditions are met. The impact of modifying the turbine generators at the Jacksonville facility will not cause or contribute to a violation of any ambient air quality standards.

Table 1
 Allowable Emission Limits
 2500 KWH Turbine Generator

| Pollutant | Standard | Gas Turbine ¹ |
|-----------------|--|--|
| NOx | 0.0150 $\frac{14.4}{Y} + F$ ² | 170 PPM (gas); 91.5 TPY 220 PPM (No. 2 oil); 1.97 TPY |
| SO ₂ | 0.8% S by weight 0.015 by volume at 15% oxygen on a dry basis | 0.8% S by weight 0.015 by volume at 15% oxygen on a dry basis |
| PM | | 15% opacity |

¹ The turbine generator units will be operating mostly with natural gas. Diesel fuel No. 2 will be used for 168 hrs/yr for emergency back-up. This No. 2 fuel oil is the alternate fuel for the gas turbine. The NOx allowance for oil burning is 50 ppm.

² F=0, NOx emission allowance for fuel-bound nitrogen. Natural gas has virtually no fuel-bound nitrogen.

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GENERAL CONDITIONS:

- b. The permittee shall retain at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation), copies of all reports required by this permit, and records of all data used to complete the application for this permit. The time period of retention shall be at least three years from the date of the sample, measurement, report or application unless otherwise specified by Department rule.
- c. Records of monitoring information shall include:
- the date, exact place, and time of sampling or measurements;
 - the person responsible for performing the sampling or measurements;
 - the date(s) analyses were performed;
 - the person responsible for performing the analyses;
 - the analytical techniques or methods used; and
 - the results of such analyses.

15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be submitted or corrected promptly.

SPECIFIC CONDITIONS:

1. The maximum emission rates for the 38.8 MMBtu/hr turbine generator unit shall not exceed the limits specified by 40 CFR 60, Subpart GG, Standards of Performance for Stationary Gas Turbines. For natural gas fuel, these limits are:

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SPECIFIC CONDITIONS:

Nitrogen Oxides NSPS Standards = $0.0150 \frac{(14.4)}{Y} + F$
or
= 170 ppm NOx

Sulfur Dioxide NSPS Standard = 0.015% by volume at 15% oxygen
on a dry basis

Visible Emissions Not to exceed 15% opacity

No. 2 Fuel Oil Not to exceed 0.8% sulfur
content by weight

2. This unit shall be allowed to operate continuously (8760 hours per year). The gas turbine shall operate on natural gas at all times, except that No. 2 fuel oil, with a maximum sulfur content of 0.8 percent by weight, shall be allowed to be burned when natural gas is not available.

3. Maximum No. 2 fuel oil consumption in the turbine shall not exceed 277 gals/hr for up to 168 hrs/yr.

4. Before this construction permit expires, the 2500 KW gas turbine shall be tested for sulfur dioxide, visible emissions, and nitrogen oxides. Except as provided under 40 CFR 60.8(b), the performance tests shall be in accordance with the provisions of the following reference methods which are described in Appendix A of 40 CFR 60.

- a. Method 1. Sample and Velocity Traverses
- b. Method 2. Volumetric Flow Rate
- c. Method 3. Gas Analysis
- d. Compliance with the opacity limitation shall be determined by EPA Reference Method 9, Visual Determination of Opacity of Emission from Stationary Sources.
- e. Compliance with the sulfur dioxide emission limit shall be determined by EPA Reference Method 20 or by calculations based on fuel analysis (ASTM 1552) for sulfur content.
- f. Compliance with the allowable emissions limit for nitrogen oxides shall be determined by EPA Reference Method 20, Subpart GG, Section 60.335.

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SPECIFIC CONDITIONS:

Measured NOx emission at 15 percent oxygen will be adjusted to ISO ambient atmospheric conditions by the following correction formula:

$$\text{NOx} = (\text{NOx obs}) \left(\frac{P_{\text{Pref}}}{P_{\text{Obs}}} \right)^{0.5} e^{19(H_{\text{Obs}} - 0.00633)} \left(\frac{T_{\text{AMB}}}{288^{\circ}\text{K}} \right)^{1.53}$$

where:

NOx = Emissions of NOx at 15% oxygen and ISO standard ambient conditions.

NOx obs = Measured NOx emission at 15% oxygen, ppmv.

Pref = Reference combustor inlet absolute pressure at 101.3 kilopascals (1 atmosphere) ambient pressure.

Pobs = Measured combustor inlet absolute pressure at test ambient pressure.

Hobs = Specific humidity of ambient air at test.

e = Transcendental constant (2.718).

TAMB = Temperature of ambient air at test.

Test results will be the average of 3 valid runs. The BESD's office shall be notified 15 days in advance of the compliance test. The test will be conducted at 90-100% permitted capacity.

5. A continuous monitoring system shall be installed to monitor and record the fuel consumption and the ratio of water to fuel being fired in the turbine.

6. Sulfur and nitrogen content of the fuel being fired in the gas turbine shall be determined and recorded as specified in the NSPS for Gas Turbines, 40 CFR 60, Subpart GG, Section 60.334 except as provided in EPA's letter of April 7, 1987. The records of fuel oil usage will be kept by the permittee, available for regulatory agency's inspection for a two year period.

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SPECIFIC CONDITIONS:

7. The applicant shall comply with all requirements of 40 CFR 60, Subpart GG, Standards of Performance for Stationary Gas Turbines.

8. The construction shall reasonably conform to the plans and schedule submitted in the application. If the permittee is unable to complete construction on schedule, the BESD's office must be notified in writing 60 days prior to the expiration of the construction permit and submit a new schedule and request for an extension of the construction permit, (Rule 17-2, FAC).

9. To obtain a permit to operate, the permittee must demonstrate compliance with the conditions of the construction permit and submit a complete application for an operating permit, including the application fee, along with compliance test results and Certificate of Completion, to the BESD's office 90 days prior to the expiration date of the construction permit. The permittee may continue to operate in compliance with all terms of the construction permit until its expiration date. Operation beyond the construction permit expiration date requires a valid permit to operate, (Rules 17-2 and 17-4, FAC).

13. If the construction permit expires prior to the permittee requesting an extension or obtaining a permit to operate, then all activities at the project must cease and the permittee must apply for a new permit to construct which can take up to 90 days to process a complete application, (Rule 17-4, FAC).

14. Upon obtaining an operation permit, the permittee will be required to submit annual reports on the actual operation and emissions of the facility. Annual reports shall be sent to the Bio-Environmental Services Division (BESD) in Jacksonville.

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Issued this _____ day of _____, 1988

STATE OF FLORIDA DEPARTMENT OF
ENVIRONMENTAL REGULATION

Dale Twachtmann, Secretary

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