



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 2

290 BROADWAY

NEW YORK, NY 10007-1866

JAN 22 2004

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Ms. Kathleen Antoine
Environmental Director
HOVENSA, L.L.C.
1 Estate Hope
Christiansted, VI 00820-5652

Re: Prevention of Significant Deterioration of Air Quality (PSD)
Gas Turbine No. 10 Modification

Dear Ms. Antoine:


On April 7, 2003, the U.S. Environmental Protection Agency (EPA), Region II, received an application for the modification of the existing GT No. 10 PSD permit to allow for an increase in utilization of the combustion turbine during natural gas firing while decreasing the quantity of oil combusted in the unit. As a result of these changes, potential annual emissions for all pollutants decrease.

On December 2, 2003, EPA issued a preliminary determination, subject to public review, to approve the PSD permit modification. No comments were submitted to EPA during the 30-day public review period, which commenced upon publication of EPA's preliminary determination in the Virgin Islands Daily News on December 10, 2003, and expired on January 9, 2004. As such, no changes have been made from the draft PSD permit revision issued to HOVENSA on December 10, 2003, to the final permit revision that is being issued today.

The EPA concludes that this final permit modification meets all applicable requirements of the PSD regulations codified at 40 CFR §52.21, and the Clean Air Act (the Act). Accordingly, I hereby approve HOVENSA's modified PSD permit for the GT No. 10 Project. This letter and its attachments represent EPA's final permit decision, and is effective immediately. A project description is provided in Attachment I, and the permit conditions are delineated in Attachment II.

If you have any questions regarding this letter, please call Mr. Steven C. Riva, Chief, Permitting Section, Air Programs Branch, at (212) 637-4074.

Sincerely,



Walter Mugdan, Director
Division of Planning and Protection

Attachments

Internet Address (URL) • <http://www.epa.gov>

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Attachment IHOVENSA, L.L.C.
GT No. 10
Project DescriptionGeneral Project Description:

HOVENSA, L.L.C. (HOVENSA) operates an oil refinery on the south shore of St. Croix in the Virgin Islands. On March 22, 1993, HOVENSA (formerly HOVIC) received a PSD permit for the construction and operation of a General Electric (GE), Frame 5 combustion turbine (Model PG5371 (PA)), Gas Turbine No. 10 (GT No. 10) to provide electricity at its St. Croix refinery. GT No. 10 can combust both gaseous and liquid fuels to produce approximately 27 MW of peak power and 25 MW at base load. An unfired heat recovery steam generator (HRSG) produces steam from the waste heat. The original GT No. 10 project was subject to PSD for nitrogen oxides and carbon monoxide. To reduce emissions of NO_x, GT No. 10 is equipped with a steam injection system.

On April 7, 2003 HOVENSA submitted an application for two modification projects designed to increase the availability and reliability of power generation and two emission reduction programs to offset the increases from the modifications. The first project consists of modifying the PSD permit for GT No. 10 to allow for increased utilization while decreasing oil combustion. The second project involves the construction of a turbo expander within the exhaust stream of the FCCU to provide an additional power source to meet power needs while maintaining proper levels of "spinning reserve" so that if there is a sudden disruption in power supply from another unit, additional power will be available to continue operations. The projects, both combined and taken independently do not result in a significant net emissions increase for any pollutant. This action addresses the revisions to GT No. 10 and includes the necessary emission reductions from the No. 2 Vacuum Unit Heaters.

PSD-Affected Pollutants Emitted at the GT No. 10 Project:

GT No. 10 has as constituents in the combustion by-products, the PSD-affected pollutants listed below which are formed in the following ways:

Nitrogen Oxides (NO_x) - formed from the high-temperature oxidation of nitrogen contained in the combustion air (thermal NO_x) and from the oxidation of nitrogen that is bound in the fuel (fuel NO_x).

Carbon Monoxide (CO) - formed as a result of the incomplete combustion of the carbon contained in the fuel. Incomplete combustion can be caused mainly by fuel-rich conditions,

- Incorporating annual emission limits for NOx and CO;
- Revising the hourly PM-10 limit to reflect recent test results;
- Incorporating limits on the No. 2 Vacuum Unit heaters to make emission reductions associated with the reduction of oil firing in the heaters enforceable; and
- Updating the stack test method for PM-10 to include Method 202.

PUBLIC COMMENT/APPEAL PROCEDURES

No comments were submitted to EPA during the 30-day public review period, which commenced upon publication of EPA's preliminary determination in the Virgin Islands Daily News on December 10, 2003, and expired on January 9, 2004. As such, no changes have been made from the draft PSD permit revision issued to HOVENSA on December 10, 2003, to the final permit.

This determination is final Agency action under the Clean Air Act. Under Section 307 (b)(1) of the Act, judicial review of this final action is available only by the filing of a petition for review in the United States Court of Appeals for the appropriate circuit within 60 days from the date on which this final permit decision is published in the Federal Register. Under Section 307 (b)(2) of the Act, this final permit decision shall not be subject to later judicial review in civil or criminal proceedings for enforcement.

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PSD Permit Conditions

GT No. 10, as described in Attachment I, is subject to the following conditions:

I. Permit Expiration

This PSD Permit shall become invalid 1) if construction has not commenced (as defined in 40 CFR Part 52.21(b)(8)) within 18 months after the approval takes effect, 2) if construction is discontinued for a period of 18 months or more, or 3) if construction is not completed within a reasonable time.

II. Notification of Commencement of Construction and Startup

The Regional Administrator (RA) shall be notified in writing of the anticipated date of initial startup (as defined in 40 CFR Part 60.2) of each facility of the source not more than sixty (60) days nor less than thirty (30) days prior to such date. The RA shall be notified in writing of the actual date of commencement of construction and startup within fifteen (15) days after such date.

III. Facilities Operation

All equipment, facilities, and systems installed or used to achieve compliance with the terms and conditions of this PSD Permit shall at all times be maintained in good working order and be operated as efficiently as possible so as to minimize air pollutant emissions. The continuous emission monitoring systems required by this permit shall be on-line and in operation 95% of the time when GT No. 10 is operating.

IV. Malfunction

The Regional Administrator shall be notified in writing within ten (10) days following any failure of air pollution control equipment, process equipment, or of a process to operate in a normal manner which results in an increase in emissions above any allowable emission limit stated in Condition VIII of this Attachment II. This notification shall include: a description of the malfunctioning equipment or abnormal operation; the date of the initial failure; the period of time over which emissions were increased due to the failure; the cause of the failure; the estimated resultant emissions in excess of those allowed under Condition VIII of this Attachment II; and the methods utilized to restore normal operations. Compliance with this malfunction notification provision shall not excuse or otherwise constitute a defense to any violations of this permit or of any law or regulations which such malfunction may cause.

V. Right to Entry

The Regional Administrator and/or his authorized representatives, upon the presentation of credentials shall be permitted:

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1. to enter at any time upon the premises where the source is located or in which any records are required to be kept under the terms and conditions of this PSD Permit;
2. at reasonable times to have access to and copy any records required to be kept under the terms and conditions of this PSD Permit;
3. to inspect any equipment, operation, or method required in this PSD Permit; and
4. to sample emissions from the source.

VI. Transfer of Ownership

In the event of any changes in control or ownership of facilities to be constructed or modified, this PSD Permit shall be binding on all subsequent owners and operators. The applicant shall notify the succeeding owner and operator of the existence of this PSD Permit and its conditions by letter, a copy of which shall be forwarded to the Regional Administrator.

VII. Types of Fuels Allowed on GT No. 10

1. HOVENSA shall only combust the following fuels in GT No. 10:

a. **Gaseous Fuels**

- i) Refinery Grade Propane
- ii) Refinery Grade Butane

b. **Liquid Fuels**

- i) Distillate Fuel Oil ≤ 0.2 % sulfur by weight

- * 2. HOVENSA shall combust liquid fuels up to a maximum of 876 hours per year, as calculated on a 365-day rolling total basis.
 - a. For the purposes of this condition, when liquid and gaseous fuels are co-fired during the hour, the equivalent amount of time for liquid fuel consumption is taken as the ratio of the heat content of the liquid fuel to the heat content of the total fuel for that hour independent of the total load. For instance, if 70 MMBTUs

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of liquid fuel and 210 MMBTUs of gaseous fuel were used in an hour (at about 90% load), the time of liquid fuel usage would be $70/(70+210)=0.25$ hours.

VIII. Emission Limitations for GT No. 101. **Nitrogen Oxides (NO_x)**

- a. NO_x emissions, during gaseous and/or liquid fuel firing, shall not exceed 42 parts per million dry volume (ppm_{dv}) corrected to 15% oxygen, or 57.0 lbs/hour, whichever is more stringent.
- * b. Annual NO_x emissions shall not exceed 150.2 tons per year as calculated on a 365-day rolling basis.
- c. Except during startups and shutdowns, HOVENSA shall use steam injection at all times to control NO_x emissions. The optimum steam to fuel ratio will be established during the performance testing and will be incorporated in the VIDPNR operating permit.

2. **Carbon Monoxide (CO)**

- a. CO emissions, during gaseous fuel firing, shall not exceed 206.5 parts per million dry volume (ppm_{dv}) corrected to 15% oxygen, or 94.0 lbs/hour, whichever is more stringent.
- b. CO emissions, during liquid fuel firing, shall not exceed 242 parts per million dry volume (ppm_{dv}) corrected to 15% oxygen, or 111 lbs/hour, whichever is more stringent.
- * c. CO emissions shall not exceed 44.1 tons per year as calculated on a 365-day rolling basis.
- d. CO emissions, during combination fuel firing, shall not exceed the prorated gaseous and liquid fuel emissions as determined by the flow rate of each fuel type.
- e. GT No. 10 shall be operated, except during periods of startups and shutdowns, at loads greater than 50%.

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3. Particulate Matter Under 10 Microns (PM₁₀)

- a. Emissions of PM₁₀, during gaseous fuel firing, shall not exceed 2.5 lbs/hour.
- * b. Emissions of PM₁₀, during liquid fuel firing, shall not exceed 9.5 lbs/hour.
- c. PM₁₀ emissions, during combination fuel firing, shall not exceed the prorated gaseous and liquid fuel emissions as determined by the flow rate of each fuel type.
- d. Opacity of emissions shall not exceed 10 percent (six-minute average) except for one six-minute set per hour which shall not exceed 25 percent.

* IX. No. 2 Vacuum Unit Heaters (H-2101, H-2102)¹

- 1. HOVENSA shall only combust refinery fuel gas, propane, butane and/or No. 6 fuel oil in No. 2 Vacuum Unit Heaters H-2101 and H-2102.
- 2. HOVENSA shall limit its combustion of No. 6 fuel oil in heaters H-2101 and H-2102 to a maximum of 260 barrels per day total.
- 3. The sulfur content of No. 6 fuel oil burned in the heater shall not exceed 1.0% by weight.
- 4. Except as modified by this permit, the provisions of the 1997 Fluid Catalytic Cracking Unit PSD permit shall continue to apply to the No. 2 Vacuum Unit.

X. Continuous Emission Monitoring (CEM) Requirements

- 1. Prior to the date of startup and thereafter, HOVENSA shall install, calibrate, maintain, and operate the following continuous monitoring systems in the GT No. 10 exhaust stack:
 - a. Continuous emission monitoring (CEM) systems to measure stack gas NO_x (as measured NO₂) and opacity concentrations. The systems shall meet EPA monitoring performance specifications (40 CFR Part 60.13 and

¹Not subject to PSD; included to make reductions used for netting enforceable.

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40 CFR Part 60, Appendix B, Performance Specifications 1, 2, and 3, and Appendix F).

- b. A continuous monitoring system to measure stack gas volumetric flow rates. The system shall meet EPA monitoring performance specifications (40 CFR Part 52, Appendix E).
 - c. A CEM system to measure CO and a continuous monitoring system to measure oxygen. These systems, at a minimum, shall meet EPA monitoring performance specifications of 40 CFR Part 60, Appendix B, Performance Specifications 3 and 4, and 40 CFR Part 60, Appendix F.
2. Not less than 90 days prior to the date of startup of the GT No. 10, HOVENSA submit to the EPA a Quality Assurance Project Plan for the certification of the CEM systems. CEM performance testing may not begin until the Quality Assurance Project Plan has been approved by EPA.
 3. HOVENSA shall notify EPA 15 days in advance of the date upon which demonstration of the CEM system performance will commence (40 CFR Part 60.13(c)). This date shall be no later than sixty days after the facility's GT No. 10 startup.
 4. HOVENSA shall submit a written report to EPA of the results of all monitor performance specification tests conducted on the monitoring system(s) within 45 days of the completion of the tests. The continuous emission monitors must meet all the requirements of the applicable performance specification test in order for the monitors to be certified.
 5. HOVENSA shall submit a written report of all excess emissions to EPA for every calendar quarter. All quarterly reports shall be postmarked by the 30th day following the end of each quarter and shall include the information specified below:
 - a. The magnitude of excess emissions computed in accordance with 40 CFR Part 60.13(h), any conversion factor(s) used, and the date and time of commencement and completion of each time period of excess emissions.
 - b. Specific identification of each period of excess emissions that occurs during startups, shutdowns, and malfunctions for the GT No. 10 unit. The nature and cause of any malfunction (if known) and the corrective action taken or preventive measures adopted shall also be reported.

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- c. The date and time identifying each period during which the continuous monitoring system was inoperative except for zero and span checks and the nature of the system repairs or adjustments.
 - d. When no excess emissions have occurred or the CEM system has not been inoperative, repaired, or adjusted, such information shall be stated in the report.
 - e. Results of quarterly monitor performance audits, as required in 40 CFR Part 60, Appendix F.
 - f. Excess emissions shall be defined as:
 - i) any one-hour period during which the average emission of NO_x, as measured by the CEM system, exceeds the corresponding mass or concentration emission limit set for NO_x in Condition VIII.1 above.
 - ii) any one-hour period during which the average emission of CO, as measured by the CEM system, exceeds the corresponding mass or concentration emission limit set for CO in Condition VIII.2 above.
 - iii) any 6-minute period during which the average opacity, as measured by the CEM system, exceeds 10% opacity, except for one 25% opacity per each one-hour period.
 - * iv) any rolling 365-day period during which total emissions of NO_x or CO, as measured by the CEM system exceeds the corresponding annual emission limits set in Conditions VIII.1.b. and VIII.2.c., respectively.
 - g. For the purposes of this permit, excess emissions indicated by the CEM systems, except during startup or shutdown, shall be considered violations of the applicable emission limits.
6. HOVENSA shall maintain a file of all measurements, including CEM system performance evaluations; all CEM systems or monitoring device calibration checks; adjustments and maintenance performed on these systems or devices; and all other information required by 40 CFR Part 60 recorded in a permanent form suitable for inspection. The file shall be retained for at least five years following the date of such measurement, maintenance, reports, and records.

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7. Emissions in excess of the applicable emission limit listed under Condition VIII. of this permit, during periods of startup and shutdown, shall not be considered a violation of the applicable emission limit.

8. For the purposes of this permit, startup and shutdown shall be defined as:

* Startup - The establishment of a 12.5 MW load to the turbine and operation of the steam injection system. The startup process shall not exceed one hour.

Shutdown - The removal of electrical load to the turbine. The shutdown process shall not exceed one hour.

9. HOVENSA shall continuously calculate the NO_x and CO mass emission rates for GT No. 10. HOVENSA shall submit to EPA for approval the proposed methodology for this calculation at the same time the Quality Assurance Project Plan required by Condition X.2 is submitted. The calculated mass emission rates shall be used to determine compliance with the NO_x and CO mass emission rate limits contained in Condition VIII.

10. At all times, including periods of startup, shutdown, and malfunction, HOVENSA shall, to the extent practicable, maintain and operate the GT No. 10 in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to EPA and/or VIDPNR which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the facility.

11. In each quarterly report, HOVENSA shall maintain 95% quality data availability for the opacity monitor and all gaseous monitors.

XI. Performance Test Requirements

1. Within 60 days after achieving the maximum production rate of GT No. 10, but no later than 180 days after initial startup as defined in 40 CFR Part 60.2, and at such other times as specified by the EPA, HOVENSA shall conduct performance tests for SO₂, NO_x, PM₁₀, CO, and opacity. All performance tests shall be conducted at the maximum operating capacity of the unit(s) being tested, except for CO, and/or other loads specified by EPA.

2. At least 60 days prior to actual testing, HOVENSA shall submit to the EPA a Quality Assurance Project Plan detailing methods and procedures to be used

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during the performance stack testing. A Quality Assurance Project Plan that does not have EPA approval may be grounds to invalidate any test and require a re-test.

3. If a performance test is required by EPA or VIDPNR, HOVENSA shall use the following test methods, or a test method which would be applicable at the time of the test and detailed in a test protocol approved by EPA:
 - a. Performance tests to determine the stack gas velocity, sample area, volumetric flowrate, molecular composition, excess air of flue gases, and moisture content of flue gas shall be conducted using 40 CFR Part 60, Appendix A, Methods 1, 2, 3, and 4.
 - b. Performance tests for the emissions of SO₂ shall be conducted using 40 CFR Part 60, Appendix A, Method 20.
 - c. Performance tests for the emissions of NO_x shall be conducted using 40 CFR Part 60, Appendix A, Method 20.
 - * d. Performance tests for the emissions of PM₁₀ shall be conducted using 40 CFR Part 51, Appendix M, Method 201 (exhaust gas recycle) and Method 202 or Method 201A (constant flow rate) and Method 202.
 - e. Performance tests for the emissions of CO shall be conducted using 40 CFR Part 60, Appendix A, Method 10.
 - f. Performance tests for the visual determination of the opacity of emissions from the stack shall be conducted using 40 CFR Part 60, Appendix A, Method 9 and the procedures stated in 40 CFR Part 60.11.
4. Test results indicating that emissions are below the limits of detection shall be deemed to be in compliance.
5. Additional performance tests may be required at the discretion of the EPA or VIDPNR for any or all of the above pollutants.
6. For performance test purposes, sampling ports, platforms and access shall be provided by HOVENSA on the combustion exhaust system in accordance with 40 CFR Part 60.8(e).
7. Results of emission testing must be submitted to EPA within 60 days after completion of performance tests.

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8. Operations during periods of startup, shutdown, and malfunction shall not constitute representative conditions for the purpose of a performance test.

XII. Other Requirements

1. The maximum heat input of GT No. 10 shall not exceed 325 MMBTU/hour.
2. GT No. 10 shall not be operated below 50% load (12.5 MW), except during startups and shutdowns.
3. HOVENSA shall monitor and record the fuel consumption and the ratio of the steam to fuel being fired in GT No. 10.
- * 4. For fuels that are intermediately stored in tanks, HOVENSA shall determine the sulfur content, through laboratory analysis, each time there is a transfer of fuel to the storage tanks.
- * 5. HOVENSA shall determine and record daily the sulfur content of the liquid fuels that are directly transferred from a process unit.
6. HOVENSA shall monitor flows for all fuels fired by GT No. 10.
7. HOVENSA shall determine the total heat content (higher heating value in BTU) of each fuel fired during each hour shall be calculated from the total fuel flow and the heating value (in BTU per cubic foot or per gallon) of that fuel. The fraction of an hour of use of each fuel shall be calculated as the ratio of the heating value of that fuel to the total heating value of all fuels used during the hour.
8. GT No. 10 shall comply with the requirements codified in Standards of Performance for Stationary Gas Turbines (40 CFR Part 60, Subpart GG).
9. HOVENSA shall meet all other applicable federal, state and local requirements, including those contained in the Virgin Islands State Implementation Plan (VISIP).

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10. All reports required by this permit shall be submitted to:

Chief, Air Compliance Branch
Division of Enforcement and Compliance Assistance
U.S. Environmental Protection Agency
Region 2
290 Broadway - 21st Floor
New York, New York 10007-1866

Copies of the reports shall also be submitted to:

Region 2 CEM Coordinator
U.S. Environmental Protection Agency
Region 2
Air and Water QA Team
Monitoring and Assessment Branch
2890 Woodbridge Avenue - MS-102
Edison, New Jersey 08837-3679

Director, Division of Environmental Protection
Virgin Islands Department of Planning and Natural Resources
45 Mars Hill
Frederiksted, VI 00840-4744

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